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Affectedness and Externalization

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1. The Semantics of Affectedness

This paper offers an explicit characterization of the lexical semantics of affectedness. After offering an explicit semantic characterization of verbs with affected objects, we will claim that affectedness shows up when the position of an original external argument is taken up by a lexically externalized argument. We will claim that this is possible only for verbs with lexical-semantic representations of a certain type, that is, those which meet our definition of affectedness. We will then offer an explanation for why this is so. After presenting our account of affectedness, and showing how it applies to middle verbs and passive nominals, we will extend its domain to adjectival passives as well.

Affectedness was first detected by Anderson 1977 in passive nominals, and later applied to middles by Jaeggli and others (Roberts 1985, Hale and Keyser 1987, Tenny 1987 and Zubizarretta 1987). The examples in (1) illustrate the ungrammaticality of passive nominals and middles with unaffected objects:

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- (1) passive nominals
 (a) * the cliff's avoidance
 (b) * that car's pursuit
 (c) * the argument's assumption
 (d) * the painting's admiration
 (e) * the mistake's acknowledgement

- middles
 (a') * the cliff avoids easily
 (b') * that car pursues easily
 (c') * the argument assumes easily
 (d') * the painting admires easily
 (e') * the mistake acknowledges easily

A naive semantic characterization of affectedness was given by Anderson, who felt that there exists a unifying semantic notion behind her formal notion: "'Affected' is used in an extended sense to mean changed, moved, altered in status, or created." (Anderson 1977, 15).

Other semantic characterizations of affectedness have appeared in the literature since Anderson. Roberts, for example, identifies verbs with affected objects as the class of accomplishment verbs. Hale and Keyser characterize verbs which can undergo middle as change of state verbs with a means clause in the Lexical Conceptual Structure. Tenny 1987 characterizes affected objects as objects capable of "delimiting" the event denoted by the verb.

However, to our knowledge, no one has offered an explanation for why it is just the class of verbs with affected objects which form middles and passive nominals. This is true of Hale and Keyser, Roberts and Tenny, who do not explain why the verbs they identify should be the ones to form middles and passive nominals. This is even truer of formal accounts of affectedness, which explicate affectedness on the basis of the form of the constructions sensitive to it, like Anderson's original account, Jaeggli 1986 and Pesetsky 1990.

Like Hale and Keyser, we propose that the distinction between verbs with affected objects and those with unaffected objects can be captured at a level of lexical representation, which we call event-structure (e-structure). Our e-structures, like the ones used by Grimshaw 1990 and Pustejovsky 1988, specify the sub-eventualities of the total eventuality

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described by the verb and its arguments. Event-structure is distinct from argument structure (a-structure), which merely specifies the adicity of the verb with some hierarchical structure. For example, the transitive verb gallop has two arguments, as shown in (2a), an external one and a direct internal one. (2b) encodes an aspect of the semantics of this verb: every event which is a galloping of y by x conceptually consists of two separate events and a causation relation between them.

- (2)(a) a-structure: gallop (x, y)
 (b) e-structure: CAUSE (DO (x), gallop (y))

We do not give a full account of e-structure, but assume that it encodes the information present in decompositions of the type that Dowty 1979 develops. We conceive of a-structure as a kind of projection from e-structure.

We will define affectedness over e-structure representations, and claim that what characterizes affectedness is the separation of the arguments of the verb into different sub-eventualities, with the external argument missing from one of the sub-eventualities:

- (3) affectedness as the "separation" property

y is an affected argument of V(x, y)
 iff
 the event-structure of V contains a
 sub-eventuality e such that y, but not x,
 is an argument in e.

We will show that the "separation" property does not have to be stipulated as an independent principle of grammar, since it follows from natural assumptions about the relation between e-structure and a-structure, and about the relation between morphologically related predicators. In section 2 we state the "Principle of Morphological Relatedness" from which the separation property follows.

By our definition of affectedness, the object of transitive gallop, for example, is an affected object, in view of the e-structure which was shown in (2b). This e-structure contains an event gallop (y) which contains the object y but not the subject x. Note that it is not sufficient for the verb to be decomposable;

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the decomposition must be such that the external argument is missing from the "caused" sub-eventuality.

In Dowty's decompositions, only the representation of causative verbs meets the specification in (3). Dowty identifies the class of causative verbs with the class of accomplishment verbs. We, however, will not identify verbs with affected objects with accomplishment verbs, as Roberts does. Gallop, for example, is a causative activity verb which meets the specification in (3). On our account, then, verbs with affected objects are a subclass of causative verbs.

To give an additional, more complex example, *y* is an affected argument of distribute in (4), since it is an argument of two sub- eventualities which exclude *x*, namely distributed (y) and BECOME (distributed (y)):

- (4)(a) a-structure: distribute (x, *y*)
 (b) e-structure:
 CAUSE (DO(*x*), BECOME (distributed (*y*)))

On the other hand, the e-structures of verbs with unaffected objects do not involve the separation of the arguments. There may be two sources for the lack of the separation property. First, a verb may be conceptually simple, e.g. states such as admire (states are ipso facto non-causative) and non-causative activities such as pursue. Second and more interestingly, verbs with complex e-structures may also lack the separation property. In such cases, the eventuality described by the verb, though complex, has no sub-eventuality that contains the internal argument but not the external argument. One example of such as case is achievements verbs such as realize (x,y) or reach(x,y), which are usually analyzed as BECOME(STATE (*x,y*)). These verbs lack passive nominals and middles, e.g. *the mistake's realization, *London reaches easily by train. There are also examples among the causative verbs themselves which lack the separation property. Compare in this regard the verbs transfer and bring as in (5):

- (5)(a) John transferred some money to the bank.
 (b) John brought some money to the bank.

These verbs differ in affectedness, as shown by the difference in grammaticality of their middle forms:

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- (6)(a) The money won't transfer easily.
 (b) * The money won't bring easily.

Although both verbs are naturally analysed as causatives, with the result in both cases that the money is at the bank, being at the bank applies only to the money in (5a), whereas in (5b) John must be at the bank too. While the lexical representation of transfer contains a sub-eventuality with the internal but not the external argument, this is not the case with bring. The object of transfer is therefore affected, and the object of bring is not. Possible e-structures are shown in (7):

- (7)(a) a-str: transfer (x, y, to z)
 e-str: CAUSE (DO(x), BECOME (AT (y,z)))
 (b) a-str: bring (x, y, to z)
 e-str: CAUSE (DO(x), BECOME (WITH (AT (x,z), y)))

2. The Separation Property and Lexical Externalization

Having presented an explicit characterization of affectedness, our main endeavour now is to show why affectedness is implicated in certain syntactic constructions. Our claim is that affectedness is implicated in constructions which involve the lexical externalization of an internal argument. In the following sections we will show that this is indeed the case. Here we offer an explanation for why lexical externalization is possible only with verbs with affected objects, i.e. with the separation property.

We assume that the notions "external" and "internal" arguments are defined over a hierarchically organized argument-structure, as in the work of Levin and Rappaport 1986, Zubizaretta 1987 and Grimshaw 1990. We assume also that the argument which is defined in a-structure as external (on the basis of its semantic type) must be expressed as the syntactically most prominent argument. Therefore, lexical externalization of an internal argument dictates that the erstwhile external argument can no longer be an argument of the verb, as it would now no longer be syntactically most prominent.

Since a-structure is a projection of e-structure, if the external argument is no longer part of the a-structure, it must also be absent from e-structure.

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Therefore, all the affectedness constructions are associated with e-structures which differ from those of the base verb, in that they don't contain the external argument. The separation property (stated in (3)) as a condition on constructions which involve lexical externalization now follows from the following principle:

- (8) Principle of Morphological Relatedness (PMR):
For two predicators with distinct e-structures to be morphologically related, they must contain a sub-eventuality in common.

It should be clear now why the PMR implies that the removal of the original external argument is possible only for verbs with the separation property. If P' is a predicator morphologically related to a predicator P, but without the external argument, then, by the PMR, the e-structure of P must contain a sub-eventuality e which is contained in the e-structure of P'. e doesn't contain the external argument. Therefore P must exhibit the separation property.

3. The Middle Construction

Semantically, middles do not report events, a fact stressed by many, in particular Fagan 1988. Our claim is that middles, e.g. This bread slices easily, predicate an individual-level property of the original internal argument. Keyser and Roeper 1984 note that middles do not appear in the progressive, and they attribute this to the stativity of middles. However, as was suggested by Carlson 1977 and Dowty 1979, we believe that the progressive is a diagnostic which distinguishes individual-level from stage-level predicates, and not stative from non-stative predicates. Stage-level predicates can appear in the progressive while individual level predicates do not. To illustrate, the sentence The picture is hanging on the wall is stative but appears in the progressive, since it contains a stage-level property. The fact that middles do not appear in the progressive therefore supports our claim that middles predicate an individual-level property.

We assume that individual-level properties must be predicated of an external argument. Since the middle verb is predicated of the original internal argument,

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its theta-role must be externalized, that is, lexically assigned to the VP-external position. Following the reasoning of section 2, the original external argument can no longer be an argument of the middle verb. Therefore, as shown in (9), if V is a transitive verb with an external argument x and an internal argument y, then its middle counterpart V-middle has y as its sole argument. y is expressed as an external argument according to the assumptions we have made:

(9) a-structure: $V(\underline{x}, y) \rightarrow V\text{-middle}(\underline{y})$

By the PMR, the e-structure of V-middle must contain a sub-eventuality of the e-structure of V. But crucially, this sub-eventuality must not contain x, since x is not an argument of V-middle. For verbs with non-affected objects, there will be no sub-eventuality containing y but not x. Verbs with affected objects, on the other hand, will, by definition, have an e-structure which contains a sub-eventuality with y and not x; thus, only verbs with affected objects undergo middle.

Although it is sometimes claimed that middles do contain an agent, that is, the original external argument, Hale and Keyser show that in fact it is not possible to grammatically express the external argument in the middle construction. Consider the example in (10):

(10) This door opens easily

This sentence means that it is easy under standard circumstances to bring it about that the door is open. The a- and e-structures of the middle verb open are shown under (11):

(11)(a) a-str: open-middle (\underline{y})
 (b) e-str:
 MAY (STANDARD-CIRCUMSTANCES (e), CAUSE (e, open(y)))

The operator MAY in the e-structure of the middle verb introduces the modality characteristic of middles. Note that the causing event \underline{e} and its arguments, present in e-structure, are not arguments in a-structure. We attribute this to the quantification of \underline{e} implicit in the operator MAY. This is similar to Grimshaw's analysis of the external argument in passive constructions: the external argument is lexically quantified in a-structure and therefore finds no direct

expression in the syntax, although there can be a-adjuncts associated with this quantified argument. In the same way, middles can appear with with-phrases, as noted by Hale and Keyser:

(12) This door opens with a key

We understand the with-phrase to modify e.

4. Passive Nominals

The second expression of affectedness in syntax that we discuss is passive nominals. There is no consensus in the literature on the derivation of passive nominals. In the work of Chomsky 1972, Anderson 1977, Kayne 1984, Pesetsky 1990 and others, passive nominals have the same a-structure as active nominals. As a consequence, they also have the same d-structure, and are then derived by movement, as exemplified in (13):

- (13) the movement analysis of passive nominals:
 (a) a-structure: distribution (x, y)
 (b) d-structure: e [distribution the drugs]
 (b) s-structure: the drugs' [distribution t]

Other researchers claim that passive nominals are all result nominals, lacking a-structure, as in (14), (cf. Williams 1982, Higginbotham 1983, Zubizarreta 1987, Grimshaw 1990 and to some extent Safir 1987):

- (14) the "result" analysis of passive nominals:
 (a) a-structure: distribution ()
 (b) d- and s-structs: the drugs' distribution

Our position on passive nominals differs from both of these accounts. We disagree with the "result" analysis, since we consider the prenominal NP in passive nominals to be thematic. The prenominal NP in result nominals is typically "free-thematic" in its interpretation, but the prenominal NP in passive nominals can only be interpreted as corresponding to the internal argument of the verb. the drugs in (15a) must be the internal argument of distribution, whereas with the result nominal analysis in (15b), John can be either the theme or the agent:

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- (15)(a) the drugs' distribution (internal)
 (b) John's analysis (free-thematic)

Moreover, precisely in the case where the prenominal NP must be interpreted as internal, the nominals do not display semantic drift, as shown in (16a), and are non-count, as shown in (16b). Nouns lacking a-structure are typically count nouns, and may undergo semantic drift, as in (16c):

- (16)(a) the city's development (no semantic drift)
 (b) * the city's developments (as plural of (a))
 (c) the city's developments (semantic drift to housing complexes, the city interpreted as possessor)

These considerations suggest that the prenominal NP in nominals such as (16a) is indeed an argument of the deverbal noun, and that passive nominals differ from result nominals in having an a-structure. But the fact that passive nominals have an a-structure doesn't entail that they have the same a-structure as their active counterparts. In particular we argue that the internal argument in passive nominals is not assigned to the same position as it is in active nominals. We follow Williams and others in assuming that there is no NP-movement in nominals. This accounts for the absence of raising and pleonastics, as shown in (17). In fact, the prenominal position must be a thematic position as it is not licensed by any other principles such as the Extended Projection Principle:

- (17)(a) * John's belief to be smart
 * Its certainty that John is smart

Since the internal theta-role is assigned to a position normally occupied by the verb's external argument, even though in this case it is not external to the maximal projection, we consider it a case of externalization. Because the externalization of the internal argument is lexical and not syntactic, we predict that the original external argument should be entirely absent in the lexical representation of passive nominals. This prediction is corroborated by three sets of facts, two of which are already well known if not uncontroversial. One is the absence in passive nominals of control into rationale clauses; the example in (18) is Grimshaw's:

- (18)(a) the translation of the book to make it
 available to a wider readership

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- (18)(b) * the book's translation to make it available to a wider readership

Second is the impossibility of an adjunct modifying the verb's external argument. The example in (19) is modelled after Safir's examples:

- (19)(a) The dispersal of the crowd naked gave the chief of police a bad reputation.
 (b) * The crowd's dispersal naked gave the chief of police a bad reputation.

An additional manifestation we found of the loss of the agent is shown in (20). Verbs with the causative/inchoative alternation are ambiguous in the active as to whether the agent is lacking or implicit, as in (20a), but the passive nominal reading unambiguously lacks the agent, as in (20b):

- (20)(a) the oxidation of the metal (ambiguous)
 (b) the metal's oxidation (non ambiguous)

To recapitulate, we maintain, as shown in (21), that lexical externalization of the internal argument is attested in passive nominals:

- (21) the present analysis of passive nominals:
 (a) a-structure: distribution (y)
 (b) d- and s-structs: the drugs' distribution

Since externalization is lexical, the considerations of section 2 dictate that this can be done only with verbs with the "separation" property, which is our version of affectedness. In fact, we claim that while the verb destroy has the e-structure in (22),

- (22)(a) destroy (x, y)
 (b) CAUSE (DO (x), BECOME (destroyed (y)))

the passive nominal destruction has an event-structure which corresponds only to the subconstituent BECOME (destroyed (y)) of (22a), shown in (23):

- (23)(a) a-structure: destruction (y)
 (b) e-structure: BECOME (destroyed (y)))

(23) captures our point that the original external argument is no longer part of the lexical representation of the passive nominal.

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Other passive nominals may correspond to the resultant state itself, not to the change of state, such as those in (24):

- (24)(a) the population's distribution
(e-structure: distributed (y))
(b) the student's discouragement
(e-structure: discouraged (y))

5. Adjectival Passives

We now extend our analysis to adjectival passives. We maintain that affectedness effects can be detected in this construction as well, though with more difficulty than in middles and passive nominals, since they are obscured by orthogonal factors.

Adjectival passives are constrained by the projection principle, as was shown by Levin and Rappaport 1986. But the projection principle is only a necessary, not a sufficient condition for adjectival passives. Many adjectival passives which satisfy the projection principle are still ruled out by the grammar, as the examples in (25) show:

- (25)(a) * a pursued car
(b) * an avoided cliff
(c) * a cabled mother
(d) * a found dog
(e) * the reached destination
(f) * the realized fact

Also notice the contrast, based on the examples in section 1:

- (26)(a) the transferred money
(b) * the brought money

We claim that what accounts for the ungrammaticality of (25) and (26b) is affectedness. It is well known that adjectival passives involve externalization of the internal argument. Since the possibility of externalization depends on affectedness, we expect only affected objects to externalize in adjectival passives. This explains why the examples in (25) and (26b) are ungrammatical. The problem is that there are many verbs with unaffected arguments which have adjectival passives. Some are listed in (27):

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- (27)(a) a known problem
 (b) a loved child
 (c) the feared repercussions
 (d) an assumed premise
 (e) an acknowledged mistake
 (f) an admired writer

But notice that all these counterexamples are stative. Therefore, what needs to be explained is how externalization is possible in adjectival passives of stative verbs despite unaffectedness. The explanation lies in the combination of two facts. The first is that adjectival passives of stative verbs denote the same state denoted by the active verb. This is not true for adjectival passives based on non-stative verbs, where the adjectival passive denotes a state, while the verb does not. The second fact is that, as argued by Grimshaw 1990, the a-structure of adjectives allows the expression of the external argument of the verb as an internal argument, as in (28). In section 1, we claimed that externalization of an internal argument precludes the syntactic expression of the original external argument. We assume that this is not the case with adjectival passives based on stative verbs, since the external argument of a stative verb is not agentive, and can therefore be expressed as an internal argument.

- (28)(a) This problem was known to the ancients
 (b) This child looks loved by his mates
 (c) This writer remains admired by everyone

Because it is the e-structure of the base verb itself, not a sub-eventuality of it, which represents the meaning of the adjectival passive of stative verbs, and because lexical externalization does not necessitate loss of the external argument, adjectival-passive formation with these verbs is independent of unaffectedness. The arguments need not be separable in e-structure, since all arguments are common to the stative verb and to its adjectival passive in both a-structure and e-structure as shown in (29):

- (29)(a) a-structure: know (x, y), known (x, y)
 (b) e-structure: know (x, y)

The expression of the original external argument as an internal argument is special to adjectives. Middle verbs do not allow it, and neither do passive nominals, though passive nominals have by-phrases. The by-phrases found in passive nominals are adjuncts and

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not arguments, and they may appear even in nouns lacking a-structure. The by-phrase in (30a) is an adjunct on a par with the one in (30b):

- (30)(a) the drugs' distribution by the dealers
 (b) a letter by Bill

by-phrases in nominals are agentive in meaning, and therefore are not suitable candidates for internal arguments, unlike the ones in adjectival passives, which are non-agentive. Support for this claim is found in psych-verbs. In the example given in (31), the non-agentive stories is a possible by-phrase in the adjectival passive construction but not in the corresponding passive nominal:

- (31)(a) The children seem amused by the stories
 (b) * the children's amusement by the stories

6. Conclusion

We hope to have presented a unified account of three phenomena in which affectedness is implicated. There are a number of questions which remain. First, it has been reported that some languages form middles from verbs with unaffected objects. We have a feeling that this can be correlated with morphology signaling the middle in these languages, but this is very speculative at present. Second is the question of whether the account here can be extended to cover Rizzi's 1986 observation that pro objects have to be affected. We hope eventually to be able to extend our analysis to answer these questions.

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