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By Phrases in Passives and Nominals

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Abstract. A longstanding claim in the literature holds that *by* phrases are special in the passive, receiving certain external argument roles that *by* phrases in nominals cannot, such as the role of experiencer. This paper challenges this long-standing claim and shows that *by* phrases are not special in the passive: they can receive all of the θ-roles that they can in verbal passives. They are banned from certain nominals for the same reason they are banned from certain VP types like unaccusatives and sporadic advancements: *by* phrases require the syntactic and semantic presence of an external argument. *By* phrases can receive a uniform analysis, whether they occur with verbs or in nominals. The analysis proposed here involves syntactic word formation, with syntactic heads effecting passivization and nominalization. It also relies on syntactic selection for selectional features and proposes a theory of such features. The conception of grammar that emerges is one without lexical rules, where passivization and nominalization take place in the syntax.

1. Introduction

There is a long-standing empirical claim to the effect that *by* phrases can receive θ-roles in passives that they cannot elsewhere. *By* phrases in passives seem to be able to bear any external θ-role, including in particular recipient and experiencer (see (1) and (3)), but *by* phrases in nominals do not seem to be able to bear these roles (see (2) and (4)).

(1) a. The present was received by my mother-in-law.
b. The damage was seen at once by the investigators.
(Culicover & Jackendoff 2005:(18a), (19a))

(2) a. the receipt of the present (*by my mother-in-law)
b. the sight (*by the investigators) of the damage
(Culicover & Jackendoff 2005:(18b), (19b))

(3) a. Harry was feared by John.
b. Danger was sensed by John.
c. Mary was respected by John.
(Jackendoff 1977:92–93, attributed to Hornstein)

(4) a. *the fear of Harry by John
b. *the sense of danger by John
c. *the respect for Mary by John
(Jackendoff 1977:92–93, attributed to Hornstein)

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This seems to indicate that the preposition *by* can assign a limited set of roles by itself outside of the passive (e.g., agent); but in the passive, some special syntactic mechanism is able to transmit the external role of the verb to the *by* phrase, regardless of what that role is.[1]

At the same time, *by* phrases in the sentential domain, as opposed to the nominal, seem to be quite restricted. In the nominal domain, for instance, *by* phrases can appear with nominalizations of intransitive verbs that cannot be passivized:

(5) a. Cheating by students will be punished.
b. Talking by undergraduates at High Table is forbidden.
(Keenan 1980:(13a,b))

By phrases can also appear in other nominals, not clearly derived from verbs:

(6) a. The move by United was unexpected.
b. The march on Washington by the farm workers was a success.
c. a wild pitch by Tanner/a left jab by Ali…
(Keenan 1980:(14a–c))

But in the sentential domain, only passives can have *by* phrases. If the preposition *by* could independently add an agent role, as it seems to be doing in the nominals in (5) and (6), then one would expect that it would be possible to use a *by* phrase to add an agent role to main verbs that do not have them, like unaccusatives, middles, or the "sporadic advancements" of Perlmutter & Postal 1984a. However, this is impossible (see Roeper 1987, Lasnik 1989):

(7) a.	The ship sank (*by a saboteur).	Unaccusative
b.	Politicians bribe easily (*by lobbyists).	Middle
c.	This stadium seats 10,000 people (*by ushers).	Sporadic advancement
d.	$5000 buys a lot of heroin (*by junkies).	Sporadic advancement

These two facts together appear to indicate that in the sentential domain, *by* phrases are limited to passives, and in passives, they have properties that distinguish them

[1] It should be noted from the outset that this paper only concerns itself with *by* phrases that specify the external argument of a passive or a nominal. The preposition *by* has other uses that I do not address here: it can add a means or instrument component, as in *destroy the car by blowing it up* or *paint by hand*; it can also add a spatial location, as in *the house by the sea* or *stand by the wall*. I assume that these are different and unrelated uses of the same preposition and will not address them further. (It is not yet clear to me whether *a book by Chomsky* or *a punch by Ali* represent a distinct use; it is possible that these should be characterized as external arguments, like the *by* phrase in a passive.)

from *by* phrases elsewhere. So, a theory of *by* phrases needs a special account for passives.[2]

I argue against this conclusion here, showing that these two facts are really the same fact. That is, what bans *by* phrases from certain nominals (the ones in (2) and (4)) also bans *by* phrases from certain VP-types (unaccusatives and sporadic advancements; middles require a separate account). This permits a unified account of *by* phrases, where they have no properties particular to the passive. I provide such a unified account here.

An important part of doing this involves showing that *by* phrases pattern with two other types of adjuncts—namely, instrumentals and external-argument–oriented comitatives. These are banned from the same environments as *by* phrases, and for the same reason. The analysis that I provide relies heavily on syntactic selection, and an interesting consequence is that these particular adjuncts have to be viewed as having syntactic selectional requirements.

In section 2, I reexamine the two facts given above that have been taken to argue for treating *by* phrases in passives as special. I show that once we have a proper understanding of the restriction that holds of *by* phrases, instrumentals, and external-argument–oriented comitatives, the restriction on VP types and the restriction on nominals receive a unified account. Section 3 develops a theory of the passive and the *by* phrase that accounts for all of the facts, building on Keenan 1985. This theory has selectional features do a lot of the work, and so it also develops a theory of selectional features and how they are satisfied syntactically. Within this theory, certain types of adjuncts—namely *by* phrases, instrumentals, and external-argument–oriented comitatives—have to be treated as selecting a particular syntactic category. I suggest that this might hold for other adjunct types, too. Finally, the findings of this paper also have important consequences for crosslinguistic typology and for the status of lexical rules, which I explore in section 4.

2. Reevaluating the Facts

This section reexamines the two facts given above—namely, that in the sentential domain, *by* phrases are only allowed in passives; and in passives, they behave differently from *by* phrases in nominals. I start with the sentential domain and then turn to nominals.

[2] Most analyses that I am aware of only treat passives and ignore *by* phrases elsewhere. Almost all theories have a special mechanism for relating the *by* phrase to the underlying external argument of the passive. These include the original transformational analysis of Chomsky (1957:43); the Relational Grammar theory (e.g., Perlmutter & Postal 1983) and its descendants (e.g., Postal 1986); lexical theories like those of Lexical Functional Grammar (e.g., Bresnan 2001), Head-Driven Phrase Structure Grammar (e.g., Sag, Wasow & Bender 2003), and the "Simpler Syntax" model of Culicover & Jackendoff (2005); the "theta transmission" theory of Jaeggli 1986; the theory of Baker, Johnson & Roberts (1989), where the external θ-role is assigned to the passive morpheme, whereas the *by* phrase can double it in a way analogous to clitic doubling in some languages; and the "smuggling" theory of Collins 2005, where the passive *by* phrase is generated in the same position as the active subject and receives the same interpretation. The only analysis that I know of that does not treat the passive as special is that of Keenan (1980, 1985). The analysis that I offer is in the same spirit as Keenan's.

2.1 VPs Lacking External Arguments

In the sentential domain, *by* phrases are only allowed with passives. They are not allowed with actives, nor are they allowed with other types of VPs. If the preposition *by* could independently assign external argument roles, it should be possible to add a *by* phrase to unaccusatives, middles, or the "sporadic advancements" of Perlmutter & Postal 1984a and thereby add an external argument to a VP that lacks one. As shown above, however, this is impossible:

(8) a. The ship sank (*by a saboteur). Unaccusative
b. Politicians bribe easily (*by lobbyists). Middle
c. This stadium seats 10,000 people (*by ushers). Sporadic advancement
d. $5000 buys a lot of heroin (*by junkies). Sporadic advancement

This has led most researchers to conclude that the passive involves a special syntactic relation between the external argument and the *by* phrase, and this relation is limited to passives. In the sentential domain, the preposition *by* is unable to assign a θ-role by itself.

However, there is reason to be suspicious of this conclusion. Putting aside middles (which I will return to in section 3.8), it turns out that two other types of adjuncts—namely, instrumentals and external-argument–oriented comitatives—are also incompatible with VPs that lack external arguments, although, like *by* phrases, they are compatible with passives. The following examples illustrate instrumentals:

(9) a. The enemy sank the ship with a torpedo.
b. *The ship sank with a torpedo.
c. The ship was sunk with a torpedo.

(10) a. The ushers seated 500 people with flashlights.
b. *This theater seats 500 people with flashlights.
c. 500 people were seated with flashlights.

(11) a. Junkies buy a lot of heroin with computers these days.
b. *$5000 buys a lot of heroin with computers these days.
c. A lot of heroin is bought with computers these days.

External-argument–oriented comitatives are also not compatible with these VPs, although they too are compatible with passives (where the comitative is interpreted as acting along with the unexpressed agent). Here and below the asterisk means ungrammatical on the intended interpretation, where the comitative acts along with an external argument, expressed or unexpressed:[3]

[3] Comitatives do not require an external argument when they are related to an internal argument, as in *The ship sank with its accompanying gunboat*.

(12) a. The saboteur sank the ship with a henchman.
b. *The ship sank with a henchman.
c. This ship should be sunk with a henchman.

(13) a. The ushers seated 50,000 ticketholders with the security guards.
b. *This stadium seats 50,000 ticketholders with the security guards.
c. 50,000 ticketholders can't be seated with the security guards.

(14) a. Junkies buy a lot of heroin with their bosses these days.
b. *$5000 buys a lot of heroin with one's boss these days.
c. A lot of heroin is bought with one's boss these days.

(For the rest of this paper, I use the term "comitative" as shorthand for "external-argument–oriented comitative.")

These facts show that it is not just *by* phrases that are incompatible with VPs that lack external arguments; other adjuncts are, too. It will not do to say that the preposition *with* is not capable of assigning an instrumental or comitative role by itself and must get that role somehow in the passive (and the actives that allow it). Generally, instrumental and comitative roles are added as adjuncts; most syntacticians analyze them as contributing roles by themselves, given that lexical verbs for the most part lack them. Therefore, some other explanation is going to be necessary for why instrumentals and comitatives are incompatible with these VPs. If this same explanation will cover *by* phrases, then we will have an independent reason for why *by* phrases are limited to passives in the sentential domain.

In the case of comitatives, the reason for this incompatibility is clear: an external-argument–oriented comitative needs an external argument as part of its semantics. Unaccusatives and sporadic advancements lack external arguments. Comitatives are therefore semantically incompatible with them. Given that instrumentals and *by* phrases seem to pattern with comitatives, we could pursue the following hypothesis:

(15) Hypothesis: *By* phrases, comitatives, and instrumentals require the (syntactic and/or semantic) presence of an external argument.

I will make this hypothesis more precise in the next section.

One way of thinking about this in the case of *by* phrases is the following: *by* phrases do not *add* external argument roles; they *fill* them. That is, they are an alternative realization of the external argument. But there must be an external argument for them to realize it. This idea suffices to explain the facts regarding unaccusatives and sporadic advancements, which means that passives are not special at all. All that is necessary is a worked-out theory, which I provide in section 3.

2.2 Passives versus Nominals

As shown in the introduction, *by* phrases in nominals seem to be much more restricted in θ-roles than *by* phrases in passives. Most researchers have taken this to mean that passives involve a relation that is absent from nominals. However, I will show that the same hypothesis that explains unaccusatives and sporadic advancements (as above) also accounts for nominals. This means that *by* phrases have the same properties in all contexts, and there is nothing special about the passive.

2.2.1 *The claimed facts*

The passive *by* phrase always appears to receive the same semantic role as the corresponding active subject. In addition to agent or actor semantics, this can be a goal or recipient (16a), perceiver (16b), holder of a knowledge state (17), or experiencer (18).

(16) a. The present was received by my mother-in-law.
b. The damage was seen at once by the investigators.
(Culicover & Jackendoff 2005:(18a), (19a))

(17) That fact is known by everyone.

(18) a. Harry was feared by John.
b. Danger was sensed by John.
c. Mary was respected by John.
(Jackendoff 1977:92–93, attributed to Hornstein)

It is often claimed that these are *not* semantic roles that can be independently assigned by the preposition *by*. Researchers usually present certain nominals where, they claim, *by* phrases with these semantics are not allowed:

(19) a. the receipt of the present (*by my mother-in-law)
b. the sight (*by the investigators) of the damage
(Culicover & Jackendoff 2005:(18b), (19b))

(20) a. *the fear of Harry by John
b. *the sense of danger by John
c. *the respect for Mary by John
(Jackendoff 1977:92–93, attributed to Hornstein)

I will divide these nominals into two groups. The first group includes *receipt* and *knowledge*. These actually do allow *by* phrases. The second group includes *sight*, *fear*, *sense*, *respect*, *smell*, and *taste*, which do not allow *by* phrases. I will refer to this group as the *sight* class of nominals. First I dispense with *receipt* and *knowledge* and

then turn to the *sight* class. We will see there is an independent explanation for why *by* phrases cannot appear with the *sight* class of nominals, and that it is the same explanation as for why *by* phrases cannot appear with VPs that lack external arguments.

2.2.2 *Receipt and knowledge do allow by phrases*

The first group of nominals, consisting of *receipt* and *knowledge*, actually does allow a *by* phrase. In my judgment, for instance, Culicover and Jackendoff's example in (19a) is perfectly acceptable. Other cases of these same nominalizations with a *by* phrase with these same meanings sound completely natural:

(21) a. The receipt of at least three of those letters by their intended recipients is a matter of historical record.
b. Complete knowledge of those techniques by more than just a carefully controlled few had to await the collapse of the guild system.

This was confirmed by Google searches performed on November 20, 2006, and April 20, 2010, which turned up numerous examples of *by* phrases assigning the role of recipient or holder of a knowledge state. I give three examples of each here:

(22) … after the date of **receipt of the letter by the GDS**…
(http://www.hedna.org/library/procedures.cfm)

(23) The start date must be at least ten days after the **receipt of the form by Gift Processing**.
(https://devar.washington.edu/departments/gpa/AdminPolicy.asp)

(24) To ensure proper **receipt by EPA**, it is imperative that you identify docket control number OPP-34143C in the subject line on the first page of your response.
(http://www.epa.gov/fedrgstr/EPA-PEST/2002/January/Day-10/p631.htm)

(25) Suspicious trading points to advance **knowledge by big investors** of September 11 attacks

(26) Prior **knowledge by the physician** of a melancholic patient's tendency to commit suicide (http://cat.inist.fr/?aModele=afficheN&cpsidt=7696177)

(27) …to show there was prior **knowledge by Federal and OK state law enforcement personnel** of the OKC bombing.
(http://www.newswithviews.com/Briley/Patrick32.htm)

Thus, it is not true that *by* cannot independently assign the semantic roles of recipient and holder of a knowledge state. Such roles do appear in nominals.

2.2.3 *Nominals that do not allow by phrases*

The second group of nominals includes *sight*, *fear*, *sense*, *respect*, *smell*, and *taste*. These genuinely do not allow *by* phrases. Hence, we might think that the role of perceiver or experiencer cannot be assigned independently by the preposition *by*, and therefore that role must be transmitted to the *by* phrase from the verb in the passive.

However, other nominals that would have these same roles *do* allow a *by* phrase. For instance, both *perception* and *experience*, derived from the roots that give us the names for these roles, allow a *by* phrase:

(28) a. His inadequacies were finally perceived by his wife.
b. the perception of his inadequacies by his wife
c. …light signal perception by plants…
(http://www.nature.com/nature/journal/v407/n6804/full/407585a0.html)
d. Unfortunately, the acoustics of typical classrooms greatly reduce auditory speech perception by these students.
(http://aja.asha.org/cgi/content/abstract/13/1/62)

(29) a. Pain can be experienced by the unborn.
b. the experience of pain by the unborn
(http://www.popline.org/docs/0530/007926.html)
c. the experience of pain by a Native American
(http://www.mindfullivingprograms.com/coping.php)

So do various synonyms that turn up in thesaurus searches on *sight*, *sense* and *respect* (the examples are modeled on actual sentences found using Google):

(30) Synonyms of *see*:
a. *detect*: the detection of the sound by sensitive instruments
b. *observe*: the observation by Darwin that finches…
c. *recognize*: the recognition of self by others and by legal and social institutions

(31) Synonyms of *sense*:
a. *apprehend*: the apprehension of God by a finite mind
b. *discern*: the discernment of God's will by the entire church

(32) Synonyms of *respect*:
a. *admire*: the admiration of beauty by the ancients
b. *appreciate*: the appreciation of beauty by other people
c. *venerate*: the veneration of God by the gentiles

(33) Synonyms of *smell*:
a. *olfaction*: olfaction of general odorants by small-mouthed salamander larvae

This indicates that the roles of perceiver/experiencer *can* be assigned by *by* in nominals, and there must be some other reason that the nominals *sight*, *fear*, *sense*, *respect* and *smell* do not allow *by* phrases.

I list the nominals with experiencer/perceiver roles below according to whether they allow a *by* phrase:

(34) Do allow *by* phrase:
perception, experience, detection, observation, recognition, apprehension, discernment, admiration, appreciation, veneration, olfaction

(35) Do not allow *by* phrase:
sight, fear, sense, respect, smell, taste

An obvious difference between these two classes is their morphological complexity. The nominals that do allow *by* phrases are morphologically complex (except perhaps *experience*) and are clearly derived by overt morphology from verbs (except *olfaction*). The nominals that do not allow *by* phrases are not clearly deverbal and are monomorphemic.

One might therefore suggest that the two groups of nominals differ according to the classification of nominals suggested by Grimshaw (1990). Grimshaw divides nominals into complex event nominals, result nominals, and simple event nominals. Only complex event nominals take arguments; result nominals and simple event nominals do not. One could hypothesize that the nominals that do allow a *by* phrase are complex event nominals, whereas the ones that do not allow a *by* phrase are result nominals. They would therefore disallow a *by* phrase because, according to Grimshaw, *by* phrases with result nominals are only interpreted as something like authorship (Grimshaw 1990:61), and this interpretation would make no sense with the *sight* class. This explanation would fit with the common claim that zero-derived nominals are never complex event nominals (e.g., Borer 1999, Alexiadou & Grimshaw 2008).

It is certainly true that the *sight* class can be result nominals, according to Grimshaw's diagnostics: they can occur without any arguments (36a), can pluralize (36b–e), can take indefinite determiners (36b), can appear in the existential construction (36c), can take a postnominal genitive (36d), can take a time expression as a prenominal genitive (36e), and can appear as a predicate (36f). (But note that *respect* does not always pattern the same as the others.)

(36) a. Fear/respect/that sight/that sense/that smell is disturbing.
b. Animals have many fears/senses. The woods present many sights/smells. (*respects)
c. There are many sights/fears/senses/smells. There isn't a lot of respect in this department.
d. those fears/senses/smells/sights of Gerald's (*the respect of Gerald's)
e. Yesterday's sights/fears/smells/??senses/*respects were overwhelming.
f. This is fear/respect/a sight/a smell/a sense.

In this result nominal use, the *of* phrase is disallowed, as expected:

(37) a. They took in the sights (*of blood).
b. There are many sights (*of carnage) in this country. (not to be confused with *site*)
c. This is a sight (*of blood).

However, the *sight* class also passes some of Grimshaw's tests for complex event nominals. In the event use, the *of* phrase is obligatory, as Grimshaw documents for complex event nominals generally. For instance, this class can take event modifiers with an *of* phrase (again, *respect* is exceptional):[4]

(38) a. the frequent/constant sight of blood
b. the frequent/constant fear of rejection
c. the frequent/constant sense of danger
d. the frequent/constant smell of formaldehyde
e. *the frequent/constant respect for one's colleagues

When the *of* phrase is present, these nominals cannot be used in any of the ways in (36):

(39) a. Animals have many fears/senses (*of danger). The woods present many sights/smells (*of decomposition).
b. There are many sights/fears/senses/smells (*of blood/danger).
c. those fears/senses/smells/sights (*of blood) of Gerald's
d. Yesterday's sight/fear/smell (*of blood) was overwhelming.
e. This is a sight/a smell/a sense (*of blood).

This makes it appear that when the *of* phrase is present, these nominals are complex event nominals.[5] So one could not claim that *by* phrases are disallowed because these nominals, as result nominals, disallow arguments.

We must therefore look elsewhere for an explanation for why these nominals disallow *by* phrases. One possibility might be that it has something to do with the realization of the arguments of the head noun. All the members of the *sight* class allow a possessor understood as the experiencer, but most do not allow the theme to

[4] A reviewer notes that a relative clause improves (38e): *The frequent/constant respect for their colleagues that they show is undeserved.*

[5] Contra Alexiadou & Grimshaw (2008), zero-derived nouns like *fear*, *smell* and *sense* and irregularly derived nouns like *sight* can be complex event nominals. This is also true of nouns derived from unaccusative verbs, like *growth*, which Alexiadou & Grimshaw (2008) claim are never complex event nominals. I take sequences like *the rapid growth of the weeds* to be complex event nominals. The *of* phrase is not compatible with determiners other than *the* or any of the other diagnostics of result nominals: *some growth (*of the weeds) occurred last night; there has been a lot of growth (*of the weeds); yesterday's growth (*of the weeds).* Such nominals can also take adverbs just like the morphologically complex ones documented by Fu, Roeper & Borer (2001): *The growth of the beanstalk immediately/so suddenly surprised me.*

be expressed as a prenominal genitive (*respect* also marks its object with *for*, rather than the expected *of*):

(40) a. the sight of the damage (*by the investigators)
b. the investigators' first sight of the damage
c. *the damage's sight

(41) a. the fear of dogs (*by cats)
b. cats' fear of dogs
c. *dogs' fear (with the meaning 'fear of dogs')

(42) a. the sense of danger (*by John)
b. John's sense of danger
c. *danger's sense

(43) a. the respect for pole dancing (*by John)
b. John's respect for pole dancing
c. *pole dancing's respect

However, *smell* and *taste* allow the theme to be a prenominal genitive (I thank a reviewer for (44b)):

(44) a. the smell of the beer (*by the investigators)
b. When I took my first smell of this beer …
c. the beer's smell

(45) a. the taste of the beer (*by the brewers)
b. the brewers' first taste of the beer
c. the beer's taste

One might have thought that it was significant that the *sight* class does not allow the theme as a prenominal genitive, but *smell* and *taste* do allow it. Additionally, many of the nominals that do permit *by* phrases do not permit their objects as prenominal genitives:

(46) a. the perception of light by the patient
b. *light's perception

(47) a. the admiration of beauty by the ancients
b. *beauty's admiration

So, there is no relation between disallowing a *by* phrase and disallowing the theme as a prenominal genitive.

However, there is one fact that correlates perfectly with disallowing a *by* phrase. This that the nominals that disallow *by* phrases also do not allow certain adverbial phrases—namely, the ones that were also disallowed by unaccusatives and sporadic advancements. The nominals that do not allow *by* phrases also do not allow instrumental adjuncts (I leave out *fear* and *respect*, because I cannot come up with a good instrumental even for verbal *fear* and *respect*):

(48) a. The inspector saw the blood with a microscope.
b. The blood was seen with a microscope.
c. *the sight of the blood with a microscope

(49) a. The sample was smelled with an electronic nose.
b. *the smell of the sample with an electronic nose

(50) a. The danger was sensed by Peter with his spider-sense
b. *Peter's sense of danger with his spider-sense

(51) a. The food was tasted with a spoon.
b. *the taste of the food with a spoon

In contrast, nominals that do allow *by* phrases also allow instrumentals:

(52) a. the perception of light with a photosensor
b. the detection of the sound with an amplifier
c. the discernment of God's will with various omens

The nominals that do not allow *by* phrases also do not allow comitative adjuncts:

(53) a. The inspector saw the crime scene with his assistant.
b. The crime scene should be seen with one's assistant.
c. *the sight of the crime scene with one's assistant

(54) a. The sample should be smelled with one's assistant.
b. *the smell of the sample with one's assistant

(55) a. The danger was sensed by Peter with Mary Jane.
b. *Peter's sense of danger with Mary Jane

(56) a. This food should only be tasted with the sous-chef.
b. *the taste of the food with the sous-chef

In contrast, nominals that do allow *by* phrases also allow comitatives:

(57) a. a person's experience of loss with their spouse
b. the bat's detection of the sound with its hunting mates
c. Darwin's observation of finches with his assistant
d. a believer's discernment of God's will with her priest
e. a believer's veneration of God with her priest

Additionally, the nominals that do not allow *by* phrases also do not allow *without* clauses, unlike the corresponding verbs, active or passive:[6]

(58) a. Everyone saw the blood without (anyone) getting sick.
b. The blood was seen without anyone getting sick.
c. *the sight of the blood without anyone getting sick

(59) a. Everyone smelled/tasted the blood without (anyone) getting sick.
b. The blood was smelled/tasted without anyone getting sick.
c. *the smell/taste of the blood without anyone getting sick

(60) a. Everyone fears Harry without (anyone) realizing it.
b. Harry is feared without anyone realizing it.
c. *the fear of Harry without anyone realizing it
d. *John's fear of Harry without realizing it

(61) a. Everyone sensed the danger without (anyone) being consciously aware of it.
b. The danger was sensed without anyone being consciously aware of it.
c. *the sense of danger without anyone being consciously aware of it
d. *John's sense of danger without being aware of it

(62) a. Everyone respects Mary without (anyone) ever showing it.
b. Mary is respected without anyone ever showing it.
c. *the respect for Mary without anyone ever showing it
d. *John's respect for Mary without ever showing it

The nominals that do allow *by* phrases also allow *without* phrases:

(63) a. the patient's perception of light without being aware of it
b. the patient's experience of pain without being able to react to it
c. the instrument's detection of the sound without registering it
d. Darwin's observation of finches without prejudging their relationships
e. the Republicans' recognition of that fact without really registering its significance
f. a believer's apprehension of God without truly comprehending it
g. a believer's discernment of God's will without understanding it

[6] It is crucial that the complement of *without* be a clause and not just an NP. The *sight* class of nominals does allow *without NP*, as in *Sense without sensibility is dangerous*.

h. the ancients' admiration of beauty without really appreciating it
i. other people's appreciation of beauty without truly admiring it
j. the gentiles' veneration of God without understanding His aspects

Hence, *by* phrases are disallowed with the *sight* class of nominals, but so are other types of adverbial phrases, ones that are clearly adjuncts. The preposition *by* can assign perceiver/experiencer roles in other nominals, so *by* phrases must be disallowed with the *sight* class of nominals for some other reason. That reason should also rule out *without* and instrumental and comitative phrases. Given that the same adjuncts (except *without* phrases; see below) are also banned from unaccusatives and sporadic advancements, it appears that the same restriction is at work in the sentential domain as in the nominal domain, and there is nothing special about *by* phrases in the passive.

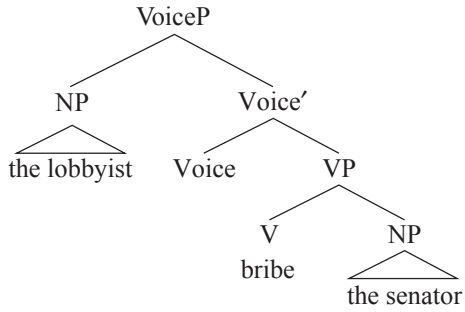
The next subsection sketches the basic hypothesis to cover all of these facts and motivates the empirical generalization behind it. Section 3 works out a detailed analysis. No existing analysis of *by* phrases that I am aware of relates all of the facts discussed in this section, and they all stumble in incorrectly ruling out *by* phrases with nominals like *perception* and *experience* (because they all assume that *by* cannot independently assign perceiver/experiencer roles).

2.3 The Basic Hypothesis and the Empirical Claims

This section has shown that, contrary to long-standing claims in the literature, *by* phrases can bear all the external argument roles in nominals that they can in passives. Additionally, two other classes of adjuncts—namely, instrumentals and comitatives—are barred from the same environments that *by* phrases are: in the sentential domain, unaccusatives and sporadic advancements; in the nominal domain, with the *sight* class of nominals. The hypothesis that I have advanced is that *by* phrases, comitatives, and instrumentals require the (syntactic and/or semantic) presence of an external argument.

Here is the basic idea, to be worked out in detail in the next section: following Kratzer (1996), we can hypothesize that external arguments are introduced by a projection outside the lexical VP, call it Voice:

(64)



The next step is to hypothesize that *by* phrases, comitatives, and instrumentals all have to attach to a projection of Voice. Hence, they will only be allowed with phrases that include Voice. If unaccusatives and sporadic advancements lack Voice, then we explain why none of them can appear with these types of VPs. In the nominal domain, we can hypothesize that nominals are built up compositionally, and many of them include verbal projections. Only if this verbal part of the nominal projection includes Voice will they allow *by* phrases, instrumentals, and comitatives. So, the *sight* class does not include Voice, but other nominals do.

The remainder of this section attempts to solidify the empirical foundations of this analysis. There are two empirical generalizations that I have tried to make here: first, *by* phrases can bear all the external argument roles in nominals that they can in passives. Second, *by* phrases, instrumentals, and comitatives require Voice, meaning that they require the syntactic and/or semantic presence of an external argument.

Let us look at the first generalization first. As shown earlier, *by* phrases can bear recipient, experiencer, and perceiver roles in nominals. Despite this, an anonymous reviewer argues that it is not correct that *by* phrases can bear the same roles in nominals that they do in passives. The reviewer's argument builds on observations from Marantz (1984) and Roberts (1987). Marantz (1984) showed that the exact interpretation of an external argument depends on the combination of the verb and its internal argument:

(65) a. throw a baseball
b. throw support behind a candidate
c. throw a boxing match (i.e., take a dive)
d. throw a party
e. throw a fit (Marantz 1984:25, (2.19a–e))

(66) a. kill a cockroach
b. kill a conversation
c. kill an evening watching T.V.
d. kill a bottle (i.e., empty it)
e. kill an audience (i.e., wow them) (Marantz 1984:25, (2.19k–o))

Roberts (1987:27) showed that the same compositional semantic role goes to the *by* phrase in the passive:

(67) a. A baseball was thrown by Fernando.
b. Support was thrown behind the candidate by the CIA.
c. The match was thrown by the prizefighter.
d. The party was thrown by the department.
e. A fit was thrown by the countess. (Roberts 1987:27, (35))

(68) a. The cockroaches were killed by the fallout.
b. The conversation was killed by the linguist.
c. The evening was killed by John watching TV.
d. The bottle was killed by the wino.
e. The audience was killed by the witty repartee. (Roberts 1987:27, (37))

(In the Voice theory, the compositional role is just the contextual interpretation of the external argument role assigned by Voice: the specific interpretation of that role depends on the content of the complement of Voice. This is true for *by* phrases, as well.)

The reviewer claims that at least some of these compositional interpretations do not work in nominals:

(69) a. the throw of the ball by Fernando (N.B. This is ungrammatical in my judgment.)
b. *the throw of support behind the candidate by the CIA
c. *the throw of the match by the prizefighter
d. *the throw of a party by the department
e. *the throw of a fit by the countess

(70) a. the killing of the cockroaches by the fallout
b. ??the killing of the conversation by the linguist
c. *the killing of the evening by John watching TV
d. *the killing of the bottle by the wino
e. *the killing of the audience by the witty repartee

However, in my judgment the above nominals are ungrammatical even without the *by* phrase. It is the not the *by* phrase that is ungrammatical, it is the nominal itself:

(71) a. the throw of the ball (N.B. This is ungrammatical in my judgment.)
b. *the throw of support behind the candidate
c. *the throw of the match
d. *the throw of a party
e. *the throw of a fit

(72) a. the killing of the cockroaches
b. ??the killing of the conversation
c. *the killing of the evening watching TV
d. *the killing of the bottle
e. *the killing of the audience

Therefore, the reviewer is incorrect in claiming that certain semantic roles can be assigned to the *by* phrase in the passive but not to the *by* phrase in a nominal. My

claim stands, that any semantic role that can be assigned to a *by* phrase in the passive can be assigned to a *by* phrase in a nominal.[7]

The second generalization arises from the hypothesis that *by* phrases, instrumentals, and comitatives require Voice and that the contexts that disallow them lack Voice. If Voice is what introduces external arguments, then phrases that disallow all of these adjuncts should not show any properties of having external arguments.

This is uncontroversial for unaccusatives and sporadic advancements. *The ship sank* does not imply the presence of anyone or anything that sank the ship. Similarly, *this canoe seats four* does not imply the presence of someone that seats people in the canoe. In contrast, passives clearly imply an external argument, even when it is not expressed. (For an overview of implicit external arguments, see Bhatt & Pancheva 2006; I discuss middles in section 3.8.)

Nominals are much trickier. Given that I have hypothesized that the class of nominals that disallow *by* phrases lacks Voice, we should see no evidence of an external argument being present with these nominals. However, all of the *sight* class of nominals allow a prenominal genitive, apparently interpreted as the experiencer/perceiver. I repeat the examples here:

(73) a. the investigators' first sight of the damage
b. cats' fear of dogs
c. John's sense of danger
d. John's respect for pole dancing
e. When I took my first smell of this beer…
f. the brewers' first taste of the beer

Given that these can include an event modifier (*first*), these appear to be complex event nominals, and the genitive appears to be the external argument.

The alternative that I propose is that the prenominal genitive here is simply the possessor, coming into possession of a sense. The idea is that *the brewers' first taste of the beer* is something like *the brewers got a taste of the beer*, where *a taste* is clearly a simple nominal. In contrast, *olfaction of general odorants by small-mouthed*

[7] The same reviewer also suggests that what the facts enumerated here show is that certain nominals can be "passivized," whereas others cannot. The reviewer seems to mean by this that the NP that corresponds to the object of the verb can appear either after *of* or "passivize" to become a prenominal genitive. Apparently, then, the nominals that allow *by* phrases should also allow the underlying object to be a prenominal genitive. This is not correct, though, as was shown in the text: *smell* permits *the beer's smell* but does not permit a *by* phrase; at the same time, many of the nominals that do permit *by* phrases do not permit their objects as prenominal genitives (*the perception of light by the patient* but **light's perception*). Additionally, Keenan's examples of *by* phrases with intransitives that cannot be passivized also argue against any such notion of "passivizable" nominals (*cheating by students*, *talking by undergraduates*; see the examples in (5) and (110)). The only sense I can make of the reviewer's suggestion is that some nominals are nominalizations of verbal categories that are *potentially* passivizable; for instance, *cheat* and *talk* can undergo pseudopassivization. However, the class of potentially passivizable verbs is exactly the class of verbal projections that include Voice (e.g., unergatives can be pseudopassivized but unaccusatives cannot). Spelling the reviewer's suggestion out in this way, then, makes it equivalent to the theory that I am presenting here.

salamander larvae or *the larvae's olfaction of general odorants* would involve a true external argument, introduced by Voice (because *olfaction* allows a *by* phrase).

Is there any evidence that this is correct? I believe that there is. The first piece of evidence comes from the ability of adverbs to appear after nominalizations, discussed by Fu, Roeper & Borer (2001). If nominals like *olfaction* and *detection* include verbal projections up to at least Voice (given that they allow *by* phrases), then they should allow adverbs. They do:

(74) a. The patient's detection of the sound immediately surprised me.
b. The larvae's olfaction of odorants so efficiently is impressive.
c. The experience of emotion so completely is incomprehensible to me.

If the *sight* class of nominals differs in not having these verbal projections, then we would expect them to not allow adverbs. They do not:

(75) a. *The brewers' taste of the beer so suddenly surprised me.
b. *John's respect for pole dancing so completely is amazing.
c. *The sight of the blood so suddenly caught me by surprise.

One other phenomenon distinguishes the *sight* class of nominals from the deverbal nominals that allow *by* phrases. This is binomi(n)al *each* (Postal 1974, Dowty & Brodie 1984, Safir & Stowell 1988, among others). Binomial *each* can relate the internal argument of nominals like *destruction* and *detection* to the external argument realized as a prenominal genitive:

(76) a. the barbarians' destruction of two houses each
b. the doctors' detection of two tumors each
c. the patients' perception of two twinges each

This is not possible with the *sight* class of nominals:

(77) a. *the children's sense of two dangers each
b. *the children's fear of two dogs each
c. *the professors' respect for two students each

In this they pattern with simple nominals:

(78) a. *the children's two kittens each
b. *the children's kittens from two breeders each
c. *the children's presents from two uncles each

It appears that binomial *each* requires verbal projections. That is, it is only able to relate arguments (or adjuncts) of verbs. Therefore, only nominals that include verbal projections permit binomial *each*. Given that the *sight* class of nominals does not allow binomial *each*, it must not have these verbal projections.

I take all of this to support the two empirical generalizations argued for here. First, *by* phrases in nominals and passives do not differ: any role that can be assigned in the passive can be assigned in a nominal. Second, phrases that allow *by* phrases all include Voice and have the syntax and semantics of an external argument (even when it is not overtly realized). Phrases that do not allow *by* phrases lack Voice and do not have the syntax/semantics of an external argument.

Having established these generalizations, I turn to working out a detailed analysis.

3. The Analysis

Let me begin this section by stating some desiderata of a theory of *by* phrases that have emerged from the previous discussion. First, the theory should treat *by* phrases uniformly, and not give them special treatment in the passive. Second, the theory needs to limit *by* phrases to phrases (whether verbal or nominal) that have an external argument. At the same time, however, the *by* phrase is incompatible with any other expression of that argument (so, *by* phrases cannot appear in active clauses or in nominals with a genitive external argument). Moreover, *by* phrases are always optional, so the particular morphological form (nominal or passive verb) has to be compatible both with the *by* phrase and its absence. This last fact is going to necessitate some flexibility in the syntax and semantics of the phrases involved. Additionally, we have to figure out what is going on with the external argument when there is no *by* phrase.

3.1 External Arguments: Passives versus Nominals

The literature is in general agreement that the implicit external argument of a passive or a nominal is semantically present (for a good overview, see Bhatt & Pancheva 2006). However, passives and nominals differ in a way that indicates that their external arguments are realized differently syntactically. This is that the implied argument of a passive can never be controlled or bound (Williams 1987, Partee 1989):

(79) a. John wants Mary to be seen. (cannot mean 'John wants to see Mary')
b. Every journalist$_1$ wants the president to be interviewed. (cannot mean 'by him$_1$')

What the sentences above mean is best paraphrased as *John wants Mary to be seen by someone* and *Every journalist wants the president to be interviewed by someone*. That is, the passive external argument is existentially quantified over (Bach 1980; Keenan 1980, 1985; Williams 1987; and numerous others). The analysis I develop here will therefore involve existential quantification over the unexpressed external argument.

In contrast, the unexpressed external argument of a nominal can be controlled and bound:

(80) a. Marc Antony is bent on the complete destruction of his enemies.
Marc Antony can be the destroyer
b. Every journalist hopes that a conversation with the president will be forthcoming. Converser can be bound by quantifier

Note that (80b) probably does not involve control, because the nominal is not a co-argument of the quantifier. The relation must be that of binding. So, implicit external arguments of nominals can be controlled and bound, unlike the implicit external arguments of passive verbs. This means that they are probably not existentially quantified over. Instead, they are probably projected, as null arguments (Sichel 2009, 2010; Landau 2010:n. 18). The analysis given here will therefore project the external argument of a nominal as a null pronoun if it is not present overtly.[8]

It is also important that the complement of *by*, when the *by* phrase is present, can be controlled or bound, unlike the implicit argument of a passive:

(81) a. John$_1$ wants Mary to be seen by him$_1$.
b. Every journalist$_1$ wants the president to be interviewed by him$_1$.

So, the theory will have to have existential quantification of the external argument when there is no *by* phrase, but not when there is one.

3.2 Active Voice

I turn now to the actual analysis, beginning with the active voice. I will sketch out a syntax accompanied by an event semantics. The semantics will be entirely standard and very simple, meaning that it can be elaborated easily to accommodate more complexities. The analysis of the passive and the *by* phrase is very similar to that of Keenan 1980, 1985, but expressed in a different syntactic and semantic framework.

As said earlier, I assume that external arguments are projected by a head located above the lexical verb, Voice (Kratzer 1996). Transitive verbs are functions from individuals to functions from eventualities to truth values (type ⟨e,st⟩). Voice (departing from Kratzer, who uses a rule of Event Identification) takes a function

[8] Two other arguments that are often given for projecting the external argument of a nominal do not distinguish nominals from passives. These are condition C and secondary predicates. Both nominals and passives allow secondary predicates predicated of the implicit argument, and both require that that argument be disjoint from further-embedded R-expressions:

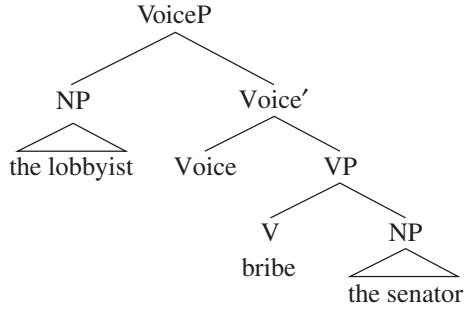
(i) a. Discussion of these issues stoned rarely produces satisfactory results. (Safir 1987)
b. This issue must have been discussed stoned.

(ii) a. No one paid attention to [the claim that Fred was the culprit]. Claimer cannot be Fred; see Ross 1969
b. John was told that the director will be handling this personally. Teller cannot be the director

Because these two phenomena do not distinguish passives from nominals, all they show is that both have syntactically active implicit external arguments.

of type ⟨s,t⟩ and adds an external argument to it (Voice is type ⟨st,est⟩). I will use the term *Initiator* as a cover term for all external argument roles: agent, cause, experiencer, and so on (Ramchand 2008; cf. the *originator* of Borer 1999 and other work). I assume that the exact interpretation of the Initiator is determined by the lexical semantics of the particular verb and the internal arguments it combines with (Marantz 1984). These same factors determine the exact interpretation of the Initiator in the passive, as well (Marantz 1984, Roberts 1987). In neither case is the exact interpretation part of the truth-conditional meaning of the sentence. The following tree shows the syntactic structure I am assuming and the compositional semantics:

(82)

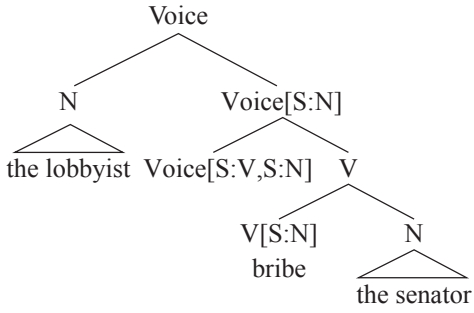


a. [[bribe]]=$\lambda x \lambda e$.bribing(e,x)
b. [[VP]]=λe.bribing(e,the senator)
c. [[Voice]]=$\lambda f_{\langle s,t \rangle} \lambda x \lambda e . f(e)$ & Initiator(e,x)
d. [[Voice′]] = $\lambda x \lambda e$.bribing(e,the senator) & Initiator(e,x)
e. [[VoiceP]]=λe.bribing(e,the senator) & Initiator(e,the lobbyist)

So, the denotation of the VoiceP is a set of bribing events initiated by the lobbyist, where the senator is the one bribed (I follow Kratzer, to appear, in not making use of a Theme relation). (Tense and aspect will bind the event variable, but I ignore this for the purposes of this paper.)

I assume that θ-roles are not part of the syntax at all but only the semantics. They are only present in the denotations of predicates and play no role in the syntax. All the syntax cares about is selection, which I will implement using features. Syntactic heads have selectional features, which are checked off by merging them with an element of the appropriate category. So, a verb that takes an object of category N has the selectional feature [S:N] (cf. Adger 2003). Voice takes both a projection of V and an N, in that order, which I notate ([S:V,S:N]). What it means to check off a selectional feature is for that selectional feature to stop projecting. So, when Voice merges with a projection of V, the resulting object no longer has the feature [S:V]; once it merges with a projection of category N, it no longer has any selectional features:

(83)



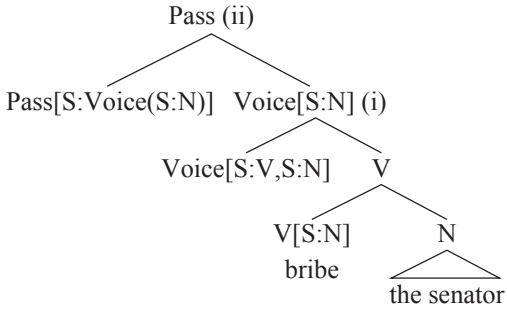
Maximal and nonmaximal labels have no meaning in this system, so I stop using *X′* and XP labels.

Given that these selectional features are present in the syntax, as part of the label of a node, they can themselves be selected. This will be an important feature of the analysis of passives, nominals, and the types of PP adjuncts under discussion.

3.3 Passives

I propose that passive is a head (Pass) that selects a projection of Voice that has not yet projected its external argument. I notate this selection as [S:Voice(S:N)]. That is, Pass selects for a Voice with an unchecked [S:N] feature. This means that the complement of Pass is an unsaturated Voice projection, as follows (the "(i)" and "(ii)" labels are there for the compositional semantics in (87)):

(84)



A head that selects a head with an unchecked feature will check that feature when it combines with it. So, Pass checks off the [S:N] feature on Voice, because it selected Voice(S:N). This means that the feature [S:N] on Voice does not project to the resulting object formed by combining Pass and Voice (so, that object's label is just Pass). These checking principles are formalized as:

(85) A selectional feature [S:X] on node Y projects to a dominating node Z *unless*
  a. The daughters of Z are Y[S:X] and X, *or*
  b. The daughters of Z are Y[S:X] and W[S:Y(S:X)].

Because both clauses of (85) hold for Pass (ii) in (84), neither selectional feature projects to the mother node (Pass).

Although Pass syntactically selects an unsaturated Voice projection, it has the property of requiring that all of the arguments be saturated. This means that if the external argument of Voice has not been saturated, Pass will have to saturate it. It does this by existentially binding it. As stated earlier, all the evidence indicates that the external argument of a short passive is existentially quantified. I propose the following denotation for Pass (to be revised slightly):

(86) $[\![\text{Pass}]\!]=\lambda f_{\langle e,st\rangle}\lambda e.\exists x{:}f(x,e)$

Pass will combine with the other nodes in the tree as follows:

(87) a. $[\![(84)(i)]\!] = \lambda x\lambda e.\text{bribing}(e,\text{the senator})\ \&\ \text{Initiator}(e,x)$
b. $[\![(84)(ii)]\!] = \lambda e.\exists x{:}\text{bribing}(e,\text{the senator})\ \&\ \text{Initiator}(e,x)$

Because there are no syntactic thematic roles in this system, there is also no θ-Criterion. Elements will either combine semantically, or they will not. If a head is a function that calls for an argument and an argument of the appropriate type combines with it, the semantics will be well-formed. If a predicate calls for an argument and no argument combines with it, it will be ill-formed. If there is an argument that does not serve as the argument of any predicate in the semantics, the result will also be ill-formed. All the work of the θ-Criterion is done by the semantics.

Note that there are two modes of selection in this system, syntactic and semantic. Syntactic selection selects for categories and features (which together comprise labels). Semantic selection is type-driven function application. In the case above, they match: Pass selects for a syntactically unsaturated projection of Voice, and semantically it is a function that takes a similarly unsaturated function as its argument. We will see that they do not have to match, however; the syntax can select for one thing, whereas the semantics wants a type that does not match the syntactic category.

If there is no *by* phrase, the above tree and denotation will be all there is to the passive, ignoring higher tense, aspect, and modals. A passive will simply involve existential quantification over the external argument. (Typically, the object will also move to the surface subject position, but this is not necessary, depending on the language and the environment. I ignore this movement here for the moment, as it is irrelevant to the syntax and interpretation of the Pass phrase.)

As for the morphology, I assume that the combination of Pass, Voice, and V are spelled out as the past participle form in English. It appears that V moves at least to Voice in actives but not in passives (Blight 1999, Caponigro & Schütze 2003). The verb's morphological form, then, is determined by Agree (Chomsky 2000) in the passive, as in Adger (2003:230): Pass Agrees with Voice, which Agrees with V; this agreement is spelled out as the past participle. The highest projection of Pass forms the complement of the auxiliary verb *be*, not shown in the trees here. This analysis therefore predicts that the semantics of the passive is entirely independent of *be*, which is correct, as shown by reduced relatives:

(88) a. Anyone [bitten by a dog] will require a tetanus shot.
b. The person [murdered on Tuesday] was found on Thursday.

I treat reduced relatives as identical to verbal passives, except that the underlying object moves to Pass and abstracts over it, creating a predicate that is the appropriate type to combine with a nominal expression. The underlying object is either null, or the head noun itself, as in Bhatt 1999 and Iatridou, Anagnostopoulou & Izvorski 2001.

3.4 By Phrases

As detailed earlier, *by* phrases, instrumentals, and comitatives all require the category Voice. I take this to mean that, although they are adjuncts, they strictly select the syntactic category of the phrase they adjoin to. This means that each of these PPs will have a selectional feature for a projection of Voice. I will hypothesize that it is [S:Voice(S:N)], like the Pass head above.

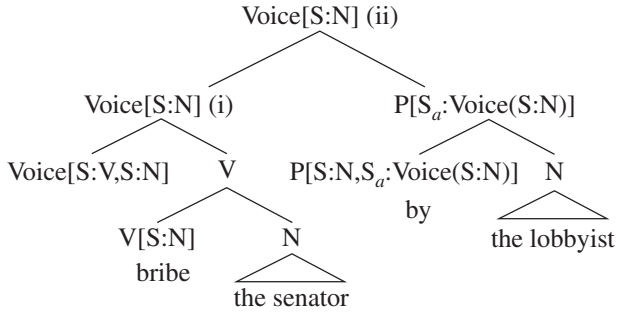
A *by* phrase specifies the Initiator. It does this by selecting a category that assigns the Initiator role and filling in its own argument for that role. Syntactically, then, the *by* phrase is like Pass in selecting an unsaturated Voice. Because it has an internal argument that it combines with first, *by* has the selectional features [S:N,S:Voice(S:N)]. Because it is an adjunct, when it combines with its second argument, that argument will project, not it. For the purposes of this paper, I simply notate this with a subscript *a* on the second argument: [S:N,S_a:Voice(S:N)]. Furthermore, adjuncts do not check off the selectional features of the categories they combine with (but their own selectional features are checked off):

(89) A selectional feature [S:Z] on node X projects to the next dominating node if its sister is Y[S_a:X(S:Z)].

So, when the *by* phrase adjoins to Voice, its own selectional feature does not project, being satisfied, but the selectional feature of Voice does project. This is what it means to be an adjunct: the category that the adjunct merges with does not select it, and its own selectional features are not affected by merger of the adjunct.

Semantically, *by* takes a function with an open individual argument and supplies its own argument to saturate that function, as follows:

(90)

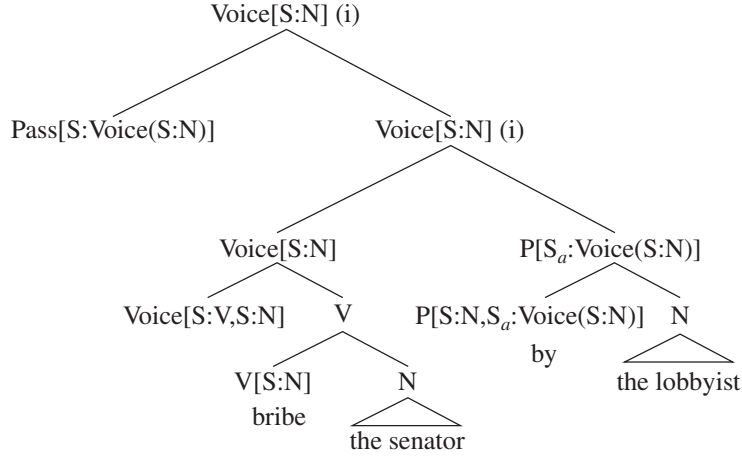


a. [[by]] = $\lambda x \lambda f_{\langle e,st\rangle} \lambda e.f(e,x)$
b. [[by the lobbyist]] = $\lambda f_{\langle e,st\rangle} \lambda e.f(e,$the lobbyist$)$
c. [[(i)]] = $\lambda x \lambda e.$bribing$(e,$the senator$)$ & Initiator(e,x)
d. [[(ii)]] = $\lambda e.$bribing$(e,$the senator$)$ & Initiator$(e,$the lobbyist$)$

As can be seen, a projection of Voice with a *by* phrase adjoined to it is semantically equivalent to an active Voice phrase with its specifier projected (cf. (90d) with (82e)). Actives and passives with *by* phrases are truth-conditionally equivalent.

A projection of Voice with a *by* phrase adjoined to it is still the right syntactic object for Pass to take as its complement, given that Pass selects Voice[S:N], and the *by* phrase, as an adjunct, did not check off the [S:N] feature on Voice. Pass can therefore take the tree in (90) as its complement, resulting in the tree in (91). As stated earlier, Pass requires that all of the arguments be saturated. It only existentially binds the external argument if it has not already been saturated. If the external argument has been saturated (by the *by* phrase), Pass is semantically (but not morphologically) vacuous. I therefore revise its denotation slightly to (91a).

(91)



a. [[Pass]] = $\lambda f_{\langle(e,)st\rangle} \lambda e.(\exists x)$:$f((x,)e)$
b. [[(i)]] = $\lambda e.$bribing$(e,$the senator$)$ & Initiator$(e,$the lobbyist$)$
c. [[(ii)]] = $\lambda e.$bribing$(e,$the senator$)$ & Initiator$(e,$the lobbyist$)$

Semantically, then, Pass could attach to an active Voice projection with the external argument projected in Spec,Voice. This is ruled out by strict selection, however: Pass selects Voice[S:N], not a projection of Voice with all its features checked. Merging Pass with the latter would leave its selectional feature unchecked, and the derivation would crash. The external argument can only be saturated by a *by* phrase because, as an adjunct, it does not check off the selectional features of the node it adjoins to. This rules out passive voice with a projected external argument, such as **The lobbyist was bribed the senator.*

It is also impossible to have a *by* phrase and an external argument in Spec,Voice at the same time. The denotation of the projection of Voice with the *by* phrase adjoined to it in the trees above (given in (91b)) is not a function that takes an individual argument. If an NP were projected in Spec,Voice, it would be uninterpretable, because it would not serve as the argument of any predicate. This rules out **The lobbyist bribed the senator by the CEO of Blackwater*, as desired.

It is also not possible to continue a derivation from a projection of Voice with a *by* phrase adjoined to it (node (i) in the tree in (91)) without Pass. I assume that an X[S:N] category is not an appropriate argument for any higher functional heads other than Pass (e.g., Asp, T). That is, unlike Pass, they all select for heads with all their features checked off. Additionally, such a derivation would have an unchecked selectional feature ([S:N] on Voice). So **The senator bribed by the lobbyist* is ruled out as a violation of selection: Infl or Asp or whatever the next node is above Voice cannot combine with an X[S:N] category, and that feature remains unchecked.

So, an important feature of this analysis is that unchecked selectional features can themselves be selected. Both Pass and the *by* phrase select for Voice[S:N]. I contend that this is also true of instrumentals and comitatives, and group them with *by* phrases as "Voice Adjuncts":

(92) Voice Adjuncts have the selectional feature [S_a:Voice(S:N)].
(Because they are all transitive, their full selectional features are [S:N,S_a:Voice(S:N)].)

This means that certain types of adjuncts, at least, strictly c-select the category they adjoin to. This is amply justified for *by* phrases, comitatives, and instrumentals by the empirical evidence in this paper. It may also be true of other adjuncts, as well. For instance, hanging topics apparently only adjoin to category CP. Adjectives only adjoin to phrases of category N; adverbs, to projections other than N. I suspect that adjuncts in general have syntactic selectional features, but leave exploration of this topic to other work.

3.5 Instrumentals and Comitatives

A detailed analysis of comitatives that fits nicely with the view that Voice Adjuncts select an unsaturated Voice is given by Yamada (2010). In Yamada's analysis, the comitative preposition takes an individual as its first argument and a function of type ⟨e,st⟩ as its second argument and forms a group out of its first argument and the individual argument of that function, as follows:

(93) $[\![\text{with}_{com}]\!] = \lambda x \lambda P_{\langle e,st\rangle} \lambda y \lambda e$:VS($x$)($y$)($e$).*P($\{x,y\}$)($e$) (Yamada 2010:(240))

(The "VS" component yields a presupposition that the two individual arguments form a substantive pair; see the cited work for details.) In Yamada's analysis, the *with* phrase attaches to *V′*, which corresponds to my Voice[S:N].

A similar analysis could be given for instrumentals. The instrumental preposition would take an individual argument and then a function of type ⟨e,st⟩. It might say that the individual argument of that function used its first argument in the event. So *She hit the metal with a hammer* would be a set of hitting events where she is the Initiator and the metal is hit, and she uses a hammer to hit the metal. (See Lakoff 1968 for numerous parallels between instrumental *with* and *used NP to*.) The following is a first attempt at a denotation like this:

(94) $[\![\text{with}_{inst}]\!] = \lambda x \lambda f_{\langle e,st\rangle} \lambda y \lambda e{:}f(y,e)$ & $\exists e' \leq e[\text{using}(e',x)$ & $\text{Initiator}(e',y)]$

Here, the event of the verb has to include an event of using the complement of *with* as a part.

Instrumentals, comitatives, and *by* phrases all adjoin to an unsaturated projection of Voice, then. The difference between *by* phrases and the other two is that the *by* phrase semantically saturates the argument of Voice. Instrumentals and comitatives do not; instead they add their own roles. Hence, there is still an argument to be projected in Spec,Voice, and instrumentals and comitatives, unlike *by* phrases, can appear in active clauses as well as passive ones. Additionally, these are all adjuncts and do not check off the [S:N] feature of Voice, so more than one of them can attach to the same Voice (but not more than one of each type; Lakoff 1968:21).

3.6 Interim Summary

The most important part of this analysis is selection of an unsaturated Voice projection ([S:Voice(S:N)]). I have suggested that Pass and all the Voice Adjuncts (*by* phrases, instrumentals, comitatives) have this selectional feature. In *X′*-theoretic terms, this would be selection for *Voice′*, something that is explicitly not allowed in many versions of *X′*-theory. However, selection of an unsaturated predicate is very common in generative semantic analyses and appears to be very well motivated. For example, the analysis of secondary depictive predicates in Pylkkänen 2008 (from Geuder 2000) has them attaching to predicates with an open individual argument (type ⟨e,st⟩). Nissenbaum's (1998) analysis of parasitic gaps has the phrase containing the parasitic gap attach to an open predicate. Bruening's (2004) analysis of verbal reciprocals has a reciprocal morpheme take an unsaturated V projection as its argument (this is a common approach to reciprocals generally). Nakanishi's (2007) analysis of split measure phrases in Japanese has them attach to an open predicate. Yamada's (2010) analysis of comitatives, presented earlier, has the comitative phrase attach to an open predicate. There are numerous other such analyses. It is clear from the semantics literature that the syntax must allow operators to merge with open predicates, what would (at least sometimes) be an *X′* category in *X′*-theory. Because this is so well motivated semantically, it must be possible syntactically. Not only that, the elements investigated here seem to be strictly limited to taking such projections as their arguments. Given that it must be possible for

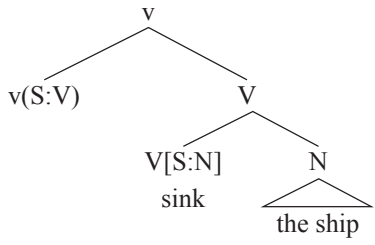
syntactic elements to select unsaturated projections as their arguments, I have proposed a formalism that allows it.

So, Pass and all the Voice Adjuncts (*by* phrases, instrumentals, comitatives) syntactically select for Voice(S:N). Instrumentals and comitatives do not stop the projection of Voice's argument in Spec,Voice, but Pass and *by* phrases do. This analysis has the result that a *by* phrase can only attach to a phrase that includes Voice (because it selects Voice[S:N]), but Voice's own argument cannot be projected in Spec,Voice when the *by* phrase is present. There are two environments where this will lead to grammaticality. One is where the resulting projection of Voice serves as the complement to Pass, as described above. The other is where it serves as the complement to a nominalizing head. This analysis therefore accounts for all of the restrictions on *by* phrases discussed above. I show this in the next subsections, beginning with VPs that do not have external arguments and then turning to nominals.

3.7 VPs without External Arguments

This theory explains why *by* phrases cannot appear with VPs that do not have external arguments, thereby adding one (see section 2.1). It also explains why comitatives and instrumentals are similarly banned from this environment. All of them are Voice Adjuncts, and they strictly select Voice[S:N]. I assume that unaccusatives and sporadic advancements do not have Voice; instead they have a different functional head. For lack of a better term, I use v in the following representation of an unaccusative (see Marantz 1997, Legate 2003). This head is semantically contentless:

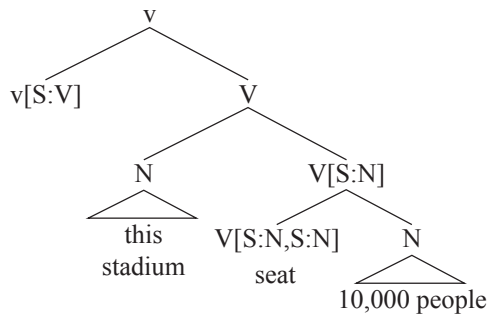
(95)



Given that Voice Adjuncts require Voice, we explain why *by* phrases, instrumentals, and comitatives are ungrammatical with unaccusatives. They strictly select Voice[S:N], but that category does not appear in unaccusatives. Additionally, because Pass also selects Voice[S:N], we predict correctly that there will be no (pseudo)passives of unaccusatives (Perlmutter & Postal 1984a).

As for sporadic advancements, I do not have a detailed analysis to present. Simply to be concrete, I suggest that the V can take a locative argument in addition to its internal argument, with the locative undergoing movement to become the surface subject:

(96)



The important part of such an analysis is that sporadic advancements lack Voice, just like unaccusatives, and therefore disallow *by* phrases, instrumentals, and comitatives, as well as passivization (Perlmutter & Postal 1984a). (It is also possible that sporadic advancements have some other contentful head besides the v of unaccusatives; the important point is that it is not Voice. As discussed earlier, this lack of Voice correlates with the lack of an external argument semantically: *this stadium seats 10,000 people* does not imply the presence of someone that seats people in the stadium.)

3.8 Middles

As for middles, they pattern with unaccusatives and sporadic advancements in not allowing *by* phrases (Keyser & Roeper 1984), but they do allow instrumentals and comitatives:

(97) a. *Senators bribe easily by lobbyists.
b. *This door opens easily by handicapped people.
c. *The bread cuts easily by children.

(98) a. Senators bribe easily with cash.
b. This door opens with a key.
c. This bread cuts easily with a machete.

(99) a. Senators bribe easily with an accomplice.
b. This door opens readily with a friend.
c. This bread cuts easily with an assistant.

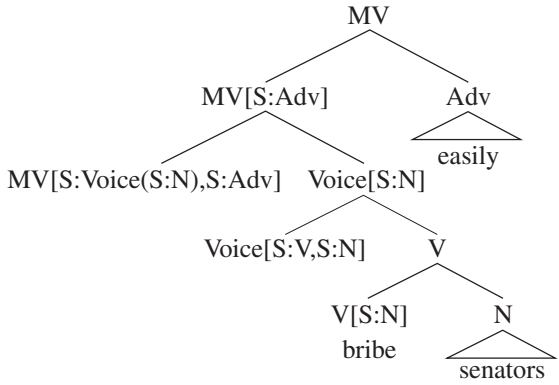
Given that middles do allow instrumentals and comitatives, I assume that they do have Voice, and should in principle allow a *by* phrase. (There is a large literature arguing for the semantic presence of an external argument in middles; see, among others, Keyser & Roeper 1984, Condoravdi 1989, Fagan 1992, and Ackema & Schoorlemmer 1995.[9]) There is a reason why they might not allow a *by* phrase,

[9] It is often noted that middles act differently from actives (and passives) in not allowing agent-oriented adverbs or purpose/rationale clauses. Although I have no explanation for this, I do take examples like (99) to show that there is an external argument present semantically. See the discussion and references in Bhatt & Pancheva 2006.

however: the external argument cannot be saturated by the *by* phrase, because it is necessary for the semantic computation of higher projections.

One way of spelling this out is to say that a higher syntactic head, call it MV (for "Middle Voice"), takes a function of type ⟨e,st⟩ as its semantic argument and selects for Voice[S:N], just like Pass. However, unlike Pass, it is not type-flexible; there must be an open individual argument. If a *by* phrase adjoins to Voice, the individual argument of Voice will be saturated, leading to an unresolvable type mismatch. Here is what the syntax would look like on this analysis (I tentatively suggest that MV takes an adverbial expression as its second argument):

(100)



Semantically, MV would existentially quantify over the argument of Voice, and introduce generic quantification over events, as in Condoravdi (1989):

(101) Senators bribe easily.

a. $[\![\text{MV}]\!] = \lambda f_{\langle e,st\rangle}\lambda g_{\langle s,t\rangle}.\text{Gn } e.\exists x_{\text{arb}}.f(e,x) \rightarrow g(e)$

b. $[\![\text{Voice[S:N]}]\!] = \lambda x\lambda e.\text{bribing}(e,\text{senators}) \,\&\, \text{Initiator}(e,x)$

c. $[\![\text{easily}]\!] = \lambda e.\text{easy}(e)$

d. $[\![(100)]\!] = \text{Gn } e[\exists x_{\text{arb}}.\text{bribing}(e,\text{senators}) \,\&\, \text{Initiator}(e,x_{\text{arb}})] \rightarrow [\text{easy}(e)]$

The external argument,"x_{arb}," is a variable restricted to ranging over groups of humans (Chierchia 1995:120).[10]

[10] An alternative semantic representation that is often suggested has the external argument as an argument of the adverb, as in "it's easy for x for x to bribe senators." This might be a fairly good paraphrase of this particular example, but it does not work generally: *This book reads poorly* is not adequately paraphrased as "it's poor for x for x to read this book"; *Klingon poetry does not translate well* cannot be paraphrased as "it's not well for x for x to translate Klingon poetry." Condoravdi's suggested semantics fares much better: "Generally, an event where someone reads this book is a poor event" (on the appropriate, experiential, understanding of an event being poor); "Generally, an event where someone translates Klingon poetry is not a good event" (again, on the appropriate understanding—having a good result). Clearly more needs to be said, but it does seem that Condoravdi's semantics is more promising.

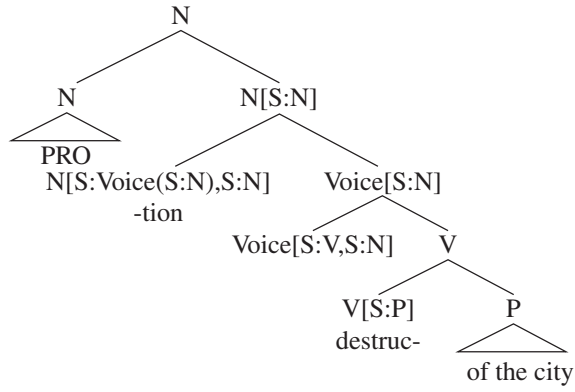
In this analysis, if a *by* phrase were to adjoin to Voice, it would specify the Initiator role, and there would be no individual argument for MV to existentially quantify over. This would cause the derivation to crash.

To summarize so far, the analysis that I have proposed is able to explain why *by* phrases cannot appear with VPs that lack external arguments. It also explains why *by* phrases pattern with instrumentals and comitatives in passives, unaccusatives, and sporadic advancements but not in active clauses or middles.

3.9 Nominals

Turning to nominals, I hypothesize, as is standard, that different types of nominals differ in their internal makeup. Some, clearly deverbal ones like *destruction*, include verbal projections, most importantly Voice. I assume that some nominalizing heads are like Pass in selecting Voice[S:N]. However, given what was presented earlier, it does not appear that nominals are like the passive in existentially binding the external argument; rather, it appears that the external argument is projected, as a null NP if not an overt one (see Sichel 2009, 2010; Landau 2010:n. 18). I therefore analyze N as projecting the external argument in its own specifier, which I notate as PRO:[11]

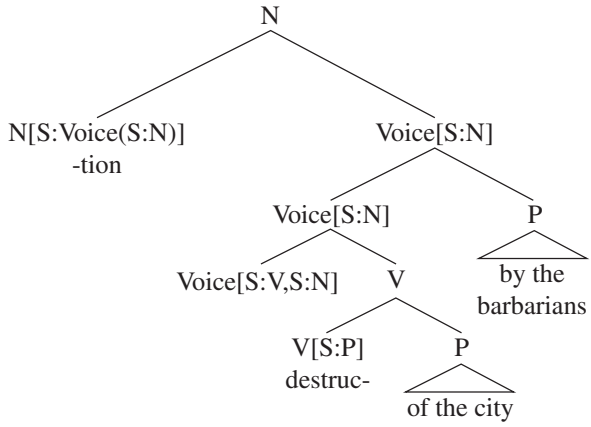
(102)



The head Nom is like Pass in requiring that all arguments be saturated. If there is an open argument, Nom, unlike Pass, will project it in its own specifier. If there is no open argument, Nom, like Pass, is semantically vacuous. The way the open argument of Voice can be saturated prior to merger of Nom is by adjoining a *by* phrase:

[11] It may be that the complement of the verb here is still of category N, with *of* functioning as a case marker. Because this is not important to the analysis, I simply change the selectional feature of the verb to [S:P].

(103)



N is also selectionally flexible, being either N[S:Voice(S:N),S:N] or N[S:Voice(S:N)].

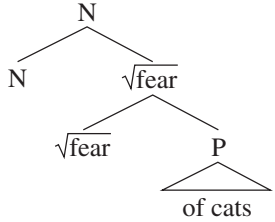
As for the semantics, the simplest theory regards nominalizations as identical to VPs: they denote sets of events (Zucchi 1993:123, Higginbotham 2000). Sets of events can be the arguments of determiners and quantifiers, just like sets of individuals. So *the destruction of the city by the barbarians* is just the following:

(104) [[the destruction of the city by the barbarians]] = ιe.destroying(e,the city) & Initiator(e,the barbarians)

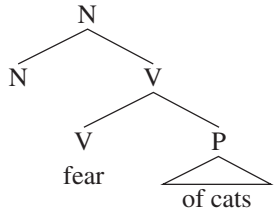
Nominalizing heads, then, are semantically vacuous. They simply change the syntactic category, from V to N. They also require that all arguments of the verbal projection be saturated, and project the external argument as PRO if they are not.

Within this theory, the difference between nominalizations like *destruction* and nominals like those in the *sight* class is that *sight* nominals are not nominalizations of a category that includes Voice. They are either root nominals, that is, not nominalizations of a V at all, or they are nominalizations of a bare V, without Voice:

(105) fear *as root nominal:*



(106) fear *as V nominal:*



It seems most likely that these nominals are root nominals and have no verbal structure at all, given the evidence from binomial *each* above. Either way, they lack Voice and so do not allow *by* phrases, instrumentals, or comitatives.

As for the other adverbial phrase that patterned with instrumentals, comitatives, and *by* phrases—namely, *without* clauses—they do not seem to require the semantic presence of an external argument, as shown by sporadic advancements and unaccusatives:

(107) a. This stadium seats 10,000 people without anyone feeling squished.
b. $5000 buys a lot of heroin without anyone needing to pay taxes.
c. The ship sank without anyone even noticing.

Without phrases, then, do not belong to the class of Voice Adjuncts that select Voice(S:N). However, they do appear to attach very high in the phrase structure, as shown by the lack of condition C effects in examples like the following:

(108) I insulted her$_1$ [without Carrie$_1$ even noticing].

Suppose that *without* clauses must attach at least as high as Voice. Then they can attach in any clause, because IP is certainly high enough, even if there is no Voice present, as in the examples in (107). In nominals, however, there is no IP, so *without* phrases will only be able to attach in nominals that have at least a Voice projection. Hence, in nominals, *without* phrases pattern with instrumentals, comitatives, and *by* phrases. They are barred from nominals that do not include Voice.

Note that, as predicted by this analysis, gerunds, which are generally agreed to be nominalizations of higher clausal projections (e.g., Abney 1987), allow the full range of adjuncts discussed here:

(109) a. The smelling of the blood by Holmes shocked everyone.
b. The smelling of the blood with a scent amplification device shocked everyone.
c. The smelling of the blood with his assistant shocked everyone.
d. The smelling of the blood without touching it impressed everyone.

Furthermore, the appearance of a *by* phrase with a verbal category that is not passive in (109a) is problematic for the view that *by* phrases only get semantic roles like experiencer derivatively in the passive. Recall that the claim was that the nominal *smell* does not allow a *by* phrase, because *by* phrases in nominals cannot be experiencers. Only passives allow a *by* phrase to have the experiencer role. However, examples like (109a) are not passive; as such, they should be unable to be experiencers, contrary to fact. Such nominals can even involve intransitives that cannot passivize (without a PP), like the examples in (5) or these here:

(110) a. Dancing by elephants should be discouraged.
b. Squealing by little girls is not allowed.

In the theory proposed here, a *by* phrase will always be allowed, so long as it can combine with a higher category that selects Voice[S:N]. The passive is only one instance of this; the other is nominalizing heads like *-tion* and *-ing*.

3.10 Summary

This section has provided an analysis of passives, nominals, and *by* phrases that meets all of the desiderata outlined above and explains the data introduced in this paper. *By* phrases are not special in the passive and are analyzed as identical in passives and nominals. Their distribution is explained by having them syntactically select for an unsaturated projection of Voice, just like the Pass head and instrumentals and comitatives. An important feature of this analysis is that syntactic elements can select for the selectional features of their arguments, something that is amply justified by semantic considerations. Another important feature is that adjuncts syntactically select. I discussed only the selectional properties of Voice adjuncts here but suggested that syntactic selection by adjuncts is actually more general.

4. Further Implications

The findings of this paper have numerous consequences. I discuss two here, the status of lexical rules and the crosslinguistic typology of passive constructions.

4.1 Lexical Rules

Many approaches to the passive analyze it as involving a lexical rule (e.g., Bresnan 2001; Sag, Wasow & Bender 2003; Culicover & Jackendoff 2005). Such theories postulate a grammar with two combinatorial components: the syntax and a generative lexicon. Lexical rules are claimed to differ from syntactic rules in certain respects (see Wasow 1977 and subsequent literature). In contrast, I have shown here that it is possible (and desirable) to formulate an entirely syntactic analysis of the passive. In my analysis, Pass is a syntactic head that performs certain functions. The *by* phrase is a syntactic object that performs a certain function on the phrase structure it adjoins to.

Given this, there is no need for a lexical component; there is only the syntax, as in the theory of Distributed Morphology (Halle & Marantz 1993; see especially Marantz 1997 and Embick 2004).

One consequence of this paper, then, is that we should greatly simplify the grammar and do without a grammatical component consisting of lexical rules. We only need one combinatorial component of the grammar—namely, the syntax. There is no such thing as a lexical rule, and there could not be. Apparent cases of changing an argument to an adjunct, like English *by* phrases, are actually not. There is no such thing as "demotion," and no operation that can turn an argument into a nonargument. Morphosyntactic operations like the passive are actually syntactic heads (like Pass) that can existentially bind an open argument, or add additional ones, but they are incapable of doing much else. Things like *by* phrases are syntactic elements that perform operations on predicates, filling in their argument slots or adding additional arguments. They attach in the syntax.

In other words, the finding that there is no need for a lexical passivization rule to relate the *by* phrase to the active subject leads to a much more restrictive theory of grammar, and a simpler one, with only one combinatorial component and not two.

4.2 Typology

Finally, the characterization of the passive given here can be expanded into a universal definition of the passive, with significant consequences for crosslinguistic typology. The view that I have adopted here (basically that of Keenan 1980, 1985) holds that the passive is a morphosyntactic operation that prevents the syntactic projection of the external argument in its normal argument position. It does this either by itself, by existentially binding the argument of Voice, or in concert with a *by* phrase, which saturates Voice's argument with its own. A passive can therefore be defined as follows:

(111) Definition of the passive
The passive is a morphosyntactic operation that prevents the realization of the external argument as an argument.

And a passive can be identified as one of the following:

(112) Identifying features of the passive
a. The external argument is missing, and is interpreted as an existential; or
b. The external argument is realized as an adjunct.

Notice that object promotion is irrelevant, and oblique realization of the external argument is not necessary. Also irrelevant is case.

Object promotion has long been known to be irrelevant, as shown by impersonal passives. However, this point seems to have been lost in a great number of instances, because there has been a lot of confusion in the literature regarding what should be

treated as a passive and what should not. The confusion chiefly arises regarding object promotion: if a language has some construction with object promotion, the tendency is to treat that construction as a passive. However, given the definition in (112), the construction is only a passive if it involves oblique- or non-realization of the external argument. If the external argument is still realized as an argument, that construction is not a passive. I suggest the term "inverse" for cases of this sort, a term that has been used for Algonquian and various other languages (e.g., Dahlstrom 1991, Klaiman 1992).

This is more than a terminological issue, because what one takes to be a passive then colors the approach one adopts to the passive operation and one's view on the character of syntactic operations more generally. So, for instance, Guilfoyle, Hung & Travis (1992) reject the validity of Burzio's generalization, "because it cannot account for the facts of passivization in Austronesian languages like Tagalog and Malagasy. In these languages both the Agent and the Theme are expressed in passive structures" (p. 409). They go on to design a theory of the passive where thematic roles are assigned in the usual manner, but languages vary in whether the agent role can be expressed in the passive, based on whether case can be assigned to the external argument position (yes in Austronesian, no in English). As can be seen, the theory that one is led to changes drastically depending on the view of passive: if one concludes, as I did here, that passive is truly the suppression of the external argument, then what Guilfoyle, Hung & Travis have been calling "passive" is not a passive at all, and the case theory and conclusions about Burzio's generalization are unwarranted. When one looks at other languages, it is clear that case is irrelevant: dative case can continue to be assigned in the passive, for instance, even when the NP that receives dative case clearly moves into the surface subject position and assumes all subject properties (e.g., Icelandic; Zaenen, Maling & Thráinsson 1985, Marantz 1991).

The converse issue also arises in Algonquian: there has always been a debate about whether indefinite subject forms of transitive verbs are passives (e.g., Dahlstrom 1991). Given the definition above the answer is clearly yes: the external argument is removed, with the semantics of existential binding. If the logical object acts in some ways like it is still the object and has not been promoted to subject, that fact is completely irrelevant.

As another example, the literature on Relational Grammar and its descendants assumes that advancement is crucial to the passive, to the effect that impersonal passives must involve a dummy inserted as object and advancing to subject (see Perlmutter & Postal 1984b, Postal 1986). However, there is very little evidence that this advancement analysis is correct. More generally, the essential feature of the passive (suppression of the external argument) remains constant across languages and constructions where apparent promotion (in word order, plus binding and control properties) is divorced from nominative case and subject agreement (e.g., Icelandic quirky case passives; Zaenen, Maling & Thráinsson 1985). There is absolutely no benefit to be gained by arguing that an expletive has "advanced" from object to subject in an impersonal passive. Rather, the core identifying property of the passive is the removal of the external argument. It is not crucial at all that the external

argument appear as an oblique, and it is also not important at all that an object become the subject.

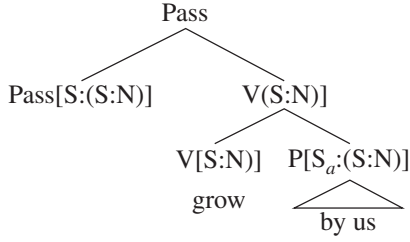
The one advantage of the analysis of impersonal passives involving promotion of a dummy was that it could then interact with the One Advancement Exclusiveness Law to ban impersonal passives of unaccusatives, raising verbs, and other categories (Perlmutter & Postal 1984b). However, the same facts are predicted by any theory that limits Pass to applying only to verbs with external arguments (Marantz 1984; Baker, Johnson & Roberts 1989). The theory here does this by having Pass select Voice[S:N].

This leads into another typological issue, however. It has also been claimed that certain languages present counterexamples to the One Advancement Exclusiveness Law and allow impersonal passives of unaccusatives, or even multiple passivization. Such languages include Lithuanian (Timberlake 1982, Keenan & Timberlake 1985), Turkish (Özkaragöz 1980), Sanskrit (Ostler 1979:chap. 5), and Irish (Nerbonne 1982). Assuming that the right analysis of these is in fact a passive, the theory advanced here has a natural way to accomodate them.

The few languages that allow impersonal passives of unaccusatives can be accounted for by relaxing the selectional requirements of Pass. In these languages, Pass can take as complement any verbal projection with an unchecked selectional feature. In the case of an unaccusative, this would be V rather than Voice:

(113) a. Ir pamiršom visi, kur mūs gimta, kur augta?
forget all where us.GEN born.NOM.N.SG where grown.NOM.N.SG
'And we have all forgotten, where we were born and where we grew up.'
(Lit. '… where by us was being born, where being grown up')
(Timberlake 1982:(8))

b.



The *by* phrase (in Lithuanian, genitive case) is similarly nonselective, being able to duplicate both internal and external roles and adjoining either to V[S:N] or to Voice[S:N].[12]

Importantly, it is impossible in such languages for the object of a transitive to be suppressed using the passive, whereas the subject is still projected as the external argument (Baker, Johnson & Roberts 1989). What this would require in the current theory is merging Voice on top of Pass. But Voice universally selects for V. It cannot

[12] In this theory, one could view the antipassive as a Pass head that strictly selects V[S:N] rather than Voice[S:N].

take a projection of Pass as complement. The end result is that Pass has to be the topmost projection in the extended verbal projection (before aspect, tense, and so on), and so only the outermost argument of a predicate can be suppressed via passivization. This is exactly the crosslinguistic situation that obtains (Keenan 1980, Keenan & Timberlake 1985).

In summary, then, the current theory can be extended naturally to account for crosslinguistic variation, while capturing significant generalizations about passives in the world's languages. Additionally, the findings of this paper should help to lead to greater clarity and less terminological confusion (with substantive consequences) on the issue of passives, an issue that has been at the forefront of linguistic research for decades.

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