MORPHOLOGICALLY-RELATED PREDICATES: ERGATIVES AND MIDDLES IN ENGLISH

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This paper explores a new way of characterizing the ergative and middle alternations and presents a view that they are both captured by means of zero affixation constrained in terms of conceptual structure. The analysis to be developed here contrasts sharply with the current view in the generative grammar in that it provides a view that ergatives as well as middles in English are intransitives at D-structure. Our approach will reveal some properties of the lexicon as contrasted with those of the syntax and will eventually lay the ground toward a typology of intransitive verbs.*

1. INTRODUCTION. There is general agreement in the literature that intransitive verbs are classified into several subtypes: UNERGATIVES, ERGATIVES, MIDDLES, and so on.

(1) a. Mary is dancing on the floor.
   b. John went to the park.

(2) a. The boat sank.
   b. The ice melted.

(3) a. This bread cuts easily.
   b. The book sells well.

Unlike unergatives exemplified in 1, both ergatives (=2) and middles (=3) have transitive counterparts:

(4) a. They sank the boat.
   b. The sun melted the ice.

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(5) a. John cut the bread.
b. They sell the book.

We will call the relation between 2 and 4 ERGATIVE ALTERNATION (=EA) and the one between 3 and 5 MIDDLE ALTERNATION (=MA), both of which will be collectively called DIATHETIC ALTERNATIONS (=DA). As noted above, the two types of DA's share the following property: the Patient is realized as a subject in one case and as an object in the other. Given the parallelism between EA and MA, what, if any, distinguishes between these two types of DA's? Throughout the discussion to follow, we assume that DA's are of grammatical import; native speakers of English do not acquire the two uses of relevant verbs separately, but there are linguistically significant rules relating intransitive and transitive use.

In what follows, we will see that EA and MA are characterized in different manners but treated uniformly in terms of lexical rules, each constrained in terms of CONCEPTUAL STRUCTURE (=CS) in the sense of Jackendoff 1983, 1987, forthcoming, among others. Moreover, we will claim that the EA is based on the intransitive input and the MA on the transitive one. We will begin by discussing the EA, putting off the discussion of the MA until section 3. In the course of the discussion, we will make critical comments on the current approaches to each of the DA's and present an alternative to the DA's.

2. ERGATIVE ALTERNATION. There are logically four approaches to the EA with respect to the component (syntactic/lexical) and the base form (transitive/intransitive). In this section, we will present a view for a lexical and intransitive-based approach, nullifying the other three possibilities.

2.1. LEXICAL APPROACH. Those who advocate a syntactic analysis claim that intransitive ergatives (=2) are derived from corresponding transitives via MOVE-ALPHA (cf. Burzio 1981, Baker 1988). A syntactic analysis based on intransitive ergatives is immediately excluded in the general framework assumed here, since deriving transitives from intransitive ergatives in syntax violates the PROJECTION PRINCIPLE. Those who propose a lexical analysis claim that intransitive ergatives are the result of the movement in the lexicon (cf. Keyser and Roeper 1984; henceforth K&R), the result of lexical redundancy rule (cf. Jackendoff 1975), or the result of some version of argument structure changing (cf. Fagan 1988).

Before looking into the details, we should lay out the schema in terms
of which to distinguish the a priori possible levels of representation. First, we will assume that the lexicon is a storage of lexical items, each containing only idiosyncratic information, phonological, syntactic, and conceptual. Moreover, some lexical items are rule-inducing, i.e. change some information stored in the lexical entry of an item. For example, the lexical item -able which requires a predicate of a certain semantic type forms an adjective from a verb (cf. Wasow 1977, Williams 1981):

(6) a. This book is readable.
    b. John's statement is believable.

Therefore the lexical item -able is specified for the rule it triggers as well as for phonological, syntactic (i.e. morphological subcategorization), and conceptual information.

Second, some lexical rules obey semantic restrictions, while syntactic rules are free from such restrictions and are constrained only in terms of locality conditions such as SUBJACENCY, and so on. Bridge verb phenomena, reanalysis, etc. should thus be captured at the level of semantic representation (cf. Guéron 1981).

Third, and most importantly for the concerns of this article, lexical rules may affect conceptual structure, a semantic representation of linguistic and cognitive relevance (cf. Jackendoff 1983). This in fact derives from the modular theory advocated in the principles-and-parameters approach; lexical rules are not subject to the projection principle (cf. Chomsky 1981, Borer 1984).

With these assumptions in mind, consider the following examples:

(7) a. Fred knew the answer.
    b. *The answer knew.
    c. The answer was known by Fred.

(8) a. Aboriginals inhabit the island.
    b. *The island inhabits.
    c. The island is inhabited by aboriginals.

(9) a. Mary played the sonata.
    b. *The sonata played.
    c. The sonata was played.

There is a sharp contrast between 2 and (7-9)b: know, inhabit, and play are not involved in the EA. The ungrammaticality of (7-9)b has often been attributed to the AFFECTEDNESS CONSTRAINT (cf. Anderson 1979, Jaeggli 1986). Jaeggli (1986: 607) states this condition as follows:

(10) If a complement of X is unaffected, it is impossible to eliminate the external θ-role of X.
The complements of *know, inhabit, play* are unaffected; hence, the impossibility of eliminating the external θ-role and placing the complement in the subject position. If the second assumption introduced above is right, the affectedness constraint should not be visible to a syntactic rule. This suggests that the alternation in question is a lexical phenomenon at least in some part.¹

The following examples show that the affectedness constraint is also at work in the formation of derived nominals and that the assumption in question is on the right track:

(11)   a. *The answer's knowledge by Fred
   b. *Bill's avoidance by John (Anderson 1979: 43)
   c. The city's destruction by the enemy

The NP in the specifier position is not derived via move-alpha, but base-generated in the position (cf. Williams 1982, Safir 1987). As Safir (1987: 565) points out, the movement analysis incorrectly permits such nominals as 12c,

(12)   a. the photograph of John sick
   b. Bill's photograph of John sick
   c. *John's photograph sick

since an adjunct phrase like *sick* does license a trace in the object position as the following examples show:

(13)   a. Bill's photographing John sick irritated us.
   b. John's being photographed sick irritated us.

The ungrammaticality of 12c thus indicates that there is no trace in the object position and that the NP in the specifier position is base-generated in situ. Therefore, if we make a plausible assumption that the specifier position and its head are thematically related to each other, we can claim that the affectedness constraint is a general constraint on the thematic relation between an external argument and its verbal head. Intransitive ergatives (and middles as we shall see later) are parallel to this case; the affectedness constraint should generally be attributed to the external argument.

¹ An EL reviewer suggests that (7–9)b are excluded because they violate the θ-criterion. This claim is not valid, however, because it cannot give any principled account of why *The glass broke, The boat sank*, and so on are not excluded on the same basis despite the fact that the subject positions of these verbs are θ-positions (e.g. *They broke the glass, They sank the boat*). Such an account would have to make an implausible assumption that some verbs have two distinct thematic structures. See section 2.2.
2.2. AGAINST THE UNACCUSATIVE HYPOTHESIS. The preceding section suggests that the EA should be captured as a lexical rule. In this section, we will present an empirical argument that the EA should be characterized as a causativization, which will automatically dismiss the syntactic approach since causativization in the syntax is prohibited by the projection principle as mentioned above. Therefore, serious doubt will be cast on the UNACCUSATIVE HYPOTHESIS (cf. Perlmutter 1978), whether it is syntactic (e.g. Burzio 1981, Baker 1988) or lexical (e.g. K&R), since the hypothesis says that intransitive ergatives are derived from transitive counterparts.

First, consider the following paradigm from Wasow (1977: 333):

(14) a. John darkened his hair.
    b. His hair darkened.
    c. John tinted his hair.
    d. *His hair tinted.

(15) a. We moved the boxes.
    b. The boxes moved.
    c. We transported the boxes.
    d. *The boxes transported.

K&R’s version of the unaccusative hypothesis, even if corroborated by the affectedness constraint, does not exclude the ungrammatical sentences in (14–15)d; the complements in (14–15)c are as ‘affected’ as those in (14–15)a. Therefore, it wrongly predicts that (14–15)d are both grammatical. Notice that ‘Burzio’s generalization’, which states that if no Case is assigned to [NP, VP], then no θ-role is assigned to [NP, IP], cannot account for the contrast in these examples: if the alternations seen in (14–15)a, b are subject to the generalization, why not those in (14–15)c, d? Thus the ungrammaticality of the sentences in question cannot be attributed to Burzio’s generalization, hence the θ-criterion (cf. footnote 1). The examples in 14 and 15 suggest that the EA is in fact a causativization. The verbs darken and move, specified as intransitives, are involved in the alternation, whereas tint and transport are not since they are dyadic.

Burzio’s generalization should thus be weakened: it holds true if a subject clitic, i.e. an element base-generated in Infl θ-related to [NP, IP] via a θ-chain (e.g. English passive morphology en, Italian impersonal si, etc.), is present (cf. Belletti 1982, Roberts 1985, Cinque 1988). In other words, the absence of a subject clitic implies that the construction in question is not subject to Burzio’s generalization; the presence of a subject clitic is a sufficient but not a necessary condition. The EA in English does not in-
volve a subject clitic, being free from Burzio's generalization.

Our interpretation of Burzio's generalization is further confirmed by French EA. As is well-known, there are two types of EA in French: the one involving a subject clitic *se* as in 16 and the one not involving the clitic as in 17:

(16)  a. Pierre a brisé la glace.
      'Pierre broke the ice.'
    b. La glace s'est brisée.
      'The ice broke.'

(17)  a. Jean a coulé le bateau.
      'John sank the boat.'
    b. Le bateau a coulé.
      'The boat sank.'

The present approach predicts that the EA not involving *se* does not necessarily behave like an unaccusative, and this is indeed the case. Unaccusative verbs, unlike unergatives whose sole argument is base-generated in the subject position, allow the extraction from VP-internal position; cliticization is possible in the case of unaccusatives, but not in the case of unergatives (cf. Belletti and Rizzi 1981). The following Italian examples (taken from Burzio (1981: 45)) indicate that the NP following the unaccusative *arrivare*, but not the NP following the unergative *telefonare*, is in the object position.

(18)  a. Arrivano molti studenti.
      Arrive many students
    b. Ne arrivano molti.
      Of them arrive many

(19)  a. Thelefonano molti studenti.
      Telephone many students
    b. *Ne telefonano molti.
      Of them telephone many

Our approach predicts that French *couler* is parallel to *telefonare* with respect to cliticization. The following French examples confirm this point (cf. Zubizarreta 1987: 90):

(20)  a. Il ne s'en est cassé que trois ici.
      'There of them broke only three here.'
    b. *Il n'en a coulé que trois ici.
      'There of them sank only three here.'

This contrast indicates that such verbs as *couler*, which do not involve a subject clitic, form a natural class with the Italian unergatives in that the
sole argument is generated in the subject position at D-structure. This is actually what we predict; no subject clitic is involved and Burzio's generalization is not at work in this case.

Further evidence comes from word formation for our hypothesis that English ergative verbs are basically intransitives. Pesetsky 1985 claims that a word structure may not be unique in that it may have distinct structures with respect to the levels of representation: S-structure (i.e. input to PF) and LF, thereby evading the so-called 'bracketing paradox'. In other words, he claims that a word structure may undergo affix raising, an analogue of QR. Assuming his approach, consider the following verbal compounds involving an ergative head from Pesetsky (1985: 236) (cf. Selkirk 1982, Williams 1984):

(21) a. *Weather changing is typical of western Massachusetts.
    b. *Time elapsing worries philosophers.
    c. *Heart beating is a good sign of life.

Pesetsky claims that these examples violate the specified subject condition: raising of the deverbal suffix -ing is blocked by the presence of a specified subject, i.e. the first element of the compound which is assigned a subject grammatical function from its verb root:

(22)

In this structure, the specified subject weather prevents the affix -ing from binding its trace; hence, the ungrammaticality of 21. This analysis quite naturally explains the grammaticality of the following primary compounds:2

(23) heartbeat, landslide, rainfall, earthquake, ...

Although the first element is assigned a subject grammatical function by the indexing mechanism which we will see later, it does not function as a specified subject because no affix raising is involved in this case, hence the grammaticality of these primary compounds.3

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2 Takane Itoh points out to me that compounds such as heart failure may be a counterexample to the present analysis, since there is actually a nominal affix -ure involved here. I suppose that affixes are distinguished in one way or another in terms of the possibility of raising.

3 It should be noted, however, that deverbal compounds of the unergative type are much better than those of the ergative type (=21) (Pesetsky 1985: 237):
This discussion directly supports the claim that ergative predicates in English are real intransitives, i.e. have a subject rather than an object in the lexicon and at the D-structure; otherwise, examples like (21) should be ruled in just like object-incorporated compounds such as car-driving, pasta-eating, and so on.

2.3. Lexical-conceptual approach. In this section, we will present our proposal that the EA is a CS changing phenomenon triggered by a zero causative affix.

First, look at the following ergative-causative pairs:

(24) rise/raise; sit/set; lie/lay

These examples indicate that some of the EA's reflect morphological process. So, we interpret the morphological structure of raise as follows:

(25) \[ \text{V} \quad \text{Cause} \]
\[ \text{rise} \]

Notice that category-changing causative affixes in English do regularly reflect morphological process: deadjectival -ize and -en, and denominal -ify (Zubizarreta 1987: 93):

(26) a. modern/modernize, social/socialize, standard/standardize, ideal/idealize
b. red/redden, glad/gladden, sad/sadden
c. liquid/liquefy, terror/terrify, horror/horrify

We simply interpret these category-changing causative affixes as proper subsets of a larger class of the Cause affix.

Our claim is therefore that there is a phonetically-null (non-category

\[ \text{(i) a. \%Dog barking can be eliminated with a muzzle.} \]
\[ \text{b. \%Child dancing is forbidden.} \]
\[ \text{c. \%Student swimming is allowed only on Thursday.} \]

The subject of unergatives is a typical Agent, which allows for another option: adjunct-like interpretation (cf. Itoh 1985). That this option in fact saves the examples is verified by the following contrast (Pesetsky 1985: 237):

\[ \text{(ii) a. *Changing by weather is typical of western Massachusetts.} \]
\[ \text{b. *Elapsing by time worries philosophers.} \]
\[ \text{c. *Beating by hearts is a good sign of life.} \]

\[ \text{(iii) a. ?Barking by dogs can be eliminated with a muzzle.} \]
\[ \text{b. Dancing by children is forbidden.} \]
\[ \text{c. Swimming by students is allowed only on Thursday.} \]
changing) causative affix in English, which has the effect of causativizing the CS of a verb root. The EA is now specified as a mapping function listed in the lexical entry of the affix Cause:

\[(27) \text{[Event GO ([Thing X]_i, [Path Y]_k)]} \rightarrow \text{[Event CAUSE ([Thing Z]_i, [Event GO ([Thing X]_j, [Path Y]_k)])]}\]

The indices indicate correspondence to the position at D-structure: the index \(i\) maps the argument onto the subject position, and the other indices map their arguments onto the position in the subcategorization frame of the verb (cf. Jackendoff 1987). This function correctly characterizes the causative process in which an Event-type predicate is turned into a sub-event brought about by a newly-introduced entity, i.e. Causer (= [Thing Z]). This type of process is not an arbitrary process and can be generalized to a much wider class, as suggested by Levin and Rapoport 1988.\(^4\)

The advantage of this approach is that we can successfully incorporate the effect of the affectedness constraint discussed above; the affectedness effect follows naturally from the presence of GO-function at CS. We will not go into the details of the discussion of CS per se, but merely note, following Jackendoff 1987, that \(\theta\)-roles are not primitive concepts, but rather are structurally defined in terms of the position which some conceptual categories occupy at a CS. For example, the thematic category Theme is defined as the first argument of the functions, GO, STAY, BE, and ORIENT. In our approach, we can define ‘affected Theme’ as the first argument of GO-function, a typical argument which undergoes change of state.\(^5\)

Given the claim that English ergatives are parallel to unergatives in terms of the position which the sole argument occupies at D-structure, why are unergatives such as go not involved in the alternation?

\[(28) \begin{align*}
a. \text{Bill went into the room.} \\
b. \text{*We went Bill into the room.}
\end{align*}\]

As Perlmutter 1978 points out, the major semantic difference between

\(^4\) A question arises at this point as to linking between conceptual categories and syntactic positions at D-structure: the conceptual category [Thing X], which corresponds to the syntactic category NP, is in one case mapped onto the [NP, IP] position, but in the other case is mapped onto the [NP, VP] position, and the newly-created [Thing Z] is mapped onto the [NP, IP] position. Based on the discussion of middles in the next section where we claim that there is an unindexed Agent, we simply assume that the indexing system is a necessary device. See Jackendoff forthcoming for further discussion.

\(^5\) See Jackendoff forthcoming for a different view on the affected Theme.
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unergatives and ergatives is that the argument of the former is an Agent as well as an undergoer of change (= Theme). We can capture this distinction by adding the ACTION TIER in the sense of Jackendoff 1987; the CS of unergatives is generally represented in the following manner:

\[
\begin{array}{l}
\text{(29) } \left[ \begin{array}{c}
\text{GO (} \text{[Thing } X\text{], [Path } Y\text{])} \\
\text{Event ACT (} \text{[Thing } X\text{])}
\end{array} \right]
\end{array}
\]

Therefore our formulation of causativization predicts the ungrammaticality of 28b; the action tier blocks causativization.\(^6\)

3. MIDDLE ALTERNATION. There are also four logical approaches to the MA. Nevertheless, we will limit our discussion to transitive-based approaches because the middles are obviously derived predicates.

3.1. LEXICAL APPROACH. There are two types of transitive-based approaches to the MA: syntactic and lexical. In this section, we will claim that the MA is also a lexical process and is not a subcase of move-alpha as proposed by K&R.

First, as pointed out in Riemsdijk and Williams 1986, positions from which movement usually takes place are not necessarily accessible to the middle formation (30–31 from Riemsdijk and Williams (1986: 112–113), 32 from Roberts (1985: 366–367)):

\[
\begin{array}{l}
\text{(30) } \ast \text{Women give poetry books more commonly than men.} \\
\text{(31) a. } \ast \text{Graduate students don't take advantage of very often in this country.} \\
\text{b. } \ast \text{Advantage doesn't take of graduate students very often in this country.} \\
\text{(32) a. } \ast \text{John sees sing easily.} \\
\text{b. } \ast \text{The mountains see beautifully after rain.}
\end{array}
\]

If, as is claimed by K&R, the MA is a syntactic process, these examples should be all acceptable just as their passive counterparts are.

That the MA is a lexical process is further confirmed by the fact that

\(\ast\) We will not go into the discussion of agentive objects exemplified in (ib) below:

\[
\begin{array}{l}
\text{(i) a. } \text{The horse walked.} \\
\text{b. John walked the horse.}
\end{array}
\]

We simply note that this type of alternation is truly exceptional. Indeed, there are only a few verbs which are involved in this type of alternation; gallop, march, walk, run, fly, jump, swim are the only possible candidates that I have actually encountered. Rather, we take the existence of this type of sporadic causativization to be indicative of the generality of the EA.
the affectedness constraint is also at work in the case at issue.\(^7\)

(33)  a. Fred knows the answer.
       b. *The answer knows easily.

(34)  a. We want beer frequently.
       b. *Beer wants frequently. (O'Grady 1980: 64)

Furthermore, morphological facts argue in our favor (cf. Levin and Rappaport 1988: 1077).

(35)  baker (=potato), broiler, fryer, roaster, steamer (=clam), ...

Crucially, these \(-er\) nominals can refer to the Theme argument of the root verb; they are taken to be derived from corresponding middles. If derivation such as \(-er\) affixation, in contrast to inflection, is a process to be captured within the lexicon (cf. Borer 1984), it follows that the middle formation must be a lexical process; otherwise it cannot feed such morphological processes.

3.2. MIDDLES AS STATIVE PREDICATES. There is a crucial semantic effect in the MA. Middle predicates are generally characterized as stative predicates (cf. Roberts 1985, Fagan 1988). If a semantic effect like stativization is a sufficient condition of a lexical rule, the following examples from Roberts (1985: 369–72) suggest that the MA is indeed a lexical rule; middles cannot occur in the circumstance where stative predicates are generally excluded.

(36)  a. *Bureaucrats are bribing easily.
       b. *Chickens are killing nicely.

(37)  *John forced the bureaucrats to bribe easily.

(38)  *Bribe, bureaucrats!

(39)  *Bureaucrats bribe easily voluntarily.

(40)  *What the chicken did was kill easily.

(41)  a. *Bureaucrats bribe every year at Christmas.
       b. *Last week, the chickens killed nicely.

The ungrammaticality of these sentences is explained if we identify middles with stative predicates, since statives are generally excluded in

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\(^7\) Roberts 1986, granting the facts in the text (i.e. 30–34), develops a syntactic analysis, based on some special device of V-Infl indexing to which semantic properties of middles including the presence of chômeur (see 3.4.) are ascribed. We will not discuss his proposal in detail here, but merely note that his approach, or any non-lexical approach to the semantics of the middle, loses the important generalization that stativization is a general lexical process, as we will claim in 3.4.
the above contexts: the present progressive (=36), the complement of verbs of object control (=37), the imperative mood (=38), the Agent-oriented adverbs like voluntarily (=39), the focus position of pseudo-cleft sentences (=40), the iterative simple present and the preterit with punctual interpretations (=41). Therefore we take these facts to be indicative that the middles should be characterized as stative predicates and that the MA involves stativization.

3.3. MIDDLES ARE NOT THE SAME AS ERGATIVES. There is a common property shared by the ergative and middle alternations: affectedness. In fact, there are some verbs that are involved in both alternations, illustrated by the ambiguity of the following sentences (K&R: 383):

(42) a. The door opens easily.
    b. The car moves easily.
    c. The bottle breaks easily.
    d. The clothes hang easily.

Under the ergative interpretation, the predicate constitutes what Talmy 1985 calls ‘autonomous event’ and there is no one who brings the event about. On the other hand, under the middle interpretation, there is an Agent involved: some unspecified person brings the action about.

Based on this kind of similarity of ergatives and middles, Hale and Keyser 1986b (henceforth H&K) identify these two types of predicates and claim that either of them is derived by a more general rule called ‘the Ergative-Middle Alternation’. This analysis, however, has empirical drawbacks serious enough to make it untenable. First, as they themselves point out, the observed ambiguity does not necessarily arise in the case at issue (H&K: 34):

(43) a. These chickens kill easily.
    b. These chickens die easily.

43a can only be interpreted as a middle construction and differs clearly in meaning from 43b. H&K cannot give an adequate account of the absence of ergative interpretation of 43a. As pointed out in Noguchi (1987: 63), such verbs as handle, frighten, scare, print, digest, polish, wash, etc. belong to the same class as kill; they are never given an ergative reading.

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8 Hale and Keyser 1986a take a rather different position, claiming that ergatives are different from unaccusatives and middles and that the EA is a causativization process, a view similar in spirit to ours.
Moreover, agency is involved in middles in contrast to ergatives. This becomes apparent with the addition of certain adverbials which require the predicate to be non-agentive. The typical ergative construction like 44a permits the adverbial *all by itself, whereas the middle construction like 44b does not (K&R: 405):

(44) a. The boat sank all by itself.
   b. *Bureaucrats bribe easily all by themselves.

Another difficulty should be mentioned: stativity of middles. In H&K's account, it is not entirely clear why middles, but not ergatives, are characterized as stative predicates. In brief, they cannot account for the following contrasts:

(45) a. The boat is sinking.
    b. *Chickens are killing.

(46) a. Sink, boat!
    b. *Kill, chicken! (K&R: 384)

The ungrammaticality of the progressive and imperative middle should be attributed to stativity of the predicate.

3.4. LEXICAL-CONCEPTUAL ANALYSIS. As we saw in the previous section, the MA involves a conceptual category changing: [Event] $\rightarrow$ [State]. This type of effect is indeed frequently found in lexical processes: adjectival passives (e.g. a broken vase) and -able adjectives (e.g. This experience is unforgettable). Specifically, we will claim in this section that the middles are characterized as stative causatives (cf. Iwata 1988). Actually, this is not a peculiar property of middles, but is found in many constructions. Ray Jackendoff (personal communication) points out the following sentence in this connection:

(47) The crack lets light in.

The use of simple present tense is characteristic of statives. Thus the example indicates that the verb let, in addition to being an eventive causative (e.g. Let me in), can be a stative causative as well (cf. Jackendoff forthcoming). We claim that the MA is parallel to this type of process in that it is interpreted as stativization with the causal relation intact.

Before we proceed, we have to clarify the notion of causation. We in-

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9 See Iwata 1988 for the analysis of verbs, strike and impress. He correctly claims that the expressions such as Tom strikes me as being honest and The idea strikes me are represented as stative causatives in the conceptual structure.

10 Thanks to Noriko Imanishi for bringing this possibility to my attention.
interpret a causal relation to be a function which brings about any type of change, be it locational or statal. Therefore, we consider conceptual categories like \([\text{Event}]\) and \([\text{State}]\) to be primitive notions independent of functions, and not entirely defined by the composition of the CS (cf. Iwata 1988), although it may be the case, as suggested to me by Noriko Imanishi, that some combinations of a conceptual category and a function are taken to be marked types. As we saw in the preceding section, there is an implicit Agent involved in the middle construction. We take the agentive interpretation of the middle to derive from the causal relation; the implicit Agent in the middle is taken to be the extrinsic Initiator of an event in the sense of Jackendoff 1987.

As in the case of the EA, we propose that the MA is also a morphological process involving zero affixation which triggers a CS changing of the following form:

\[
(48) \quad \text{[Event CAUSE ([Thing X], [Event GO ([Thing Y], [Path]])]} \rightarrow \\
\text{[State CAUSE ([Thing X], [Event GO ([Thing Y], [path]])]}
\]

What is crucial in this formulation is that in the resultant CS, the conceptual category \([\text{Thing} X]\) is unindexed and the category \([\text{Thing} Y]\) is assigned an index \(i\), i.e. a subject grammatical function. The unindexed category functions as a ‘chômeur’ (cf. Roberts 1985), and this accounts for agency implied in the middle construction. Unlike Roberts 1985, however, who merely stipulates chômeur by using a diacritic feature in the argument structure, we propose the following condition:

\[
(49) \quad \text{The conceptual category } [\text{Thing} \quad ] \text{becomes a chômeur iff}
\]

(a) it is unindexed, and

(b) it is an argument of a CAUSE-function.

The clause (b) sharply contrasts with the case where an unindexed category is an argument of a GO-function. This probably is the case of null object construction, as suggested by Jackendoff 1987. In both cases, an argument exists in the CS but is not syntactically realized (cf. Jackendoff 1987, Rizzi 1986). Thus we can treat chômeur in a systematic way.

Let us see how the present system (=48) works. First consider the examples 30–34 again. The subjects in the ungrammatical sentences are all unaffected because they are not the first arguments of the GO-function; these sentences are excluded since they do not have a viable CS for the MA.

Our view correctly accounts for the general prohibition on the agentive by-phrase in the middle construction as exemplified in 50a:

\[
(50) \quad \text{a. *This bread cuts easily by anyone.}
\]
b. This bread cuts easily with any knife.
As the formulation 48 predicts, [Thing X], i.e. an Agent, is unindexed and therefore is not syntactically realized. Unlike the agentive by-phrase, the Instrumental with-phrase is freely admitted as in 50b since it is not an unindexed argument, but merely an adjunct.

The differences between ergatives and middles naturally fall under the present system proposed in 27 and 48. For example, the contrast in 43 is straightforwardly accounted for in our approach. The verb kill, which is inherently a dyadic predicate, is able to enter into the MA, but it cannot enter into the EA which allows for only intransitive verbs.\(^{11}\) The contrast in 44 is explained in a similar vein. The verb bribe, in contrast to sink which is basically monadic, always has an Agent, indexed or unindexed, in its CS; hence, the incompatibility of the adverbial all by themselves.

This approach is also consistent with the data in 42. The observed ambiguity follows naturally from our hypothesis because all of the predicates are basically ergatives; ergative predicates may be turned into middles by way of causatives, but the reverse operation is not possible, as our formulation predicts.

Control phenomena also support our hypothesis. As indicated by the following examples, rationale clauses are incompatible with middles:

(51) a. *Bureaucrats bribe easily to keep them happy.
    (K&R 1984: 407)

b. *Apples eat to get slim.
    (Roberts 1985: 364)

The incompatibility with a rationale clause suggests that the chômeur, and more generally the syntactically-unprojected argument, cannot act as a controller.\(^{12}\) This line of reasoning can be extended to account for the

\(^{11}\) Kinsuke Hasegawa pointed out to me that it remains for our analysis to account for the reason why the verb die is not involved in the EA. We simply attribute this to the blocking effect by the presence of the verb kill: the putative causative countepart of die should be exactly the same in meaning as kill. This is not the case with the corresponding Japanese pair: sinaseru ‘cause to die’ and korosu ‘kill’. Compare the following sentences:

( i ) a. Hahaoya-wa musuko-o sensoo-de sinaseta.
    ‘The mother lost her son in the war.’

b. Hahaoya-wa musuko-o sensoo-de korosita.
    ‘The mother killed her son in the war.’

The verbs such as elapse, arise, and emerge are still problematic to our approach. We simply interpret these verbs as predicates that resist any kind of causation because they represent a spontaneous event.

\(^{12}\) This line of reasoning can be extended to account for the
so-called ‘Bach’s generalization’, which states that the object may not be omitted when it is a controller (cf. Bach 1979, Bresnan 1982):

(52) a. Louise promised Tom to be on time.
b. Louise promised to be on time.
(53) a. Louise taught Tom to smoke.
b. *Louise taught to smoke.

In our terms, the object controller in 53b is not assigned an index and is not syntactically realized; it therefore cannot control. Therefore we can account for the ungrammaticality of 51 and 53b in a natural way.

Some might argue that our approach is not natural in that it assumes as critical the existence of an unindexed category. In fact, this is not a problem at all, for the MA is indeed a marked process; it involves the changing of a conceptual category and of indices. There is evidence, indirectly from language acquisition, that our formulation is on the right track. K&R (1984: 414) report that a child acquires the ergative construction at age two, while the middle construction is not learned until the age of six. We can attribute this fact to the markedness of the MA.

4. CONCLUDING REMARKS. We have presented an argument, mainly empirical but conceptually plausible as well, that (i) ergatives in English should not be captured in terms of the unaccusative hypothesis, but the sole argument is generated as a subject at D-structure, (ii) the ergative and middle alternations are morphological processes restricted in terms

12 Control is possible in the romance middles. Probably this is due to the fact that the clitic is involved, which suggests a syntactic derivation of middles in these languages which is similar to the English passive. See Cinque 1988 for discussion.

13 It follows from this argument that the implicit argument, when it acts as a controller, is syntactically realized. For example, the sentence The books were sold to make money should be represented in the following manner:

(i) The books, were sold ti e i [PRO j to make money]

This is indeed the approach taken by Roberts 1985 and we assume that his analysis of English passives is essentially correct.

14 We have not discussed so far the general obligatoriness of adverbs in the middle construction. We have no specific proposal here, so we will hint at a viable approach in rather speculative terms. The middle construction is semantically interpreted as a statement on the property of the subject. This room cleans easily, for example, is interpreted as: This room is easy for anyone to clean. Therefore, the adverb is given a predicate-like interpretation at some abstract level of semantic interpretation. So predications-like requirement may be involved here. We will leave this open for future research. See Fellbaum 1986 for discussion on the use of adverbs in the middle construction.
of CS, (iii) ergatives and middles are different morphological processes; ergatives are basically monadic and middles dyadic, and (iv) ergatives and middles are semantically different: ergatives are Event-type predicates and middles State-type predicates. We hope that this research contributes to the typology of intransitive verbs, a nontrivial matter.

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