An Analysis of the Material/Product Alternation in English*

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1. Introduction

In this paper we explore the relationship between verb classes and the (transitive) Material/Product alternation in English (cf. Levin (1993 : 2.4.1)). Levin (1993) points out that there is a transitive construction the verbal phrase of which involves two arguments representing a created entity (the Product) and a raw material from which the Product is created (the Material), where one of them is syntactically realized as object NP and the other as NP within a prepositional phrase (*into* PP or *from / out of* PP). The Material/Product alternation reverses the linear order of the two NPs, thus the constituents following the verb are realized either in the frame 'Material NP *into* Product NP' (hereafter the into variant) or in the order 'Product NP *from / out of* Material NP' (the *from / out of* variant). She observes that it is only verbs of the BUILD class that allow this alternation : they can appear in either of two frames : the *from / out of* variant as in (1 a,b,c) or the *into* variant as in (1a',b',c') :[1]

(1) BUILD class verbs :

    a. Martha carved a toy out of the piece of wood.

    a'. Martha carved the piece of wood into a toy.

    b. He assembled the computer himself from parts.

    b'. He assembled the parts into a computer.

    c. Lucy tried to spin thread out of wool.

    c'. Lucy tried to spin wool into thread.

                ((a, a') from Levin (1993 : 56))

While the BUILD class allows the alternation, there are also verb classes which can only appear in either of the two frames.[2] They are the CRE-

ATE, the KNEAD, and the TURN class. The first class only allows the into variant. Consider the following paradigms, where the first pair in (2) is from Levin (1993 : 56) :[3]

(2) CREATE class verbs :

    a. David constructed a house out of/from bricks.

    a'. *David constructed the bricks into a house.

    b. The writer created a great work purely from his imagination.

    b'. *The writer created his imagination into a great work.

    c. She correctly derived a conclusion from evidence.

    c'. *She correctly derived evidence into a conclusion.

On the other hand, the other two classes allow the *into* variant alone, as shown by the following examples (again the first pair in each paradigm is from Levin (1993 : 56)) :

(3) KNEAD class verbs :

    a. I kneaded the dough into a loaf.

    a'. *I kneaded a loaf from the dough.

    b. John collected fallen leaves into a heap.

    b'. *John collected a heap from/out of fallen leaves.

    c. She twirled my hair into a column with great dexterity.

    c'. *She twirled a column from/out of my hair with great dexter-
       ity.

(4) TURN class verbs :

    a. The witch turned him into a frog.

    a'. *The witch turned him from a prince.

    b. The student converted water into steam.

    b'. *The student converted steam from/out of water.

    c. They rapidly transformed their feudal nation into a modern
       state.

    c'. *They rapidly transformed a modern state from/out of their
       feudal nation.

The goal of this study is to explain the distribution of the four verb classes with respect to the two variants. Since, whether it is in the *into* or in the *from/out of* variant, the postverbal constituents represent an

event caused by the action denoted by the verb (the resulting event, here-after):   the Material undergoes a certain change and as a result, the Product comes into existence. The Product is syntactically realized within the PP in the *into* variant, whereas it is realized as the direct object of the verb in the *from / out of* frame. Note that the former variant has a similar structure with the resultative construction in that NP of the entity under-going a change immediately follows a verb and the resulting state is real-ized as a predicative phrase. In what follows, we will overview the opera-tion referred to, in Levin and Rapoport (1988), as lexical subordination (which has an effect of deriving the resultative construction as well) and the operations discussed in Levin and Rappaport Hovav (1995), which gen-erates the resultative construction, and then provide two distinct opera-tions for the resulting event construction. The distribution of the two al-ternatives in (1-4) will be explained in terms of the applicability of the op-erations (which will generate the resulting event construction). If neither of the two possible operations is available to derive a variant of the alter-nation, that frame will be ruled out.

The paper is organized as follows :   In section 2 we will overview lexi-cal subordination proposed in Levin and Rapoport (1988) and its treat-ment in Levin and Rappaport Hovav (1995). Then we provide two distinct operations to generate the resulting event construction which are relevant to our analysis.   In section 3, we analyze the relationship between the Material/Product alternation and the verb classes. The analysis proceeds in the following order :   KNEAD/TURN class verbs, CREATE class, and lastly BUILD class verbs. Section 4 makes concluding remarks.

2.   Lexical Subordination :   Operations to Generate the Resulting Event Construction

It has been proposed in the literature that formation of resultative constructions (and some other constructions) involves a certain type of lexical operation (or rule) which changes the semantic and syntactic prop-erties of verbs so that the resulting verbs may enter into the relevant con-structions. This type of lexical operation/rule is referred to as 'lexical sub-

ordination' in Levin and Rapoport (1988). Lexical subordination is a lexi-
cal operation which takes a base meaning of a verb and 'subordinate' it
into a larger semantic frame representing a resultative construction.

The basic idea of this operation is to yield a change in the lexical con-
ceptual structure (LCS) in the following manner :

(5)　LCS :　manner/instr ⟶ LCS :　[result BY manner/instr]

　　　　(BY is used to represent 'by means of' or 'in the manner of')

This means that the inherent LCS of a verb is lexically subordinated into
a larger LCS and the resulting LCS represents that the subject causes an
event to occur by undergoing the action denoted by the original verb.
Levin and Rapoport claim that resultative constructions are generated
through the operation of lexical subordination. They provide (transitive)
resultative constructions (such as in (6b) as an example of the effect of
lexical subordination.

(6)　a.　Evelyn wiped the dishes.

　　　　　wipe$_1$:　[x 'wipe' y]

　　　b.　Evelyn wiped the dishes dry.

　　　　　wipe$_2$:　[x CAUSE [y BECOME (AT) z] BY [x 'wipe' y]]

Lexical subordination changes the LCS in (6a) into that in (6b). The origi-
nal LCS of the verb (i.e., [x 'wipe' y] in (6a)) is "subordinated" (or embed-
ded) in the derived LCS in (6b), which represents the conceptual structure
of the resultative construction. Following their analysis, we generally as-
sume that resultative constructions are generated by the operation of lexi-
cal subordination. In the rest of this section, we review Levin and Rappa-
port Hovav's (1995) analysis of the construction ; then we reformulate
lexical subordination and provide two distinct operations to generate the
resulting event construction.

Levin and Rappaport Hovav (1995), in analyzing resultative construc-
tions, propose the three types of operation for generating (i) the resulta-
tive construction based on a transitive verb followed by its object, (ii) the
construction based on a transitive verb without its object, and (iii) the con-
struction based on an unergative verb.

In their analysis, the first operation (i.e., the operation generating (i))

is carried out by adjoining a resultative phrase after the verbal object. As a result, by mutually m-commanding each other (cf. Williams (1983)), the object NP and the adjoined phrase together establish a predication relation (i.e., a resulting event structure, in our terms). As for case (i), they present the following examples :

(7) a. Woolite safely soaks all your fine washables clean. [ad]

   b. . . . a 1,147 page novel that bores you bandy-legged . . .
       [P. Andrews, "Abandoned in Iran," 28]

   c. . . . while she soaps me slippery all over . . . [D. Pryce-Jones, *The Afternoon Sun*, 186]

   d. And when her father finally did come home and kiss them, he was like the handsome prince, though Laura, kissing them all alive. [D. Smith, *Remember This*, 28]

   e. The music is violent and mindless, with a fast beat like a crazed parent abusing a child, thrashing it senseless. [B. A. Mason, "A New-Wave Format," 227]

   f. Absently, she dipped a finger into the peanut butter and licked it clean. [M. Thurm, *The Way We Live Now*, 66]

                          (Levin and Rappaport Hovav (1995 : 34 f.))

According to their analysis, the construction in (1a), for example, is derived in the following manner : the verb *soak* takes an object NP (*all your fine washables*), but by adjoining the (resultative) phrase *clean*, the object and the adjoined phrase come to establish a predication relation (by satisfying the mutual m-command requirement), and the established 'small clause' represents a resulting event caused by the denoted action.

As for the resultative construction of type (ii), the transitive verb is followed by the resulting event structure which consists of a 'fake (nonsubcategorized) NP' and a resultative phrase. They consider, following Carrier and Randall (1992), that the operation to generate type (ii) is available only when the transitive verb involved may take an 'unspecified object' (i.e., if the intransitive use of a verb is possible).[4] They present the following examples for case (ii) :

(8) a. Sudsy cooked them all into a premature death with her wild

food. [P. Chute, *Castine*, 78]

    b. 'I'm glad you didn't stay at the Club drinking yourself dottier.' [W. Muir, *Imagined Corners*, 62]

    c. Having . . . drunk the teapot dry . . . [E. Dark, Lantana Lane, 94]

    d. Drive your engine clean. (Mobil ad)

(Levin and Rappaport Hovav (1995 : 37))

However, as pointed out in Levin and Rapoport (1988), there are resultative constructions involving a (transitive) verb which cannot select an unspecified object. In other words, there are cases, contrary to Levin and Rappaport Hovav (1995), where (obligatorily) transitive verbs can appear in resultative constructions. Consider the following examples :

(9) a. Matilda poked a hole in the rice paper screen (with her cane).

    b. Stephanie burned a hole in her coat (with a cigarette).

    c. Frances kicked a hole in the fence (with the point of her shoe).

(Levin and Rapoport (1988 : 278))

The object NPs above are not selected by the verbs. We should notice that the verbs in (9) are not Effect verbs but basically pure Affect verbs. Thus the sentences are ruled out when the PPs are dropped as in (10). This means that the possibility of the operation for case (i) in Levin and Rappaport Hovav (1995) is excluded.

(10) a. *Matilda poked a hole.

    b. *Stephanie burned a hole.

    c. *Frances kicked a hole.

Moreover, they do not allow intransitive use and cannot take an 'unspecified object' as the following examples show.

(11) a. *Matilda always pokes.

    b. *Stephanie burns.

    c. *Frances kicks.

Lastly, the sentences in (9) suggest that the constituents following the verbs form 'small clauses', which represent, in Levin and Rapoport's (1988) terms, resulting events (i.e., the 'result' in (20)). Thus, the structure of the

sentences in (9) can be represented as follows :

(9') a. Matilda poked [sc a hole in the rice paper screen]
(with her cane).
b. Stephanie burned [sc a hole in her coat] (with a cigarette).
c. Frances kicked [sc a hole in the fence] (with the point of her
shoe).

Then the operation for (ii) proposed by Levin and Rappaport Hovav is not enough and is too strict to generate the constructions in (9). In order to cover these sentences, we need to extend the operation to apply even to cases where verbs may not take an unspecified object. To generate the sentences in (9), application of the second operation should not be restricted to transitive verbs which also have their intransitive counterparts (contrary to Levin and Rappaport Hovav (1995)). It is not whether or not the (transitive) verbs involved allow intransitive use that triggers the relevant operation. What is crucial in the second operation is only the fact that transitive verbs involved are detransitivized (irrespective of whether the resulting intransitive constructions are grammatical). What this means is that the effect of detransitivization (and the function of the resulting intransitive verb in the construction) is only to focus on the action itself. In other words, the operation for (ii) in Levin and Rappaport Hovav (1995) should not be restricted only to transitive verbs which may select an unspecified object. To sum, the second operation is carried out in the following manner : to detransitivize a transitive verb (by suppressing the object) and add a small clause which consists of a fake NP and a predicative PP, which represents a resulting event. (The detransitivized verb corresponds to the "manner/instr" in (5).

Here we can summarize the operations of generating the resulting event construction (lexical subordination) in the following way : the construction which involves a resulting event is generated by either (i) to adjoin a resultative phrase to the transitive construction, in which case the object and the added phrase together constitute a resulting event and the former functions as the subject of the event (this is the operation for case (i) of Levin and Rappaport Hovav (1995)) ; (ii) to suppress the (canonical)

object (i.e., to detransitivize transitive verbs) and newly add a small clause which corresponds to the resulting event. As for (i), we follow Levin and Rappaport Hovav (cf. Williams (1983)) in assuming that mutual m-command relation between the object NP and the adjoined phrase establishes the predication relation, and this 'small clause' represents the resulting event. As for operation (i) (and presumably for (ii)), the small clause adjoined to the detransitivized verb consist of an NP and a predicative phrase (e.g., PP), where the former functions as a 'fake' object to the verb.[5]

3. Analysis

With the two operations for the resulting event construction reformulated above, we will analyze, in this section, the relation between the verb classes in (1-4) and the Material/Product (henceforce, M/P) alternation. The basic strategy of our analysis is as follows : since the postverbal constituents in each variant represent a resulting event, both of the two frames (the *into* and the *from / out of* variant) of the M/P alternation must be generated either of the two operations. If both variants can be generated through either of the operations, this means that the M/P alternation is possible. On the other hand, if neither of the two operations can apply to the base (transitive) construction somehow, the intended variant will be ruled out, and hence the alternation will be impossible for the verb class.

3.1. KNEAD / TURN Class Verbs

We start with the KNEAD/TURN classes. Verbs of these classes do not allow the M/P alternation :   they allow the *into* variant but not the *from / out of* variant. We repeat the relevant examples below :

(3)   KNEAD class verbs :

    a.   I kneaded the dough into a loaf.

    a'. *I kneaded a loaf from the dough.

    b.   John collected fallen leaves into a heap.

    b'. *John collected a heap from/out of fallen leaves.

    c.   She twirled my hair into a column with great dexterity.

    c'. *She twirled a column from/out of my hair with great dexter-
       ity.

(4) TURN class verbs :

    a. The witch turned him into a frog.

    a'. *The witch turned him from a prince.

    b. The student converted water into steam.

    b'. *The student converted steam from/out of water.

    c. They rapidly transformed their feudal nation into a modern
       state.

    c'. *They rapidly transformed a modern state from/out of their
       feudal nation.

Let us examine the *into* variant. We can easily observe that the basic
type of the verbs is the Affect type (cf. Nakau (1994)), selecting a patient
object. Then, the *into* phrase, which involves an NP denoting the Product
is expected to be an adjunct and optional. Consider the following exam-
ples with a KNEAD class verb :

(3') KNEAD class verbs :

    a. I kneaded the dough (into a loaf).

    b. John collected fallen leaves (into a heap).

    c. She twirled my hair (into a column) with great dexterity.

Thus, we can say that the resulting event structure in the *into* variant is
derived simply by adjoining PP with *into*. In other words, the verb pre-
serves the semantic-selectional properties of the Affect type, and the pa-
tient object and the adjoined phrase seem to form a small clause repre-
senting a resulting event. This operation is the first of the two operations
proposed in section 2. However the *into* PP cannot be dropped and in the
into variant of the TURN class verbs. Consider the following examples :

(4') TURN class verbs :

    a. The witch turned him *(into a frog).

    b. The student converted water *(into steam).

    c. They rapidly transformed their feudal nation *(into a modern
       state).

The PP is obligatory and this fact may seem to imply that the second op-

eration but not the first one is involved in deriving the *into* constructions
in (4). It is true that the object NP and the *into* PP appear to represent a
resulting event. However, we should consider that the *into* variant with a
TURN class verb is not derived through the second operation, either : In
other words, the variant is derived through neither of the operations. We
assume here that TURN class verbs are inherently subcategorized for an
NP and a PP headed by *into*. The reason for this assumption comes from
the Total Transformation alternation of the TURN class (cf. Levin (1993 :
2.4.3).[6] According to Levin, the TURN class is the only verb class which
allows this alternation, and in each variant of it, the entity which under-
goes a certain change and the one which comes to exist as a result of the
event must be obligatorily expressed as NP object and *into* PP, respec-
tively (while the *from* PP is optional).[7] Thus, in the M/P alternation as
well, we consider that TURN class verbs are, by themselves, selecting the
Material (object NP) and the Poduct (the *into* PP) ; neither operation pro-
vided in section 2 is involved in the *into* variant of the TURN class.

Now we must explain why these classes of verbs do not trigger the al-
ternation : why is it that they are excluded from the *from/out of* variant
(in contrast to the BUILD/CREATE classes) ? As we have seen in section
2, there are two possible ways for generating the construction which in-
volves a resulting event. One is to adjoin a prepositional phrase to the
transitive construction, so that the object NP and the PP forms a small
clause ; and the other is to detransitivize a transitive verb and adjoin a
small clause which corresponds to a resulting event.

We can easily exclude the first operation. Since the verbs in (3) and
(4) are of the Affect type, Product NPs cannot occupy the object position,
which are to be followed by a resultative phrase. Moreover, the NP in the
from/out of PP refers to a Material, it must correspond to the patient ob-
ject, but this is contrary to the requirement of the verbs involved. Thus,
we cannot construe the object NP and the *from/out of* PP as representing
a resulting event. Then, the remaining option is the second operation : to
detransitivize the verb, and then adjoins a small clause representing a re-
sulting event. But the fact suggests that this option is not available,

either. In other words, this *from / out of* frame cannot have the following structure : *Vi + [sc NP + *from / out of* NP]. Let us examine the second possibility for the resulting event construction in detail. In order to rule out the *from / out of* variant, we must explain why this operation should also be excluded.

Here, we need to examine the notion of Product again. If we carefully examine the Product NP in the *into* variant based on a KNEAD/TURN class verb, and compare it with Product NPs in the other classes of verbs (i.e., the BUILD and the CREATE class), we find that there is one clear difference between them. Compare the Product NPs (which are italicized) in (3) and (4) on the one hand, and those in (1) and (2) on the other :

(3) KNEAD class verbs :

    a. I kneaded the dough into *a loaf.*

    b. John collected fallen leaves into *a heap.*

    c. She twirled my hair into *a column* with great dexterity.

(4) TURN class verbs :

    a. The witch turned him into *a frog.*

    b. The student converted water into *steam.*

    c. They rapidly transformed their feudal nation into *a modern state.*

(1) BUILD class verbs :

    a. Martha carved *a toy* out of the piece of wood.

    a'. Martha carved the piece of wood into *a toy.*

    b. He assembled *the computer* himself from parts.

    b'. He assembled the parts into *a computer.*

    c. Lucy tried to spin *thread* out of wool.

    c'. Lucy tried to spin wool into *thread.*

(2) CREATE class verbs :

    a. David constructed *a house* out of/from bricks.

    b. The writer created *a great work* purely from his imagination.

    c. She correctly derived *a conclusion* from evidence.

We notice here that the product NPs in the KNEAD/TURN classes cannot be regarded as pure created entities resulting from the activities denoted

by the verbs. Rather, they represent merely 'resulting states' or 'resulting forms or shapes' of an entity. On the other hand, the Products in the other classes are pure products (resultant objects) and the verbs of these classes are of the Effect type.[8]

Then the resulting event encoded in the *into* variant of the KNEAD/ TURN classes (more specifically, the small-clausal sequence 'Material NP *into* Product NP') does not represent an 'appearance of an entity' (or a 'creating activity') but a 'change of state (including form or shape)' of an entity. (The verbs are of the Affect type.) In other words, what are referred to by the two NPs in the small clause are a 'starting state' and a 'resulting state', both sharing and keeping the inherent property of the entity.

If this is the case, then the corresponding NPs in the *from/out of* variant can also be regarded as representing a starting and a resulting state (though their order is reversed), and no NP in this frame represents a resultant object, either. This can be schematically represented in the following way :

(12)　KNEAD/TURN class verbs

　　　a.　*into* variant :　　　　　x V [y → y']

　　　b.　from/out of variant :　　*x V [y' ← y]

　　　(cf. y = a starting state ; y' = a resulting state)

The claim that the Product is not a resultant entity but a resulting state is supported (at least for the TURN class) by the possibility of the Total alternation (cf. Levin (1993 : 2.4.3)). As the following example indicates, TURN class verbs allow the *from-into* variant ((13b)).[9]

(13)　a.　The witch turned him into a frog.

　　　b.　The witch turned him from a prince into a frog.

　　　　　　　　　　　　　　　　(Levin (1993 : 57))

Since the verb *turn* in (13 b) takes an object NP (besides the two NPs in the PPs), we can clearly see that the object *him* is the entity undergoing a change of state and that the NP in the *from* PP represents a starting state and the one in the *into* PP a resulting state of the entity.

As for the KNEAD class, in contrast to the case with the TURN class,

the Total alternation cannot support the claim that the Product is a re-
sulting state because the alternation is not allowed for this class (cf. Levin
(1993 : 2.4.3)).[10] Compare the following pair with (13) :

(14) a.   I kneaded the dough into a loaf.

　　b. *I kneaded the dough from a lump into a loaf.

<div style="text-align:center">(Levin (1993 : 57))</div>

However, we purport that our claim concerning the nature of the 'Product'
and the 'Material' can also be extended to the KNEAD class as well. That
is because, with a close look at the examples of the *into* variant of this
class, it will be clear that the NPs following the preposition *into* (corre-
sponding to the 'Product' in Levin (1993)), represent only a state of the en-
tities referred to by the object NPs. Consider the following examples of the
KNEAD class, where the italicized NPs represent only a state (or a shape)
of the object NPs :

(15) KNEAD class verbs :

　　a.   He beat gold into *gold leaf*.

　　b.   It's easy for my mom to beat/whisk/whip eggs into *a froth*.

　　c.   I bent a piece of metal tubing into a *U-shape*.

　　d.   My mother twisted my long hair into *braids*.

　　e.   Lucy can fold a piece of paper into *the figure of a crane*.

　　f.   David drove/whipped/worked himself into *a frenzy / fury*.

　　g.   She worked worked herself into *a sweat*.

　　h.   The speaker worked his audience into *a frenzy*.

We have seen so far that the Material and the Product of the KNEAD/
TURN classes represent a starting and a resulting state, respectively, and
that the resulting event denoted by the small clause (i.e., [object NP +
PP]) encodes a change of state. We are now in a position to explain why
the *from / out of* variant is impossible for these classes.

　　Levin and Rapoport (1988) argue that types of the resulting event (the
'result' clause in (5), in their terms) are limited in number, claiming that
"lexical subordination does not result in the creation of arbitrarily complex
LCS" (p. 283). This means that the predicates which can appear in the re-
sulting event fall into a limited number of types. They list, with an exam-

ple for each, the following as the possible types of predicates :[11]

(16) a. go : The bottle floated into the cave.

     b. create : Frances kicked a hole in the fence.

     c. remove : The company processed the vitamins out of the food.

     d. cause-state : Evelyn wiped the dishes dry.

     e. cause-location : Philip waltzed Sally across the room.

     f. express : Pauline smiled her thanks.

                     (Levin and Rapoport (1988 : 283))

Among the types listed above, the change of state is included in (16 a), and it may be represented by the GO function. If their analysis is correct, and GO is the only possible function for the event, then there is expected to be no function semantically reversed to GO (say, for example, the '$-$GO' or 'COME (FROM)' function). Then, if it is the change of state that must be encoded in a resulting event clause, the predicate in the clause must be consistent with the GO function.

Now we can explain the unacceptability of the *from/out of* variant with a KNEAD/TURN class verb. Even if verbs of these classes are de-transitivized (suppressing their object NPs) and adjoined a small clause structure, the resulting event (namely, the change of state) cannot be structurally expressed at all because of the lack of the '$-$GO' or 'COME FROM' function and thus the second possibility cannot generate the intended structure either.

(12') KNEAD/TURN class verbs :

     a. *into* variant :   x CAUSE [y GO y']

     b. *from/out of* variant :   x CAUSE [y' *COME FROM y]

As a result, the *from/out of* variant is ruled out for these classes of verbs.

In this connection, we point out that when the resulting event represents an appearance of an entity or a creating activity, the second choice (i.e., detransitivization plus adjunction of a small clause) is possible. This is the case with the sentences in (9), repeated below.

(9) a. Matilda poked a hole in the rice paper screen (with her cane).

     b. Stephanie burned a hole in her coat (with a cigarette).

     c. Frances kicked a hole in the fence (with the point of her shoe).

We should compare these examples with the *from/out of* variant with a KNEAD/TURN class verb, which is ungrammatical. For example, a hole in (9a) does not merely describe a state or a form of the fence (which is the patient of the act of kicking) but a resultant (created) object, which came to exist in the fence. Actually, it is impossible for a fence to turn into a hole. Then, in (9), in contrast to the KNEAD/TURN classes, the object NPs are the real resultant objects and not resulting states of some entities. This means that the resulting event (corresponding to a small clause) does not represent a change of state but an appearance of an entity. Then, following Levin and Rapoport (1988), the semantic representation of the sentences in (9) can be schematically expressed as in (17) :

(17)   x CAUSE [z EXIST (IN w)][12]

Hence, the function in the small clause need not (and cannot) be the hypothetical function 'COME FROM', and the sentences are grammatical. This, in turn, further supports our claim that as for the KNEAD/TURN classes of verbs, the resulting event is a change of state rather than a creating activity.

3.2.   *CREATE Class Verbs*

The second class we discuss in this section is the CREATE class.   Verbs of this class also do not allow the Material/Product alternation : they only allow the *from/out of* variant.

(2)   CREATE class verbs :

    a.   David constructed a house out of/from bricks.

    a'. *David constructed the bricks into a house.

    b.   The writer created a great work purely from his imagination.

    b'. *The writer created his imagination into a great work.

    c.   She correctly derived a conclusion from evidence.

    c'. *She correctly derived evidence into a conclusion.

Let us start with the grammatical *from/out of* variant. As is obvious, the basic type of verbs in this class is the (pure) Effect type, which selects a resultant object. Then we expect that the *from/out of* phrase is an adjunct and can be dropped. The following examples show that this is correct :

(2') CREATE class verbs :

    a.   David constructed a house (out of/from bricks).

    b.   The writer created a great work (purely from his imagination).

    c.   She correctly derived a conclusion (from evidence).

This means that even in the *from/out of* variant holds the basic construction, with the verb selecting an object, and the resulting event is derived by adjoining the prepositional phrase to it. In other words, this frame is derived through the first operation for the resulting event construction.

Then, why is this class of verbs excluded from the *into* variant (in contrast to the fact that the BUILD class, which also seems to be of the Effect type, can trigger the alternation)? We will see below that this is because neither of the two possible operations to create the resulting event construction is allowed for CREATE class verbs.

We can easily detect that the first one (i.e., adjoining a resultative phrase) is impossible with this class. In this frame, the object NP and the one in the *into* PP would correspond to the Material and the Product, respectively. On the other hand, since the verb is of the Effect type, it requires its object to represent a resultant entity. Thus, there arises a contradiction, and thus the first choice is not available. Then, the remaining operation at hand is operation (ii). That is, the operation to detransitivize the verb and add a resulting-event small clause. Since the into variant is ruled out as in (2 a',b',c'), we must say that somehow this option should also be unavailable. Here, let us reconsider the case in which the resulting event represents an appearance of an entity, that is the case in (9). We repeat the relevant examples below :

(9)   a.   Matilda poked *a hole* in the rice paper screen (with her cane).

    b.   Stephanie burned *a hole* in her coat (with a cigarette).

    c.   Frances kicked *a hole* in the fence (with the point of her shoe).

We notice here that the created entities (i.e., the resultant NPs, which are italicized above) always occupy the small-clause subject position. Here we speculate that when the resulting event represents an appearance (or a creation of an entity), the resultant is forced to appear in the small-clause

subject position (cf. (17)).[13]   Then, the *into* variant of the CREATE class is excluded because in that frame the Product (i.e., the resultant) cannot appear as the object (i.e., as the small-clause subject) but is forced to be realized in the *into* PP.   Then neither operation can generate the *into* variant and hence verbs of the CREATE class do not allow the M/P alternation.

3.3.   BUILD Class Verbs

The last class is class.   This class, in contrast to the other three classes, allow the Material/Product alternation.   Consider the following examples :

(1) BUILD class verbs :
   a. Martha carved a toy out of the piece of wood.
   a'. Martha carved the piece of wood into a toy.
   b. He assembled the computer himself from parts.
   b'. He assembled the parts into a computer.
   c. Lucy tried to spin thread out of wool.
   c'. Lucy tried to spin wool into thread.

Since the verb *build*, which is qualified as the label of this class, is an Effect verb, it seems natural to consider that, as is the case with verbs of the CREATE class, verbs of this class is also of the Effect type.   Let us assume that this is correct :   the basic type of this verb class is the Effect type, selecting a resultant as object.   If so, we expect that the BUILD class should show the same pattern, with respect to the M/P alternation, as the CREATE class does, contrary to fact.   The BUILD class, but not the CREATE class, is compatible with the *into* variant.

Let us start with the fact that *from/out of* variant is grammatical, which we can expect to be provided with a rather straightforward explanation.   Since the verbs are of the Effect type, the *from/out of* variant is expected, as is the case with the CREATE class, to be derived through the first operation provided in section 2.   Then, we expect that the *from/out of* PP is an adjunct.   Consider the following examples :

(1') BUILD class verbs :
   a. Martha carved a toy (out of the piece of wood).
   b. He assembled the computer himself (from parts).

    c. Lucy tried to spin thread (out of wool).

These examples show that the verbs are still selecting the postverbal (re-sultant) objects and the resulting event in the *from/out of* variant is de-rived by the first operation, namely adjunction of the prepositional phrases.

    In this relation, a comment on the KNEAD/TURN classes is in or-der. At a glance, it may seem that this frame (i.e., the *from/out of* frame) based on the BUILD class and the same frame based on the KNEAD/TURN classes are semantically parallel: in each case, the "Product" occupies the object position and the "Material" appears within the *from/out of* PP. If there were a real parallelism between them, we would have to explain why the variant is OK with the formers but not with the latter. But the fact is not so simple; it is inappropriate to as-sume a simple parallelism by taking the labels (Material and Product) as just cause. As pointed out in the discussion of the KNEAD/TURN classes in 3.1, the resulting event of the KNEAD/TURN classes represents a change of state. On the other hand, the event of the BUILD class repre-sents an appearance of an entity (i.e., creation of an entity). Furthermore, the *from/out of* variant with the former classes are ruled out even if the PP is dropped, whereas the phrase is optional in the case of the latter class and it does not affect the judgement of the frame. This indicates KNEAD/TURN class verbs are typical Affect verbs (and operation (ii) pro-vided in section 2 does not apply to them, ruling out the *from/out of* vari-ant); whereas BUILD class verbs are of the Effect type and, keeping the type as it is, the *from/out* of PP is adjoined as an adjunct.

    Now, let us consider the problematic data, namely the *into* variant with a BUILD class verb. Since this class forms the *from/out of* variant simply by adjoining the PP, the *into* variant cannot be derived simply by adding the PP and we may expect that the only available operation for the *into* variant is the second one, namely detransitivization of the verb plus adjoining a small clause. If we explore the second choice, however, there arise some undesirable results. We must explain a contrast between the CREATE and the BUILD class: Somehow, in contrast to the case with

the former class, this operation is allowed only for the latter class. Why is it that the operation is disallowed for the former but not for the latter? Moreover, this might lead us to abandon the generalization drawn from the (unacceptable) *into* variant of the CREATE class and the case in (9) : the created object must occupy the direct object position (i.e., the small-clause subject position).

Let us start to examine the *into* variant in detail. If it is the second operation which is available to derive the *into* variant, we expect that the *into* PP is an obligatory constituent to the construction, on a par with the PPs in the examples in (9). However, this is not the case. Consider the following examples :

    (1″) BUILD class verbs :
        a'. Martha carved the piece of wood (into a toy).
        b'. He assembled the parts (into a computer).
        c'. Lucy tried to spin wool (into thread).

The prepositional phrases are optional and can be deleted. These examples suggest that verbs of this class has, inherently, the Affect use, as well as the Effect use.

In this relation, it is a well known fact that some verbs in English have both the Affect and the Effect use. For example, verbs like *paint* or *dig* may take either a patient or a resultant object.

    (18) a. Mary *painted* the ceiling of her room.   (Affect)
        b. Mary *painted* a portrait of her mother.   (Effect)
    (19) a. John *dug* the ground.   (Affect)
        b. John *dug* a hole in the ground.   (Effect)

If we carefully compare the verbs of the BUILD class with those of the CREATE class listed in Levin (1993), we notice that most of the former have both the Affect and the Effect use. The following examples, which involve a verb of the BUILD class, provide further support for our analysis of this class, where the verbs take either a patient or a resultant object.

    (20) a. Charlie carved the piece of wood.   (Affect)
        b. Charlie carved her name and his in the bark of the tree.

                                                    (Effect)

(21) a.   The machine weaves threads together.   (Affect)
      b.   Lucy wove a garland of flowers   (Effect)
(22) a.   It's difficult for a child to blow glass.   (Affect)
      b.   Lucy was blowing soap bubbles.   (Effect)
(23) a.   The project assembled technological wonders. (Affect)
      b. Linus assembled a computer.   (Effect)
(24) a.   My grandma is spinning wool.   (Affect)
      b.   My grandma is spinning thread.   (Effect)

On the other hand none of the CREATE class verbs may take a patient object :[14]

(25) a.   *David constructed the bricks.   (Affect)
      b.   David constructed a house.   (Effect)
(26) a.   *The writer created his imagination.   (Affect)
      b.   The writer created a great work.   (Effect)
(27) a.   *She correctly derived evidence.   (Affect)
      b.   She correctly derived a conclusion.   (Effect)

Then, we need to reconsider the assumption regarding the basic type of the BUILD class. Although the name of the class implies that the verbs of this class are Effect verbs, the fact is not so simple. Considering the above examples, we must say that verbs of the BUILD class have both the Affect and the Effect use.[15] Then, we may say that verbs of the CREATE class are of the pure Effect type, whereas BUILD class verbs are of the Effect/Affect class.

What is important in explaining the difference between the CREATE class and the BUILD class with regard to the *into* variant is whether or not a verb has the Affect use. Since the two classes are different in their basic verb types, it seems reasonable to assume that the different grammaticality of the into variant can be attributed to this difference. In other words, the acceptability of the *into* variant depends of the use of a verb, especially the Affect use. If a verb has the Affect use, the first operation (i.e., adjunction of the *into* PP) is available as a resultant, and the patient object and the PP can form a resulting event clause. To sum up, since BUILD class verbs have both the Affect and the Effect use, each frame of

the M/P alternation can be derived by just adjoining a prepositional phrase (i.e., by operation (i)). This means, in other words, that neither frame is generated by operation (ii).

Furthermore, our claim that the *into* variant is not derived by the operation (ii) is supported if we compare the *into* variant of this verb class with the case in (9). That is, when typical Affect verbs undergo operation (ii), the canonical object (patient object) does not occupy the object position. This can be observed in (9'), repeated below :

(9') a. Matilda poked [sc *a hole* in the rice paper screen] (with her cane).

b. Stephanie burned [sc *a hole* in her coat] (with a cigarette).

c. Frances kicked [sc *a hole* in the fence] (with the point of her shoe).

In (9'), the canonical objects appear within the predicative PPs of the small clauses. Moreover, the PPs in (9) are obligatory constituents, as we have seen in (10). Thirdly, in each example above, what comes to exist (the resultant entity) occupies the subject position of the small clause (i.e., the resulting event). On the other hand, in the case of verbs of the BUILD class in their Affect use, the canonical object (patient object) occupies the object position (i.e., the subject of the small clause), and the PP is optional. Moreover the Product (resultant entity) appears within the predicative PP of the small clause. Thus, we conclude that, even if both the verbs in (9') and BUILD class verbs may be regarded as falling within the same type of verb (i.e., the Affect type), they differ from each other in generating their resulting events : the former is derived through operation (ii) whereas the latter by (i). This difference can be reduced to the distinction between the nature of "Product" in each case : in the case of the verbs in (9) the Product is a resultant (which comes to exist as a result of the denoted activity) ; in the case of KNEAD/TURN verbs, on the other hand, it is just a resulting state (or a shape) of an entity.

4. Concluding Remarks

In this paper we have explained the (un)grammaticality of the *into*

and the *from/out of* variant of the Material/Product alternation. Considering each of the two frames as a resulting event construction, we have provided (by reformulating the operation of lexical subordination) two distinct operations to generate the construction. The distribution of the two variants in this alternation is explained in terms of applicability of the two operations.

Notes

* I would like to thank Minoru Nakau for reading an earlier version of this paper. Needless to say, any remaining inadequacies are my own.

¹ As verbs of this class, Levin lists verbs *such as assemble, bake, blow, carve, cast, chisel, cook, fashion, hatch, mold, stitch, weave,* etc.

² Levin (1993) also points out that there is a verb class which allows neither variant. It is the DESTROY class, which involves such verbs as *annihilate, demolish, destroy, exterminate, ruin, waste, etc.* We do not deal with this class of verbs in this paper.

³ Each class involves such verbs as follows :

(i) CREATE class verbs : *concoct, construct, create, derive, form, manufacture, produce, recreate, etc.*

(ii) KNEAD class verbs : *beat, bend, coil, collect, compress, fold, knead, twirl, twist, whip, wind,* etc.

(iii) TURN class verbs : *alter, change, convert, metamorphose, transform, transmute, turn,* etc.

⁴ We quote their claim below :

(i) "[A]s pointed out by Carrier and Randall (1992, in press), transitive verbs that do not independently allow the omission of an unspecified object cannot be found in resultative constructions with postverbal NPs that are not selected by the verb. ...

We follow Carrier and Randall (1992, in press) in claiming that non-subcategorized NPs are found only after verbs that can independently be intransitive (i.e., the verb is unergative or may take an unspecified object).

(Levin and Rappaport Hovav (1995 : 38f.))

⁵ Since the verbs dealt with in the paper are not unergative, we can ignore the third possibility proposed in Levin and Rappaport Hovav (1995), i.e., the operation which generates resultative constructions with an unergative verb.

Operation (iii) is exemplified with the following examples in Levin and Rap-

paport Hovav (1995) :
- (i) Dora shouted herself hoarse.
- (ii) a . We searched the woods and cliffs, yelled ourselves hoarse and imagined you drowned . . . [M. Wesley, *A Sensible Life,* 327]
  - b . Well, the conclusion was that my mistress grumbled herself calm. [E. Bronte, *Wuthering Heights,* 78]
  - c . The compere stands by grinning awkwardly and the other officers laugh themselves helpless. [P. Lively, *Moon Tiger,* 112]

[6] The Total Transformation alternation with a TURN class verb is exemplified below :
- (i) a . The witch turned him into a frog.
  - b . The witch turned him from a prince into a frog.

(Levin (1993 : 57))

[7] See also the discussion below in this subsection.

[8] In section 3.3, we will argue that verbs of the BUILD class, in contrast to the CREATE class, cannot be considered pure Effect verbs.

[9] See Levin (1993 : 2.4.3) for the Total alternation.

[10] See Levin (1993 : 2.4.3) for the Total alternation.

[11] They claim that the resulting events involving one of the predicates in (16) can further be reduced to two major types, and provide the following two lexical structures for the resulting event :
- (i) a . [x BECOME (AT) y]
  - b . [x CAUSE [y BECOME (AT) z]]

(Levin and Rapoport (1988 : 284))

[12] It is interesting to point out that the verbs in (9) are Affect verbs and their canonical objects (i.e., patient objects, which are once suppressed) are realized as predicative PPs within the small clauses. Compare the following sentences with those in (9) :
- (i) a . Matilda poked the rice paper (with her cane).
  - b . Stephanie burned her coat (with a cigarette).
  - c . Frances kicked the fence (with the point of her shoe).

Thus, for example, sentence (9 c) the patient of the action must be the fence itself and thus cannot be paraphrased with the following sentence :
- (ii) Frances kicked a ball at the fence and as a result a hole was made in the fence.

[13] We leave open the question of what derives this generalization.

[14] The verb which is problematic to our analysis is *dig* (a CREATE verb, in Levin (1993)), which, apparently, has both the Affect and the Effect use.
- (i) a . He is digging the ground.   (Affect)
  - b . He is digging a grave.   (Effect)

We cannot provide an answer to this problem.

¹⁵ Considering the label of this class (i.e., 'BUILD'), it seems that Levin (1993) regards the verb *build* as a typical representative of the verbs listed in (146). However, it does not have the Affect use. Considering the fact that most of the verbs of this class may also be used as Affect verbs, we must say that the label itself is misleading, though we continue to refer to this class as the BUILD class.

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