

Thomas Roeper
UMass

Explicit Syntax in the Lexicon: the Representation
of Nominalizations

1.0 Introduction and Overview:

This essay pivots around a simple contrast¹:

- a. *the push of John
- b. John needs a push

In (a) we find that the nominalization does not allow reference to the object via a PP. In (b) we find that precisely the same object reading is obligatorily selected. Therefore the puzzle is to explain how we have access to the THEME role implicitly when it cannot be generated explicitly.

We shall make a minimalist proposal about how thematic roles and morphological operations interact. The idea is this: if morphology is added, then a bracket is added. The thematic grid itself does not change, but its capacity to project is blocked. When a bracket is added, all the consequences follow from that fact. If we assume that every verb-based lexical item possesses a thematic grid, then we argue that there is no direct deletion of thematic roles. In other words, the power of projection is lost, but nothing in the thematic structure changes.

NP verb NP_{comp}i => verb] N] NP_{COMP}
AG Th_i=> Th =/=>

¹This is a revision of an essay first circulated as Implicit Arguments and Implicit Roles in (1986). The article by Safir (1991) in Frieden (1991) comments on the earlier paper and agrees with its essential position. The theory here remains fundamentally the same but we provide a more "explicit" version of the syntactic structures operative in the lexicon. Nonetheless Safir labels the relations between verbs and nominalizations as fundamentally pragmatic. We regard it as non-pragmatic (in the ordinary use of the term) because counter-intuitive examples can be generated. The difference between these positions remains basically minor.

The sister relation is blocked by the extra bracket. A sister relation is required for the projection of internal objects via a PP in nominalizations, as it is for VP.

We can accommodate these facts by use of a syntactic structure within the lexicon, which has been advocated by Hale and Keyser (1991), and also in the framework of Parallel Morphology developed by Borer (1991): the verb help is raised to a higher NP head position. This will destroy the sister relation in a way equivalent to adding a bracket. We will argue the case in terms of simple bracketing and discuss the larger syntax of the lexicon at a later point.

How then is John connected to the implicit theme of push in (1b)? We argue that the fundamental connection involves thematic-linking (in the sense of Williams (1991) and earlier work). Williams argues that the following expressions are different:

- a. John underwent an operation => John = THEME of push
[undergo selects THEME of complement verb]
- b. John saw an operation => no connection

In addition we need a syntactic rule of object-to-subject movement (parallel to Clark's rule for retroactive gerunds (1985) to account for the contrast between:

- a. Thebes underwent destruction.
- b. *Thebes underwent Carthage's destruction

Although Agent-Nominal sequences are unacceptable without an object [*the barbarian's destruction], thematic-linking by hypothesis provides the object, as in (a). Therefore we must explain how accessibility to the object is blocked. Clark (1985) shows that a parallel syntactic object-to-subject movement rule is needed for retroactive gerunds, which remain verbal (a):

- a. This boy needs supervising
[this boy_i needs [PRO_i supervising t_i]]
- b. *This boy needs Bill's supervising

In (b) the lexical subject blocks movement. We argue that thematic-linking triggers this object-to-subject syntactic rule. It belongs then to the family of rules, like tough-movement, in which a lexical relation triggers a movement rule.

1.1 Counter-arguments

Several counter-arguments spring to mind which we would like to set aside at the outset. The first is this: the control of the object is dictated entirely by the verb. Thus verbs like undergo entail thematic-linking, as

Williams argued [John underwent an operation]. In (2) we see that an interaction between the verb and complement choice determines linking:

- a. John likes advising => John advises
- b. John likes advice => someone advises John

- a. John needs advising
- b. John needs to advise.

need => object with advice, advising
=> subject with to advise
like => object with advice
=> subject with advising, to advise

All the examples involve the traditional use of PRO as in: John likes [PRO to advise]. Depending upon the verb+complement the object-to-subject rule is required ².

The second counter-argument is semantic: the notion of result is at work here. The expression advice is a result, while advising is a process. But this observation does not explain the difference between need and like. Moreover the same contrast rearises when we add an article or a plural:

- a. Reagan enjoys defeat
- b. Reagan enjoys the defeat³
- c. The president needs thought
- d. The president needs thoughts

There remains an object-control reading in (a) not required in (b). Now it is perhaps arguable that defeat is a kind of result without an endpoint, while the defeat has an endpoint, although this is intuitively very obscure.

But again the same contrast arises in another environment where there is no contrast between process and result:

- a. the candidate needs discussion => object
- b. the candidate needs discussions => unspecified participant

It is difficult to see a real difference in the nature of the activity in discussion versus discussions. We believe that there is a syntactic effect of pluralization, elimination of thematic-linking, while the plural has its own semantic consequences (i.e. the nominalization can be interpreted as a set of discrete

²See Lebeaux (1988) for extensive discussion of the role of default analyses in theory and in acquisition.

³It also holds for indirect object control cases as well:

John promised support
John promised NP_i [PRO support t_i]
John promised supports => no connection

events). The fact that an article and plural induce the same effects, suggests that a syntactic, not a purely semantic, explanation is called for. We suggest later that the referential character of Maximal Projections plays a role here.

Finally the same argument arises in another domain where the impact of affixation can be seen:

- a. John is defensible by anyone
- b. *John is defensible by anyone

In (a) the thematic grid is carried by the affix -able, while in (b) the affix --ible, though identical in meaning, fails to reproduce the thematic grid of the underlying verb defend and therefore the by-phrase is not a sister to a thematic grid. No basic semantic difference exists between defensible and defensible. We turn now to a more general background for the discussion of these ideas.

2.0 Theoretical Approaches to Thematic Roles

Three different ideas underly current versions of theta roles:

- A. They are mapped onto syntactic positions.
- B. They constitute an independent level of grammar with formal operations that have no necessary link to syntactic positions.
- C. They are part of the meaning structure of lexical items.

They each have a typical formalism:

- A'. The projection principle constrains a relation between a thematic level and syntax (Chomsky (1981)).

We find an indexed structure roughly like (1) for passive:

- 1) John was see+en_{ag} t_{th}
[AG,TH]

Each thematic role is projected onto a syntactic position. Following Baker, Roberts, and Johnson (1989), the -ed functions exactly like a pronominal clitic.

The (B) system annotates the thematic grid itself:

B'. There is a thematic module which does not fulfill the projection principle, but allows syntactic-like constraints, such as theta-command (Williams (1989))⁴

2) John_i was (un)seen_{+en}
[AG, TH_i]

The underlining marks the thematic role as EXTERNAL; binding is also stated on the grid itself. And finally, there is a school of thought that treats THETA-roles as a part of lexical semantics in which the thematic roles are derivative from EVENT structure (Pustejovsky (this volume), Hale and Keyser (1988)).⁵

C'. There is an event structure which has its own formal properties, but they are orthogonal to syntax ((Pustejovsky (this volume), Hale (the Lexicon project at MIT))

3) John was (un)seen
EVENT_{passive} => Object = patient of unspecified agent

The domain of implicit arguments, as we shall see, is a prism through which we can evaluate these perspectives. We will extend our earlier analysis of implicit arguments (Roeper (1987)) in a way that provides specific support to part of each of these three systems. Our goal is to provide a technically and empirically precise distinction between two kinds of implicit relation: 1) an implicit role which reflects EVENT structure but does not involve a syntactic projection and (2) a syntactic implicit argument which requires a syntactic projection to an argument position, even if the position is unfilled. The analysis maintains the notion of the Projection Principle proposed by Chomsky, but specifically rejects the analysis of affixes as pronominal clitics.

⁴A system of roughly this sort is advocated by Grimshaw (to appear), and Safir (to appear), see below for discussion.

⁵This perspective has its origins in work by Jackendoff and it is pursued in different ways by Hale and Keyser, Rappaport, and Sprout. In addition, with somewhat different origins the notion of event is pursued by Lewis, Higgenbotham, Kratzer, and others.

Our argument, in brief, is this: implicit *arguments* exist when an unstated argument can be projected onto a syntactic position:

4). John was help + ed
[AG,TH] [AG,TH]

5) John_{TH} was help + ed by Bill_{AG}
[AG,TH]

The affix -ed carries thematic information, just as the verb does, and allows its expression in a by-phrase.

An implicit *role* exists when the lexical item carries thematic information but cannot project it onto a syntactic position:

- 6) a. John_i needs help
[AG_i,TH] [AG,TH_i]
b. the help of John/ John's help⁶ (John = subject)
c. *the help of John_{obj}
d. the helping of John (John = subject or object)

It is clear that need connects the AGENT of need (John) with the object (TH) relation of help in (6a). Unlike passive whereby thematic roles can be projected via the -ed affix onto a by-phrase, the bare nominal here has no affix and therefore allows no expression of the object in either an of-phrase or a prenominal genitive (6c), as in (6b). A thematic role which is unprojectable, we define as an *implicit role*.

The connection in (6a) must be made by a thematic-linking system, sensitive to the lexical structure of need. Note that if an affix is present (-ing), as in (6d), then the theta-grid percolates and the object relation is immediately expressible via an of-phrase. We will argue that Chomsky's projection principle correctly captures the implicit arguments and Williams notion of a separate THETA-module captures implicit roles, which are in turn systematically related to EVENT structure.

⁶The interpretive restriction here must undergo acquisition. In acquisition data that I have assembled I have a very clear example of a child repeating the phrase "I need my help" where the my receives object interpretation as it should if it is comparable to the object interpretation of the city's destruction.

The notion of implicit role is precisely defineable:

D. An implicit role exists wherever the internal thematic role is not in a sister relation with a projection of the thematic role.

The non-sisterhood difference between (6b) and (6c) is represented as follows:

6b) the [[help]_V \emptyset]_N of John_i
 [AG_i,TH] \emptyset]

6c) the [help]_V + ing]_N of John_i
 [AG,TH_i] [AG,TH_i]

The empty nominal bracket in (6b) blocks the projection of an object onto a syntactic position because there is no sister relation between the thematic grid and the PP position.⁷ In (6c) the thematic grid is carried by the -ing affix (either by percolation or as a lexical property⁸). Why, one might ask, is it possible to get the agent role in the help of John? The external argument is apparently accessible. This confirms the structural character of the notion of externality: the EXTERNAL argument is normally projected into the subject position, over two MP's (at least). (6b) shows that it can appear wherever a sister-relation is not required, not just in subject position.⁹ We review each of these arguments in more detail below.

1.1 Pragmatics

We need to define another dimension in order to articulate where structural interpretation differs from context. We take the notion of pragmatic to be: the free

⁷There are many, often idiomatic, lexical exceptions: the run of the store, the purchase of the car. Notably they do not generalize: *the buy of the car. See Roeper and Weissenborn (1990) for a discussion of the acquisition implications of these phenomena.

⁸See Roeper (1987) for extensive discussion.

⁹ The external argument is accessible for bare nominals as well, but just in case no object theta role exists for the nominal (*hope the money): John needs hope. It is unclear whether this is true agent selection or simple inference. See discussion of plurals below.

application of inference. In general we find that thematic relations are unspecified in many contexts and often are unspecified. If we have an expression like:

7) Mary hates tuberculosis

The interpretation will vary depending on whether Mary is a patient, a health insurance agent, a medical student, or a doctor. If free inference is at work, we would then expect the same kind of interpretation for nominalizations of all kinds. Consider now the contrast:

- 8) a. John needs to help
- b. John needs help
- c. John succeeded without helping
- d. John succeeded without help

In (8a) we find syntactic control providing an agent reading for John and the infinitive. If the domain were open to free inference in (8b), we would expect to find that either agent or theme readings are possible, just as they are in (7). But the interpretation is strictly an object interpretation in (8b), and no context is needed. Therefore a pure pragmatic account cannot work. The selection of an object reading must be specifically guaranteed by our theory of implicit role assignment.¹⁰

In effect, we argue that subjects of nominals (PRO helping) are controlled syntactically while objects of bare nominals (help) (internal arguments) are selected thematically. It means that seemingly similar aspects of word meaning (AGENT and THEME theta-roles) obey different constraints. This subject/object asymmetry in morphology, we argue, is ultimately related to the same principles of government which

¹⁰A similar account of object interpretation can be found in recent work by Safir (to appear) where he modifies an earlier version of this paper. Our theory of pragmatics here is radically at odds with his. He takes pragmatics to be another system and specifies a rule that will guarantee object control for these bare nominals. His definition of pragmatics allows a person to resist the pragmatics of the situation. However the empirical claims and the theoretical distinction between implicit arguments and implicit roles remain essentially the same in this account and Safir's.

produce subject/object asymmetries in syntax. This will be accomplished by projecting a syntax within the lexicon.

1.2 Historical Perspective on Implicit Arguments

We begin with a review of evidence for implicit arguments. Roeper (1987) and Finer and Roeper (1989) observed implicit argument effects across a wide variety of structures. In addition to the passive/ergative contrast (9), originally noted by Manzini (1983), there are effects within -able, compounds, and nominalizations:

- 9) a. the boat was sunk to collect the insurance
b. *the boat sank to collect the insurance.
- 10) a. the sinking of the boat to collect the insurance
b. boat-sinking to collect insurance
c. boats are easily sinkable to collect insurance

In 9b) we find ungrammaticality because the ergative has no agent to control the rationale clause. In every other structure a transitive verb underlies the derived form. The agent of the underlying verb controls the rationale clause. These facts led us to the lexical projection principle:

E. Thematic information is maintained throughout lexical derivations.

And it led to a syntactic claim:

F. Information on the thematic grid can function as syntactic controllers. Therefore they can be regarded as implicit arguments.

Four kinds of adjunct clauses can be controlled: rationale clauses, without phrases, small clauses, and purpose clauses (adding recent discoveries):

- 11) a. the game was played without wearing shoes
b. Countries know a lot about each other. Big deals can't be made without getting into each other's finances.
- 12) a. the game was played drunk

- b. the game was played drunkenly
- c. the game was played determined to win

13)a. One letter was selected to send e_i to the moon.

b. who_i was selected to give money to e_i.

[AGENT of select is AGENT of give]

These examples are selected to reveal that implicit arguments can control across a broad array of environments. In (11a) we find not only that an implicit argument can control a without-clause, but, with context (11b), it can be coreferential with a reciprocal.¹¹ In (12a) we find that the implicit agent can control a small clause (play+ed [PRO drunk]_{sc}). The contrast in meaning between the adjective(12a) and the adverb (12b) reveals that the adjective is construed of the agent and not the whole activity.¹² In the same vein, the presence of a complement in (12c) reveals that an AP is present (which is not possible for an adverb). In (13) we find that purpose clauses and parasitic gap constructions, which contain an empty category, also allow the infinitival agent to be controlled by an implicit argument.

Such examples provide the empirical background for the claim that implicit arguments function syntactically. How and where should they be represented? Elsewhere I have argued that they must be present on the HEAD of a derived word. It follows then that implicit arguments must be present on (or linked to) affixes under the common theory that affixes are heads.¹³ This claim follows from the following contrasts:

- 14) a. protection of the city
- b. taxpayer of property
- c. *protection plan of the city
- d. *taxman of property
- e. proud of children
- f. *proudly of children
- g. player of games

¹¹See Manzini (1986) for arguments on the assumption that reciprocals are not allowed. We find them acceptable in context.

¹²It has sometimes been suggested that the adjective is really a reduced adverb in these contexts. These examples directly counter that view.

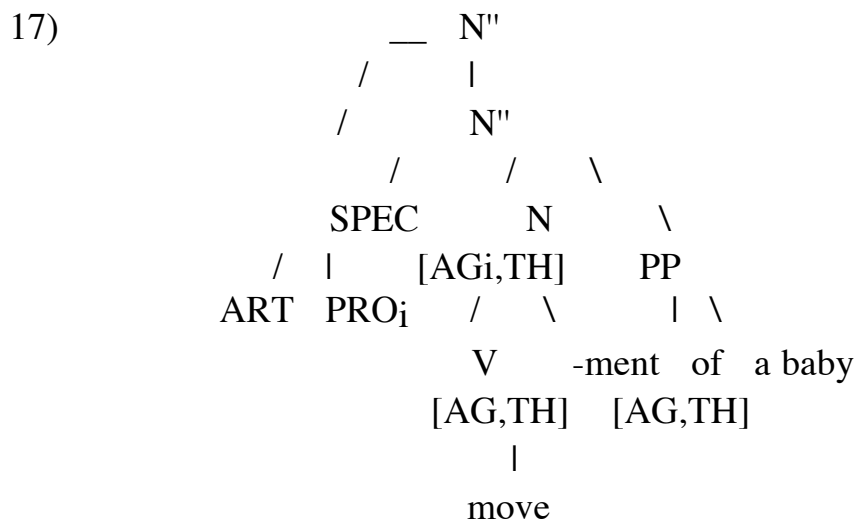
¹³See Williams (1985)

h. *playful of games

All of the contrasts in (14) follow from the same principle, though different degrees of subtlety are evident in our intuitions. In (14c, d) we see that when another noun intervenes between a nominalization and a thematic PP, then the phrase becomes ungrammatical. In effect the phrase must be a sister to the derived word. The contrasts in (14 e,f,g,h) reveal that the constraint is subtler. If a non-thematic affix intervenes (-ful), the thematic PP is also blocked. Therefore it is argued that the thematic grid itself must be in a c-commanding sister relation to the thematic PP. In (16) we find that plurals, though sometimes subtly, will also block the thematic projection (for both events (loss) and objects (students)).

- 16) a. the leaving of Rome
 b. the leavings of Rome
 c. the loss of bankersth
 d. the losses of bankersag
 e. the student of Paristh
 f. the students of Parisloc
 g. the movement of the baby
 h. the movements of the baby

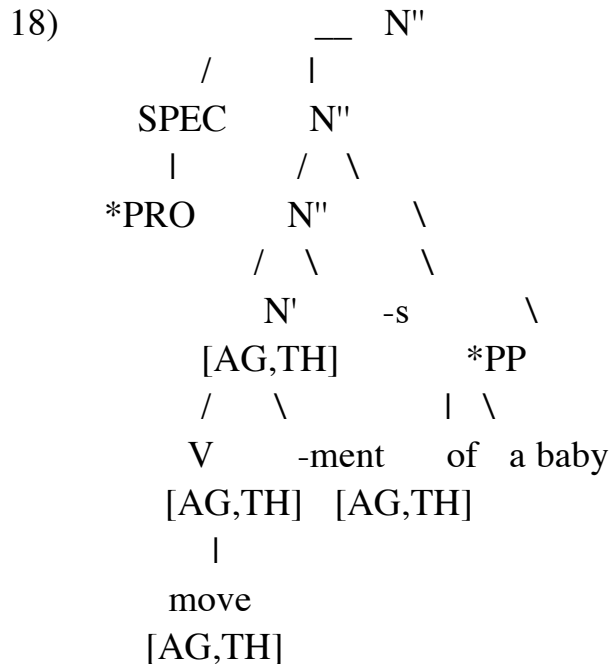
The plurals do not inherit the thematic grid and therefore create a bias against the internal argument. We can represent percolation and projection to PRO_i (AG_i) as follows:



[AG,TH]

If the affix and the verb agree in their thematic structure (17), then the N1-bar node shares their features, and c-commands the thematic PP.¹⁴ If another node intervenes, then the Head-Complement relation is broken, and there is no thematic PP and no projection onto PRO:

¹⁴See Chomsky (1986) for a brief discussion of feature-sharing.

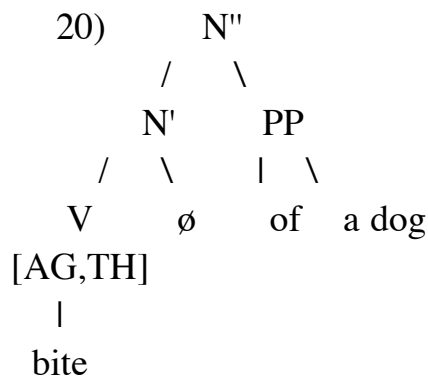


There is no percolation to the node above the plural because the affix and the derived nominal do not share features.¹⁵ Consequently the TH is not projected onto PP, and the PP can receive the external argument. The same contrast arises with bare nominalizations which arguably have a zero-affix which does not allow percolation:

- 19)a. the bite of a dogag
 b. the biting of a dogth

The system does not allow percolation with an empty affix, and therefore blocks the THEME reading in (19a):

¹⁵See Roeper (1987) for a more detailed account.



As we have noted above, the external argument appears:

- 21) a. the smell of fish
- b. the smelling of fish
- c. the fracture of a leg
- d. the fracturing of a leg

In ergative cases, we find that the interpretation also shifts to the external argument. Thus (21a) has the interpretation of the fish smells, unlike (21b), which corresponds to someone smells the fish. Note that we do not have **the smell of fish by Bill*¹⁶ while *the smelling of fish by Bill* is fine. Why does the external argument emerge? The answer is that the external argument can be one node further away, as it is in active sentences, and does not have to satisfy a sisterhood relation.

The next prediction is that affixes which block thematic PP's will also block adjunct rationale clauses:

- 18)a. *the smell of fish to establish freshness
- b. the smelling of fish to establish freshness
- c. *the close of the stockmarket to show power
- d. the closing of the stockmarket to show power
- e.*the start of the game to begin the season.

¹⁶A large number of exceptions exist. We have, for instance, *the review of the book*, However the form is not generally productive, as in **the buy of clothes,*the bring of toys, *the write of a book*.

f. the starting of the game to begin the season

We can find the same contrast when we consider rationale clauses with compounds.

- 19)a. it was created by birds to make a nest
b. it was created to make a nest
c. *it was bird-created to make a nest
d. it was made by man to trap water
e. *it was man-made to trap water (with man as agent of trap)

The compound data isolates the fact that it is the affix which controls the rationale clause. The creation of the compound causes a new node to appear, which lowers the $\bar{c}d$ affix to a position where it no longer c-commands the PP. The word bird although it is derived from a copy of the agent (created by birds) is also not in a c-commanding position and therefore does not control.¹⁷

All of these facts flow from a simple principle:

- 20) a. A thematic grid can license a PP or a rationale clause only if the thematic grid c-commands the PP or S.
b. If the PP is not expressed, the arguments are implicit.

This principle leads to ask a question which will be the focus of the discussion to follow: What is the status of a buried thematic grid which does not license PPs? Our answer, once again, is that the thematic grid does not disappear. The thematic roles continue to exist but do not function as arguments. They remain accessible under limited conditions.

1.4 Adjectival Passives

Our account of implicit thematic roles has direct application to the representation of adjectival passives, which have been carefully discussed and analyzed by Levin and Rappaport (1986). They argue, in effect, that adjectival passives no longer project the agent role. We argue that it is correct that the adjectival passive no longer projects the

¹⁷See Roeper (1985) for a discussion of copying implicit arguments. essentially the same argument about by-phrases is made in Zubizarreta (1984), Jaeggli (1984) Roberts (1985).

AGENT role, but this does not mean that it deletes the AGENT role. In our account, its status shifts from implicit argument to implicit role. Consider the following expressions:

- 21)a. the rolled ball (*by Bill)
- b. the bounced (*by Bill) ball
- c. the fractured bone
- d. the unfractured bone
- e. the unbounced ball
- f. the unrolled ball

In each instance we have an interpretation of a potentially ergative verb which corresponds to the transitive. This can be explained by the origin of these phrases: they each derive from the passive (22b) and not from the active:

- 22) a. the ball bounced
- b. the ball was bounced
- c. the ball was unbounced¹⁸
- d. *someone unbounced the ball

It is clear that they must be derived from a passive form in the lexicon in order to obey the dictum of the projection principle that thematic roles are not changed in the course of a syntactic derivation (Chomsky (1981)).

If the adjectival passive eliminates thematic roles (i.e. AGENT) in the lexicon then it is impossible to explain why the interpretation (with AGENT) remains constant. The prenominal adjective should allow both transitive and intransitive readings but it allows only the transitive reading.¹⁹ Our analysis supports the general thesis of Levin and Rappaport by making a further distinction: we argue that the thematic grid is lexically accessible but not syntactically accessible.²⁰

¹⁸Some speakers may feel that the word unbounced is somewhat unnatural. This could be true. However the significant fact is that the transitive interpretation is very clear.

¹⁹There are about fifty lexicalized exceptions, such as the fallen leaf, the sunken treasure, the departed guest, the deceased man. However we do not have *the left guest, the died man, etc. which should be grammatical if the intransitive prenominal adjective were a productive form. See Fabb (1984) for discussion.

²⁰This could then be construed as a very concrete form of "lexical-conceptual structure", a notion introduced by Hale and Keyser (1985), see below. In effect,

The additional bracket, introduced by un-, makes these structures violate the sisterhood criterion for a Government relation. Therefore, not surprisingly, we find that most such forms are disallowed, but some exceptions exist (just like the review of the book):

- 23)a. the vase was unbroken by anyone
- b. the case was uncontested by the lawyers.

The latter form exists because the agent which is associated with the transitive verb *contest* is copied in the *by*-phrase. If the agent were completely absent then these phrases would be as impossible as *the boat sinks by Bill.

2.0 PRO in NP

Our view of thematic control depends upon the claim that the verbal subject position carries over to the nominalization. This has come to be known as the debate over whether there is a PRO in NP. We will not review the numerous arguments in behalf of the claim that a PRO or PRO-like element exists within a nominalization²¹, but rather concentrate on a few new observations.

There is a *prima facie* argument in behalf of PRO in NP in terms of the grammaticality distinction between (37a) and (37b):

- 37a. the destruction of the city to prove a point
- b. *the city's destruction to prove a point

The difference can be accounted for in terms of the fact that the PRO-NP position in (37b) is filled by the object preventing control by an agent in that position. Williams' argues that the difference can be accounted for in terms of the attachment site of the rationale clause ("suppose the result [i.e. rationale] clause is attached under the NP, but not under N"). This account will not explain the following grammaticality difference:

- 38a. John enjoyed the preparation of his own funeral
- b. John enjoyed his own funeral's preparation

if a thematic grid is removed from a c-command position, it remains nevertheless as a part of the lexical-conceptual structure.

²¹See Chomsky (1986), Sproat (1985), Lasnik (1986) and references therein.

In (38a) there is a clear reading that he prepared his funeral himself, while in (38b) the agent is unspecified in the fashion typical for passives. If we assume that there is a PRO in (38a) controlled by John, then the difference is accounted for. The entire nominalization is c-commanded by the subject John in both cases and therefore one cannot appeal to structural differences as an explanation.

We can deepen this analysis by use of some other examples where the absence of the determiner causes obligatory control:

- 39a) John enjoyed falls from the airplane
- b) John enjoyed the falls from the airplane
- c) John was in control of the army
- d) John was in the control of the army
- e) John survived by love of God
- f) John survived by the love of God

In (39a,c,e) we get a strong reading that John is the agent, while in (39b,d, f) the reading is optional. It is noteworthy for our discussion below that in (39e,f) the by-phrase is a non-subcategorized adjunct, but the control relations remain unchanged.²²

We can demonstrate the effect in the opposite direction (using a case where Williams' advocates subcategorized thematic linking):

- 40)a. The use of drugs to go to sleep
- b. *drug's use to go to sleep

Here the preposing blocks downward control of a putatively subcategorized clause.²³

²²See Roeper (1985) for discussion of the structural differences between PRO with and without an article. See also Grimshaw (to appear) for extensive use of this diagnostic.

²³Another approach to this question is to argue that the preposed nominalization lacks a thematic grid altogether. This perspective derives from earlier work by Williams' (1982), in opposition to a preposing transformation. It is proposed by Finer and Roeper (1989) and developed by Safir (1986b). This approach must deal with considerable evidence that preposed nominalizations continue to maintain thematic structure. For instance, the fact that *the barbarian's destruction is ungrammatical without a THEME, which is inexplicable if the possessive position is free of any thematic projection.

Lasnik (1986) provides further evidence that a subject position in nominalizations exists. He points out the correlation between:

- 41)a. Bill opened the door with a skeleton key
- b. *Bill opened the door by a skeleton key
- c. Bill's opening of the door with a skeleton key
- d. *Bill's opening of the door by a skeleton key
- e. The skeleton key opened the door

He argues that examples (41b,d) are excluded because the by-phrase is linked to the subject position.

There is further evidence, not only that there is a prenominal argument position, but that such a position can undergo passive-like dethematization. The affix -able projects the theme into subject position, but continues to have an agent in its thematic grid. Therefore the following array is possible:

- 43)a. the grammar is learnable by the child
 (compare: *John is defensible by Bill)
- b. the learnability of the grammar
- c. the grammar's learnability
- d. ?the learnability of the grammar by the child
- e. *the child's learnability of the grammar.

Example (43e) is sharply ungrammatical because the -able rule has projected passive properties²⁴ (as in 44b) onto the empty subject position (44a), allowing only THEME to be put there (as in 43c), putatively by movement²⁵:

- 44)a. The PRO_{non-ag} learnability of grammar_i
 [AG,TH_i]
- b. NP_i was see+ en
 [AG,TH_i]

²⁴ "Burzio's generalization" states that the subject is dethematized when the verb no longer projects case.

²⁵Strictly speaking, then, the notion of "dethematization" is also inadequate, because it does not stipulate that only a THEME can occupy that position.

Williams' strongest argument is that implicit argument effects continue to exist when the prenominal genitive is filled:

44) a. yesterday's destruction of the city to prove a point.

It is possible, however, that yesterday's is a sentential adverb which will allow another prenominal position. Consider:

- 45a. yesterday's people's revolution is today's dictator's paradise.
b. Yesterday's President's proclamation has more weight than today's underling's correction.
c. Boston's President's welcome was better than New York's mayor's homecoming
d. one man's week's work is another man's year's achievement

These double possessives are not easy to construct. The reason seems to be that there is a strong parsing preference for treating several possessives as recursively generated (my sister's brother's...). These cases work because we know, for instance, that there is no Boston's President. These examples suggest that the prohibition against two possessives is a low-level non-grammatical constraint which can be overcome. We conclude that there is both an argument position and a non-argument position for the PRO (we return to this issue below).

3.0 Implicit Roles

We turn now to thematic control where no syntactic positions are involved. We will extend Williams' account of thematic control and argue that they fit perfectly a concept of thematic roles which is distinct from arguments.

Our analysis of bare nominalizations raises the question: what is the status of the thematic grid which is not on the HEAD of the word? One might argue (following Finer and Roeper (1989) or Safir (1986)) that the thematic grid disappears. One can in fact show quite clearly that it does not disappear. In fact one can use Williams' approach to implicit arguments as a demonstration. Williams' argues that there is a linking between the thematic grid of the verb undergo and the thematic grid of the nominalization.

46. John underwent an examination
(AGi,TH) (AG,THi)
[Agent associates with Theme of complement]

Here John picks up the theme role of examination even if no explicit arguments are present.

What is the status of the thematic grid when linking occurs? Our diagnostic system provides a clear answer. Consider the following ungrammatical constructions, whose ungrammaticality follows from the principles outlined above:

- 47a. *a big push of John's career
b. *a bad break of a foot
c. *the buy of clothes
d. *the kick of Mary

Counter-example Question

There is a large number of counter-examples, but this is not surprising, since the counter-examples are like extended words. To have 500 counter-examples is like having 500 words. They include completely idiomatic cases like:

- a. the make of the car
b. the run of the store
c. the push of a button
d. the hope of mankind

And a large group of "creative" or anti-creative elements:

- a. the loss of life
b. the pursuit of happiness
c. the review of the book
d. the repeat of the movie

These remain a tiny minority in comparison to the cases which are excluded:

- a. *the steal of money (compare: the theft of money)
b. *the hate of God (compare: the love of God)

It is possible that there is a low-level semantic feature which defines the permissible class. Verbs of "creation" may be involved. This does not change the basic observation that extremely few are permitted, while nominalizations with affixation are perfectly regular.

We find that just these constructions allow the thematic-linking process:

- 48)a. John's career underwent a big push
- b. A foot underwent a bad break
- c. The clothes were a good buy
- d. John gave Mary a kick (from Williams)

In addition we find that the plurals which do not allow objects can have them in thematic-linking contexts:

- 49)a. *the cuttings of the lawn (activity reading)
- b. the lawn underwent several cuttings
- c. *the developments of new ideas
- d. New ideas underwent (several) developments

The thematic-linking process fails to satisfy the diagnostic for implicit arguments, namely, a sisterhood relation, but they exist nonetheless. Therefore we consider them to be implicit roles.

We can illustrate how the higher verb selects a thematic role in a complement nominalization without providing an argument for the nominalization. It is well-known that there is a THEME-requirement on the presence of agents in activity nominalizations.²⁶ Therefore we find that an agent alone in a nominalization is ungrammatical (50a):

- 50a. *the barbarians_{ag} destruction
- b. the barbarians' destruction of the enemy

What satisfies this constraint? It is usually assumed that the presence of a THEME will satisfy the requirement. We can show, however, that the presence of a THEME is not sufficient. We can do this via the control structures under discussion. The theme is provided via control from the higher verb in the following sentences, and yet they remain ungrammatical:

²⁶See Chomsky (1981) Finer and Roeper (1989) and particularly Safir (1986) for discussion. In addition Grimshaw (to appear) provides many examples of this phenomenon.

- 51a. *Thebes underwent the enemy's destruction
- b. *the town underwent the state's establishment
- c. the town underwent establishment by the state
- d. the state's establishment of the town
- e. *the woman underwent the doctor's implantation
- f. the doctor's implantation of the woman
- g. the woman underwent implantation
- h. *the disease underwent the doctor's eradication
- i. the disease underwent eradication by the doctor

If the PRO subject of the nominalization is filled, as in the enemy's destruction then the sentence is ungrammatical. If the subject is not filled, as in 51c), then the sentence is grammatical. This means that the theme-requirement is a function of syntactic argument-projections and not the content of the thematic grid for the examples above. How can we account for this kind of control?

Clark (1985) provides an extensive analysis of retroactive gerunds which show the same properties:

- 52) a. this room needs a good cleaning
- b. *This room needs Bill's cleaning

He argues that there is a movement rule from object to subject which then allows higher control:"

- 53) this room needs PRO_i cleaning t_j

Presence of a subject in the genitive position will block this movement rule. This analysis reveals a) that the theme-requirement specifically requires argument projections, and b) that existing rules of movement and control lead to the appropriate predictions.

If the THEME-requirement is a requirement on argument projections, not thematic roles alone, then we make a further correct prediction. Where the THEME-requirement must be met, theme can be syntactically projected. This is just what we find:

- 54) the destruction of Thebes

Once again (54) stands in contrast with *the help of John_{th}.

One might now ask if we have eliminated the need for the concept of implicit roles? In fact, there is a set of counter-examples to those listed above which involve a specific set of nominalizations that allow filled subjects:

- 55)a. John underwent the CIA's training
- b. Bill underwent the school's examination
- c. John underwent the FBI's investigation
- d. You will have to undergo our interrogation
- e. The child needs the court's supervision
- f. The man needs our love
- g. The child elicits our devotion
- h. We need the doctor's permission to go
- i. We have selected the finest rugs for your consideration
- j. We have only the finest wines for your delectation
- k. You owe us nothing for our service
- l. This report was not intended for journalists' consumption
- m. He did not deserve our condemnation

These are nominalizations which have been lexicalized to occur independently (See discussion of Grimshaw (to appear) and Clark (1985)). They can occur without arguments and allow plurals (the examinations/ investigations/ interrogations were terrible). The significant fact here is that the THEME-linking process continues to work. We argue that there are no grounds for saying that the thematic grid disappears when it is deeply embedded. It loses the capacity to assign thematic roles to argument positions, but the thematic roles remain. One can in fact embed the critical nominalization within a compound and the linking survives, although intuitions become more obscure:

- 56a. You will have to undergo our interrogation program
- b. You cannot avoid undergoing the examination system
- c. The manuscript must undergo our review system□

Note the clearly worse comparative grammaticality of *the examination system of you/*the examination of you system.

3.1 Recursive-linking

It is also possible to have recursive-linking. In effect, then, we get a linking between several elements:

- 57)a. John sought protection from attack
- b. The house underwent selection for reconstruction

In (57) we find that John is linked to the object of both protection and attack. If an intervening element requires an agent, then ungrammaticality results:

- 58) *John sought evasion from attack

John is the subject of evade and the object of attack. Although (58) represents intuitively a natural thing to seek, the sentence fails to link thematic roles properly and therefore is ruled out.

3.2 Prepositions and Linking

We find the same kind of linking under prepositional guidance.

- 59)a. John bought the book for review
- b. John selected Mary for discussion
- c. Reagan selected the Nicaraguans for disembowelment
- d. the state selected John for promotion
- e. He took home a copy for examination
- f. the book is under review
- g. He submitted himself to evaluation
- i. He tricked Bill by deception.

The prepositions for, under, to all select the object for the nominalization and the subject is selected as agent when one is present.²⁷ We find that the same relation holds when the matrix agent is an implicit agent.

²⁷It is evident that the object can be uncontrolled in the by-phrase case through examples like: We chose the best person by elimination which does not mean that we eliminated the best person.

- 60) a) the apartment was selected for display
- b) the house was bought for living in

We can now ask the question: is there argument-control or thematic linking? Our diagnostics indicate that argument-control can be involved. First we find that presence of a different subject blocks control:

- 61) * we brought the candidate home for Bill's discussion

Second, we find that that addition of plurals can shift the interpretation to an uncontrolled one:

- 62)
 - a. John brought the candidate home for discussions
 - b. he took home a copy for examinations
(contrast: he took home a copy for examination)

In each case, the role of the nominalization (examinations, discussions) is open with respect to other NP's. In (62b) a copy (of something) is somehow relevant for some (unspecified) examinations, but we do not know what the relationship is.

Nonetheless, we find once more that thematic-linking is also needed. In some instances the object reading is clearly possible if the nominalization is lexicalized and allows subject genitives or plurals :

- 63) a. we brought the candidate home for your consideration
- b. we prefer those manuscripts with reviews

Grimshaw (to appear) discusses similar cases and argues that the plural cases fail to be process verbs and therefore, in effect, lose their thematic roles. Our approach is in the same spirit, but we offer a technical reason for the shift in interpretation. We fail to see that the plural necessarily shifts the underlying meaning of the nominalization (examination), but nonetheless the argument control relation is clearly lost in most

instances.²⁸ Therefore we claim that it is the loss of the argument projection which blocks syntactic control. This leaves the thematic role available for linking for those nominalizations which remain grammatical and must therefore have been lexicalized, thereby allowing genitive (your consideration) or plurals (reviews).²⁹

3.2 Disjoint Reference (DR)

There is another feature which shows a sharp distinction between arguments and roles. It has long been known that passives exhibit disjoint reference (Postal (1971), Baker, Roberts, Johnson (1989)):

- 64) a. John shaved
- b. John was shaved (=someone else did it)
- c. John was shaven

While (64a) is clearly reflexive, we find that (64b) implies that some other person shaved John. In (64c) we have argued that in the adjectival passive, the agent is present as a role and not as an argument. Since (64c) does not exclude the coreferential reading, it follows that arguments but not roles entail disjoint reference. This is what the facts say, but it remains unclear why DR should apply to arguments and not roles.

Baker, Roberts, and Johnson (1989) argue that the distinction reflects the operation of Principle B upon the pronominal clitic manifested in the affix -ed. We have

²⁸In some instances, of course, even the non-plural can become obscure in its interpretation, suggesting either pragmatic unclarity or a loss of thematic roles. Consider this contrast:

- i. John likes advice = John likes to receive advice
 - ii. ?John likes investigation =/= John likes to be investigated
- In (ii) the interpretation is open, as if the word were in quotation "investigation". It is also not completely grammatical, perhaps because One could argue that

²⁹The impossibility of plurals with true nominalizations makes a further prediction. As Lebeaux has pointed out, the nominalization is ruled out here:

- 66. *the enemy's destructions of the city

We find that the distinction between arguments and roles has numerous manifestations.

argued that the clitic analysis is incorrect. The affix is a verbal element which carries a thematic grid of its own.

Further evidence in behalf of this view is that fact that -able exhibits exactly the same characteristic of disjoint reference (65):

- 65) a. John and Mary are hugging
- b. John and Mary are huggable
- c. they are a loving couple
- d. they are a loveable couple
- e. *they are reciprocally loveable
- f. *they are loveable by each other
- g. *they are loveable by themselves

Note that the -able affix also produces DR and excludes both reflexive and reciprocal coreference. In (65d) we cannot have the reading that they love each other as one has in (65c). In (65b) it is only by indirect accident that John and Mary would hug each other. How can we represent this fact? We can make Principle B apply to the thematic grid itself in the fashion which Williams' advocates for all principles of binding. In a thematic grid, the elements that are projectable onto separate syntactic positions are disjoint:

- 66) monkeys_x are easily loveable by X_y
 [AG_y, TH_x]
 Z ≠ x (x = *each other)

If the TH is externalized, then the agent may not be coreferential with it. This is a technical statement of the restriction, but not an explanation.

We have shown above that -able projects AGENT both to the subject PRO position in a nominal and into a by-phrase, in contrast to -ible: defendable by Bill/*defensible by Bill.

Now where no syntactic projection is involved, we find that there is no restriction on reciprocal interpretations:

- 67)
- a. they have a reciprocal love
- b. they have love for each other

c. they need each other's love

Why should the principle of Disjoint Reference not apply to the implicit roles of bare nominals? We will sketch an answer to this question, although we adduce the evidence primarily as a diagnostic for the distinction between arguments and roles. The logic we have in mind is this:

- E. 1. Arguments entail projections to MP positions.
2. MP positions are susceptible to independent reference.
3. The principle of DR is stateable with respect to elements that are potentially referential.

Elsewhere, I have argued (following Sproat (1985)) that where an MP is not present, no definite reference is possible. Because compounds involve the incorporation of a HEAD and not an MP (rice-eater/*such rice-eater), the incorporated element must be generic. This is not the place to articulate a deeper theory of reference, sensitive to both syntax and morphology. It is clear that such a theory will be defined not in terms of syntactic positions alone, but in terms of the referential potential of syntactic categories. We return to the relation between MP's and reference below.

4.0 Subject/Object Assymetry

We have established now a distinction between arguments and roles. We have illustrated how syntactic control of agents, via PRO, and of objects, via movement to PRO (following Clark (1985)) operates. We have also shown that object control, however, exists without argument projection and without syntactic movement. We have therefore outlined an assymetry in the system: object control of implicit roles by linking exists, but subject control must be syntactic. Why? We will argue that the principle of Proper Government, applied within the lexicon, defines a restrictive domain over which thematic-linking can occur.

Before we proceed, let us provide a further example of how subject-control functions. The presence of an article makes subject control optional for some nominalizations which are otherwise obligatorily controlled. (Some speakers do allow a PROarb reading, but all speakers detect a difference.) Consider this array:

68a. John enjoyed preparation of his own funeral

- b. John enjoyed the preparation of his own funeral
- c. John enjoyed his own funeral's preparation

In (68a) it is difficult to get the reading that someone other than John prepared his funeral; control is obligatory. In (68b) it is possible to get both a controlled reading and an uncontrolled one. In (68c), where the THEME-argument occupies the PRO position, it is only possible to get an uncontrolled reading: the agent of preparation is unspecified.

In summary we have shown:

69)

- A. Thematic-linking affects only internal arguments (themes)
- B. A controlled PRO is present in nominalizations
- C. The presence of an article makes control optional
- D. The presence of an argument in prenominal position eliminates control.

In sum, all cases of AGENT control are linked to a PRO position while THEME-linking does not obey this restriction. What would explain this asymmetry?

Hale and Keyser (1984)³⁰ argue that VP structure exists in the lexicon but nothing more. They propose:

70) No structural position is associated with the subject within the lexicon.

If the lexicon operates on VP's, then rules can refer to VP structure. Moreover, the AGENT must still be listed in the thematic grid but cannot be assigned a position. Only elements which have been assigned a position in either a lexical structure or a syntactic structure can undergo co-indexing.

If VP is present in the lexicon, then under the assumption that principles of grammar are completely general, we would predict that government applies in the lexicon. Therefore we propose: ³¹

71) Only properly governed elements can be subject to thematic linking³².

³⁰See Safir (1986) for discussion

³¹See Keyser and Roeper (1984) for evidence that lexical derivation is sensitive to proper government, and hence the lexicon contains structure.

³² In Keyser and Roeper (1984) we argued that a large number of lexical rules are sensitive to the principle of proper government, which implies the presence of lexical structure. For instance, the ergative rule will only operate

We now have an explanation for precisely the asymmetry which we have observed. Bare nominals have VP lexical structure but no syntactic structure. Therefore a nominal cannot syntactically express the object relation. Hence *the help of John is ungrammatical. But the lexical item has a lexical structure to which rules of control can refer. Therefore the object can be linked to a higher verb, but not the subject, since subjects are not lexically defined.³³

We must however address a further question. If the VP assigns a direct-object position, then it would appear that the lexicon contains an MP and therefore Principle B should be applicable to theme-linking contexts. Roeper and Keyser (1989) have argued at length, on quite independent grounds, that an abstract clitic position must exist in the lexicon which is a projection site for thematic roles. The position defined within the lexicon is a clitic position that allows only Heads. Therefore no DR requirement would be necessary for implicit roles.

In sum, we view the lexicon as containing implicit syntactic structure. This leads in turn to another fundamental claim: all control or linking is structurally contingent.

4.1 Articles and Optionality

Articles and Optionality

How do we account for the optionality induced by the presence of an article? In fact the conditions under which PRO_{arb} are induced have always been quite mysterious. The introduction of the concept of a DP node (Fukui and Speas (1986)) offers us an insight into this problem which draws control theory together with bounding theory.

where there is an adjacent NP. We find the party broke up and we broke the party up. But we cannot have *the party broke into just as we cannot have *we broke the party into. Middles, we pointed out, do not follow the same restriction: the room will break into easily.

³³There is an apparent counter-example:

- i. John performed Mary's operation

In (i) it appears that John is the agent of the operation, although the prenominal PRO position is filled. However we do not believe that this claim is straightforward. If the relation were a normal AG/TH relation, then we would expect there to be a nominalization. But the nominalization is excluded:

- i) *John's performance of Mary's operation
- ii) *Mary's operation by John

The DP constitutes a MP and therefore belongs to the category which can generate a barrier³⁴. In addition, following recent suggestions of Chomsky, who argues that nodes which are not utilized are absent, we have a fundamental difference between (a) and (b):

- a. Reagan enjoys defeat
- b. Reagan enjoys the defeat

In the second instance it appears as if there is a completely free interpretation. Other evidence, however, shows that there is still a control-contrast:

- c. He enjoyed the preparation of his own funeral
- d. he enjoyed preparation of his own funeral.
- e. He enjoyed his own funeral's preparation

The contrast between (c) and (d) is between obligatory and optional control. In (c) there remains a reading where he clearly does the preparation himself. In (e) there is no implication at all about who does the preparation. Thus the controlled reading is blocked.³⁵

there are two other instances which have PRO_{arb} which exhibit a similar profile:

- f. John does not know [what to do]
- g. John thinks [NP [to sing] is good]

In each instance there is an additional MP between the PRO and a potential controller. This coincidence looks systematic and therefore we argue that PRO_{arb} is induced precisely when a barrier exists.

It is not the case when a reflexive is involved:

John did not know what to give himself

³⁴Thanks to P.Speas for discussion.

³⁵Grimshaw (1990) argues in a fashion largely comparable to the analysis here. But she also argues that these forms are not open to a process reading. We see no real difference at the semantic level of process/result in these three cases. In addition we provide below arguments to the effect that there must be a subject position for nominalizations above. [See also Safir, Longobardi and Giorgi, Boyd, Chomsky]. Her arguments depend upon the absence of PRO in NP. Therefore, in general, we think her analysis misses an important syntactic operation that is captured in this analysis and in the analysis of retroactive gerunds provided by Clark (1985).
There

Here control is achieved, but once again, it is not required. Where no barrier exists, the control relation is obligatory exactly as it is with the case of:

John likes [Pro_i defeat t_i]

This is a clue to the final explanation, but obviously a deeper account is called for. What could it be? ³⁶

This evidence points toward a positive theory of control. Boyd (1992) has shown that control can decrease a barrier effect:

- a. *what did John discuss the claim that Mary left t
- b. what did John_i make [NP the PRO_i claim [that Mary left t

These facts together point toward an active theory of control indexing which reverses the default PRO_{arb} designation. In brief, such a theory could be enlarged to claim that where no Maximal Project is present (likes defeat), then co-indexing is obligatory, eliminating the default PRO_{arb} in phrases like the defeat, where the article allows independent reference. We will not develop this theory here.

We turn now to the question of why articles make control optional. One solution is to make the following argument:

72) SPEC must be obligatorily filled.

In a bare nominal, SPEC is filled by PRO, while if an article is present, SPEC is filled by either the article or both the article and the PRO in each of the argument and the non-argument positions we proposed above.³⁷ If PRO is present, then control occurs. If it is not present, then there is no control, producing the appearance of optional control. If there is a prenominal argument NP, then the PRO position is filled and control is impossible. The notion that there is an obligatory SPEC is consistent with a consistent system of X-bar projections. This, then, accounts for the full array of facts.³⁸

³⁶Boyd (1992) also shows how a pronominal coreference relation can have the equivalent of an L-marking effect on possible barrier categories.

³⁷This perspective has been carefully developed and argued for in work by Fukui and Speas (1987).

³⁸ Consider a second effect of the presence of an article, namely the interpretation of the post-nominal PP:

We will offer a speculation now which we believe provides a natural conceptual background to the technical solution just proposed. Intuitively it is evident that only one act has occurred in a phrase like:

73) John fooled Bill by the use of deception

If one says:

74) John selected Mary for the discussion

Then there is a discussion which has a referential character separate from the act of selection. Mary could be the object or the participant. In (81):

75) John selected Mary for discussion

only one event has occurred. A single act of "select for discussion". It is as if there were a function composition creating a complex verb with a single object.³⁹ Another act, namely a discussion, could occur later, but it would be different from "select for discussion".⁴⁰

This fits the idea we have advanced above (following Sproat (1985) that only MP's can refer. Elements which constitute less than the maximal projection constitute a subpart of another MP which has the power to refer. Therefore unless the NP is

41a. John is in control of the army

b. John is in the control of the army

Following Auon (1981), we have argued elsewhere (See Roeper (1985) that there is an indexing relation between the subject position and the PP. Now the question becomes why no indexing can occur in (41a). We argued that a copying rule operates only with respect to elements that are not sisters to a thematic grid. If the article has the effect of creating a branching node in the SPEC, then sisterhood is lost and copying occurs.

³⁹See Bach (1982) and Larson (1989) subsequent work for discussion of this option.

⁴⁰There is independent evidence that many PP's allow a simple head object, which is an N and not an NP and therefore incapable of being an argument.

We have in mind cases like: by foot, by spoon, by design, with effort, with force, etc, under supervision. The prepositional class is actually much larger than the verbs which select for bare nominals.

"specified", it has a dependent referential character and cannot "refer". It follows then that it refers only in accord with another referential domain, within which it falls.

We now have a division between two modes of reference: an article defines a connection to the world while a control relation defines a connection to a higher predicate which in turn has referential character. Underlying this division is a principle:

- F. 1. All lexical items must refer:
2. the SPEC fixes reference
3. SPEC_{Article} refers directly; SPEC_{PRO} refers indirectly
by a connection to a higher referring MP.

In sum all NPs must be either controlled or referential. This approach then gives conceptual unity to the set of elements which appear in SPEC.

Re-analysis in terms of raising:

Instead of a simple bracket theory, we could also adopt current proposals that there is lexical raising in the phrase-structure from a verbal node to a nominal one.

This is advocated by Hale and Keyser and Borer (1991). The result is the same: the sister relation between the thematic grid and the THEME is broken. We can illustrate it as follows.

In addition we illustrate the path of the object movement rule in Clark's analysis. It will in fact account for much of the object control situation.

4.3 The Pragmatic Challenge

The arguments which have been advanced here (and those of Williams') must meet a substantial challenge from a purely pragmatic point of view. There are many speakers (but significantly not all of them), who find the following expressions to be perfectly acceptable:

- 76) John could not undergo a long trip
- b. The senator could not undergo another session of congress
- c. He had to undergo another family reunion

In fact one can construct cases where the relations reverse themselves:

77) The old doctor's eyesight was poor. He could not undergo another operation without an assistant.

Here the most natural interpretation is that the doctor is the agent. In addition there are cases where the object position is filled:

- 78) a. John was forced to undergo (the) amputation of his left arm.
b. His body will undergo the gradual destruction of his liver.
c. the baby underwent the destruction of fetal cancer cells by machine.

This would seem to provide direct counter-evidence to the view that the THEME of the verb is involved, since the THEME is present.

These examples, if generally acceptable, could undermine the empirical basis of our arguments, although the argument could still be correct. The empirical basis is challenged because pragmatics will provide all of the same readings that are produced by thematic-linking or control. It could be that the verb undergo will optionally take a theme if a grid position is available, but otherwise use pragmatics. How can one tell?

A closer look at these examples reveals that when the object position is syntactically filled, then inference applies without a special relation to the nominalization. Consider the meaning of (97c). It does not mean that the baby underwent destruction; it means the opposite: the baby underwent creation because the cancer was destroyed. Were the THEME-linking still in effect, then one would have the false reading: the baby underwent destruction by the destruction of cancer cells.

A stronger argument can be made which, effectively, eliminates the pragmatic option:

G. Thematic roles cannot be pragmatically duplicated.

Consider the cases like:

- 79)a. The sound of a trumpet.
b. *John's sound of a trumpet.
c. the trumpet sounded.
d. yesterday's sound of a trumpet

Now one might ask the following question: if the prenominal position is free, as Williams' and others have argued, then we predict that (79d) is possible, but also that one should be able to insert John in (79b) and freely arrive at the AGENT interpretation. Just this interpretation is blocked. This is consistent with principle (G): a true thematic role must be involved, wherever a thematic-role interpretation arises. It follows that bare nominals cannot provide a theme-object interpretation unless theme is present.⁴¹

The same contrast arises in the following comparison:

- 80)a. *the thief of the bank
- b. the thief of Baghdad
- c. *a cook of stew
- d. a cook of great ability

A THEME role may not be pragmatically inferred in the PP, while other non-thematic relations are possible and open to inference.

The upshot of this discussion is that the use of a verb like undergo can assume an inferential connection to its complement. However if an unconnected thematic grid is present, then the thematic grid must be invoked. In this fashion, which is admittedly indirect, we can argue that it cannot be via pragmatics that the semblance of thematic-linking arises. Thematic-linking occurs as a genuine, formal process.

4.4 Lexical Semantics

There is a larger argument against the free use of inference in the interpretation of the small domain under discussion. Natural inferences fail repeatedly in a description of language. A theory of inference cannot explain why we can say the key opened the door but not *the fork ate the meat. If we can say he performed swimming exercises why is it odd to say *he performed swimming? While children make entertaining errors in this domain occasionally, they are amazingly few. Such sharp distinctions in grammaticality, which clearly refer to semantics, suggest that we must radically enrich

⁴¹Adjectives like American in the american invasion of Germany must be interpreted as "in an American fashion" and not simply as a duplicated agent from the perspective we have developed here. See Dischullo and Williams (1987) for support for this perspective.

the theory of linguistic semantics. One often hears "knowledge of the world" adduced as an explanation of semantic ungrammaticality. It is hard to see how "knowledge of the world" would automatically limit the meaning domain of words like perform.

The formal inventory of semantic concepts that dominates current theoretical work does not extend far beyond the set of thematic roles which have been at the heart of our discussion. Nonetheless important concepts such as process, result, causative, resultative, depictive are clearly present in a systematic fashion that is much too constrained to be explained by simple inference. In this respect, this essay fits the growing body of literature which seeks a formal role for enriched semantics in the description of language.⁴²

5.0 Conclusion

First let us summarize. We have developed a system which combines syntactic control of subject PRO in nominalizations with thematic-linking for objects where no syntactic position is involved. In brief, undergo allows a) prenominal genitives, b) plurals, and c) recursive-linking,⁴³ and it does not satisfy the THEME-requirement for nominalizations. Nevertheless there is linking between the subject and the internal THEME of the nominalization, no matter how far the thematic grid is embedded. Where AGENT is the external argument, we found that the traditional principles of positional syntactic control of PRO were involved. Thus an asymmetry between internal and external, or subject and object, within lexical items emerges. In technical terms, all of the facts can be accounted for within a system of sister-projections from the thematic grid. If a sister-projection is blocked by additional affixation, then syntactic control is blocked, but thematic linking is possible. We argued for a theory of the operation of SPEC in which it fulfills the role of establishing reference. Either an article on a nominalization indicates a separate event, in which case control is optional, or the absence of an article indicated that the nominalization was referentially dependent on a higher verb. Its dependence is established via a control link to a higher verb. In this respect our system creates a convergence between syntax and semantics which has been the goal of many schools of thought.

⁴²See Pustejovsky (this volume), as well as the work of Jackendoff (1988), Randall and Carrier-Duncan (to appear), Hale and Keyser (1987), and the Lexicon project.

⁴³Williams (1986) "Implicit Arguments and Binding" discusses related issues from a more lexically defined perspective.

Where does this analysis fit into current morphological theory? In Keyser and Roeper (1984) we argued that *move-alpha* must exist in both the syntax and the lexicon. Now we argue that a single concept of control operates with respect to both syntactic and lexical structure. Moreover, the control domain is governed by a lexical principle of Proper government. In addition, principles like disjoint reference apply not only in syntax but with respect to morphological entities like -able. We can see again that deep principles operate throughout the grammar. Level distinctions belong largely to the domain of variation.

And finally, we have argued for a distinction between thematic arguments and thematic roles which falls naturally out of the concept of a thematic grid. The grid has the potential of projecting thematic roles onto syntactic positions. If the projection does not occur, then the grid remains with implicit projections. If implicit projections are blocked, then the grid remains with implicit semantic roles. These roles are accessible under a lexical theory of control.

Appendix:

Semantics and Events

One feature of thematic roles is whether they dissolve into events. The question is perhaps miscast. There can be little doubt that a conception of events includes thematic roles. Now we can ask again whether there is any need for thematic roles, if events are also available. Are thematic roles epiphenomenal abstractions from events with no independent reality? The answer lies in whether there is any points of automatic or discrete reference.

In fact affixation provides an independent source of information on this point. It is interesting that in an event an actor often acts in concert with an instrument. One might then expect that there would be a capacity for referring to the actor/instrument combination. The driver = car plus driver/ diver = person plus pool/ cook = person plus utensil. In fact, however this is never the case. The -er affix always refers to either the agent or the instrument but never the combination although in many situations it would be very natural. If we say "the driver is here" we naturally infer the presence of the car, but it is not automatic and therefore the inference is necessary. Were we to say "the driver and the car are here" it would seem redundant, although it clearly means something different from simply saying that the driver is here. Thus the restriction on the interpretation of -er points to the necessity of thematic roles. This essay, which turns on the presence of implicit thematic roles, constitutes more evidence in behalf of the view that thematic roles have psychological reality. (See also Carlson's discussion of why we do not have more than one thematic role).

We find that other affixes share distinctive references to thematic roles. Consider the relation between -ing and -ant as affixes. One never entails an agent and the other always seems to entail one:

- a. the lines are converging
- b. the lines are convergeant
- c. the students are converging on the administration building
- d.*the students are convergent on the administration building.

We can also say:

- a. John is a descendant of Moses
- b.*John is a descendant of the mountain

These affixes, one might say, refer to different sorts of events, but they differ exactly in the role of the agent. Consider in the same respect an informer as opposed to an informant.

It is clear from these affixes that the affixes involve discrete differences in meaning. It is in a sense, the violation of the integrity of events, to create discrete subparts, but it appears to occur in the reflection of events in the grammar. It is captured by the notion of thematic roles. Levin and Rappaport (1986) have argued that no rules refer to thematic roles, which may be true for rules which add no lexical material, but it is clearly the case that affixes appear to refer to precisely those kinds of entities.⁴⁴

Nominalizations often refer to events or results, but also to subparts of those events: cook, fork, thief. Those discrete differences seem to correspond quite well to the partially arbitrary subdivision of events into thematic roles.

Are thematic roles ever deleted? It appears to be the case that just the notion of agency is dropped in some adjectives, and also in what is not referred to in nominals. How does one get the object reading for John likes advice. Williams argues for a linking rule that selects such objects. It seems to be correct that something of that sort must occur (see also Safir).

Therefore we argue that rules operate on a subdivision of events which corresponds to thematic roles. That subdivision is, at the moment, fairly crude and a richer version, more naturally related to the concept of event is quite possible. However the notion that language has a fixed style of

⁴⁴Roeper (1984) points out that all affixes refer only to external arguments. Leven and Rappaport make the same argument about -er. However this restriction does not exhaust the restrictiveness of -er. If we say:

That John sang impressed me

We do not say:

ii.*that John sang is an impresser.

It is people or instruments that can be -er referents, not anything in the external argument position. Therefore it is clear that the affixation system subdivides events. The subdivision corresponds to thematic roles.

subdividing events is not open to doubt. Now we will explore that question from a certain perspective.

Appendix: Williams' Critique

Williams (1985) offers two critiques of this view of implicit arguments. The first claim is that it is not the "agent" but the entire event which serves as the subject of the rationale clause. This reflects an appropriate criticism of one sequence of examples. The nominalization provides a direct diagnostic of the viability of this approach. In the sentence:

24) the city was destroyed to prove a point.

it is possible to take the entire sentence as the subject:

25) the destruction of the city proved the point.

Now, however, note that there is a large range of examples where the nominalization cannot serve as the subject:

- 26) a. the door was opened to enter the room
- b. *the opening of the door entered the room
- c. Drugs were taken to go to sleep
- d. *the taking of drugs went to sleep

The event subject reading clearly fails in this environment. Our discussion pertains only to the latter, agent-controlled, cases.

The second critique is pragmatic. It is argued that the imaginability of an agent lies at the root of grammaticality rather than the explicit presence of an agent on the thematic grid. Therefore if one says:

27) The boat sank to end the scene.

We have a grammatical sentence because the "director" functions as an agent. First one should observe that this example fails to be a clear agent control case because the event can serve as subject:

28) the boat's sinking ended the scene

Second one can invoke a pragmatic context and it still does not eliminate grammaticality effects:

29. The wedding party arrived at the church.
- a. the doors were opened to enter the church.
 - b. the doors opened for everyone to enter the church.
 - c. ?*the doors opened to enter the church.

Example (29a) is more grammatical to our ears, but less pragmatically sensible than example (29c), because it means that the people who entered the church opened the doors themselves. We find that (29c) is ungrammatical, though an agent is clearly imaginable (in fact contextually provided).⁴⁵ We conclude that one cannot reinstate the grammaticality of an ergative sentence merely by providing a context where an agent is imaginable.

The third critique relates to the argument for small clauses from adjectival adjuncts. Williams correctly observes that adjectives can apply to the subject broadly interpreted. One can use the term a "nude game". This factor explains why many other small clause cases are excluded:

- 30) a. *Reagan was elected angry (electors are angry)
b. an angry Reagan was elected

The predicative reading blocks the control by the implicit agent.⁴⁶

However, one can find many examples where this diagnostic clearly fails:

- 31) a. the letter was carried nude

⁴⁵There are ergative sentences which occur grammatically with rationale clauses:

- i. Jesus died to save our souls
- ii. Joan of Arc burned at the stake to save France

Here one can plausibly argue that the subject of the ergative receives a secondary thematic role of agent from the rationale clause, as Zubizarreta (1984) has argued.

⁴⁶Exactly why blocking occurs rather than ambiguity is an interesting question which we will not address.

- b. *the nude letter
- c. the game was played unhappy
(does not entail: the game was unhappy)
- d. a speech cannot be delivered ill-at-ease
(does not equal: an ill-at-ease speech cannot be delivered)

- 32) a. The crowd booed both teams.
The whole game was played irritated at the crowd.
- b. *an irritated at the crowd game/the game was irritated at the crowd

The example (32a) reveals that the adjective can have a complement which supports the small clause view that an AP is present.⁴⁷ As Williams notes, such AP phrases will not serve as subject modifiers (32b).

The concept of the imaginability of the "agent" has a clear relevance in this domain. We find that it causes a sharp discrimination in grammaticality for the following sentences:

- 33)a. *the letter was sent nude (compare: the letter was carried nude)
- b. the letter was carried on our shoulders
- c. ?*the letter was sent on our shoulders

The unacceptability of (33a) is paralleled by (33c). The verb carry has a concrete interpretation which invokes a sense of the agent. No imaginary agent arises with send, allowing (33b). Note that general plausibility is not the decisive factor here; it is relatively implausible that one would either carry or send a letter on a person's shoulders. The fact that the imaginability of the agent works with small clauses, but not (very well) with ergatives, indicates again that the ergatives resist adjunct rationale clauses for grammatical reasons and not pragmatic reasons.⁴⁸

⁴⁷Williams marks as ungrammatical *the game was played mad at Bill. This example may be excluded because implicit agents are generic and therefore prefer generic interpretation throughout. Note the contrast between:

- i) *the island was uninhabited by Bill
- ii) the island was uninhabited by man

⁴⁸See also Safir (1986) for extensive discussion of small clause adjectives on nominalizations (the discussion of the issue stoned was unfortunate).

The next argument that Williams' advances is that implicit agents from passives will not allow a rationale clause. This view is not supported by the intuitions reported in most of the current literature⁴⁹:

34)a.(*ESW) Mary was arrested to indict Bill

b. Ultimately, Mary was arrested to provide a way to indict Bill

The sentence (34a) is not particularly plausible and therefore it appears to be ungrammatical. It is much-improved when it becomes plausible (34b). Consider now the following minimal contrast:

35)Reagan was elected to provide the world with a strongman

36) Reagan got elected to provide the world with a strongman

The "get" passive does not show the implicit agent effects which are clearly evident in (35). Reagan is the AGENT of the adjunct clause in (36) while the implicit AGENT controls in (35). Note, again, that the event is virtually identical in both cases. It is the grammatical accessibility of thematic roles which causes the difference. In the system outlined above, we would argue that elected acquires an extra bracket as an adjectival complement of *get* and therefore the implicit agent, which it still continues to possess, is unavailable for control. Note that the interpretive contrast between (35) and (36) exists independent of the different degrees of grammaticality which one might assign to these sentences.⁵⁰

In addition, we cannot explain why the object control is obligatory rather than subject or object. The answer lies in the role of linking between theta-

⁴⁹Chomsky (1985), Roberts (1985), Jaeggli (1984), Jones (1985), Lasnik (1986), Manzini (1986)

⁵⁰It is also worth note that rationale clauses can occur in contexts where no event whatsoever occurs:

i. Flamingoes are pink to attract the opposite sex.

What is present here is an abstract notion of "intentionality" which cannot be attached to the thematic structure of the word "pink" or "is".

complexes which we have shown to be independently necessary. Whereas all verbs make this selection for defeat:

John abhors
likes
avoids

But it is less clear in this contrast:

- a. The President needs thought
- b. The president needs thoughts
- c. The President enjoys thought

Whereas (b) cuts off the object connection via the plural, we find the object connection cut off by the choice of verb. Therefore additional information about the verb is required. There remains something quite tricky here, since the following case elicits the object reading:

d. The President enjoys advice

Section on the help of John:

the help of John appears to be a kind of result. Some semantic change has occurred, although it is extremely difficult to characterize. There are two kinds of results: object-results, and situation-results.

- a. his cooking tasted funny [cooking = food]
- b. *the destruction weighted five hundred pounds [destruction =/= rubble]

Now there is a correlation between a situation-result and the inability to refer to the object. But this does not follow in any natural way. Moreover, if we argue that there are no thematic roles at all in derived nouns, then why is the agent available for reference and why are there so many lexical exceptions? If there is an oblique mode of reference, it will work, but a true affected object simply cannot be referred to:

- a. the help to John
- b. *the push of John
- c. *the push to John

So how does one explain the existence of this hole in the system?

We offer a technical explanation, but the explanation should also have a conceptual dimension. What does it mean to change the category of a verb? We are unable to change the category of a VP. There is a VP-affix, namely, -ing, and it includes the object.

The idea is that there is a special construal relation between verb and object which entails sisterhood. We might say that the UG form of a VP is

with "light" verbs which are meaningless without objects. In fact light verbs do not form like:

- a. *the take of a bath
- b. *the kill of the idea
- c. *the gift of credence

These are all ruled out.

The VP is a unit which requires, for compositional reasons that are not fully clear,

a non-adjunct structure in English. It is a contradiction to make an argument into an adjunct in a sense. Non-sisterhood excludes the kind of composition that verb+object involves. There is a fundamental point here, but we cannot yet state it properly. These are then just sketchy indications.