Lexicality and Argument Structure[1]

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1 The Problem

Argument structure has two faces, semantic and syntactic. On the semantic side, argument structure represents the core participants in events (states, processes) designated by a single predicator. From this point of view it appears as a type of representation of event structure. On the syntactic side, argument structure represents the minimal information needed to characterize the syntactic dependents of an argument-taking head. From this point of view it appears as a type of syntactic subcategorization or valence register. Thus argument structure is an interface between the semantics and syntax of predicators (which we may take to be verbs in the general case).[2] Its function is to link lexical semantics to syntactic structures.

(1)

$$\begin{array}{c}\text{lexical semantics}\\ \downarrow\\ \text{a-structure}\\ \downarrow\\ \text{syntactic structure}\end{array}$$

Argument structure encodes lexical information about the number of arguments, their syntactic type, and their hierarchical organization necessary for the mapping to syntactic structure (Bresnan and Zaenen 1990, Rappaport Hovav and Levin 1995b).

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[1]Special thanks to Adele Goldberg for useful comments on an earlier version of this material and to Sam Mchombo for advice on the Chicheŵa evidence. I alone am responsible for all errors.

[2]—ignoring the issue of complex predicates, or multi-headed lexical constructs (Alsina, Bresnan, and Sells (eds.) in press).

Research in lexical semantics has shown that much information about the number, obligatory status, and hierarchical organization of arguments in argument structure is in fact predictable from semantics. To take just one example among many that could be cited, Rappaport Hovav and Levin's 1995b work on the elasticity of verb meaning suggests that the number and obligatory status of arguments is predictable from their lexical semantics in the way illustrated in (2):

(2)

lexical semantics:	activity	accomplishment
a-structure:	sweep $< ext\ (int) >$	sweep $< ext\ int\ [\ ] >$
syntax:	NP_1 sweep (NP_2)	NP_1 sweep NP_2 AP/PP

Both the presence of the AP/PP argument in the accomplishment and the obligatory status of the object NP_2, shown in (3), can be derived from the lexical semantics.

(3) a. Mary swept (the path).

b. Mary swept *(the leaves) from the path.

c. Mary swept *(the path) clean.

Rappaport Hovav and Levin 1995b propose the basic generalizations from which these facts follow in (4):

(4) There must be at least one syntactic argument expressed per each subevent. A co-argument of a subevent can be left unexpressed if it is understood as prototypical.

Thus, as shown in (5), the activity of sweeping is a single activity subevent involving two participants, the actor and the surface, which can be unexpressed when prototypical.

(5) event structure for (3a): [x act on y]
(sweeping manner)

Examples (3a) and (3b) have the augmented event structures available to the class of verbs of surface contact to which *sweep* belongs, shown in (6):

(6) event structure for (3b,c): [[x act on y] cause [[y be become at location/state]
(sweeping manner)

The fact that the object must be expressed in (3a) and (3b) follows from (4) together with (6). In (6), if the surface argument y is unexpressed in the activity subevent on the left, then it is unexpressed in the change of state/location subevent on the right, violating (4).

From results like these, one might conclude that argument structure is a redundant level of lexical representation. Everything we need to know about arguments, we know from the semantics alone. However, Rappaport Hovav and Levin reject this conclusion, arguing that argument structure is a lexical *syntactic* construct, to be distinguished from lexical semantics. They argue that the distinction between lexical semantics and argument structure "finds empirical support in the morphologies of the languages of the world, which in general distinguish between morphemes that signal the relation between words with distinct but related LCSs [lexical semantic structures–jb] and morphemes that signal the relation between words with common LCSs but distinct argument structures." (pp. 3-4). Crosslinguistically, verbs with related LCSs either have the same name or names related by lexical aspectual class morphology. In contrast, verbs having the same LCS but differing in argument structure—for example, verbs related by passivization or causativization—are almost always morphologically marked, generally by nonaspectual morphology. If true, this is important evidence for the significance of argument structure as a level of structure distinct from lexical semantics.

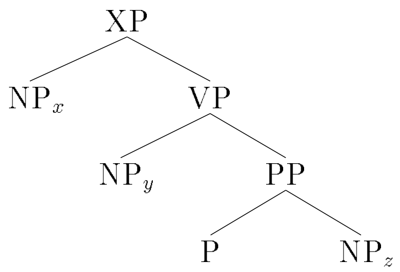
This conception of argument structure as a lexical syntactic construct is common to many lexicalist theories of syntax, which may differ from Rappaport Hovav and Levin in the specific model of argument structure adopted, but agree in general conception (see, e.g. Bresnan and Zaenen 1990). Nevertheless, it is vulnerable to the other side of the argument from redundancy: if argument structure is not semantically redundant, perhaps it is *syntactically* redundant. In fact if we interpret the 'syntax' in (1) as an underlying syntactic tree prior to movement—as do Rappaport Hovav and Levin—this conclusion is irresistible. One of them is redundant.

To see this, consider the well-known model of a-structure proposed by Rappaport and Levin (1988, 1995c). (7) shows their argument structure for the verb *put*.

(7) $x<\underline{y}, P_{loc}\ z>$

The three arguments x, y, and z in this representation are classified according to their syntactic type and their hierarchical structure in syntax. The lower case variables x, y, and z represent nominal arguments (NPs/DPs). The variable P represents a locative preposition. x, outside the angled brackets, is the external argument; y and z are internal arguments; y, the underscored argument, is the direct internal argument (which must be a sister of the verb to be governed and hence receive a theta role), while z is simply an internal argument embedded in a prepositional phrase. As (8) shows, the correspondence between this representation and the underlying X′ tree projected by the verb is one-to-one (omitting the verb, as (7) does):

(8)



Rappaport Hovav and Levin 1995c themselves characterize the syntactic projection relation between the argument structure and the initial syntactic structure as "trivial", although they do not draw the obvious conclusion that one of the two structures is redundant. This fact casts doubt on the interface model they assume, the familiar scheme in (9):

(9)

lexical semantics
↓ Lexicon
a-structure
↓ Syntactic projection
initial syntactic structure
⇓ Syntactic transformations
final syntactic structure

The triviality of the relation between argument structure and a level of initial syntactic structure invites an alternative, which has been taken in much recent work. This is to eliminate a distinct level of lexical argument structure altogether in favor of the syntactic construction of meanings from lexical semantic primitives (e.g. Hale and Keyser 1993). This alternative is schematized in (10):

(10) lexical primitives

$$\begin{array}{cl} \text{lexical primitives} & \\ \Vert & \text{Lexicon} \\ \text{initial syntactic structure} & \\ \Downarrow & \text{Syntactic transformations} \\ \text{final syntactic structure} & \end{array}$$

Here, argument structure is in effect identified with an initial syntactic structure in a transformational derivation. It is a syntactic representation, as in Rappaport Hovav and Levin, but no longer lexical in the same sense, being formed from syntactic categories and relations. Indeed, echoing a line of argument from early work in generative semantics, Hale and Keyser contend that the generalizations about possible meanings of verbs reflect syntactic constraints on movement. (See Kiparsky in press and Rappaport Hovav and Levin 1995b for a contrary argument.) Thus this approach denies the *lexicality* of argument structure by identifying it with the initial syntactic structure.

I will argue just the opposite: the decision to reject (9) on grounds of redundancy is correct, but what is redundant is not the argument structure; it is the initial syntactic structure that should be eliminated. In other words, the role of underlying syntactic trees in the linkage of lexical semantics to syntax should be eliminated. Thus I will argue in favor of (11) over (9) and (10):

(11)

$$\begin{array}{cl} \text{lexical semantics} & \\ \downarrow & \text{Lexico-semantic projection} \\ \text{a-structure} & \\ \downarrow & \text{Lexico-syntactic projection} \\ \text{final syntactic structure} & \end{array}$$

(11) is of course the scheme that underlies the design of LFG and other lexicalist frameworks. To see this, simply take the final syntactic structure in (11) to be the f-structure, which is an abstraction over typologically varying c-structures representing overt forms of expression. The argument structure is directly mapped onto this level.[3]

Evidence in favor of (11) was first given by Bresnan 1978 and Mchombo 1978. In many languages passivization, causativization, and other relation

[3] In early LFG the argument structure underwent various lexical rules augmenting the inputs to syntactic mapping; since 1986 lexical rules have been eliminated in favor of the lexical mapping theory (Levin 1986, Bresnan and Kanerva 1989, Bresnan and Zaenen 1991, Bresnan 1990, etc.). Recent work in HPSG (e.g. Wechsler 1995en. 1995.) has also adopted essentially this scheme.

changes often derived by syntactic transformation feed various lexical processes of derivational morphology such as nominalization, adjective formation, and compounding. The passivized or causativized verb is thus 'trapped' within a lexical nominalization or derived adjective, which itself is formed by lexical morphology and not by syntactic derivation. To maintain the syntactic derivation of passives or causatives, one must either postulate duplicate lexical processes for each of the syntactic ones, a clear loss of generalization, or else reconstruct derivational morphology in the syntax. The latter course leads to serious losses of generalization (e.g. Bresnan and Mchombo 1995, T. Mohanan 1995, Sells 1995, Cho and Sells 1995, Spencer 1995).

This evidence that syntactic relation changes feed lexical morphology is widely felt to have been answered by the development of a theory of argument structure within the transformational framework, particularly by the work of Levin and Rappaport 1986. They argued that the properties of adjectival passives could be explained by independent properties of adjectives and verbs, within the overall framework of (9), without duplicating lexical and syntactic rules. What adjectival and verbal passives have in common could be explained by a shared argument structure, they proposed, while the differences could all be derived from the differing syntax of adjectives and verbs under general principles of syntactic theory. No additional lexical equivalent of the NP movement involved in verbal passives need be postulated.

Much of their argument was directed against the particular model of argument structure advanced by Bresnan 1982 quite a bit earlier to explain the phenomena. In that early model, (i) argument structure was an unstructured list of semantic roles linked to surface suntactic functions, (ii) lexical rules could augment the stock of argument structures, realigning the possible linkings, and (iii) a thematic role condition was used to represent a semantic constraint on the formation of adjectival passives: the subject of predication of an adjective must be a theme. Levin and Rappaport 1986 argued instead that adjectival passives are constrained only by the general *syntactic* properties of adjectives. (Subsequently, Levin and Rappaport 1989 came to adopt a semantic condition of telicity as well as their syntactic condition.)

Levin and Rappaport were certainly correct that aspects of the argument structure model of Bresnan 1982, originally developed ten years earlier, were unnecessary or empirically inadequate. In fact, the model had already begun to change in all of the respects (i)–(iii) by 1986, when Levin and Rappaport 1986 was published. But the central idea of the model—that we can dispense with underlying syntactic trees and directly link verbs and other predicators to final syntactic structures—is still the heart of the matter. All of the questions that Levin and Rappaport 1986 addressed—whether we should have specific rules or only general principles, whether we should refer to thematic roles or only to lexical classes of verbs—are in fact independent of this central issue: does argument structure characterize, or can it be identified with, an underlying syntactic tree structure that is transformally linked to the surface forms of expression?

I will now revisit the empirical arguments originally advanced for the radical lexicalist scheme (11), both on the basis of English adjectival passives (Bresnan 1978, 1982) and on the basis of Bantu deverbal nominalizations (Mchombo 1978), and I will show that the proposals made by Levin and Rappaport to solve the problem are insufficient. The evidence points to the conclusion that the role of underlying syntactic trees in the linkage ofverbs to final syntactic forms should be eliminated.

2 English Participle-Adjective Conversions

In English there is evidence that passivization is a lexical relation change, not involving syntactic transformations, in that it can feed lexical processes of derivational morphology (Bresnan 1978). The argument is quite straightforward.[4]

Adjectives vs. Verbs First, English has distinct categories of Adjective and Verb, which display different morphological and syntactic properties. For example, adjectives but not verbs can be negated by *un-* prefixation (see (12a)). (There is a separate verbal prefix *un-* in *untie, unlock*, which reverses the action denoted by the base verb.) Adjectives but not verbs can be prenominal modifiers (see (12b)), can be modified by *too* without *much* (see (12c)). Adjectives but not (transitive) verbs resist direct NP complements (12d). Adjectives but not verbs can head concessional relative phrases beginning with *however* (see (12e)).

(12) a. *un-* prefixation: *happy/unhappy, clear/unclear, *untouch, *ungo*

b. prenominal modifiers: A N vs. *V N

[4]The following analysis is based on Bresnan 1982 and Levin and Rappaport 1986. See these works and Ackerman and Goldberg to appear for fuller references.

c. *too (*much)* AP vs. *VP too *(much)*: *it is too flat* vs. **it is too much flat ...*

d. *[A NP]$_{\mathrm{AP}}$ vs. [V NP]$_{\mathrm{VP}}$: *supportive my daughter* vs. *support my daughter*

e. *however* AP vs. **however* VP: *however supportive of her daughter she may have been* vs. **however supporting her duaghter she may have been ...*

Participle-adjective conversion Second, English has a general morphological process of participle-adjective conversion, which enables all verbal participles to be used as adjectives:

(13) a. *present participles*: a smiling child, a breathing woman, the boring story

b. *perfect participles*: a fallen leaf, an escaped convict, wilted lettuce

c. *passives*: a considered statement, the spared prisoners, an opened can

By the tests in (12), these converted adjectives are adjectives and not verbs. They appear prenominally, as in (13), and show other evidence of being adjectives:

(14) *an unconsidered statement, however considered her statement may be been, too wilted to eat, unbreathing*

Passive participles convert to adjectives Third, passive verb forms, being verbal participles, also undergo conversion to adjectives, as in (13c). As evidence for this conversion, the adjectival passives show the full range of passive participle morphology that we find with passive verbs:[5]

[5] A few adjectives like *drunken* reflect conversions of older participial forms not in current use.

(15)

Verb	*Participle*	*Adjectival Passive*
sing	sung	an unsung hero
fight	fought	hard-fought battles
write	written	a well-written novel
give	given	a recently given talk
consider	considered	an unconsidered action
inhabit	inhabited	an uninhabited island
break	broken	my broken heart
split	split	split wood

If there were a separate morphological rule of 'adjectival passivization' alongside of verbal passivization, these morphological parallels would be an unexplained accident. Further evidence comes from the fact that complex passives consisting of a passive verb and following preposition may also undergo conversion:

(16) a. After the tornado, the fields had a *marched through* look.

b. Each *unpaid for* item will be returned.

c. You can ignore any recently *gone over* accounts.

d. His was not a *well-looked on* profession.

e. They shared an *unspoken (of)* passion for chocolates.

f. Filled with candy wrappers and crumpled bills, her bag always had a *rummaged around in* appearance.

But exceptions to complex passivization are also exceptions to the adjectival passive:

(17) a. *The twin is looked like by his brother.

b. *a looked-like twin (cf. like-minded)

(18) a. *No reason was left for.

b. *the left-for reason (cf. each unpaid-for item)

Again, this fact would remain unexplained if there were a separate rule of adjectival passivization alongside verbal passivization.

Differences between adjectival and verbal passives explained Certain differences between adjectival passives and verbal passives have a natural explanation on this theory. As noted above, English adjectives cannot take NP complements, but require a mediating preposition. (See (12): **she is supportive her daughter, she is supportive of her daughter.*) Therefore, adjectival passives of ditransitive verbs are more restricted than verbal passives. When one of two NP objects is expressed as the passive subject of a verb, the other can remain as a complement of the verb, but as a bare NP it cannot be the complement of the converted adjective. Hence, when the NP complement is required by the passivized verb, the corresponding adjectival passive will be ill-formed. This observation explains the contrast between (19) and (20):[6]

(19) a. A medal was recently given (to the winner.)

b. The winner was recently given *(a medal).

(20) a. a recently given medal

b. *a recently given winner

Bresnan 1982 originally attributed this contrast to the theme subject condition—the subject of predication of an Adjective must be a theme—but in fact it already follows from the LFG principle of functional completeness (Kaplan and Bresnan 1982, Bresnan 1996).

Furthermore, when the passivized ditransitive verb does not require an NP complement, the adjectival passive is allowed:

(21) a. New skills were taught (to the children).

b. The children were taught (new skills).

c. The prisoners were spared (execution).

(22) a. untaught skills

b. untaught children

c. the spared prisoners

[6]Recall that the notation '*(...)' indicates that the parenthesized material cannot be omitted, while '(*...)' means that the parenthesized material cannot be present.

This generalization, too, was observed by Levin and Rappaport 1986. It already follows from Bresnan's 1982 conversion analysis, without any extra condition.

Finally, when the passivized verb requires a PP complement, the adjectival passive may be well-formed, but it cannot occur in prenominal position because of the generalization that nominals and the heads of their modifiers must be adjacent (Maling 1983): *a yellow book*, **a yellow with age book*, *a book yellow with age.*[7]

(23) a. The pillows were being stuffed (with feathers).

b. The feathers were being stuffed ??(into their pillows).

(24) a. stuffed pillows

b.?? stuffed feathers

c. feathers [still unstuffed into their pillows]$_{\mathrm{AP}}$

A context in which the last example (24c) might be used naturally is the following: *I walked into the room looking for my sister, who works as a freelance pillow-stuffer. She was nowhere in sight, but there were pillows on the floor, half-stuffed pillows on the tabletop, and on a long counter I beheld heaps of feathers still unstuffed into their pillows.* The generalization underlying these facts (which is observed by Hoekstra 1984 and Rappaport and Levin 1986) also follows from the completeness principle of LFG: the absence of a required syntactic complement leads to a violation.

Thus, there is no need to postulate a separate rule of adjectival passivization in addition to verb passivization to explain the above differences between adjectival and verbal passives: the differences as well as the similarities follow directly from the morphological process of participle-adjective conversion together with general syntactic properties of adjectives and verbs in English. We need only assume that passivized verbs are available lexically to be converted.

Differences between adjectival and verbal passives unexplained However, the present account is not sufficient. There are further differences between

[7]Again recall the interpretation of the parenthesis notation given in n. 6: '??(...)' means that the parenthesized material is ill-formed or very questionable when present; it is preferred to omit it.

the verbal participles and converted adjectives that are not yet explained (Wasow 1977, Bresnan 1982). First, verbal passives can be predicated of idiom chunks, but adjectival passives cannot:

(25) a. Advantage was not taken of my presence.

b. *untaken advantage (cf. untaken seats)

Second, some verbs like *thank* have a verbal passive but no adjectival passive:

(26) a. We were thanked by our friends.

b. *a thanked person

Third, intransitive verbs have past participles which undergo adjective conversion only in some cases:

(27) a.

wilted lettuce	lettuce that has wilted
elapsed time	time that has elapsed
an escaped convict	a convict who has escaped

b.

*the run child	the child who has run
*an exercised athlete	an athlete who has exercised
*a flown pilot	a pilot who has flown
*a recently left woman	a woman who has left recently

Nothing in the above account explains this.

These further restrictions suggest that we must take into account the semantics of adjective conversion. It is clear that adjective conversion in general denotes a state derived from the semantics of the base verb. This seems to be true for all types of conversion, including the present participles (*a smiling woman*). In the case of the past participles, Bresnan's 1982 first attempt at characterizing the semantics was the theme subject condition: the participles that do convert, as in (27a), have a theme subject, while those that do not, as in (27b), have an agent subject. This explanation is problematic in that it is not obviously applicable to examples like (22) *untaught children/skills*, where two distinct arguments must then be analyzed as themes (as Levin and Rappaport 1986 point out). However, there is a more adequate semantic account readily available. The state denoted by the adjective appears to be the result state of the eventuality denoted by the participle (Langacker 1991: 202–3, Parsons 1990: 236, Levin and Rappaport 1989). Wilting involves an involuntary change of state, but even highly volitional eventualities such as having escaped can entail result states, such as freedom. Because the activity of running lacks an inherent result state, it is strange to say *a run child*. But when the goal is supplied to the activity, a result state is defined, and now conversion is possible (*a run-away child*). Similarly with other activities, such as exercising, flying, or travelling: when a goal or limit of some sort is supplied, a result state is defined and conversion is possible. Thus, the converted adjectives of the following unergative past participles are all possible:

(28)	a run-away slave	a slave who has run away
	an over-exercised athlete	an athlete who has exercised overly
	a flown-away bird	a bird that has flown away
	the widely-travelled correspondent	the correspondent who has travelled widely

In contrast, the verb *leave* in (27) is bad because the predicate focuses on the source of motion, not on the goal or result state (Adele Goldberg p.c.).

This generalization is reinforced by the contrast in (29), due to Adele Goldberg (p.c., August 3, 1995):

(29) grown man vs. ??grown tree

Goldberg (ibid) characterizes the contrast as follows: "The former refers to a culturally recognized endpoint, namely adulthood, while the latter does not since there is no culturally recognized end state of treehood."

The same semantic generalization suggests that **a thanked person* will be ill-formed, because there is no salient result state defined by the process of thanking. Similarly, the complex predicates consisting of verb and noun combinations like *take advantage of* do not define a result state of the internal noun (e.g. *advantage*), which forms part of the idiom.

Most interesting are the examples in (30).

(30)	a well-prepared teacher	a teacher who has prepared well
	a confessed killer	a killer who has confessed
	a recanted Chomskyan	a Chomskyan who has recanted
	(un)declared juniors	juniors who have (not) declared [majors]
	a practiced liar	a liar who has practiced
	an unbuilt architect	an architect who has not built [buildings]

Verbs like *confess, recant*, and *declare* designate verbal actions that change one's moral, legal, or administrative status. These are strongly unergative verbs by tests proposed by Levin and Rappaport (1995):

(31) *He confessed his way out of trouble, He recanted his way into acceptance by the functionalists, She declared her way from science into art.*

Build is another verb that results in a change of status (for an architect): *He built his way to fame.*[8]

Note finally that it is important not just that the adjectival passive's verbal base be telic, but that it predicate a result state of its *subject*. *Give up*, for example, is telic, to judge by the typical aspectual tests:

(32) I gave up in a minute/??for an hour.

Yet the endpoint state of giving up is not predicated of the subject in (32); it applies only to what is given up, the unspecified object. Hence the adjectival passive of *given up* has only the passive reading (33b), not the perfect intransitive reading (33a):

(33) a. *given up students

b. given up hopes for success

The semantic concept of result state thus suffices to explain some of the restrictions on adjectival passives that have been observed. But it is not a necessary condition: Ackerman and Goldberg to appear show that there is a general pragmatic condition of informativeness at work as well. The following examples (from Adele Goldberg p.c. August 3, 1995) are adjectival passives based on atelic verbs, both activities (34) and states (35):

(34) long anticipated event
much hoped for consequences
much talked about idea
strongly backed candidate

[8]Caroline Heycock (p.c., October 12, 1995) has suggested that *an unbuilt architect* might be used analogously to *an unplayed composer*, where the person is substituted metonymously for the works of the person. Certainly, *They never play that composer any more* involves this transfer, but the parallel *?They never built that architect* sounds somewhat odd. *That architect has never built (anything)* is easily interpreted as meaning that he has never had his designs built; this would be the hypothesized source of the perfect intransitive.

(35) much-loved doctor
much-feared consequence
communally owned property
despised politician
highly acclaimed actor
well-known performer

Most of these examples require adverbial modification to be felicitous (cf. *??a talked about idea, ??a backed candidate, ??owned property*). The adverbial modification increases the informativeness of the attribute, and thus its acceptability. Pramatic informativeness and the semantic result state condition are members of what may be a family of conditions on the use of adjectives.

In sum, both present and past participles in English undergo conversion to adjectives. The past participles may be active or passive, 'unaccusative' or 'unergative', so long as they satisfy the complement restrictions on adjectives and the semantic/pragmatic conditions on adjectival states. There is no morphological rule of 'adjectival passive' alongside a syntactic passive. There is only the verbal passive, a lexical relation-change which may undergo the general lexical morphologial process of participle-adjective conversion. Participle-adjective conversion simply preserves the subject of predication of its verbal base.

If the general analysis given above is correct, then we can tell what must be involved in the lexical relation change of passivization. It cannot be merely the 'suppression' of an external theta-role, as assumed by Levin and Rappaport 1986, following the conventional GB analysis. Such an analysis leaves to a syntactic movement transformation the 'externalization' of the internal theta role assigned by the passivized verb, by which is meant the association of the object role with a subject of predication. Because the adjectival passive is a lexical formation of derivational morphology, something else must externalize its internal role. Levin and Rappaport (1986: 654) propose that adjective conversion itself externalizes an internal role. But this lexical process of adjectival externalization (or relation change) simply duplicates the effect of the syntactic externalization with passives verbs—precisely what we wish to avoid. To solve this problem, Levin and Rappaport 1986 propose that the externalization of the internal role required by adjectival passives can be derived from a single general fact about adjectives: that all adjectives must assign an external role. This is independently motivated by examples like (25) **untaken advantage*.

Now if all that is required is that an Adjective assign an external theta role, then the unergative verbal argument structures that deverbal adjectives may inherit should be fine (as in (30)). These verbal argument structures have an external role as their only role. But what then happens when an unaccusative or passive verbal argument structure is inherited by a deverbal adjective? By Levin and Rappaport's 1986 framework of assumptions, these verbs have only an internal role and no external role to assign. By hypothesis, these verbs project direct object NPs (or DPs) at a level of underlying syntactic structure prior to movement. If their internal arguments remain unexternalized inside the adjective, then the result will be ruled out by the general syntactic princples assumed by Levin and Rappaport (the theta-criterion, Projection Principle, case theory). So if all that were required were that Adjectives assign an external theta-role, we might verb well expect that adjective conversion could apply *only* to unergative perfect participles of Verbs, and that adjectives based on passives and unaccusatives would be ungrammatical, contrary to fact.[9]

To solve this problem, we could propose that it is a general property of adjectives not just that they assign an external role, but that they externalize an internal role—that is, that they are all unaccusative. This is obviously false for converted present participles. (The language of invective is rich with them: *a lying, cheating, murdering coward.*) But even if we restricted the externalization proposal to just the past participles (the passives and perfects), we still could not explain the unergative examples in (30).

Thus, the idea that argument structure can be identified with an initial level of syntactic tree structure, to which argument-moving transformations apply, inevitably leads to losses of generalization. At that level, the subjects of unergatives and the underlying objects of passives and unaccusatives have nothing in common. Thus, it is not the process of adjective conversion, but the base passive or unaccusative verb itself that must 'externalize' its argument role, allowing it to be associated with the subject of predication. But this means that the relation change involved in passivization must itself be lexically available to processes of derivational morphology.

3 Chicheŵa Manner Nominalizations

The same argument that Bresnan 1978 made from English evidence was made from Bantu evidence by Mchombo 1978: passivization is a lexical relation

[9]Levin and Rappaport 1986 actually rule out the possibility of examples like (30) by analyzing the adjectival perfect participles as being derived by the *passive* morpheme, which must suppress an external argument. This seems empirically incorrect.

change, not a syntactic transformation, and as such, it can feed lexical processes of derivational morphology—in this case, deverbal nominalizations. It is well known that English deverbal process nominals of the type *the destruction of the city*, *the examination of my daughter* show the same syntactic distribution and structure as morphologically underived nouns (Chomsky 1970). Nouns differ from verbs in that they do not take direct NP complements (cf. (36a), (37a)), are modified by adjectives rather than adverbs (cf. (36b), (37b)), disallow the verbal negative (*not*) (cf. (36c), (37c)), and lack verbal aspect (cf. (36d), (37d)):

(36) a. examining my daughter

b. quickly examining my daughter

c. not examining my daughter

d. having examined my daughter

(37) a. *the examination my daughter
(cf. the examination of my daughter)

b. *the quickly examination of my daughter
(cf. the quick examination of my daughter)

c. *the not examination of my daughter

d. *the having examination of my daughter

These properties of nominalizations follow if they are formed by lexical morphological processes and begin syntactic life as nouns, not verbs. The extent to which they share relational properties of verbs is captured at the level of argument structure (Rappaport 1983, Grimshaw 1990).

Chichewa, a Bantu language of East Central Africa, has deverbal nominalizations with these same properties (Mchombo 1978). Contrast the Chichewa verb *kulîma* 'to farm' with the manner nominalization *ka-lim-idwe* 'the manner of farming':[10]

(38) a.

Mw-ăna	a-na-lím-á	mŭ-nda.
1-child	1.S-PAST-farm-FV	3-field

'The child farmed the field.'

[10]The data presented in (38)–(39) are from Alsina 1990.

b. [NP Ka-lim-idwe ká mú-nda] ka-na-lí k-ó-dódómetsa.
12-farm-NOM 12.ASC 3-field 12.S-PAST-be 12-ASC-INF-amaze.
'The farming of the field in that manner was amazing.'

The manner nominalization is formed by suffixing *-idwe* to the verb stem and prefixing the class marker *ka-* (class 12). The resulting nominalization has the syntactic distributional properties of a noun. As (38b) illustrates, it can head a subject NP with which the verb and predicate agree in noun class. It also shows all of the other expected properties of nouns, parallel to the English examples in (37):

(39) a. *ka-lim-idwe mŭ-nda
12-farm-NOM 3-field
Lit.: 'the farming the field in that manner'

b. *ka-lim-idwe bwino
12-farm-NOM well
Lit.: 'well manner of farming'
(cf. ka-lim-idwe ká-bwino
12-farm-NOM 12-good
'good manner of farming')

c. *si-ka-lim-idwe, *ka-sa-lim-idwe
NEG-12-farm-NOM 12-NEG-farm-NOM
Lit.: 'the not farming in that manner'

d. *ka-na-lim-idwe ká mú-nda
12-PST-farm-NOM 12.ASC 3-field
Lit.: 'the having farming of the field'

(39a) shows that the nominal does not take a direct object; contrast (38b) which shows that the 'associative marker' (an agreeing particle with the meaning 'of') must mark the complement NP of the nominalization. (39b) shows that the adverb *bwino* 'well' cannot modify the nominalization, while the agreeing adjective *kábwino* 'good (class 12)' can. (39c) shows that the verbal negative prefixes cannot appear on the nominal, and (39d) illustrates the fact that tense/aspect markers cannot appear on the nominalization.

In all these respects, then, the Chicheŵa deverbal manner nominalizations behave like lexical nouns. Now the verb stems that undergo this nominalization can themselves be morphologically derived (Mchombo 1978, Bresnan and

Mchombo 1985. Alsina 1990). In each of the following examples, the manner nominalization of verb stem V means 'the manner of V-ing':

(40)	send-ets-a 'cause to skin'	ka-sendets-edw-e
	gon-ĕts-a 'cause to sleep'	ka-gonets-edw-e
	dul-ir-a 'cut with'	ka-dulir-idw-e
	yend-a 'go'	kayendedwe
	yend-ets-a 'drive'	kayendetsedwe
	thamăng-a 'run'	kathamangidwe
	thamang-its-a 'chase'	kathamangitsidwe
	on-a 'see'	kaonedwe
	on-an-a 'see each other'	kaonanidwe
	sĭy-a 'leave'	kasiyidwe
	siy-ăn-a 'leave each other'	kasiyanidwe

In these examples, the derived verb stems are causative, applicative, or reciprocal.

Just as with English nominalizations of transitive verbs (*the doctor's examination of my daughter, the examination of my daughter by the doctor*), the Chichewa nominalizations of transitive verbs express the complement as an 'of' phrase (*ká*), while the agent can be expressed either as a possessor (also marked by *ká*) or as a prepositional phrase (marked by the preposition *ndí* 'by, with'). Significantly, the nominalizations of transitive verbs derived by the causativization from intransitives (as in (41b,c)) are just like the nominalizations of underived transitive verbs (as in (41a)):

(41) a. ka-send-edwe ká mbûzi ndí zígawênga
12-skin-NOM of goats by terrorists
'the skinning of the goats by the terrorists in that manner'

b. ka-yend-ets-edwe kánú ká ndêge
12-go-CAUS-NOM your of airplane
'your flying an airplane in that manner'

c. ka-thamang-its-idwe ká áfîsi (ndí álenje)
12-chase-CAUS-NOM of hyenas (by hunters)
'the chasing of the hyenas (by the hunters) in that manner'

This shows that the verbal base of these nominalizations is not merely causative in form, it is truly a transitivized verb with the characteristic roles and relations of the causative verb. Causativization has fed the lexical morphological process of nominalization, as we might expect of a lexical relation change.

The same is true of the nominalizations of reciprocal verbs. Reciprocalization intransitivizes Chicheŵa verbs, and the manner nominalizations are based on the reciprocalized (intransitive) verb (Mchombo and Ngalande 1980; Bresnan and Mchombo 1985; Sells, Zaenen, and Zec 1987; Mchombo 1992, 1993a; Dalrymple, Mchombo, and Peters 1994):[11]

(42) a. ka-on-an-idwe kâwo
12-see-RECIP-NOM their
'their manner of seeing each other (encounter)'

b. ka-siy-an-idwe kâke
12-leave-RECIP-NOM his/her
'his/her manner of parting' or 'the manner of parting'

The reciprocalized form of the verb requires either a plural subject or a singular subject together with a *ndí* 'with' phrase complement:

(43) a. Zi-na-ón-an-a.
10.S-PAST-see-RECIP-FV
'They (cl. 10) saw each other.'

b. *Njovu i-na-ón-an-a.
9.elephant 9.S-PAST-see-RECIP-FV
Lit.: *'The elephant saw each other.'

c. Njovu i-na-ón-án-a ndí ḿkângo.
9.elephant 9.S-PAST-see-RECIP-FV with the lion
'The elephant and the lion saw each other.'

Similarly, the nominalized reciprocal requires either a plural possessor or a singular possessor together with a *ndí* 'with' phrase complement:[12]

[11] Example (42b) is ambiguous, because the third person singular possessive stem -*ake* can also be used as a definite marker in Chicheŵa: cf. *Ndagula gálímoto yá tsópăno koma gálímoto* **yâke** *ilíbé wáilesi* 'I have bought a new car but **the** car does not have a radio'.

[12] These data were provided by Sam Mchombo (personal communication, February 1 and 18, 1995).

(44) a. ka-on-an-idwe kâwo
12-see-RECIP-NOM their
'their seeing each other'

b. ka-on-an-idwe kâke
12-see-RECIP-NOM his/her
*'his/her seeing each other (encounter)', 'the encounter'

c. ka-on-an-idwe kâke ndí Mávûto
12-see-RECIP-NOM his/her with M.
'his/her and Mavuto's seeing each other (encounter)'

Again, a lexical relation change is feeding a lexical process of derivational morphology—not a surprising result within our theory, but completely unexpected if these verbal relation changes are viewed as the result of movement operations on syntactic structures.

Curiously, manner nominalization in Chicheŵa can apply to productive causative, reciprocal, and applied verb forms, but not to productive passives:[13]

(45) mang-ĭdw-a 'be built, be arrested' *ka-mangidw-idw-e
meny-ĕdw-a 'be hit' *ka-menyedw-edw-e

Note that the nominalizing suffix *-idwe* has the form of the passive suffix *-idw* followed by the final vowel *-e*. This fact makes it tempting to attribute this restriction to an analysis of these nominalizations as based on the passive form of the verb (as suggested by Mchombo 1978). Yet this analysis would not explain why intransitive verbs that do not passivize in Chicheŵa freely undergo manner nominalization: *fika* 'arrive', *kafikidwe*; *bwera* 'come', *kabweredwe*; *gŏna* 'lie, sleep', *kagonedwe*. In Kikuyu a corresponding process of deverbal manner nominalization is based on the applied suffix *-ĩre* (Barlow 1951: p. 99).[14] Further research is required to determine the source of this restriction.

Whatever the explanation may be for the restriction against nominalizing passive verbs, it probably does not lie in the syntactic movment theory of passivization. It is true that the passive suffix is usually final in the sequence of verb stem 'extensions' (the Bantuist term for the verb stem-deriving suffixes), but this fact may have a phonological explanation: in most Bantu languages

[13]With applied verb forms, manner nominalization is restricted, excluding beneficiary arguments but allowing instrumentals.

[14]Thanks to John Mugane for bringing this fact to my attention.

the passive morpheme is phonologically a vowel (or glide), and many instances of suffixation in Bantu skip over a final vowel; the suffix is prosodically infixed to the stem if it ends in an extrametrical vowel (Hyman 1990, Alsina 1990). The Chicheŵa passive suffix *-idw/ -edw* differs in this respect, and in fact it can precede another verbal extension, under the appropriate semantic conditions. In the following example, due to Alsina (1990: ex. 13b), the passive extension is followed by the applicative:

(46) U-konde u-ku-lúk-ídw-ir-á pá-m-chenga (ndí á-sodzi).
14-net 14.S-PRES-weave-PASS-APPLIC-FV 16-3-sand by 2.fisherman
'The net is being woven on the sand (by fishermen).'

Elsewhere in Bantu, passivized verb stems, like the other derived verb stems, productively undergo lexical morphological processes of nominalization. In Gitonga, a language spoken in Mozambique, deveral nouns can be productively formed of both active and passive verbs (Lanham 1955: pp. 106):[15]

(47)

renga 'buy'	murengi 'buyer'
songa 'kill'	musongi 'murderer'
thum-el-a 'work for'	muthumeli 'one who works for someone'
lim-el-a 'farm for'	mulimeli 'one who farms for someone'
thum-is-a 'cause to work'	muthumise 'one who causes to work'
hodz-is-a 'cause to eat'	muhodzise 'one who feeds'
hodz-w-a 'be eaten'	muhodzwa 'one who is eaten'
hung-w-a 'be bound, tied'	bahungwa 'prisoners'
won-w-a 'be seen'	muwonwe 'one who is seen'

These derived deverbal nouns have the same syntactic properties as morphologically underived nouns.[16]

[15] These examples are from Lanham (1955: pp. 106–7) and Alsina (1990: n. 17), who draws on personal communication with Gregorio Firmino, a speaker of Gitonga.

[16] Agentive deverbal nominalizations can undergo compounding. In English, such compounds (e.g. *book-lover*, *lion-killer*, *medal-winner*) retain the head-final Germanic order of compounds, in which the complement precedes the deverbal noun, and this property clearly distinguishes them from English phrasal constructions. In Bantu, in contrast, the compounds are head-initial and therefore much harder to distinguish formally from phrasal constructions. Since compounds in general can contain phrasal elements (e.g. *used-book lover*, *three-time Olympic gold medal winner*), and Bantu synthetic compounds are highly productive while Bantu nominalizations can be relatively referentially transparent, it is a subtle matter to distinguish the compounds from syntactic phrasal constructions (cf. Myers 1987, Bresnan and Mchombo 1995). For this reason the manner nominalizations provide a simpler case for the lexicality of verbal relation changes in Bantu.

Thus, Bantu nominalizations clearly support the lexicality of verbal relation changes, including passivization. In Bantu these very productive relation changes belong to the derivational morphology of verb stem formation.[17]

In sum, the derivational morphology of English as well as Chicheŵa shows quite clearly that the various verbal relation changes which transitivize or intransitivize verbs (such as causative, passive, applied and reciprocal verb forms) are lexical morphological processes. It follows that underlying syntactic tree structures are unnecessary in linking verbs to their final syntactic structures, and ought to be eliminated.

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[17]This insight is familiar in a number of reference grammars of Bantu languages (such as Cole 1955, Lanham 1955) which include passives, causatives, and other relation changes under the morphological heading of 'verb stem derivation'. Within generative grammar, a lexical approach to verbal relation changes in Bantu is adopted by Mchombo 1978, 1980, 1993a,b, Mchombo and Firmino 1992, Mchombo and Ngunga 1994, Machobane 1989, 1993, Alsina 1990, 1992, 1993, Alsina and Mchombo 1990, 1993, Bresnan and Kanerva 1989, 1992, Bresnan and Moshi 1990, and Harford 1990, 1993.

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