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θ–government, Thematic Government and Extraction Asymmetries in Zero Derivation

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Previous research in the area of complex verb has focussed on causatives, incorporation and idiom formation. The present paper extends the discussion on derived verbs of the type enthrone NP, bottle NP and broaden NP, where the suffixal head is a functional verbal Root = V^0, and V projection is formed by Zero Derivation (ZD) conceived as head movement ($\alpha = N^0, A^0, V^0, P^0$) which applies at Root-structure and derives D-structure. ZD affects only – but not all – arguments. The asymmetry is explained by restricting the notion thematic role as opposed to θ-role. It is proposed that ZD and other rules of the Root Component follow a Thematic ECP, which applies at D-structure, whereby non-pronominal empty categories must be thematically governed. This properly excludes subjects of broadly defined – small clause – type structures, which – we claim – are universally non-incorporable.

Key words and Phrases: complex verb, language universals, incorporation, zero derivation, head movement, move-α, lexicon, Root-structure, Root Component Rule, thematic roles, theta-roles, small clause, word formation.
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CONTENTS

0.0 INTRODUCTION

Zero derivation or conversion is one of the most productive word formation processes of English. Due to this process the English lexicon contains numerous multicategorial word entries such as water, wet, blind, mother, and thousands of others. The theoretical discussion of zero derivation focussed primarily on one question: is it a special kind of affixation, which would derive the verbal usage of water by adding a zero suffix to the nominal base, or is it a particular property of the English lexicon that it contains underived, multicategorial entries for some roots. If the theory presented in this study is to be placed in the morphological tradition it should be classified as the zero affix theory of the process and thus the term Zero Derivation is used, rather than conversion. This term is here applied to all processes that form verbs by suffixation and the zero affixes are considered heads of phrases, extending the ideas of the other X-bar morphologists (Williams 1981).

The paper proposes, however, a novel, syntactic analysis of Zero Derivation, based on the previous work of the author, cf. Walinska de Hackbeil (1985, 1986). On this analysis Zero Derivation is an operation on the entire argument structure headed by the zero head. In section 2 arguments are presented that Zero Derivation is in fact a local move α, which extracts a category X = N, V, A, P from a syntactic argument position and adjoins X to the left of the zero head. The moved category and the zero head from together a word projection, cf. $[[\text{water}]_{N_i^0}\ [\varnothing]\ V^0]_V \ldots e_i \ldots$

The paper focuses on the semantic properties of arguments that may be affected by Zero Derivation. It is shown that Zero Derivation may not move non-arguments. Interestingly, however, not all types of thematic arguments may be moved, but only those which are in a core lexical relation with the verbal head. For instance, in causative argument structures such as to $[[[\text{orphan}]_{N_i^0}\ [\varnothing]\ V^0]_V$ the baby $e_i\ ]\ V$, where the zero head has all the properties of the causative verb make (the whole structure means 'to make the baby an orphan'), only the predicate of the direct object may be moved, not the direct object itself.

Various authors have observed that in the causative argument structures the causative head is in the complex verb relation with the predicate. We look into this relation from the

perspective of morphology and word formation. Our goal is to formulate a set of possibly universal principles that restrict argument linking within verbal word structures.

In order to achieve this as well as to explain the contrasts in the extraction of arguments by Zero Derivation, section 1 of the paper outlines a theory of semantic functions of arguments, where thematic roles are discerned from θ–roles. The explanation of the contrasts in argument extraction is based on distinguishing two ways of the formal assignment of thematic roles to argument positions: lexical and structural. For instance, in the causative structure to orphan the baby, the predicate role of orphan is assigned lexically by the zero head, while the role of the direct object is assigned structurally by the predicate argument. It is then proposed that only those arguments which are assigned their roles lexically may be moved by Zero Derivation.

The last section of the paper aims at extending these thematic restrictions on other rules akin to Zero Derivation, such as Dative, Particle Movement, or Ergativization. We propose that the English grammar contains a particular subset of movement rules, which are called here Root Component Rules. These rules, which apply prior to D-structure, may all be constrained within the thematic theory proposed in the first section of the paper.

1.0 THREE STRATA OF SEMANTIC ROLES

1.1 Root-structure and Root Component rules

It is a standard assumption that theta roles, i.e., semantic categories such as Agent, Patient or Goal unmarkedly correspond to the D-structure categories of grammatical relations such as Subject, Object and Indirect Object. In this study I explore the idea, present in Jackendoff (1972) and taken up by Culicover and Wilkins (1984) that the standard set of theta roles is not homogeneous, but comprises several subtypes, to which I will refer as strata of semantic roles. I will use the term semantic role (of an argument) as a broad term that encompasses all role types. Semantic roles fall into three classes, each associated with a particular level of syntactic representation:

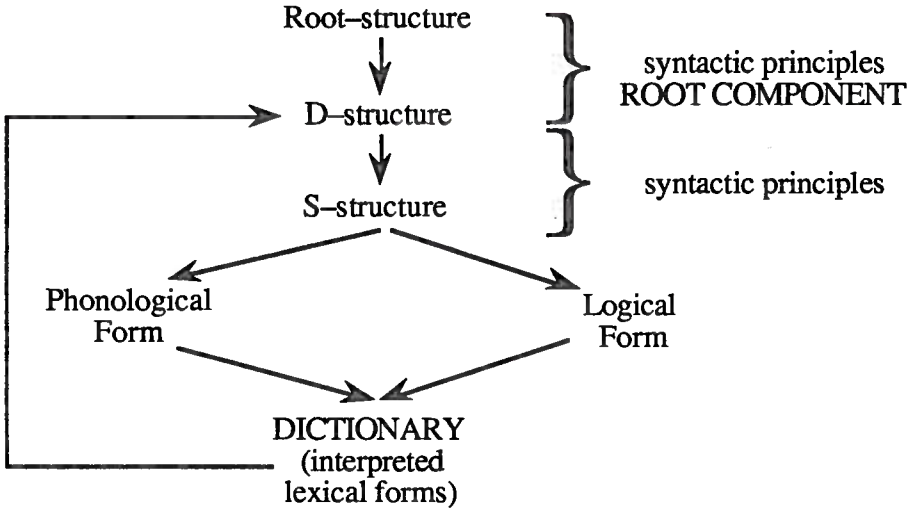
(1) Thematic roles: THEME, GOAL, LOCATION, CAUSE, SUBJECT, PREDICATE, INALIENABLE POSSESSOR (INAL POS), INHERENT LOCATION (INH LOC)

(2) θ–roles: AGENT, PATIENT

(3) Pragmatic roles: VOLITIONAL AGENT (V-AGENT), AFFECTED OBJECT (AF OBJECT)

I assume the grammatical system of the Government and Binding Theory of Chomsky (1981), with two revisions. D-structure is standard, i.e., the level where GRs are defined and Θ–roles assigned. However, thematic roles may only be assigned by verbal Roots at Root Structure, cf. (4).[1]

(4)



D–structure is fed by the rules of the Root Component (cf. Dative, Particle Movement and Zero Derivation) or by the Dictionary in the sense of Halle, which stores idiosyncratic forms, including latinate verbs.[2] Root Component rules are the only rules in the system that may crucially refer to thematic categories, and must do so.

1.2 Thematic roles

Thematic roles are centered around Guber's Theme, defined in (5):

(5) Theme: the object located, moving or possessed

Thematic roles are restricted to argument structures headed by verbal Roots, such as those in (6).

(6) fall, run, stay, lay…

All verbal Roots, V^0, carry an abstract verbal operator, which I call a γ–verb; this operator is semantically associated with the meaning of directional, locational and causative verbs. γ–verbs may be realized phonologically as the grammatical verbs of Emonds (1985, ch.4) listed in (7), or as features on lexical Roots and verbal affixes, as in (8):

(7) be, go, give, take, make, get, put

(8) BE, GO, GIVE, TAKE, MAKE, GET, PUT

In bar notation, γ–verbs are associated with the Root projection, i.e., V^0, because V^0 is the projection of verbal affixal heads, verbal Roots and grammatical verbs. If γ–verbs are designated representatives of a category in the sense of Chomsky (1965, ch. 3), then we should expect their non-lexical realization as affixes, including Ø-affix. I propose that γ–verbs carry thematic (as opposed to θ–) grids, and assign thematic roles directly and indirectly.[4] This is a direct extension of Jackendoff's theory of semantic roles, aptly characterized by Levin (1985) as predicate oriented. Independent evidence for the existence of γ–verbs is provided by the semantics of verbs that have γ–verbs in their entries; a γ–verb is the "semantic spelling" of affixal verbal heads, as shown in (9) and (10) for the verbs imprison and enslave.

(9) im prison [Ø]$_{V^0}$ him
GOAL PUT THEME = 'put him in prison'

(10) en slave [Ø]$_{V^0}$ him
PREDICATE MAKE SUBJECT = 'make him into a slave'

The lexical semantics of derived verbs is the thematic semantics, and the γ–verbs play a crucial role both in the assignment of thematic roles to word internal and word external arguments, as well as in the semantic interpretation of those verbs.[3]

That thematic roles are not associated with GR positions is illustrated in (11), where Theme occurs as a subject, direct object and a prepositional object.

(11) a. John fell

b. They felled a tree

c. They loaded the wagon with hay

Since thematic role assignment cannot be based on GRs, the latter being D-structure categories, we must find other ways of defining this type of assignment. I propose that thematic roles may be assigned either by the verb, i.e., lexically, or by predicates, i.e., structurally. Both are shown in (12) for transitive verbs:

(12) a. Lexical:

put	it	in the basket
V^0	NP_1	P NP_2
	THEME	GOAL

b. Structural:

make	him	happy
V^0	NP	XP
	SUBJECT	PREDICATE

In (12a), both NPs are assigned roles by V^0, NP_1 directly and NP_2 indirectly through P.[4] In (12b), V^0 and XP are in the complex verb relation (Chomsky 1986). I propose that in such a relation only the XP has a lexical role, while the NP receives its role structurally from the XP. The assigner and assignee of the structural role must be, respectively, in the relation of predicate and subject, where subject is the closest NP that c-commands, precedes and saturates the predicate.[5] Only arguments bearing lexical roles will be thematically coindexed with the verb.

I has been observed by various authors (Zagona 1982, Williams 1983, Chomsky 1986, Emonds 1985, Rapoport 1985) that the direct object in the complex verb structures is not lexically related to the verb. Emonds turns this observation into a principle of Anti-transitivity of Theta Role Assignment (ATRA), whereby if an argument A of a verb assigns a role to an Argument B, B may not be assigned a role by the verb. Emonds' ATRA formally restricts thematic coindexation in complex verb structures. This coindexation is shown for three types of such structures: causative, dative and load-type verbs.[6]

(13)

This gesture will make	them	happy
	<k> $SUBJECT_1$	$PREDICATE_{k,1}$

(14)

We gave	$Mary_i$	a	book	$[e]_{NPi}$
<m,k>	INAL POS_1	$THEME_{k,1}$		$GOAL_m$
	(GOAL)			

(15) They loaded the truck with bananas

<m,k> INH LOC_1 $THEME_{k,1}$

(LOCATION)

In (13) – (15), k and m indexation is lexical, and l indexation is structural. The m index in (14) is for GOAL, in (15) for LOCATION.[7] The lexical indexation expresses the semantic–thematic association between an argument position and the verb. The lexical indexation is independent from the conditions on assignment of roles.

GOAL in (14) is thematically associated with the verb, but this role is not assigned due to the lack of a P assigner. On the other hand, THEME in (14) is both associated with the verb and assigned (directly) by the verb. I assume that all maximal arguments must have their roles assigned: either directly by V, indirectly by P, or structurally. This induces Dative Movement of GOAL NP in (14). I treat INAL POS and INH LOC as positional variants of GOAL and LOCATION, respectively: GOAL/LOCATION become INAL POS/INH LOC in a position with a structural index. Structural indexing, i.e. assignment of roles under predication conditions, may be seen as a dissociation of an argument position from the thematic liaison with the verb. This dissociation may be formally expressed as a takeover by the structural index and erasure of the lexical index of the argument which receives the structural role. Thus in (14) GOAL in the empty position retains its lexical coindexing and association with the verb. But in the direct object position it loses m coindexation and becomes INAL POS. Similarly, LOCATION in (15) loses its lexical index and becomes INH LOC. I indicate both dissociated roles in parentheses. In section 2 I present evidence that the distinctions in formal coindexation may explain certain extraction asymmetries in Zero Derivation.

1.3 θ–roles

Both theta roles and pragmatic roles are correlated with particular GRs: AGENT/VOLITIONAL AGENT is assigned to the subject and PATIENT/AFFECTED OBJECT is assigned to the direct object. θ–roles PATIENT and AGENT are coextensive with and

reducible to GRs: PATIENT is the "semantic content" of the direct object, AGENT the "semantic" content of the subject. Unsurprisingly, it has been explicitly argued that θ–roles are not categories of grammar separate from GRs (Williams 1984). In my opinion, this is true only of θ–roles but not of thematic or pragmatic roles.

My main argument against PATIENT/AGENT being true semantic categories is based on the widely observed fact that no coherent semantic definition of these concepts is possible. The direct object position may be semantically anything but an AGENT since AGENTS are assigned only to subjects.

1.4 Pragmatic roles

Although the roles of VOLITIONAL AGENT and AFFECTED OBJECT are assigned to GR positions, they are not reducible to them. Not all subjects are VOLITIONAL AGENTS and not all objects are AFFECTED OBJECTS. Unlike thematic roles, pragmatic roles are not predicate oriented, and as such they may not be a lexical property of a verb. By predicate orientation of a semantic stratum, I mean that each Root is associated with a grid whose content is set for a particular verb (cf. Levin 1985). The lexical entry of fall will always contain the grid in (16).

(16) fall, V^0, < THEME, GOAL >

Thus the predicate fall delimits the content of its thematic grid, and the grid is predicate oriented. It is a matter of independent principles whether all arguments of fall will be syntactically present, empty or null. But as (17) – (19) below clearly show, the pragmatic roles are not uniquely associated with a particular predicate. For the same verb (cf. fall or swim), its subject may be a V–AGENT, or not, depending on the intrinsic features of the noun which heads the subject NP. Consider (17) – (19):

(17)	a.	An ashtray fell on the floor	
	Root-str	THEME	
	D-str	– – –	
	b.	John	fell down (to avoid a collision)
	Root-str	THEME	

	D-str	(V–AGENT)		
(18)		John	swam	the river
	Root-str	THEME		LOCATION
	D-str	V–AGENT		
(19)		John	swam	the horses through the river
	Root-str	CAUSOR		THEME
	D-str	V–AGENT		AF OBJECT

In (17b), the subject may only be a VOLITIONAL AGENT under one interpretation. The direct object in (18) is not an AFFECTED OBJECT. The two pragmatic roles may occur independently of each other. VOLITIONAL AGENTS, for example, may occur with intransitive verbs, c.f. (17b). The sentences below further illustrate this independence:

(20)	John	danced the polka (to impress Sue)
	V–AGENT	– – –
(21)	John	kept looking at Mary (to annoy Sue)
	V–AGENT	– – –
(22)	Her smile enchanted	John
	– – –	Af OBJECT

I do not intend to define the pragmatic roles conclusively. The traditional tests for agentivity (purposives, pseudo-clefts, manner adverbials) provide clear criteria for the subject role. AFFECTED OBJECT will remain for now an intuitive category.

1.5 Consequences

There are two direct consequences of the stratification of semantic roles for the current syntactic theory. The first is a redefinition of the restriction known as the "theta criterion," which allows only one semantic role to be assigned to an argument. Jackendoff (1972), Culicover and Wilkins (1984) and now also Chomsky (1986) permit multiple assignments of roles.

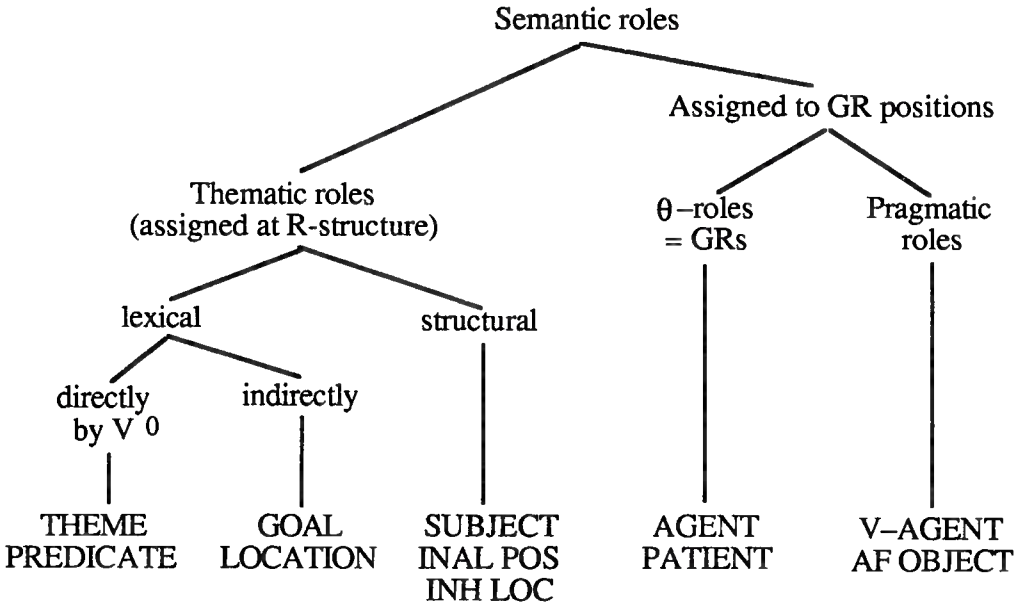
This weaker theory may be supported by a restriction that sets of roles assigned to one argument position contain no two roles that are homostratal (cf. Culicover and Wilkins 1984). It will thus become incumbent on the theory to precisely define the thematic strata, a welcome result. I have shown in section 1.2 that Emonds' ATRA corroborates the restriction on homostratal roles.

A more fundamental consequence is that it is possible to distinguish verbal Roots as a syntactically and thematically special subclass of verbs. This class is basic, unmarked, regular, native and universal, i.e., present in every language, while words that are inserted at D-structure are either borrowed or idiosyncratic. Their presence in the system is due to borrowing or language particular word-forming rules. Their categorial requirements cannot be derived from their thematic structure since they do not have one; thus they must carry idiosyncratic subcategorization frames.

The endeavor to discern classes of roles is not new. All predicate oriented theories of semantic roles focus on the thematic roles. Culicover and Wilkins (1984) distinguish between extensional and intensional roles, which are akin to our thematic and theta roles respectively. The novelty of my proposal lies in the explicit distinction of true semantic roles from GRs, as well as in the correlation of roles with distinct syntactic levels of representation: Root-structure and D-structure.

The schema (23) shows all types of roles discussed in this section:

(23)



In the rest of the paper, I will show that the distinction between thematic roles and θ–roles is paralleled by the distinction between thematic government, which includes all lexically associated

roles, and θ–government, a notion which has been introduced by Chomsky (1986) to delimit the core governmental relation. I argue that this narrower notion of thematic government is needed to explain extraction asymmetries among arguments in zero-headed verbs.

2.0 ZERO DERIVATION

2.1 Formal Properties of Zero Derivation

Zero Derivation (ZD) is a local movement rule operating in zero-headed Root structures, which adjoins a non-maximal projection to the left of the zero head, as in (24a) and (24b) where it derives the verb to imprison:

(24) a. to $_{V'}$ [[∅] $_{V_0}$ [the priests] $_{NP}$ [in prison] $_{P}$]

b. to $_{V'}$ [[[imprison] $_{P_i}$ [Ø] $_{V_0}$]$_{V}$ [the priests]$_{NP}$ [e]$_i$]

ZD is a wh-like movement in that it is a leftward adjunction of $\alpha = X$, $X = \{N, V, A, P\}$, where V is intransitive (cf. (25)). It is a movement from a case-marked position to a non-case-marked, non-argument position. Multiple ZD movements are not possible.[8]

(25) a. to [skin] $_{N_i^0}$ [Ø]$_{V^0}$ a rabbit [e]$_i$

b. to [wet] $_{A_i^0}$ [Ø]$_{V^0}$ the lenses [e]$_i$

c. to [march] $_{V_i^0}$ [Ø]$_{V^0}$ the soldiers [e]$_i$ through swamps

d. to [up] $_{P_i^0}$ [Ø]$_{V^0}$ your people skills [e]$_i$

e. *to [eat] $_{V_i^0}$ [Ø]$_{V^0}$ a child [e]$_i$ spinach
(= to make a child eat spinach)

The structure in (24a) is a Root-structure. (24b) and (25) are D-structures. The order of elements at Root-structure, cf. (24a), is determined by the direction of assignment of thematic roles and by the Head First Principle for English, which in the current model is a Root-structure restriction. This principle requires that all complements (maximal or not) follow the head. Since all the phrases moved in (24b) and (25) are complements of the zero head, the Head First Principle clearly does not apply at D-structure. The Head Placement Principle (HPP) of Emonds (1985), which applies at D-structure in English, requires that all and only maximal projections

follow the head. Thus the HPP will first exert the movements in (24) and (25) and second insure that the movement is to the left of the head, not to its right. By the Head Movement Constraint (Travis 1984), X may only move to a head Y which properly governs X.

Whether a movement of X leaves a trace is still an open matter, as the discussion of properties of traces has been concerned only with traces left by maximal projections. Here I will examine the possibility that ZD leaves a trace, and show that this trace is subject to principles which mirror restrictions on empty maximal categories, in particular the Empty Category Principle of Chomsky (1981, 1986) and the Argument Domain of Lobeck (1984).

Studies of Zero Derivation (Clark and Clark 1979, Aronoff 1980) have emphasized the vastness of the semantic patterns in zero-derived verbs. Yet (nearly) all these verbs succumb to a parsimonious number of argument structures restricted to the ones headed by (nonphonological) γ–verbs discussed in section 1.2. These patterns are briefly described in the next section.

2.2 The thematic semantics of Zero Derivation

This section of the paper will briefly characterize types of argument structures that may be affected by ZD. Under the proposed theory of ZD, no special rules of lexical semantics for this construction are needed; the semantics of derived verbs follows straightforwardly from their syntactic analysis. In section 1.2 I have introduced the distinction between two major types of argument structures: non-predicative, where roles are assigned lexically, and predicative, where the primary role of V^0 is as an argument with predicative properties (THEME or PREDICATE), which assigns a role structurally to the other argument. Both types of argument structures are represented by zero-headed words.

2.2.1 Non-predicative structures

Non-predicative structures are headed by GO, for intransitive verbs, and PUT, for transitive verbs. GO and PUT both assign Theme as their primary role. ZD in intransitives is extremely rare and restricted in English to weather verbs:

(26) a. it_i $rain_i$ V^0 s

b. it_i $snow_i$ V^0 s

c. it_i $hail_i$ V^0 s

Thematically, weather phrases such as rain falls belong in the class of motion verbs. The Root-structure for motion verbs is given in (27).

(27)

NP	GO	P^0	NP
THEME	V^0	P^0	GOAL

A movement analysis of weather verbs puts them in the same general category as Extraposition and There-insertion, explaining the presence of the expletive. The moved N^0, for example rain, bears the role of THEME, assigned directly to the subject position. I thus propose that there is a class of verbs — motion verbs and locatives — where the subject role is assigned directly by a verb. This indicates a core thematic relation between the subject of a motion verb and the verb itself: it is just in this case that subjects are governed by the verb (cf. 2.4).

Transitive non-predicative structures, on the other hand, form in English a numerical majority. In Root-structures such as (28) both arguments may prepose:

(28)

PUT	NP	in	NP
V^0	THEME	P^0	GOAL

The two cases are illustrated in (29) for THEME, and in (30) – (31) for GOAL.

(29)

	THEME	PUT	GOAL	
a.	to man_i	V^0	e_i	the ship
b.	to $carpet_i$	V^0	e_i	the floor
c.	to $roof_i$	V^0	e_i	the house

(30)

	GOAL	PUT	THEME	
a.	to $ground_i$	V^0	the planes	e_i
b.	to $bottle_i$	V^0	the wine	e_i
c.	to $trap_i$	V^0	the gopher	e_i

(31)

	GOAL	PUT	THEME	
a.	to $encage_i$	V^0	the panther	e_i
b.	to $imprison_i$	V^0	him	e_i

Following Emonds (1985), I propose that P^0 surfaces syntactically where it is a case assigner. In the en– prefixed verbs in (30), where en– = P^0, it is in fact superfluous, as I assume

that case is assigned only to maximal NPs. Historical facts corroborate this: en– prefixed verbs were once extremely productive. Now we observe doubles, as in the case of (en)trap. In the position adjacent to the verb, P is ungrammatical in the object position:

(32) to bomb$_i$ V^0 e_i (*on) the village
(= to drop bombs on the village)

This "obligatory formation of the direct object" may be explained in terms of Stowell's Case Conflict, which considers the transitive verb to be an obligatory, or preferred, Case assigner.

2.2.2 Predicative structures

Predicative structures fall into the general class of broadly conceived small clause structures, where the primary role of the verb is as an element which functions as a predicate. All three structures described in section 1.3, i.e., causative, dative and load-type structures, may also be zero-headed. Since all categories may be predicates, we expect them all in the prehead position of causative structures. This prediction is borne out:

(33)	PREDICATE	MAKE	SUBJECT		
a.	to walk $_{V^0_i}$	V^0	a dog	e_i	to the vet
b.	to dim $_{A^0_i}$	V^0	the light	e_i	
c.	to ruin $_{N^0_i}$	V^0	the table	e_i	
d.	to embitter $_{P_i}$	V^0	the man	e_i	

All verbs in (33) have the semantics of the causative construction, cf. to embitter V^0 the man = to MAKE the man bitter. I argue in Walinska de Hackbeil (1986) that the prefix en– is a copula P here, in contrast with the directional P in imprison V^0. Dative structures may be headed by GIVE, as in (34), and TAKE, as in (35):

(34)	THEME	GIVE	INAL POS		
a.	to name$_i$	V^0	the baby	e_i	John
b.	to label$_i$	V^0	it	e_i	"wicked"
c.	to title$_i$	V^0	it	e_i	"The story of O"
d.	to sanction$_i$	V^0	such an adjunction	e_i	
e.	to length$_i$en	V^0	the story	e_i	

(35)	THEME	TAKE	INAL POS	
a.	to skin$_i$	V^0	the rabbit	e_i
b.	to bone$_i$	V^0	the chicken	e_i
c.	to gut$_i$	V^0	the pig	e_i
d.	to husk$_i$	V^0	the corn	e_i
e.	to scale$_i$	V^0	the fish	e_i

To name V^0 the baby John means "to GIVE the baby the name John," and to skin V^0a rabbit means "to TAKE the skin off a rabbit." Thus again the lexical semantics in (34) – (35) is the thematic semantics.

Zero headed load-type verbs are not found in English, but they are common in Polish. In Polish these zero-derived structures always contain a perfective P^0 prefix. English lacks this SP(V) position, which possibly explains the contrast. I will discuss these structures in section 2.4.

2.3 Argument Domain and θ–government

An Argument Domain restriction has been proposed by Lobeck (1984). In accordance with current theories, Lobeck defines argument in terms of θ–roles:

(36) Argument Domain (Lobeck 1984): Y is in the argument domain of X if Y receives a θ–role from X.

Lobeck has proposed that all local rules in the sense of Emonds are restricted to the argument domain. Since I analyze ZD as such a rule, it is to be expected that ZD, too, will follow Lobeck's restriction. This prediction is borne out: non-arguments may not be preposed by ZD. Contrasts are shown in (37) and (38) for non-argument locations and adjectival adjuncts.

(37) a. Back in the cell, he was put in chains
b. Back in the cell, he was enchain$_i$ed e_i
c. The prisoner had his dinner in chains
d. *The prisoner enchain$_i$ed his dinner e_i

(38) a. She made the actor bitter
b. She embitter$_i$ed the actor e_i
c. She made the actor, bitter
d. *She embitter$_i$ed the actor, e_i

In (37a) and (38a), in chains and bitter are arguments bearing the roles Goal and Predicate, respectively. Not so in (37c) and (38c), where they are, respectively, a non-argument location

and an adjectival adjunct. Movement from the latter positions results in the ungrammatical (37d) and (38d), as predicted by the Argument Domain restriction.[9]

Lobeck's definition of Argument Domain is akin, though not equivalent, to the notion of θ–government in Chomsky (1986):

(39) α θ–governs β if α is a zero-level category that θ–marks β and α, β are sisters.

Chomsky's θ–government excludes subjects from the Argument Domain because V is not sister to the subject NP, being dominated by a different projection. Lobeck's argument domain may include subjects since she does not indicate whether Y θ–marks X directly or indirectly, in the sense of Chomsky (1981).

2.4 Thematic government

In what follows, I will show that the notion of θ–government does not adequately restrict ZD. For the rules of the Root Component we need a stricter notion, that of thematic government. Though both (36) and (39) will exclude movements from adjunct positions, which is desirable, the definitions are at the same time too weak and too strong. In English ZD moves some subjects, namely those of weather verbs. And though ZD may prepose a wide variety of arguments (cf. 2.2), θ–arguments that are assigned roles structurally may not be preposed. Consider first the weather verb in (40):

(40) it_i $snow_i$ V^0 s

In section 2.2 arguments have been given in favor of ZD derivation of weather verbs, which are not found in languages that lack ZD, such as Japanese, Persian or Turkish.[10] Thematically, in (40), the incorporated subject is lexically assigned THEME by the zero head V^0. In contrast to (40), non-THEME subjects of transitive and intransitive verbs may never be preposed, cf. (41) – (42):

(41) *It$_i$ rat$_i$ V^0 ed a nest in the basement
(= a rat made a nest in the basement)

(42) *It$_i$ mother$_i$ V^0 ed a T.A. last fall, but they usually hire childless women
(= a mother was a T.A. last fall...)

Since not all intransitive subjects may be preposed, cf. (42), the notion "intransitive subject" is also insufficient to formulate an appropriate generalization about extraction from the subject position.

There are two other types of argument structures in English that illustrate the ungrammaticality of extraction from a position which is assigned a role structurally: causative and dative. There is absolutely no exception to this in causative structures, like those in (43).

(43)

	SUBJECT	MAKE		PREDICATE	
a.	* To dog $_i$	V^0	e_i	walk to the vet	can be fun
b.	* To eye$_i$	V^0	e_i	black	
c.	* To table$_i$	V^0	e_i	a ruin	

The intended meaning of the structures is given in (44):

(44)

a.	To MAKE a dog walk to the vet	can be fun
b.	To MAKE an eye black	
c.	To MAKE a table a ruin	

Nothing whatsoever is wrong with the semantics of (43). Furthermore, all verbs in (43) are not only possible but also existing verbs of English. Crucially, formation of the direct object may not be a factor, as the NP a ruin in (43c) is a permissible direct object, being both NP and a maximal projection. ZD traces may intervene between V^0 and the direct object, cf. (29).

Dative structures are illustrated in (45), with the intended meanings in (46).

(45)

	INAL POS	GIVE		THEME
a.	* to baby$_i$	V^0	e_i	the name John
	INAL POS	TAKE		THEME
b.	* to fish$_i$	V^0	e_i	the scales

(46) a. = to GIVE a baby the name John
b. = to TAKE scales off a fish

In (45) baby and fish are both INALIENABLE POSSESSORS, a thematic role assigned structurally by the predicate-like argument.

Polish, whose grammar also contains ZD, offers yet another complex verb structure with a structurally assigned role, an INHERENT LOCATION. In English, this zero-headed structure is represented by a single verb in (47).

(47) to [over$_i$ [shadow$_j$ V^0]] e_i the partner e_j

The Root-structure for (47) is that of load-type verbs, known in Relational Grammar as a 2-promotion.[11] It has been observed that in Slavic languages the formation of load-type verbs is highly productive, and accompanied by prefixation:

(48)

	INH LOC	THEME
o-sypać	dachy	śniegiem
pfx-scatter	roofs	with snow

In (48), the instrumental THEME assigns the structural role of INHERENT LOCATION to roofs. These prefixed structures, when zero-headed, allow ZD.[12] But only THEME-arguments may move, as in (49a); INHERENT LOCATIONS, as in (49b), may not. The intended meaning for (49a-b) is given in (49c).

(49) a.

THEME	INH LOC	
o-śniez$_i$-yć	dachy	e_i
pfx snow	roofs	

b.

INH LOC		THEME
*o-dach$_i$-ować	e_i	śnieg(iem)
pfx roof		snow

c. = to cover roofs with snow

In sum, languages with ZD offer abundant evidence that structurally assigned roles may not be preposed; only lexical roles such as THEME, PREDICATE or GOAL, which are in the strict thematic domain of the verb, may be.

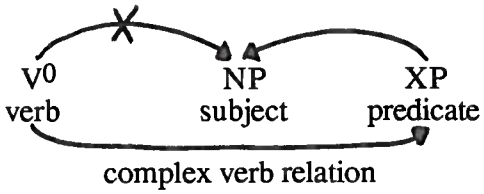
The distinction between structurally and lexically assigned roles suffices to formulate a generalization about the adjunction of $\alpha = X$ to the zero head. But the present theory also allows a more formal expression of this special thematic relation between heads and arguments: the coindexing between the thematic grid of a verb and the argument position. We have proposed in section 1.2 that only roles assigned lexically are thematically coindexed with the verb. By Emonds' Antitransitivity of Theta Role Assignment, the verb may not assign a role to — or be

coindexed with — a position which receives a (structural) role from another argument. Let us call this special thematic relation between a verb and an argument "thematic government:"

(50) Thematic government: A head X^0 thematically governs α if X^0 is thematically coindexed with α.

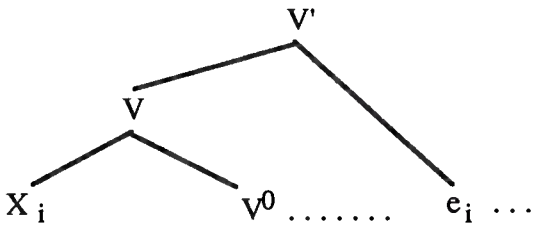
Roles assigned by the verb, i.e., the primary roles THEME and PREDICATE, are thematically governed, but so are the indirectly assigned GOAL and LOCATION. These roles are in the verbal grid. Structural roles are not a lexical property of the verb, and are not contained in the grid. The presence of the non-thematically governed arguments in the structure is thus not determined lexically, but is a consequence of predication; arguments which are not thematically governed (SUBJECT, INAL POS and INH LOC) are all subjects with respect to the predicate-like argument which is in a complex verb relation with the matrix and which assigns to these arguments a structural role, cf. (51).

(51)



Thus, all and only those arguments which have properties of subjects are non-thematically governed. The analogy with θ–government is transparent here: D-structure subject positions, in contrast to object positions, are exactly those which are not θ–governed, this contrast giving rise to subject/object asymmetries. If we therefore propose that the empty category left by Zero Derivation must be thematically governed, the contrasts in 2.4 may be seen as a special (thematic) case of subject-object asymmetries. We must also consider the possibility of antecedent government in ZD structures. Since movement from a position not coindexed thematically with V^0 forms ungrammatical words, the option of antecedent government must be excluded. And, indeed, there is an independent motivation for this. Consider a D-structure formed by ZD in (52).

(52)



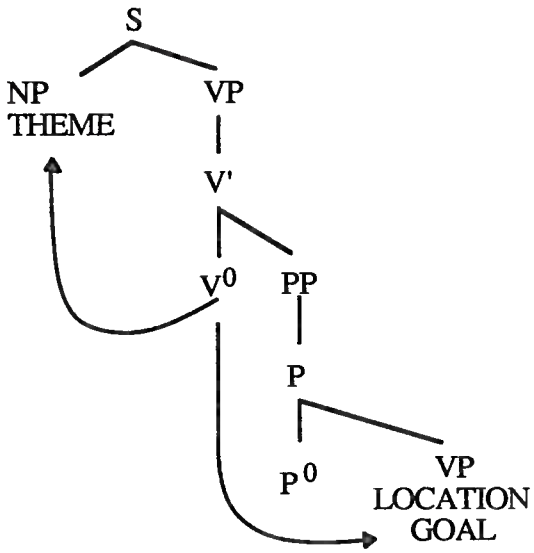
Since ZD is an adjunction to the lowest projection of V, i.e., Root V^0, the antecedent does not c-command the EC, but only m-commands it, in the sense of Aoun and Sportiche (1983). It has been suggested by Chomsky (1986) that antecedent government (and binding) may require c-command, not merely m-command. Since the adjunction structure in (52) extends to most verbal word structures, I conjecture that antecedent government by X_i is not possible from within such word structures.

I may now formulate a Thematic ECP as follows:

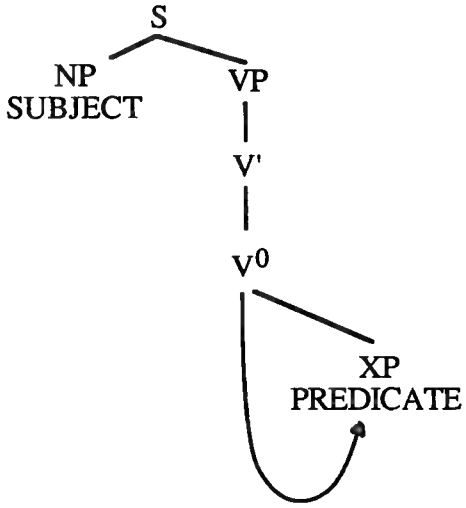
(53) Thematic ECP: A non-pronominal empty category must be thematically governed

The question to be addressed now is where the principle in (53) applies. I have given evidence that the Thematic ECP holds true of various argument structures that host ZD. Those structures are all collected in (54a - d) below. Arrows indicate the relation of thematic government, and thus possible targets of ZD.

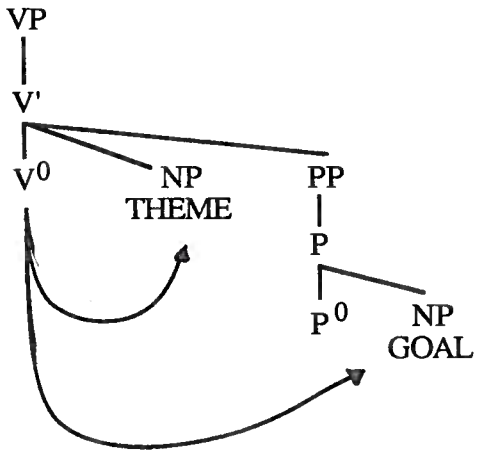
(54) a. MOTION VERBS



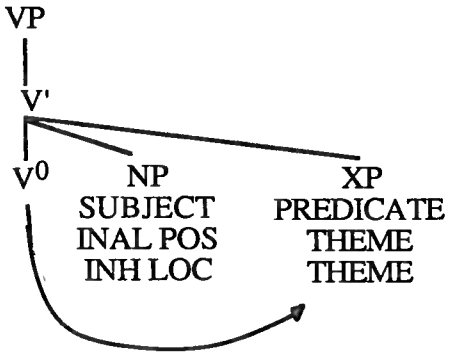
(54) b. COPULA VERBS



(54) c. DIRECTIONAL VERBS



(54) d. CAUSATIVE, DATIVE and LOAD-type VERBS



Since ZD is a rule of the Root Component perhaps the Thematic ECP may be extended to all Root Component rules, i.e., all rules that apply prior to D-structure. I will investigate this possibility in the next, concluding, section of the paper.

3.0 THEMATIC GOVERNMENT, ROOT COMPONENT RULES AND THE NATIVE STEM HYPOTHESIS

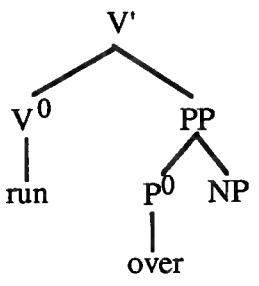
If principle (53) does apply to all RC rules, the consequences may be far-reaching. Recall our somewhat vague notion of an RC rule as a rule which operates on argument structures headed by verbal Roots and which crucially refers to thematic categories.[13] Now, since thematic governors may only be verbal Roots, V^o, because only these have thematic grids, the properties of RC rules will follow from (53). Principle (53) is a very strong restriction on all rules that apply before D-structure (and, in effect, derive D-structure). The RC rules may thus only apply to V^0–governed structures. I have, therefore, singled out a subclass of verbs and "governed" rules that apply only to this particular subclass. This is not an idiosyncrasy, but a principled limitation.

Note, furthermore, that verbal Roots are (almost) always native. There are a few instances of single latinate Roots, for example cede NP to NP, but, due to certain as yet undefined characteristics of borrowing in English, latinate verbs are morphologically complex, cf. transpose, remit, ascend and thus X, not X^0, in bar notation. Apart from exceptions such as cede, on one side, and such nativized verbs as offer, promise (for Dative) and appear, enter (for There–Insertion), with principle (53) we may derive the Native Stem Hypothesis of Stowell (1981) and Emonds (1980) for Dative and Particle movement and extend it to other rules. These authors have observed that Dative and Particle movements apply only to native verbs, save the aforementioned exceptions.

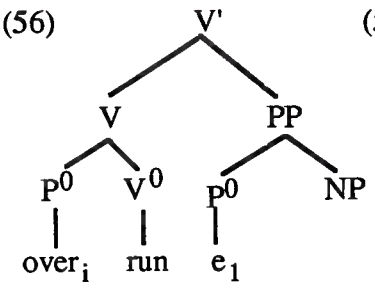
The native/non-native distinction in the English lexicon is reflected in syntax, morphology and phonology in that all types of rules are sensitive to it. The persistent problem with this distinction is its formal encoding in the grammar, resolved by the use of intrinsic features such as ±latinate or ±native. Our study indicates that, at least for verbs, the distinction is in the bar notation. Native syntactically non-derived verbs are Roots, X^0. Latinate syntactically non-derived verbs are X, i.e., at least bi-morphemic, for which there is abundant morphological and phonological evidence. I do not imply that the latinate V projections dominate syntactic structures, as English syntactically derived words would. The latinate morphemes, such as trans or fer, are not categories of English grammar, thus such syntactic representation is in fact

impossible. Rather, we have the representation in (57), contrasted with English Roots in (55) and English derived words in (56).[14]

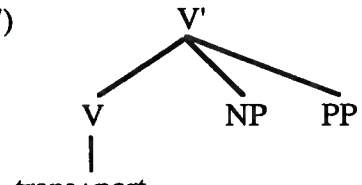
(55)



(56)



(57)



Thus there are two sources for junctions in derived words, a syntactic one in (56) and a paradigmatic "morpheme boundary" in (57). The morphemic junction in (57) is recognized by the native speaker only because of the iteration of such morphemes as trans or port in other words like transfer and import.

If the Thematic ECP applies in the Root Component, the targets of all Root Component rules should be the thematic arguments shown in (54). Let us examine the rules one by one.

(58) There–insertion
an elephant is in the garden ⇒
there$_i$ is an elephant$_i$ in the garden

(59) Weather verb ZD
rain will V^0 ⇒ it$_i$ will rain$_i$ V^0

(60) Over–Cliticization
to run over a house ⇒ to over$_i$ run e_i a house

(61) Ergativization
△ sank a boat ⇒ a boat$_i$ sank e_i

(62) Dative Movement
give the book Mary ⇒ give Mary$_i$ the book e_i

(63) Particle Movement
bring the wine in ⇒ bring in$_i$ the wine e_i

In (58) – (63) the strings on the left of the arrow are Root-structures, and those on the right of the arrow are D-structures.

As this short survey indicates, all English RC rules comply with the Thematic ECP. There–Insertion and weather verb ZD affect the THEME of (54a). I assume that expletive it and there are

inserted post-transformationally, thus there is an empty category in the Root Component (cf. Pranka 1983, Emonds 1985 on late insertion of grammatical formatives). The D-structure in (58) is standard in recent syntactic studies. Over–cliticization affects LOCATIONS of (54)a. Note that verbs of the over-estimate NP type do not result from over–cliticization (see Walinska de Hackbeil 1986, ch. 4). English Ergativization affects THEMES of (54c). My characterization of Ergativization as an RC rule falls in line with the proposal by Keyser and Roeper (1984) that English Ergativization, as opposed to Middle Formation, applies before D-structure. Finally, Dative and Particle Movement affect GOALS in (54c) (Goal in Dative is coindexed thematically with V^0, but not assigned due to the lack of a P assigner). RC rule analysis of Particle and Dative Movement finds its roots in the Native Stem Hypothesis of Stowell (1981) and Emonds (1980). The Root Component as a whole has many properties of the pre-D-structure of Perlmutter's Relational Grammar.

It should also be observed that in the English Root Component, ZD, a word forming rule, is the most productive from the point of view of the variety of argument structures in which it occurs as well as the variety of its targets. If There–Insertion is, for instance, limited to intransitive verbs in (54)a, ZD may occur in every type of Root-structure, shown in (54) and affect every argument that is thematically governed. Truly, the minimal factorization in the transformational rule formalism finds strong support in this word-forming rule, which simply could not be described in traditional terms as one process, which it is.

It is also evident that the Thematic ECP does not apply past D-structure. In small clauses, for example, subjects, which are not thematically governed, may undergo both wh- and NP movement, as in (64):

(64) $\text{Who}_i/\text{John}_i$ is considered e_i stupid

The EC in (64) is θ–governed, the notion of θ–government being relevant to S-structure ECs. Thematic government, is contrast, is relevant to D-structure ECs.

Various analyses now accept both ECs and coindexing as abstract theoretical devices allowed at D-structure. The introduction to the grammar of the Root Component restricted by the

Thematic ECP not only does not enlarge the power of the system but restricts one of the levels of representation — D-structure — in an interesting way. I have shown that at least some D-structure coindexings result from Move-α, and as such, are subject to restrictions on derived structures defined in various modules of the system. Here I have discussed in detail one such module: the theory of government. My proposal constitutes yet another step toward the dismissal of the categorial component, in line with the studies of Stowell (1981), Travis (1984) and Emonds (1985). These studies argue that properties of D-structures are set by parameters of order, by Case Theory and by θ–theory. It should not come as a surprise that they are subject to yet another independent restriction such as the Thematic ECP.

Further research will reveal the language-particular content of the Root Components of other languages. Without any doubt thematic government restricts some types of compounding in verb-final languages, such as Korean or Japanese. Tabesase, for example, where tabe is a thematic argument of sase, is a possible word in Japanese, but *sushisase and *onnasase are not, because sushi and onna are not thematic arguments. It is also likely that the distinction between thematic government and q–government discerns two types of incorporation.

Hanna Walinska de Hackbeil

NOTES

The first version of this paper was presented at the LSA Symposium on Thematic Relations in Seattle in December 1985. The current version was presented at the Annual Conference in Contrastive Linguistics in Opole, Poland in December 1986. This version is based on chapters 2 and 6 of Walinska de Hackbeil (1986). The paper extends and revises the theoretical proposals of Chapter 6. I would like to thank Janet Randall, Jolanta Szpyra and Roland Bol for their help in preparing subsequent versions of the manuscript.

1. Root-structure is a level of representation prior to D-structure. Root-structures are headed by monomorphemic words and affixes, i.e. Roots. In the current system the X-bar symbol X^0 will be restricted to Root-heads of phrases. The symbols X' and X" retain their customary usage as intermediate and maximal projections, respectively. Root-structures are, therefore, considerably more restricted than D-structures, where the lexical heads need not be monomorphemic. In the current system D-structures contain an additional "bar-less" projection X which roughly corresponds to non-monomorphemic word projections. Derived word structures in this system result from syntactic manipulations on certain levels of representations. The paper focuses on rules which apply in the Root Component, i.e., between Root-structure and D-structure. I refer to them as Root Component Rules. Chapter 3 of Walinska de Hackbeil (1986) offers a detailed discussion of this X-bar system, which incorporates word structures into phrase structures. In particular, many arguments are given there for substituting the notion "head of word" of Williams (1981), Lieber (1980), and Selkirk (1982) by the notion "head of phrase."

2. In the other syntactic systems D-structure is fed by only one module or component, i.e., the Lexicon. In the current system the Lexicon is split in two: the Root Component and the Dictionary. The Root Component generates many, though not all, word structures. Some of word structures may be generated past D-structure. This is true of all inflected word structures (cf. Emonds 1985) and other word-forming rules which affect specifiers.

3. The thematic semantics of zero headed verbs is discussed in a greater detail in section 2.2 of this paper and in chapter 6 of Walinska de Hackbeil 1986.

4. The distinction between the direct and indirect assignment of roles is understood as in Emonds 1985.

5. See Walinska de Hackbeil 1986 chapter 3 and references quoted there for elaboration of the thematic relation subject-predicate in causative and other structures.

6. I extend the thematic relation subject-predicate from causative verbs to dative and load-type verbs in the spirit of Kayne (1984) who observes that in datives the INALIENABLE POSSESSOR argument behaves like a subject with respect to the THEME argument (the subject "has" the theme). Thus in (13) – (14) all arguments are in the subject-predicate relation though only the causative verbs bear the thematic roles SUBJECT and PREDICATE, cf. the schema below.

verb:	subject ~	predicate
causative	SUBJECT	PREDICATE
dative	INAL POSS	THEME
load-type	INH LOC	THEME

Respectively, the complex verb relation of Chomsky 1986 is extended just in these structures on the verb-THEME relation though there exist, possibly, some other argument structures of a similar sort. This study endeavors to capture the stronger and lesser liaisons between the verb and its arguments, to formalize this distinction and to show that this distinction is a factor in word formation as well as in other types of rules. See section 2.4.

7. See Walinska de Hackbeil 1986 chapter 2 section 6 for an analysis of Dative Movement as a Root Component Rule. The structure in (14) is derived by Dative Movement. The THEME argument receives an inherent case under certain conditions defined as the Absolutive Domain.

8. I restrict the term 'Zero Derivation' to a subclass of verb-forming rules deriving such verbs as to skin NP, to wet NP, to march NP, or to up NP. In my analysis all these forms are headed by a zero suffix, cf. (25). A small number of verbs derived by Zero Derivation is headed by a phonological suffix -en as in lengthen. This suffix has all the properties of the verbal zero suffix, except that it is realized phonologically. In Polish zero derived verbs occur with phonological suffixes. In contrast with traditional morphological analyses of Zero Derivation, which would

treat to skin and to lengthen as separate morphological processes, the current framework properly generalizes over both. Properly, because the difference between the two lies exclusively in the phonological nature of the affix. All principles discussed in this section apply also to Polish suffixed verbs. Walinska de Hackbeil 1986 chapter 5 provides an extensive argumentation that en-prefixed verbs, cf. imprison, enthrone are also zero-headed. Zero Derivation as a local move α is discussed there in detail. In what follows I sometimes use V^0 to conveniently symbolize the zero head position.

9. Note that possible subcategorization frames for verbs embitter, V, __NP and enchain, V, NP will not account for the contrast between (b) and (d) in (37) – (38) since these verbs do have NP objects in the ungrammatical sentences.

10. See Walinska de Hackbeil (1986) chapter 6 section 6.7 for further discussion of the morphological properties of weather verbs.

11. The verb in (47) is shown rather as an illustration of a morphological pattern analogous to the Polish verbs. Such structures are not, and may not be, productive in English, which lacks aspectual prefixation.

12. In Polish zero-derived structures occur with a 'thematic' suffix which is not zero but phonological, cf. note 8.

13. cf. note 1 p. 2.

14. The structures (55) and (56) are, respectively, the Root-structure and D-structure of Over-Cliticization. This rule is discussed in chapter 4 of Walinska de Hackbeil 1986.

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