North East Linguistics Society

The Projection Principle and Rules of Morphology

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THE PROJECTION PRINCIPLE AND RULES OF MORPHOLOGY

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0. Introduction

Much recent research in grammatical theory centers on the assumption
that procedures mapping from one level of representation to another
(e.g., move ⍺) should be allowed to apply freely, and thus to
overgenerate. In turn, the ungrammatical outputs of such mapping
procedures are ruled out by well-formedness conditions which constrain
representations at different levels (e.g., the binding conditions and
the ECP of Chomsky, 1981). The purpose of this paper is to propose a
model of morphology which is organized along similar lines.
Concretely, we would like to propose that rules of morphology may
apply at any level in which their structural description is met.[1]
Morphological overgeneration resulting from this system is ruled out
by well-formedness conditions which constitute independently motivated
properties of particular levels.

The research presented here centers only on certain aspects of
the morphological phenomena. In particular, we show how the model we
propose accounts in a natural way for both the distinctions and the
similarities observed between so-called inflectional and derivational
morphology. We further show how our model offers a natural way to
treat reanalysis, a process which is problematic within modular
frameworks such as Government-Binding. Our formulation of reanalysis
reconciles it with other principles operating in the grammar (notably,
the Projection Principle of Chomsky, 1981) and places formal
constraints on possible reanalyzed structures. We have little to say
here on the application of our system to the intricate facts of

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derivational morphology. For some interesting treatment, see Fabb (1984) and Borer (forthcoming).

The organization of this paper is as follows: in section 1 we propose a reformulation of the Projection Principle as a condition on features and not as a condition on assignment. In section 2 we show how the PrPr can be used to distinguish between two classes of morphological rules. In section 3 we propose a way in which the interaction between syntax and morphology can be captured. In section 4 we demonstrate how reanalysis is treated within our system.

1. The Projection Principle as a condition on features.

Chomsky (1981) proposes that the following principle holds in the grammar:

    1. THE PROJECTION PRINCIPLE
        Lexical features must be represented at every syntactic level.

In other words, the PrPr prevents rules which apply in the syntax from changing lexical specifications. We will take the relevant lexical specifications to be the inherent features (in the sense of Chomsky, 1965). The PrPr thus states that all inherent features must be represented throughout the syntactic derivation.[2]

Note, now, that (1) yields itself to two interpretations: according to one of them, the PrPr is obeyed iff assignment relationship remain intact throughout the syntactic derivation. According to the second interpretation, assignment relationship may change, providing all the inherent features are represented at every syntactic level.[3] In order to demonstrate this distinction, consider the verb hit, as in (2), and the approximate list of its inherent features given in (3):

    2. John hit Mary
    3. a. hit assigns Case (accusative)
        b. hit assigns 2 θ-roles (agent-patient)[4]
        c. hit is subcatgorized for an adjacent NP
        d. hit is a verb ([+V,-N])
        e. hit means HIT.

In the usual case, exemplified by (2), the assignment relationship is very straight forward. hit assigns Case to Mary, it assigns θ-roles to Mary in the [NP,VP] position and to John in the [NP,S] position, it selects Mary in the VP as its subcategorized argument etc. Consider, however, the case of passive. It is a well-known fact that in passive sentences, the subject θ-role, even when not assigned, is not lost. Hence the difference in interpretation between (4a) and (4b). While in the former no agentivity is implied, it is implied in the latter. Furthermore, it is well-known that when the subject θ-role is expressed as an object of by, it is assigned exactly the same θ-role that would have been assigned by the verb to its subject. This is exemplified in (5):

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4. a. the bomb dropped (*by the airforce)
    b. the bomb was dropped (by the airforce)
5. a. the letter was received by Bill
    b. the song was heard by Mary
    c. the ball was pushed by Jake

Given this state of affairs, it is clear that the θ-role assigned to the object of by is not assigned by by itself. Rather, it is somehow transmitted from the verb. On the other hand, direct assignment by the verb is problematic, since the verb in passive sentences does not govern the object of by, and θ-role assignment is constrained by government. In the spirit of Jaeggli (1981), we may assume that the passive morphology absorbs the θ-role of the subject, and may optionally transmit it to by. The preposition by, in turn, assigns it to its object. by, then, functions as a place holder for the subject θ-role.

Now consider the PrPr. If the PrPr is a condition on features, it is not violated by the process of θ-role transmission. The verbs in (5a-c) are specified lexically as assigning two θ-roles, and indeed, they assign two θ-roles. However, the mode of assignment of these θ-roles differs from active to passive constructions. While in the former the verb assigns the subject θ-role via the VP, in the latter it assigns it to by. Similarly, the by-object is assigned the same θ-role that it would be assigned in the [NP,S] position. However, this θ-role is assigned in different ways in these respective constructions: in the active by the VP, and in the passive by the preposition by.[5] On the other hand, if the PrPr is a condition on assignment relations, and all assignment relations must be preserved at all levels, then the process of transmission of θ-role to the by phrase cannot be syntactic. Rather, we must assume that it is a lexical rule, and that in some pre-syntactic stage, the passive participle is morphologically changed so as to assign its subject θ-role to by. Note that if this were the case, then there would be no apriori reason to believe that the entire passive operation is not lexical, i.e., the rule that would internalize the subject θ-role in the lexicon would also externalize the object θ-role, leading to the following D-structure representation:[6]
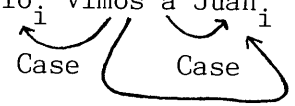
6. John was hit (by Bill)

As we will see below, a syntactic application of passive, as in our model, will force us to have the D-structure representation in (7), since the morphological rule in question cannot eliminate the subcategorized position without violating the PrPr. It can only change assignment relations between the verb and a given argument.

7. [e] was hit John (by Bill)

Consider another example. It has been argued extensively that clitics in Romance and in Semitic languages absorb Case (see Aoun, 1979; Jaeggli, 1982; Borer, 1984.) It has been further suggested that the obligatory insertion of a preposition in clitic doubling constructions (observed by R. Kayne) can be accounted for, assuming

that the preposition serves as the Case assigner for the NP that is deprived of Case by the clitic. This situation is exemplified by (8):

8. lo$_i$ vimos a Juan$_i$ 'We saw Juan'

Case   Case

subcat., θ-role

Now consider the structure in (8) from the viewpoint of the PrPr. If the PrPr is a condition on feature representation, the absorption of Case depicted in (8) may take place in the syntax: note that all the inherent features are represented in (8): the verb assigns θ-role, its subcategorized argument is present and its Case features are present as a clitic. However, if the PrPr is a condition on assignment relations, it is clear that these are not preserved in (8). In particular, the verb assigns its Case to a clitic, rather than to an adjacent NP. Thus if we assumed that the PrPr is a condition on assignment relations, we would have to assume that Case absorption is a pre-syntactic, lexical operation. This conclusion would, in turn, result in some ordering paradoxes, as cliticization is possible in constructions which are the output of syntactic movement, and where the pre-movement configuration does not satisfy the structural environment in which cliticization is possible. Thus consider the causative construction in (9):[7]

9. Jean les$_i$ fait [$_V$ manger [e]$_i$] à Marie [$_V$ e]

   Jean them made   eat   to Marie

In (9), the clitic <u>les</u> is the object of <u>manger</u>, the verb of the subordinate clause. It can be attached to <u>faire</u> only following the movement of the subordinate verb and its arguments into a position adjacent to <u>faire</u>, and after reanalysis took place. If we want to maintain our assumption that clitics are spell-outs of Case features, and further assume that the PrPr is a condition on assignment, it is clear that the process of Romance causativization must be pre-syntactic, i.e., lexical. This conclusion is avoided if we assume that the PrPr is a condition on features. In (9), all inherent features are represented. The only change that took place involved the redefining of assignment relations. In particular, the combination <u>faire manger</u> is reanalyzed so as to allow <u>faire</u> to assign accusative Case to the complement of <u>manger</u>. The possibility of accusative Case absorption by a clitic on <u>faire</u> is thus no longer problematic.
    In what follows, we will assume that the PrPr is a condition on features and not on assignment relations. It is important to stress at this point that we do not assume that lexical categories do not have specific assignment properties. To the contrary. A verb such as <u>hit</u> assigns its θ-roles in particular specified locations. We do not take this property, however, to be an inherent one. It follows that rules which apply in the syntax may change this property without violating the Projection Principle. In the absence of such "interfering" rules, on the other hand, the assignment properties of <u>hit</u> will remain intact and will be met in the canonical locations. The explanatory value of

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our proposal will become clear below, supplying, in turn, theoretical motivation for the altered formulation of the PrPr.[8]

2. <u>Morphological Rules and the Projection Principle</u>.

Given our assumption that the PrPr is a condition on features and not a condition on assignment, it is clear that rules (morphological and others) may be divided to two classes: rules whose output violates the PrPr and rules whose output does not violate the PrPr. As an illustration of the former, consider the following cases:

10. a. $[_V$ enjoy$]$ $\longrightarrow$ $[_A$ enjoyable$]$
   <u>Category change</u>, <u>Case $\longrightarrow \emptyset$</u>
 b. $[_{Vunacc.}$ drop$]$ $\longrightarrow$ $[_{Vcaus.}$ drop$]$
   <u>add Case</u>, <u>add θ-causer</u>
 c. $[$inhabited$]$ $\longrightarrow$ $[$uninhabited$]$; $[$wind$]$ $\longrightarrow$ $[$rewind$]$
   <u>semantic changes</u>

As an illustration of rules which do not violate the PrPr, consider, in addition to cliticization and passivization above, the following examples:

11. la pomme, les pommes
   the-f apple the-p apples   <u>determiner agreement</u>

   yeled tov, yalda tova
   boy good-m girl good-f   <u>modifier agreement</u>

   ha-yeled (hu) tov   ha-yalda (hi) tova
   the-boy (is) good-m the girl (is) good-f
   <u>predicate-adjective agreement</u>

   the man has/had been sick   <u>tense</u>[9]
   the man is writing/writes   <u>aspect</u>

The division exemplified by (10)-(11) is extremely similar to another division, more familiar in morphological studies: the division between derivational and inflectional morphology. It appears that all rules which are traditionally classified as inflectional morphology fall within the class of rules which do not violate the PrPr. However, we add to this class here another group of rules: rules which re-define assignment relations between different lexical items, but whose output does not result in the elimination or the addition of an inherent feature.
   Returning now to our initial goal of deriving the distribution of morphological affixation from independent principles, it is clear that all rules which violate the PrPr must apply in a pre-syntactic level, and cannot interact with any syntactic phenomena. Within this class of rules we will find most of the affixation processes that are traditionally clasified as derivational. For these rules, our system derives the lexicalist hypothesis of Chomsky (1970) from the PrPr. These rules are now barred from the syntax not by assumption, but rather, because their output violates the PrPr.

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What is now the status of the remaining affixation processes whose output <u>does</u> conform to the PrPr? Note that if we derive the lexicalist hypothesis from the PrPr alone, there is no apriori reason to prevent these processes from applying in the syntax. In fact, there are some compelling reasons to assume that some of these rules <u>do</u> apply in the syntax, as illustrated by example (9) above. On the other hand, note that we do not exclude "inflectional" morphology from the pre-syntactic level. Thus we predict that "inflectional" affixes will appear "inside" derivational operations, as well as outside derivational operations. This prediction is borne out, as is illustrated by the following examples:

12. a heads-up play, a hands-off policy, (daddy) long-legs, (Judy) blue-eyes, the excess profits tax
   (examples from Kiparsky, 1982)[10]
13. <u>Compounds in Hebrew:</u>[11]
   a. kal-raglayim
      light-legs   'fast'
   b. shomer-mitzvot
      keeper-commandments   'religious Jew'
   c. leshon-xaxamim
      tongue-wise-men   the talmudic dialect of Hebrew
   d. gan-xayot
      garden-animals   'zoo'

3. <u>The Interaction between Morphology and Syntax.</u>

As the reader may note, there is a significant difference between inflectional morphology when it appears "outside" derivational morphology and when it appears "inside" derivational morphology. Specifically, when derivational morphology appears inside a compound, as in the examples in (12)-(13), it does not participate in agreement processes. Only the head of the compound does. Thus, since in (13b), for instance, the head of the compound, <u>shomer</u> is singular, the entire compound is singular regardless of the fact that the complement of the head, <u>mitzvot,</u> is plural. It is thus clear that syntactic agreement has access only to certain parts of the compound, i.e., the features of the head, but not to others. How is this phenomenon to be accounted for within our model? On a descriptive level, we would like to claim that syntactic agreement processes have access to syntactic affixation, but not to lexical affixation. In other words, given our assumption that morphological affixation may take place wherever its structural description is met, we would like to claim that only when such affixation takes place in the syntax, its output is transparent to further syntactic operations. How is this distinction to be derived from independent principles?
   In order to answer this question, consider the following principle, proposed by Lapointe (1981) as an extension of Chomsky's (1970) lexicalist hypothesis:

14. THE LEXICAL INTEGRITY HYPOTHESIS.
   Syntactic rules cannot refer to parts of words.

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The Lexical Integrity Hypothesis can be derived from the convention of bracket erasure proposed by Allen (1978), if we assume that syntactic rules cannot refer to parts of words which are not well-defined, which are not separate constituents. Consider, for instance, a word such as industrialization. The affixation process involved in the derivation of that word, and the bracket erasure which is part of it are exemplified in (15):[12]

15. industry —→[industri]al —→[industrial]ize —→
    [industrializ]ation —→[industrialization]

By the end of the lexical derivation (and note that each of the suffixation processes in (15) must be lexical according to our criteria), all internal bracketing has been erased. Since none of the affixes is represented as a separate constituent in the syntax, no syntactic rules can refer to it.

Now consider affixation which takes place in the syntax. Assuming that the integrity of an affix is an inherent features (similar in nature to categorial type), it is clear that no bracket erasure is possible in the syntax. Rather, the internal bracketing must be preserved. Considering now a word such as hitpatxuyotav 'his developments' in Hebrew, we arrive at the following derivational history:

16. patx —→hit[patx] —→[hitpatx]ut —→[hitpatxu]yot—→
    open(root)-develop---development----development-s

    [[hitpatxu]yot]av —→ [[[hitpatxu]yot]av]
    development-s-his   'his developments'

The brackets separating the clitic and the plural marker from the stem were not erased, since these affixes were attached in the syntax. Consequently, these affixes constitute well-defined parts of the word and syntactic rules may relate to them. [13]

The conclusion that syntactic rules may relate to parts of words that were affixed in the syntactic component, coupled with the conclusion that only "inflectional" morphology will be affixed in the syntax, is extremely instrumental in explaining the availability of syntactic operations which are sensitive to morphology. For several interesting examples of syntactic analyses which make crucial use of inflectional parts of speech, see Anderson (1982), with whom we share the view that the Lexical Integrity Hypothesis as in (14) is too strong, and that the syntax must be allowed to access certain morphological affixes.[14] Within the GB model, many proposed analyses make use of parts of words. Notably, most accounts of the null-subject parameter avail themselves of the internal structure of the verb or the auxiliary, predicating the presence of absence of null subjects on properties of the INFL node (cf. Jaeggli, 1982; Rizzi, 1982; Chomsky, 1981; Safir, 1982; Borer, 1984; and others). While this is problematic for proponents of the Lexical Integrity Hypothesis, it falls naturally from an account in which the lexicalist hypothesis is a derivative of the PrPr.

Before we turn to reanalysis, it is worthwhile to consider a

certain aspect of our analysis which has interesting ramifications. Recall that we allow certain affixation processes both in the lexicon and in the syntax. However, given our understanding of syntactic affixation, we expect only those aspects of the affixation rule which donot violate the PrPr to be realized under syntactic affixation. Concretely, given an affix with a fixed set of properties, we expect all these properties to be realized under lexical affixation, but if affixation occurred in the syntax, only those properties which do not violate the PrPr will be preserved, and the others will be lost.

Given this approach, we would like to consider the suffixes -ing and -en (the passive morpheme) (much of the following discussion is the outcome of research reported in Borer and Wexler, 1984). In (17) we give the syntactic affixation of -ing, whereas in (18) we give the lexical affixation of -ing:

17. a. the eating of the apple made Snowhite sick
    b. the smelling of the homemade stew made John hungry
    c. his/the feeling of the heavy coat on his shoulders made
       John decide to risk the cold
18. a. eating the apple made Snowhite sick
    b. smelling the homemade stew made John hungry
    c. feeling the heavy coat on his shoulders, John decided
       to risk the cold

Consider now the properties of the suffix -ing in its lexical affixation. These are listed in (19):

19. a. it triggers category change from V to N
    b. the Case assigning property is eliminated
    c. it obligatorily selects an agent θ-role
    d. an aspectual (progressive) reading is added

The first property of -ing is demonstrated by the determiner the attached to V+ing forms. The second property is demonstrated by the obligatory insertion of the Case marker of. The third property is clear from the agentive reading of (17b-c), which is not their usual reading. (The normal reading being that of an experiencer subject). The fourth property is semantically clear.

Now consider the syntactic affixation of -ing. We take this affixation to be a manifestation of agreement between a particular aspect selected by the INFL node and the verb in its clause. This is in accordance with our assumption that tense and aspect are properties of clauses and not properties or particular lexical items (see fn. 8). The selection of -ing in this context is due to the fact that the meaning of -ing is compatible with the progressive meaning (as is evidenced from its lexical use). -ing in this case, however, is not adding (or eliminating) any information. In this respect, the syntactic affix -ing is similar to a plural marker on an adjective, which is selected because it is compatible with a plural meaning, but which does not add the plural meaning to a phrase.

Now consider the four properties listed in (19). The first three clearly violate the Projection Principle. The fourth, however, could reflect a mere agreement and thus it does not violate the PrPr. It

follows that the fourth property will be attested under syntactic affixation, but we do not expect the first three. This is precisely the case: syntactic -ing affixation does not change catgory, does not eliminate the Case feature and does not place thematic restrictions on its output. It does, however, convey a progressive reading.

As a more complex example, consider the distinction between adjectival passive and verbal passive (for an extensive discussion of the issues involved see Wasow, 1977). Now let us assume that the former is lexical but the latter is syntactic. Consider first the adjectival passive, as attested in (20):

20. a. the door is open
    b. the island is uninhabited

There is no reason to assume that in the constructions in (20) open and uninhabited are different from standard adjectives, such as blue and little. Thus we will assume that the adjectival passive morpheme, attached lexically, accomplishes the following tasks:[15]

21. a. it changes [+V,-N] to [+V,+N]
    b. it absorbs/eliminates the Case feature
    c. it absorbs/eliminates the subject θ-role
    d. it externalizes the internal θ-role
    e. it eliminates the [NP,VP] position

The resulting D-structure for (20a-b) is thus identical to their surface string. In particular, no position is base-generated following the adjectival passive and no movement is invoked.

Now consider the list in (21) from the viewpoint of the PrPr. Properties (a) and (e) violate the PrPr in a straightforward way. Properties (b-c) do not violate the PrPr iff the relevant lexical features are represented as the absorbing morpheme. Property (d) by itself does not violate the PrPr.[16]

We now turn to verbal passive, an affixation process which applies in the syntax. Assuming that the same affix is involved, but that the only properties that will be realized in syntactic affixation are those properties which do not violate the PrPr, we can now predict the structure of verbal passives. First, note that the Case feature and the subject θ-role are not eliminated in syntactic passive. The former is represented as the passive morphology, and the latter is implicit if not realized and may be syntactically realized, if a by phrase is present, as argued above. Now consider the elimination of the subcategorized position. This cannot happen under syntactic affixation, hence the position must be present. Assuming the θ-criterion, it is clear that since the position must be generated, it also must be assigned a θ-role at D-structure. It follows that externalization of the internal θ-role is not possible in syntactic passive. Lastly, consider the first property, which involves changing the feature [-N] to the feature [+N]. While this is clearly an impossible syntactic operation, we will assume that leaving the category in question unspecified as to the status of the [N] feature does not constitute a violation of the PrPr, as, strictly speaking, no feature is deleted or added. Thus the passive participle is a [+V]

element, unspecified with respect to the nature of the [N] node.

Given the impossibility of eliminating the [NP,VP] position, and the assignment of the object θ-role there, it is clear that the surface subject, which is assigned θ-role in that position, must be base-generated there. Similarly, the absorption of the external θ-role by the passive morphology results in the impossibility of base-generating a referential expression in the [NP,S] position, and it must remain empty at D-structure. These considerations lead us to postulate the representation in (22a) as the D-structure of verbal passive constructions. The absorption of Case by the passive morpheme, on the other hand, would rule the sentence ungrammatical, unless the underlying object moves to the [NP,S] position, where it may be assigned Case. Since the [NP,VP] position must be present at every stage of the derivation, in accordance with the PrPr, this movement must leave behind a trace. The S-structure in (22b) follows:

22. a. e was pushed John
    b. John$_i$ was pushed [e]$_i$

Summarizing, if we assume that under syntactic affixation there will be a maximalization of application up to the point of the violation of the PrPr, we can maintain that there is only one -ing affix and one -en affix. We may then derive the respective properties of adjectival passive and verbal passive, and lexical and syntactic -ing, assuming that the same affixation takes place in different components. In the syntactic component, only certain properties of the affix can be realized: Case and subject θ-role may be absorbed, a feature [-N] may be neutralized, and agreement properties (such as aspect) may be preserved. Other changes would result in a violation of the PrPr.

4. Reanalysis.

In this final section we would like to sketch briefly how our system may be used to account for reanalysis. The case that we will be considering is preposition stranding, adopting in essence the analysis of Kayne (1981). Kayne (1981) suggests that preposition stranding is possible in English, but not in French (a contrast exemplified in (23)), since reanalysis of the preposition and the verb is possible in the former and not in the latter:

23. a. the event was talked about
    b. Who did you talk about?
    c. *Marie a été revé de
    d. *qui a Jean revé de?

Concretely, following Weinberg and Hornstein (1981), Kayne proposes that preposition stranding is only possible if reanalysis of the preposition and the verb took place. In Kayne's system, this reanalysis is possible in English, since in that language both verbs and prepositions assign the same Case: objective. In French, on the other hand, verbs assign accusative Case and prepositions assign oblique Case, hence reanalysis is impossible. Kayne further assumes

that prepositions are not proper governors, but verbs are. Following reanalysis, the empty catgory left behind both in passive and in Wh-constructions can be properly governed by the verb. However, in the absence of reanalysis, the empty category cannot be properly governed, and hence the construction is ruled out as a violation of the Empty Category Principle.[17]

Assuming that in the absence of reanalysis the output violates the ECP both in English and in French, consider now the structure of reanalyzed configurations in English and in French. Following our assumptions about syntactic morphological processes, the internal bracketing between the verb and the preposition in cases such as (23) cannot be erased. Consequently, we have the configuration in (24):[18]

24. $[_V [_V \ ] [_P \ ]]$ (NP)

Now consider the Case assignment properties of the construct in (24). We will assume, as in Borer (1984), that in the unmarked situation, Case assigners are lexically specified as having unordered, unspecified Case slots, which, under government, are linked with NPs. The following conventions interpret the unspecified Case slots:[19]

25. a. V   NP ⟶ accusative   b. V   NP NP ⟶ dative

         $[_{Case} \quad]$ $[_{Case} \quad]$

     c. P   NP ⟶ oblique   d. N   NP ⟶ genitive

         $[_{Case} \quad]$ $[_{Case} \quad]$

The conventions in (25) are subject to language variation in an obvious way. Thus, for instance, convention (25d) is only found in some languages (e.g. the Semitic languages) but not in others. It is thus natural to assume that languages such as English and French may differ with respect to the conventions in (25). Concretely, we will assume that the situation in (25) is the French situation, while for English conventions (25a,c) both derive objective Case.

Now consider again the structure in (24). What is the Case assigned to the NP following reanalysis? Since bracket erasure did not occur, and since the preposition did not lose any of its inherent properties, the NP adjacent to it is interpreted as oblique in French and as objective in English. On the other hand, since the entire constituent is a V, the NP adjacent to it is interpreted as accusative in French, but again as objective in English. While in French this state of affairs leads to a Case conflict, no such Case conflict occurs in English. Assuming that WH elements (or alternatively, their traces) must be Case marked, the grammaticality of (23b) vs. the ungrammaticality of (23d) follows.

The contrast between (23a) and (23c) follows the same pattern of explanation. We argued that in passive constructions the passive morpheme absorbs accusative/objective Case. In reanalyzed constructions, this Case may only come from the preposition. However, in French the Case is not accusative or objective. Rather, it is oblique. Put differently, since the oblique Case feature is

incompatible with the verb in French, a verbal affix which absorbs verbal Case features cannot absorb it and passive affixation is rendered impossible. The ungrammaticality of (23c) follows.

Lastly, consider preposition stranding in constructions such as (26):

26. a. John was taken advantage of [e]
    b. Who did Mary take advantage of?
    c. Advantage was taken [e] of John
    d. How much advantage did Mary take [e] of John?
    e. *How much advantage was John taken [e] of [e]?
    f. *Who was advantage taken [e] of [e]?

We follow Weinberg and Hornstein (1981) in assuming that reanalysis took place in the sentences in (26), and that only if such reanalysis took place stranding is possible. Weinberg and Hornstein further observe that reanalysis may not occur across empty categories, thus accounting for the ungrammaticality of (26e-f), where both passive and WH-movement took place, and where, in order to license preposition stranding, reanalysis must apply across the trace of the passivized NP. Note that the statement of such a constraint in morphological terms in extremely natural. Morphological affixation is sensitive not to a categorial type, but rather, to particular morphemes with particular specifications. Hence, for instance, the choice of a nominalizing affix is largely idiosyncratic, as is evidenced by the grammaticality of, e.g. involvement, amusement and destruction, derivation, vs. the ungrammaticality of involvation, amusation and destructment, derivment. The impossibility of reanalysis, a morphological rule in our system, across a lexically unspecified empty category follows.

Assuming that reanalysis took place in (26) the output structure is as in (27):

27. $[_V[_V$ take] $[_N$ advantage] $[_P$ of]] (NP)

We would like to name constructions such as (27) (or (24)) Wordphrases. As the internal structure in Wordphrases is preserved, we expect syntactic conditions on well-formedness to be met inside it, which, of course, is correct: for instance, advantage in (27) must be assigned Case in accordance with the Case filter. This property of wordphrases is further illustrated in (28):

28. a. coat of arms
    b. pain au chocolat

(28a-b) are interesting in that they are lexicalized items, with specific meaning. But nevertheless, syntactic conditions must be met inside them. Thus the dummy Case markers of and à must be present to assign Case to the complement, and in (28b) we find determiner agreement inside a lexicalized phrase. If we assume that the internal bracketing in (28a-b) is preserved, these syntactic properties can be explained naturally.[20]

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5. <u>Conclusion</u>.

In this paper we argued for a particular view of morphology, according to which some morphological processes may apply in the syntactic component. The particular mode of application of these processes and their interpretation was shown to follow from the Projection Principle. Once these operations are allowed in the grammar, it is clear that they can be utilized to account in a natural way for the process of reanalysis, enabling us to explain it without violating the Projection Principle.

FOOTNOTES

      *This paper benefits greatly from discussions with Nigel Fabb, Rita Manzini, David Pesetsky, Tom Roeper, Laurice Tuller, and Ken Wexler. Needless to say, they are not necessarily committed to the analysis presented.
      1. We assume, with Lieber (1980), that affixes are listed in the lexicon with specified insertion frames. This insertion frame supplies the structural description for the application of a morphological rule.
      2. Given the PrPr and the θ-criterion, the obligatoriness of [e] in structures such as (i) follows. See Chomsky (1981) for discussion.
      i. John was hit [e]
      3. A proposal that the PrPr does not entail the preservation of assignment relationship is advanced in Marantz (1981). The distinction between Marantz's proposal and our own will become evident as we procede.
      4. The <u>agent</u> role is assigned through government by the VP. It is clear, however, that some lexical specification to the effect that <u>agent</u> is assigned must be present in the lexical entry of <u>hit</u>. The particular mechanism involved in θ-role assignment to the [NP,S] position need not concern us here.
      5. A related question is what happens to the Case assigned by the verb. Assuming the classical analysis within the GB framework, we assume that the Case feature is absorbed by the passive morphology, and thus this lexical feature is preserved. See below for the argument that Case features may be preserved as morphological affixes.
      6. This analysis is indeed advocated by Marantz (1981). (And see also analyses of passive within strictly lexicalist frameworks, such as Lexical Functional Grammar).
      7. We are abstracting away here from the question of what projection of V moves in (9), and where it lands. However, almost all analyses of causative constructions of the type illustrated in (9) assume movement of some sort (to name only a few: Kayne, 1975; Rouveret and Vergnaud, 1980; Burzio, 1981; and references cited there). Different aspects of the ordering problem in causative constructions are discussed extensively in Manzini (1983) and Zubizarreta (1983). In the latter a dual representation is suggested.

In Borer (forthcoming) we propose that adopting a morphological model
of the type suggested here, these ordering problems can be overcome
without a dual representation.
     8. It would be interesting to speculate on the reason for the
non-inherency of Case assignment and θ-assignment configurations. A
particularly interesting possibility would involve pursuing the line
suggested by Koopman (1983) and Travis (forthcoming) that the location
of θ-role assignment and Case assignment is specified for the core
grammar of every language. If this is the case, it follows that
precisely these features are not properties of particular lexical
items, but rather, canonical properties of the language in general. As
such, they are not covered by the Projection Principle. It further
follows that some rules, e.g., morphological marking of some sort, is
required in order to indicate a deviation from the canonical
assignment relations.
     9. We regard tense and aspect as properties of propositions, or,
more specifically, as properties of the INFL(=inflection) node. Their
morphological spell-out on auxiliaries or main verbs is thus an
agreement phenomena (see below for some more discussion). The list in
(11) is very partial. For discussion of some more interesting cases,
see Borer (1984, forthcoming).
     10. Kiparsky (1982) claims that <u>regular</u> inflectional affixes
would not appear inside derivational affixes, but suppletive forms
would. As an example he contrasts the grammaticality of compounds such
as <u>lice-infested</u> and <u>flee-infested</u> with ungrammatical compounds such
as <u>flees-infested</u>. While this seems to be true, in general, in English
(barring the counterexamples in the text, noted by Kiparsky himself),
this is entirely false for Hebrew--as is evidenced by (13)--where
compounding with regular plurals is rather common and entirely
grammatical.
     11. It is important to distinguish the compounds in (13) from
the construct state constructions, which have the same syntactic
structure and which denote genitival relations in Hebrew. Thus (b),
for instance, should be distinguished from an expression such as
<u>shomer (ha-)binyan</u>, 'guard-of-(the)building'. We give here three
obvious ways in which these constructions differ. First, in the
construct states the complement may have plural and singular forms
while retaining the meaning of the construct. This is impossible in
compounds. The forms in (13a-d) lose their idiomatic meanings if the
complement noun is changed to singular. Second, construct states can
be conjoined in the following way: <u>shomer binyanim u-mexoniyot</u>
'guard-of-buildings and cars'. Compounds cannot, without losing their
idiomatic meaning: <u>*gan yeladim ve-xayot</u> 'garden of children and
animals' (kindergarden and zoo). Third, in construct states the
complement may be modified by an adjective: <u>shomer mexoniyot xadashot</u>
'guard of new cars'. This is impossible in compounds without losing
the idiomatic meaning:<u>*gan xayot tropiot</u> 'garden of tropic animals'
(tropical zoo).
     12. And see also Pesetsky (1979); Mohanan (1982); Kiparsky
(1982). These proposals differ as to whether bracket erasure applies
at the end of every cycle or at the end of every level. These
differences, however, are irrelevant to our claims. For the sake of
the exposition we assume here bracket erasure at the end of every

cycle. The same theoretical results can be achieved by assuming erasure at the end of every level.

13. Alternatively, the clitic and the plural marker may be affixed in the lexicon, as there is nothing in our model that will prevent them from doing so. Our prediction at this point is that as a result, they will not participate in syntactic processes. In particular, assuming, as in Borer (1984) that a clitic must properly govern an empty category (or as in Aoun, 1981, that it A'-binds that empty category), the clitic will not be visible in the syntactic component and hence the empty category will not be properly governed. Thus this derivation will result in ungrammaticality. The status of plural markers is more complex, since certain plural markers are not affixed, but rather, are expressed as suppletive forms. At this point, two hypotheses are compatible with our analysis: we may assume that plural suppletive forms are listed in the lexicon as roots which are semantically, but not grammatically, plural. In order to render the occurrence of these forms appropriate grammatically, an additional set of brackets must be added in the syntax. Yet another possibility would be to assume that in the absence of a well-defined plural affix, agreement rules may access the word features themselves, and that since suppletive forms are inherently marked as plural, agreement may take place. For some more discussion of this point, as well as a detailed comparison between our proposal and a percolation proposal (as in Lieber, 1980) see Borer (forthcoming).

14. Our view differs from that of Anderson (1982), in that we assume that inflectional affixation and derivational affixation are the same, and that the distinction between them is due to the level at which they apply. Anderson assumes that inflectional morphology and derivational morphology are two separate components which are located in different parts of the grammar and which utilize distinct rule types. In this respect, see also Thomas-Flinders (1983). For the opposite view, advocating lexical treatment of "syntactic" morphology, see Lapointe 1981, 1983.

15. Few comments are in order with respect to (21). First, it is clear that the list in (21) could be made more efficient, in that some of the properties derive from others (e.g. the elimination of the [NP,VP] position and the externalization of the internal θ-role are clearly related). For purposes of exposition, however, these properties are listed separately. No theoretical statement is intended.

The question of whether in adjectival passives the subject θ-role and the Case feature are absorbed or eliminated is left open here. It is plaussible to assume that both options exist, and that the selection of the particular one is lexically specified. Note that this process would be available for a lexical rule, but not for a syntactic rule. Concretely, note that in the case of (20a), complete elimination of the subject θ-role is extremely likely, as <u>by</u> phrases or purpose clauses cannot be attached to it. A similar option is not available for syntactic passives, as will become clear below.

In Borer and Wexler (1984) it is argued that adjectival passives are further sensitive to semantic constraints on adjectives in general. Hence <u>the beaten child</u> but <u>*the seen child</u>. Note that verbal passive is not sensitive to similar factors, and both <u>the child was</u>

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beaten and the child was seen are equally grammatical. If this
approach is indeed correct, it supplies further evidence that lexical
passive is sensitive to factors to which syntactic passive cannot make
reference.

16. We know of no rules of morphology which are allowed to
eliminate positions in the syntax (i.e., rules which change
subcategorization frames). It is quite possible that they simply do
not exist and that a stronger condition must be formulated to capture
the fact that tree structures cannot be altered morphologically.

17. The Empty Cateogry Principle (Chomsky, 1981): an empty
category must be properly governed. Recent models within the GB
framework cast some doubt on the conclusion that preposition stranding
should be accounted for by the ECP. It is not our purpose here to
offer an analysis of preposition stranding. The question of whether
ECP is invoked or not must be determined on syntactic grounds which do
not bear on this paper. Rather, we use this case as an illustration of
the mechanism which we are proposing. Note, incidentally, that the
question of whether the ECP is invoked or not is independent from the
question of whether reanalysis is involved. Thus, for instance, in
Weinberg and Hornstein (1981) reanalysis is assumed, but not an
ECP-oriented account. It is quite clear that many of the facts they
discuss (and see, for instance, (26)) cannot be accounted for without
assuming some reanalysis.

18. Simpson (1983) advances a proposal that bears some
similarities to our own. In order to account for reanalysis phenomena
in Warlpiri and English which has morphological properties but which
interacts with the syntax, Simpson suggests that while in these cases
the word formation process applies uniquely in the lexicon, the
morphemes attached together to form a complex word (e.g. the verb and
the particle in English) are not terminal nodes, (i.e. X but rather
elements which are one-bar projections (X'). Simpson further suggests
that bracket erasure is blocked in these cases. The syntactic
transparency of these affixation processes follows, as in our system.

19. The system presented in (25) is a greatly simplified version
of the Case interpretation conventions. In particular, the dative
interpretation convention as formulated in the text is not
descriptively adaquate. This version, however, will do for the
purposes of this presentation. For a more detailed discussion and
motivation, see Borer (1984).

20. Interestingly, some compounds occur both as lexical
compounds and as syntactic compounds. A particularly illustrative
example is the contrast between viewpoint and point of view, which
have the same meaning. The former is lexical, and hence its internal
structure need not conform to syntactic conditions (view is not
assigned Case, and the phrase structure [$_{NP}$ NP N] is not attested in
English without a possessive marker). The latter is lexical, and hence
view must be assigned Case. Hence the insertion of of.

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