English and Japanese Resultatives

Resultative Constructions vs. Lexical Resultatives

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Abstract

Linguistic expressions describing a situation where an action brings about a result are called resultative expressions or resultatives. Of resultatives, those based on construction are resultative constructions. English resultative constructions are considered a family extending from core cases to peripheral and idiomatic instances. On the other hand, contrary to ordinary opinions, the Japanese language lacks explicit resultative constructions. Its resultative expressions are limited to pseudo-resultatives and resultative verbal compounds. Resultative expressions can be of two types; those whose causal relation derives from construction and those whose causal relation derives from a word. English has these two resultatives, but Japanese has only the latter. In other words, when viewed from the origin of where the causal relationship represented by CAUSE comes from, resultatives can be divided into those whose CAUSE originates lexically and those whose CAUSE originates from the construction. English has both types, while Japanese has only the lexically originated causal relationship. This paper examines this issue in detail.

Keywords: resultative constructions, construction grammar, verbal compounds

1. Introduction

1.1 Terminology

First, we need to clear away terminological issues. We use the terms such as "lexical items" and "constructions," which are related to Construction Grammar. However, Construction Grammar is not monolithic. On one approach, which Jackendoff (2013: 78) calls *homogeneous Construction Grammar*, the researchers (Goldberg 1995, 2006, 2013; Croft 2001, among others) assume that morphemes, words, idioms, sentence rules are all "construction." In their view, words are lexical constructions. They claim that English expressions are a collection of constructions, and there is no need for autonomous syntax. They argue that each construction has a structure and a specific meaning, which determines the core meaning of a linguistic expression. For example, the transitive verb construction has a specific syntactic configuration: $[X_1 \, V \, Y_2]$, and the unique meaning: "predication" (Goldberg 1995, 2006, 2013).

In contrast, another approach, which Jackendoff (2013: 79) calls *heterogeneous Construction Grammar*, opts for the idea that a particular meaning-structure pair is a lexical item rather than a construction. This version considers that only constructions with a unique meaning, such as resultative construction, belong to the lexicon and that constructions without a unique meaning (ex., the transitive verb construction) do not belong to the lexicon. In this approach, they distinguish between a meaningful construction (m-construction: a pair of meaning and form, considered a lexical item) and a form-only construction (f-construction) and assume that the autonomous syntax is a part of grammar.

We adopt the heterogeneous Construction Grammar. In other words, we assume that not all constructions have a unique meaning; the existence of autonomous syntax is a part of grammar, and the m-construction with a unique meaning is a lexical item. The term "resultative expressions" or "resultatives" refers to all linguistic expressions that express a relationship between cause and effect. In contrast, we confine the term "resultative construction" to the resultative expression whose causal meaning derives from its construction. The resultative expression whose causal meaning depends on the verb is called "lexical (or word-dependent) resultative expression." In short, resultatives have two types: resultative constructions and lexical resultative expressions.

The following (1) and (2) are all resultatives, including both types.

(1) a. John made Keiko get angry.
 b. John watered the tulip flat.
 c. John broke the vase to smothering.
 d. John shot the bear dead.

(2) a. Ken-wa Keiko-o okora-se-ta.
  Ken-TOP Keiko-ACC get angry make-PAST
  Ken made Keiko get angry
 b. Ken-wa hana-ni mizu-o yat-te taoshi-ta
  Ken-TOP flower-DAT water-ACC give-TE topple-PAST
  Ken watered the flower flat.
 c. Ken-wa kabin-o konagona-ni kowashi-ta.
  Ken-TOP vase-ACC pieces-IN break-PAST
  Ken broke the vase into pieces.
 d. Ken-wa kuma-o uchi-koroshi-ta.
  Ken-TOP bear-ACC shoot-kill-PAST
  Ken shot the bear dead.

The sentences in (1) are examples of resultatives in English, and those in (2) are Japanese resultatives that correspond semantically to (1). In (1a), an overt causative where a lexical resultative verb *make* appears. The corresponding Japanese (2a) also uses the lexical causative verb "seru." Sentence (1b) is an example of a typical English resultative. It describes an event of watering a flower and causing it to fall in one sentence. In Japanese, the same content cannot be obtainable in one sentence. However, it is achievable by combining two events connected by the conjunctive particle TE: "watering the flower" and "toppling the flower." Sentence (1c) is also often taken up as an example of the resultative construction. This sentence has a change-of-state transitive verb *break*. However, (1c) is not a genuine case of resultative construction, to which we will return soon. The corresponding Japanese (2c) also has a structure parallel to (1c) and has almost the same meaning. (1d) is also an example of the English resultative. The corresponding Japanese has a similar meaning, but the related causal relationship differs. This issue will be described in detail later.

1.2 Lexical (word-dependent) resultatives vs. resultative constructions

The above is an enumeration of English resultatives and corresponding Japanese resultatives. We will look at the differences between English lexical, word-dependent resultatives and resultative constructions. We will also consider the correspondence in Japanese.[1] First, (1a) is shown in the conceptual structure as follows.

(3) i. John made Keiko get angry
  ii. John CAUSE [Keiko BECOME angry]
  iii. make: λxλyλP [x CAUSE y BECOME P]

The conceptual structure (3ii) represents the meaning of (3i). (3iii) shows that its CAUSE derives from the verb *make*. (3i) is a case of the lexical or word-dependent resultative because its CAUSE derives from a word. Then we will consider how the function CAUSE in a resultative construction manifests itself.

(4) John watered the tulip flat
 Jn CAUSE [tulip BECOME flat] by watering

Again, the conceptual structure shows the meaning of the sentence. However, unlike (3), the CAUSE is not included in the verb, and its origin must be sought somewhere else.[2] Construction Grammar stipulates that the construction has the

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[1] Washio (1997) identifies two types of resultatives: weak and strong resultatives. He argues that only weak resultatives represented by *freeze X solid* or *wiped X clean* can find their counterparts in Japanese and that the class of strong resultatives represented by *drag X smooth,* or *run X threadbare* cannot have their Japanese counterparts. His *weak resultative* roughly corresponds to our *lexical*, *word-dependent resultative expression*, and his *strong resultative* to our *resultative construction.* However, we use our dichotomy since we focus on clarifying where causality comes from in resultatives, including Japanese compound verbs.

[2] Bittner (1999), citing an example "*I drank the teapot empty*," calls the causal relation in this sentence *concealed causative* because there is no lexical element that indicates causality in the resultative construction. Sentence (4) is also an example of this hidden causal relation. In this paper, we have adopted the construction grammatical interpretation of this hidden causality but this is not the only solution. Kratzer (2005) proposes *Causative Shift* that allows an event to be interpreted as a resultative state.

core meaning as in (5) (Goldberg & Jackendoff 2004).

(5) John watered the tulip flat.
    con-sub: John CAUSE [the tulip BECOME flat]
    MEANS (v-sub): John water tulip

Goldberg & Jackendoff 2004 stipulates that the argument structure of the resultative is given not by the verb but by the "construction," and the verb expresses the mode or means. In general, the resultative construction is defined as follows.

(6) Syntax and Semantics Provision of Resultative Construction (Goldberg & Jackendoff 2004: 539)
    Syntax: NP_1 V NP_2 AP_3
    Semantics
    c-sub: X_1 CAUSE [Y_2 BECOME RP_3]
    MEANS: v-sub: [X_1 V (Y_2)]

The adjective "*flat*" indicates the resulting state in the syntactic structure. They call this phrase the "resultative phrase" or "RP." The subject "*John*" of the transitive verb "*water*" is NP1, and the object "*the flower*" is NP2 (subscripts indicate correspondence). Also, the meaning of the resultative construction is composed of a constructional subevent (c-sub) and a verbal subevent (v-sub). The argument structure is given not from the verb but constructional subevent. The terms X1, Y2, and RP are selected by the construction, not by the verb. We interpret verbs in this construction as indicating means (MEANS). In summary, the causal relationship derives from the word's meaning in the word-dependent resultative expression. In the resultative construction, the CAUSE derives from the construction as in (5).

1.3 Organization of this paper

The structure of this paper is as the following. In Section 2, after this introduction, we will give an overview of so-called English resultative constructions and extract those that do not have a causal relationship derived from the construction. This elaboration clarifies the range of what is treated as the resultative construction. In Section 3, we scrutinize the Japanese resultatives expressions. We argue that the they do not meet the conditions that prescribe the resultative construction. We also examine the syntactic and semantic features of the resultative compound verbs. Furthermore, we inspect instances of two clauses connected by the particle TE and the degree expression HODO. The compound sentences of these types can express the meaning close to the causal relationship. This close examination clarifies that English has two types of resultatives: resultative constructions and word-dependent, lexical resultative expressions. It also clarifies that Japanese has word-dependent resultatives but no resultative constructions. Section 4 provides the conclusion and prospects.

2. Variety of the English Resultatives

2.1 Classification factors

The following factors can categorize the resultative constructions (Goldberg & Jackendoff 2004, Iwata 2019).

(7) Classification factors of the resultative constructions
    (i) Causative or non-causative?
    (ii) Whether the resultative phrase (RP) is an adjective phrase (AP) or a prepositional phrase (PP)
    (iii) Whether the RP is a property or a spatial
    (iv)Whether the verb is transitive or intransitive, and if the verb is transitive:
        (a) whether to subcategorize the object or not
        (b) whether it is a change-of-state transitive
    (v) Whether the RP's descriptive object (host) is an object or a subject

We will examine the semantic features according to the classification factors of the constructions. We start with the resultatives with transitive verbs.

2.1 Resultatives with transitive verbs

2.1.1 RP host: the object, V: a non-change-of-state transitive verb

Let us start by examining a causal resultative construction with a non-change-of-state transitive verb, having the object predicated by RP. See the examples below. The difference between (8) and (9) is whether the transitive verbs select the object or not.

(8) Transitive verb (with a subcategorized object)
  a. Mary shook her husband awake.
  b. John hammered the metal flat.
  c. Bill wiggled himself through the hole.

(A: Dowty 1979, b: Simpson 1983, c: Goldberg & Jackendoff 2004)

(9) Transitive verb (non-subcategorized object)
 a. They drank the pub dry.
 b. The critics laughed the play off the stage.
 c. We yelled ourselves hoarse.
 d. The professor talked us into a stupor.
 e. She cried her head off.
   (a-d: Goldberg & Jackendoff 2004, e: Iwata 2019)

In all examples above, RP is an object host. RP is an adjective phrase (8a, b, 9a, c) and prepositional phrase (8c, 9b, d, e). When RP is an adjective phrase, it represents an attribute. When RP=PP, it represents a space (8c, 9b, e) or an attribute (9d). Also, as in (9e), the resultative construction may be used idiomatically as hyperbole. The critical point about the above examples is that these verbs are process verbs, not change-of-state verbs. Let us show the semantic structure of some of these examples, following Goldberg & Jackendoff (2004).

(10) a. Mary shook her husband awake.
      Semantics
      c-sub: Mary CAUSE [her husband her BECOME awake]
      MEANS: v-sub: [Mary shake her husband]
   b. Bill hammered the metal flat.
      Semantics
      c-sub: Bill CAUSE [the metal BECOME flat]
      Means: v-sub: [Bill hammer the metal]
   c. They drank the pub dry.
      Semantics
      c-sub: they CAUSE [the pub BECOME dry]
      Means: v-sub: [they drink]
   d. The critiques laughed the play off the stage.
      Semantics
      c-sub: The critiques CAUSE [the play MOVE off the stage]
      MEANS: v-sub: [the critiques laugh]
   e. She cried her head off.
      Semantics
      c-sub: she CAUSE [her head her MOVE off her head her]
      MEANS: v-sub: [she cry]
      Pragmatics: She cried awfully.

The resultative construction is composed of two subevents, and its semantics is represented in a complex manner by a constructional subevent (c-subevent) and a verb subevent (v-subevent). Also, in these examples, the verb is a process verb without having an innate completion point. The semantic commonality in these examples is that the function CAUSE comes not from the verb but the construction. The construction selects the subject, the object, and the resulting predicate. [3] (10e) means "Keiko cried and her head came off," but pragmatically, it means "he cried awfully."

In examples (8), the verbs subcategorize the objects, and sentences without the resultative phrase (RP) are acceptable. When they have an RP, the verb phrases have a completion point and shift to the achievement verbs as below.

(11) a. Bill shook Lisa for five minutes / * in five minutes.
     b. Bill shook Lisa awake in ten seconds /? For ten seconds.

(12) a. Bill hammered the metal for an hour / * in an hour.
     b. Bill hammered the metal flat in an hour /? For an hour.

(13) a. Bill wiggled himself for ten seconds / * in ten seconds.
     b. Bill wiggled himself through the hole in ten seconds /? for ten seconds.[4]

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[3] Iwata (2019) stipulates the resultative construction by his force-recipient approach. The syntax X_1 V Y_2 Z_3 corresponds to the semantics "X_1 ACT ON Y_2, and as a result, Y_2 becomes Z_3." the causal function CAUSE is not specified and is embedded in the formula.

[4] Borer (2005), citing an example "*John hammered the metal flat for hours, but the metal did not become flat,*" argues that *hammer-flat* is a compound predicate and does not necessarily require a culmination point. However, in this

Consider then the cases of change-of-state transitive verbs. These are acceptable without RP as in (14).

(14) resultatives with a change-of-state transitive verb
    a. John broke the vase (into pieces).
    b. Bill painted the wall (green).
    c. Kate bent the iron bar (into a U).

Pustejovsky (1991) claimed that sentences like *the river froze solid* and *the bottle broke open*, which have non-accusative intransitive verbs with a change-of-state meaning, looking like resultatives, are nothing but expressions with additional phrases. (Pustejovsky 1991: 76). He said that it is clear from the following.

(15) a. The river froze in 20 minutes.
    b. The river froze solid in 20 minutes.

Note that the events depicted in (15a) and (15b) are the same event and that having a consequential predicate does not shift the verb from the process to a complete achievement verb. The same is true for the cases with change-of-state transitive verbs as below.

(16) a. John broke the vase in a flash.
    b. John broke the vase into pieces in a flash.

(17) a. Bill painted the wall in half an hour.
    b. Bill painted the wall green in half an hour.

(18) a. Kate bent the iron bar in a second.
    b. Kate bent the iron bar into a U in a second.

By adding RP, there is no semantic shift in the verbs. In other words, these sentences intrinsically have a completion point even without RP, and RP only supplements the completion point. Furthermore, the sentences with a change-of-state verb are highly acceptable as in (19) regarding the middle construction. However, the sentences with a non-change-of-state process verb are not acceptable as middle construction as in (20). Furthermore, the acceptance level increases when a resultative phrase is added.

(19) a. The vase breaks easily.
    b. The wall paints easily.
    c. The iron bar bents easily.

(20) a. * The dog shakes easily.
    b. The dog shakes awake easily.
    c. * The metal hammers easily.
    d. The metal hammers flat easily.

From the above, it is plausible that the change-of-state transitive verbs conceptually include the meaning of completion expressed by [CAUSE ~ BECOME P], and CAUSE is derived from the verb itself, not from the construction. Therefore, the meaning of this type of resultative expression, unlike the cases of resultatives with a non-change-of-state transitive verb illustrated as in (10), is not composed of a constructional subevent (c-sub) and a verbal subevent (v-sub). What appears to be a resultative predicate is an additional phrase, not a term selected by the construction. After all, the conceptual structure of the resultative expression with a change-of-state transitive verb is as follows.

(21) a. John broke the vase into pieces.
    John's action on the vase CAUSE [the vase BECOME BROKEN] + [adjunct into pieces]
    b. Bill painted the wall green.
    Bill's action on the wall CAUSE [the wall BECOME PAINTED] + [adjunct green]
    c. Kate bent the iron bar into a U.
    Kate's action on the iron CAUSE [the iron BECOME BENT] + [adjunct into a U]

For example, (21a) indicates that John's action on the vase is the direct cause for the vase to be broken and that the sum of John's action and its result is identical to a completed action of breaking the vase. Unspecified John's action may be anything to break the vase, such as dropping the vase on the ground or throwing it at a wall. We conclude that this type of resultative expression with a change-of-state transitive verb is not a case of resultative construction but a case of lexical resultative expression.

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example, the second sentence prompts the reinterpretation of the preceding sentence, and cancels the completion by interpreting as *John <u>tried</u> to hammer the metal flat.*

2.1.2 RP host: subject

In the above examples, RP predicates the object. There are some resultative expressions with transitive verbs in which the RP describes the subject. Consider the following.

(22) Subject host, non-causal
a. Bill followed the thief into the library.
b. Bill took the train to New York.
c. Bill traveled the Taconic Parkway to New York.
   (Goldberg & Jackendoff 2004)

These examples have in common that the object is not a patient affected by the verb. Prepositional phrases predicate the subject, not the object. Goldberg & Jackendoff (2004) raises two possibilities for their semantic representation.

(23) Bill followed the thief into the library.
   Syntax: NP1 V NP2 PP3
   Semantics: c-sub: X1 GO Path 3
   Means: [v-sub: X1 GO [Path DETERMINED BY Y2]

This rule stipulates that the constructional subevent (c-sub) specifies the subject's movement along a path and that the selectional restriction on the verbal subevent (v-sub) indicates the subject's traversing a path determined by the object. In (23), the verb *follow* satisfies the selectional restriction. However, this does not explain the example in (22b, c). Another interpretation is given in (24) (25) below.

(24) Bill followed the thief into the library.
   Syntax: NP1 V NP2 PP3
   Semantics: C-sub: X1 GO-AFTER Y2 Path3
   INSTANCE: [v-sub] e.g., follow, track, trace

(25) Bill took the train to New York.
   Syntax: NP1 V NP2 PP3
   Semantics: c-sub: X1 GO-BY WAY OF Y2 Path3
   INSTANCE: [v-sub] e.g., take
   OR MEANS: [v-sub] e.g., ride, sail, drive

(24) is the stipulation about a sentence with a verb whose meaning is "chasing," but this meaning is incorporated as GO-AFTER in c-sub. An appropriate verb for this construction must be its concrete manifestation (INSTANCE). The construction should specify elements other than the verb, but the verb itself is selected here, which is not suitable as a rule of construction. In this case, the verb *follow* can be selected lexically without relying on the effect of the construction. In (25), too, the lexical meaning GO-BY WAY OF is incorporated in the stipulation of the construction, and it is unsuitable for a rule of construction. Moreover, in (22), since the sentences without the prepositional phrases "*into the library*" and "*to New York*" are all acceptable, they are considered an additional phrase. This argument leads to (26) below.

(26) a. Bill followed the thief into the library.
       Semantics: Bill GO-AFTER the thief + [adjunct into the library]
     b. Bill took the train to New York.
       Semantics: Bill GO-BY-WAY OF the train + [adjunct to New York]

Iwata (2019: 440) argues that these examples do not constitute the resultative constructions on similar grounds. The author also concludes that these are just expressions of the subject's movement, not resultatives.

2.2 Cases with a non-causal intransitive verb

Next, let us consider non-causal resultative expressions with an intransitive verb.

(27) examples with non-causal intransitive verbs
 a. The pond froze solid.
 b. The ball rolled down the hill.
 c. The trolly rumbled through the tunnel.
      (Goldberg & Jackendoff 2004)

What they have in common is that they are not causal. In (27a), "the pond freezes and solidifies" is one simultaneous event. Pustejovsky (1991) claims that (27a) is not a case of resultative (see 2.1.1). The fact that "the ball rolled down the hill" in (27b) also describes the one situation involving the rotation and movement of the ball and has no causal relationship. (27c) means "the tram passed through the tunnel with rattling," but there is no causal relationship between making a rattling noise and going through the tunnel. The semantic commonality of these verbs is that the verb lexically

contains the meaning of the consequential predicate. *Freeze* implies a change in state, and *roll* and *rumble* imply a change in the position of an object. See the dictionary definition below.

(28) a. freeze: if a liquid or something wet freezes or is frozen, it <u>becomes hard and solid</u> because the temperature is very cold.

b. roll: If something rolls, especially something round, or if you roll it, it <u>moves along a surface</u> by turning over and over.

c. rumble: to <u>move slowly along</u> while making a series of long low sounds

(Longman Cotemporary English Dictionary, the underlines by the author)

(29) a. freeze: to <u>become hard</u>, and often turn to ice, as a result of extreme cold.

b. roll: to turn over and over and <u>move in a particular direction</u>.

c. rumble: to <u>move slowly and heavily</u>, making a rumbling sound.

(Oxford Contemporary English Dictionary, the underlines by the author)

In the definitions cited from the dictionaries, *freeze* has BECOME as a part of the meaning, which indicates a state change, and *roll* and *rumble* have the meaning of MOVE. In other words, the lexical content of each verb directly corresponds to the following adjectives and prepositional phrases and does not depend on the meaning specification of the construction. Therefore, the meanings of these expressions can be stipulated as follows.

(30) (i) The pond froze solid.

Semantics: The pond BECOME FROZEN + [adjunct solid]

(ii) The ball rolled down the hill.

Semantics: The ball MOVE by rolling + [adjunct down the hill]

(iii) The trolley rumbled through the tunnel.

Semantics: The trolley MOVE while making a series of low sounds+ [adjunct through the tunnel]

We conclude that these sentences are not cases of the resultative constructions.

2.3 Summary of this section

(31) exemplifies English resultative constructions.

(31) Causal, non-change-of-state transitive resultatives with object predicating RP

a. Bill shook Lisa awake.

b. Bill hammered the metal flat.

c. Bill wiggled himself through the hole.

d. They drank the pub dry.

e. The critics laughed the play off the stage.

f. We yelled ourselves hoarse.

g. The professor talked us into a stupor.

h. Keiko cried her head off.

These are causal sentences with a non-change-of-state transitive verb and RP describing the object. Of these, (31a-c) has a transitive verb that subcategorizes the object, and (31e-h) has a transitive verb that does not subcategorize the object. They follow the syntax and semantics provision (32) by Goldberg & Jackendoff (2004).

(32) Syntax and Semantics Provision of Resultative Constructions

Syntax NP1 V NP2 RP3

Semantics

c-sub: X1 CAUSE Y2 BECOME Z3

MEANS: [v-sub]

Semantics is composed of two subevents: a constructional subevent and a verbal subevent. The construction gives its core meaning and the verb bears the meaning of MEANS (by ~ ing). The sentences in (33) have often been cited as instances of resultative constructions. However, we exclude these cases from the domain of resultative constructions. They do not meet the constructional requirements (32) above.

(33) a. Bill broke the vase into pieces.

b. Bill followed the thief into the library.

c. The ball rolled down the hill.

After all, the English resultative construction in this present research is limited to the causal resultative sentences with an object host RP and a non-state-of-change transitive verb.

3. Japanese Resultative Expressions

3.1 Pseudo resultative construction

Let us start with the correspondence between English resultative expressions with change-of-state transitive verbs and Japanese equivalents. In Section 2, we restricted the domain of the English resultative constructions. The change-of-state transitive verb sentences (ex. John broke the vase into pieces), generally regarded as a resultative construction, are excluded from the domain of resultative constructions because the causal function CAUSE derives from a word, not from a construction. English resultative expressions with change-of-state transitive verbs exemplified in (34) can be directly related to Japanese equivalents in (35) below.

(34) a. John broke the vase (into pieces).
　　 b. Bill painted the wall (green).
　　 c. Kate bent the iron bar (into a U).

(35) a. John-wa kabin-o (konagana-ni) kowashi-ta.
　　　　John-TOP vase-ACC pieces-IN　　break-PAST
　　　　John broke the vase (into pieces)
　　 b. Bill-wa kabe-o (midori-ni) nut-ta.
　　　　Bill-TOP wall-ACC green-IN paint-PAST
　　　　Bill painted the wall green.
　　 c. Kate-wa tetsubou-o (U ni) mage-ta
　　　　Kate-TOP iron-bar-ACC (U in) bend-PAST
　　　　Kate bent the iron bar into a U.

The Japanese resultative sentences are usually composed of "subject + object + resultative state + change-of-state transitive verb," but the word order is relatively free, and "subject + resultative state + object + transitive verb" is also possible. The English resultative expressions in (34) correspond to the Japanese sentences in (35) almost perfectly. For example, let us examine the meaning of (35a) in conceptual structure (36). Note that as in English, the resultative state phrase is optional.

(36) Kenji-wa kabin-o konagona-ni kowashi-ta.
　　 Syntax: NP1 NP2 RP3 V or NP1 RP3 NP2 V
　　 Semantics: Kenji's action on kabin CAUSE kabin BECOME broken + [$_{adjunct}$ konagonani (pieces)]
　　 kowasu(=break): $\lambda x \lambda y$ [x's action on y CAUSE y BECOME broken]

The causal function CAUSE in (36) originates from the verb *kowasu* (break) as in the case of corresponding English (21a), and no constructional effect is observed. When we say "Kenji broke the vase," we assume an involvement of Kenji's implicit action. Therefore, the meaning of *kowasu* incorporates the subject's action on the object, which can be the direct cause the object to be broken. Note that the resultative construction is stipulated as a structure where its core semantic elements are provided from the construction, not from the verb, and the verb supplementally provides the meaning of "means." Following this stipulation, English resultative sentences with a change-of-state transitive verb, not dependent on the construction for their core meanings, are excluded from the domain of the resultative constructions. Therefore, we must conclude that Japanese resultative sentences with a change-of-state transitive verb are not "resultative constructions" but "word-dependent lexical resultatives." However, for convenience of classification, Japanese resultative expressions such as (35) are called "pseudo-resultative construction."

3.2 Resultative expressions with non-change-of-state transitive verbs

Next, we will turn to typical English resultative constructions and examine their correspondence to Japanese sentences with similar meanings. The typical English resultative constructions exemplified in (37) are those with the causative meaning, the object-predicating RP, and non-change-of-state transitive verbs. The examples (37a, b, c) are those with transitive verbs subcategorizing the object, while the others (37d, e, f, g, h) are cases with the verbs not selecting the object. There are also idiomatic expressions such as (37d, h).

(37)　a. Bill shook Lisa awake.
　　　 b. Bill hammered the metal flat.
　　　 c. The critics laughed the play off the stage.
　　　 d. Bill wiggled himself through the hole.
　　　 e. They drank the pub dry.
　　　 f. We yelled ourselves hoarse.
　　　 g. The professor talked us into a stupor.

h. Keiko cried her head off.

We now observe corresponding Japanese pseudo-resultative constructions with the form defined above.

(38) a. * Bill-wa Lisa-o mezame-ni yusut-ta
　　　　Bill-TOP Lisa-ACC awake-ni shake-PAST.
　　b. * Bill-wa kinzoku-0 taira-ni tatai-ta.
　　　　Bill-TOP the metal-ACC flat-NI hammer-PAST
　　c. * Hihyouka-wa sono shibai-o butai-kara warat-ta
　　　　critics-TOP tat play-ACC stage-from laugh-PAST
　　d. * Bill-wa jibun-o ana-ni tooshite kunekune ugokashi-ta
　　　　Bill-TOP himself-ACC hole through wiggle-PAST
　　e. * karera-wa sakaba-o karani non-da
　　　　theyTOP bar-ACC dry   dring-PAST
　　f. * wareware-wa jibun-o koegareni saken-da
　　　　we-TOP   ourselves-ACC hoarse yell-PAST
　　g. * sensei-wa wareware-ni azenni shabet-ta
　　　　professor-TOP us-ACC stupor-IN talk-PAST
　　h. * Keiko-wa atama-ga hazurete saken-da
　　　　Keiko-TOP head   off   cry-PAST

As (38) indicates, the Japanese "pseudo-resultative constructions" that correspond formally to the English resultatives (37) are all unacceptable. Then, are there any Japanese resultative expressions close to the meanings of the resultative constructions of (37)? Let us consider (39) below. These Japanese resultative expressions do not wholly correspond to the meanings of the English counterparts but represent more or less similar meanings.

(39) a. Bill-wa Lisa-o yusuri-okoshi-ta.
　　　Bill-TOP Lisa-ACC shake-waken-PAST
　　　≒Bill shooke Lisa awake.
　　b. Bill-wa kinzoku-o tataki-nobashi-ta.
　　　 Bill-TOP metal-ACC strike-straighten-PAST
　　　≒Bill hammered the metal flat
　　c. Hihyouka-wa sono shibai-o warai-tobash-ta.
　　　 critiques-TOP that play-ACC laugh-blow-PAST
　　　≒The critics laughed the play off the stage.
　　d. Bill-wa karada-o kunerase-TE ana-o tot-ta.
　　　 Bill-TOP body-ACC twist-TE hole-ACC pass-PAST
　　　≒Bill wiggled himself through the hole.
　　e. Karera-wa sakaba-ga karani naru HODO non-da
　　　　they-TOP bar-NOM dry-TO become HODO drink-PAST
　　　≒They drank the pub dry.
　　f. Wareware-wa koe-ga kareru HODO saken-da
　　　　we-TOP voice-NOM become-hoarse HODO yell-PAST
　　　≒We talked ourselves hoarse.
　　g. Sensei-wa wareware-ga azento suru HODO shabet-ta
　　　　professor-TOP we-NOM astounded become HODO talk-PAST
　　　≒The professor talked us into a stupor.
　　h. Keiko-wa atama-ga hazureru HODO saken-da.
　　　　Keiko-TOP head-NOM go-off HODO cry-PAST
　　　≒Keiko cried her head off.

The sentences (39a, b, c) are expressions with compound verbs. (39d) has a form of sentence$_1$ TE sentence$_2$. (39 e, f, g, h) have the degree expression "HODO," which stands for "*to the extent.*" Let us explain this variety of expressions in order.

3.2.1 Compound verbs

Japanese is rich in compound verbs consisting of two verbs joined together as in *uchi-korosu* (shoot and kill: kill by shooting). According to Kageyama (1993), there are two types: syntactic and lexical compound verbs. Lexical compound verbs show various semantic relationships where V$_1$ modifies V$_2$ in some way or other, but syntactic compound verbs are limited to those in which the verbs that come to V$_2$ have meanings such as "inception," "continuation," and "completion."

Here, we will take up the lexical compound verbs where the action represented by V_1 works as a means of action represented by V_2, resulting in some causal relationship between V_1 and V_2. The sentences with compound verbs in (40) correspond to the English resultatives of (37a, b, c).

(40) A lexical compound verb where V_1 is a means of V_2
    a. Bill-wa Lisa-o yusuri-okoshi-ta
      Bill-TOP Lisa-ACC shake-awaken-PAST
      Semantics: Bill CAUSE [Lisa BECOME awake] by shaking her
      ≒ Bill shook Lisa awake.
      okosu (= awaken): λxλy [x CAUSE [y BECOME awake]]
    b. Bill-wa kinzoku-o tataki-nobashi-ta
      Bill-TOP metal-ACC hammer-flatten-PAST
      Semantics: Bill CAUSE [the metal BECOME flat] by hammering
      ≒ Bill hammered the metal flat
      nobasu (= flatten): λxλy [x CAUSE [y BECOME flat]]
    c. hihyoka-wa sono shibai-o warai-tobashi-ta
      Critics-TOP the play-ACC laugh-blow-PAST
      Semantics: Critics CAUSE [play GO off] by laughing
      ≒ The critics laughed the play off the stage.
      tobasu (= blow): λxλy [x CAUSE [y GO off]]

The English resultatives (37a, b, c) have non-change-of-state transitive verbs that select the objects. Japanese sentences with compound verbs correspond well to the English resultatives of this type, although their meanings are not exactly the same. Japanese compound verbs have in common that the second verb V_2 is a change-of-state transitive verb with CAUSE in its meaning. In other words, in these Japanese expressions, the causal relationship lexically derives from the meaning of V_2. Therefore, they are cases of word-dependent resultative expressions. In addition, some cases hint at a causality between V_1 and V_2, whose V_2 is an intransitive rather than a transitive verb. Consider the following examples.

(41) a. Kyoko-wa asobi-tsukare-ta.
      Kyoko-TOP play-get-tired-PAST
    b. Kyoko-wa nomi-tsubure-ta.
      Kyoko-TOP drink-faint-PAST

(41a) means "playing and getting tired," and (41b) means "drinking and faint." There is a causal relationship between V_1 and V_2. The verb in position V_2 is intransitive, as part of its meaning, has no CAUSE. However, we do not get tired or faint for no reason. There should be a reason for getting tired and for fainting. Therefore, it is plausible that the conceptual structure of these words has a term of *reason,* which FROM can represent.

(42) a. Kyoko-wa asobi-tsukare-ta.
      Kyoko-TOP play-get-tired-PAST
      Semantics: Kyoko become tired FROM playing
      tsukareru (= get tired): λxλe [x become tired FROM e]   e∈E
      ≒ Kyoko played herself tired.
    b. Kyoko-wa nomi-tsubure-ta.
      Kyoko-TOP drink-faint-PAST
      Semantics: Kyoko faint from drinking
      tsubureru (= faint): λxλe [x faint FROM e]   e∈E
      ≒ Kyoko drank herself almost to death.

In the compound verbs above, V_2 is an intransitive verb. The causal relationship derives from the function FROM rather than CAUSE. In (42), "e" is a member of the set of events E. Since causal relation represented by FROM comes from a word, this is also a case of word-dependent resultative expression.

3.2.2 Compound sentences: S_1 TE S_2 and S_1 HODO S_2

Next, let us consider the compound sentence structure observed in (39 d) "Bill-wa karada-o kunerase-TE ana-o tot-ta" (Bill twisted his body and passed through a hole). The connecting particle TE attached to the end of the first sentence can be interpreted in two ways. For example, in "uta-TE odoru (singing and dancing)," two events proceed at the same time, and in "tabe-TE neru (eating and then sleeping)," the second event follows the first. In the case of (39 d) "twisting the body and passing through the hole," it is natural to think that "twisting the body" precedes "going through the hole," but the former action continues until the completion of the second. TE, in this case, can be interpreted as a function indicating one event following another and ending simultaneously, which may be represented by the function WHILE.

(43) Bill-wa [karada-o kunerase]₁-TE [ana-o tot-ta]₂

Bill-TOP body-ACC twist-TE hole-ACC go-through-PAST

Semantics: Bill [go through the hole]₂ WHILE [twisting his body]₁.

≒ Bill wiggled himself through the hole.

TE: $\lambda e_2 \lambda e_1$ [e_2 WHILE e_1] $e_1, e_2 \in E$

(the subscripts indicate correspondence)

In (43), TE is represented as the function WHILE, which takes two event variables and returns their relative time sequence so that one event proceeds and ends at the same time as another event. Causation and correlation in time are different. However, according to Hume, we can think that one thing causes another only because one regularly follows another. TE, in this respect, gives us a cue to indicate the correlation of two events and imply possible involvement of causality. This S_1 TE S_2 is a compound sentence structure, not a single sentence. Furthermore, the correlation of two events comes with the word TE; therefore, this is another case of word-dependent resultative expression.

Next, consider the expression HODO in (39 e, f, g, h). In the S_1 HODD S_2 form, the word HODO connects two component sentences. The word indicates that a quantity relating to one event reaches the extent of another event. For example, (39 e) "Karera-wa sakaba-ga karani naru HODO non-da" means that the consumption of their drinking at the bar reaches the extent that the bar runs short of alcoholics. HODO can be interpreted as a function to indicate the meaning of TO THE EXTENT.

(44) a. Karera-wa [sakaba-ga karani naru]₁ HODO [non-da]₂

they-TOP pub-SUB empty become HODO drink-PAST

Semantics: They drink₂ TO THE EXTENT that [the pub become empty]₁

≒ They drank the pub empty

b. Kyoko-wa [atama-ga hazureru]₁ HODO [saken-da]₂

Keiko-TOP head-NOM go-off HODO cry-PAST

Semantics: Kyoko cry₂ TO THE EXTENT that [head go-off]₁

≒Keiko cried her head off.

HODO: $\lambda e_1 \lambda e_2$ [e_2 TO THE EXTENT e_1] $e_1, e_2 \in E$

(the subscripts indicate correspondence)

This compound form of S_1 HODO S_2 does not directly indicate that event₂ causes event₁, but it does indicate a quantity associated with event₂ has reached an extent relating to event₁. A measurement concerning an event reaching a level associated with another event is not causal logically, but it may imply that one event is consequential upon another. This compound format may have exaggerated content. (44a) above exaggeratedly tells that they drank so much, rather than trying to convey the literal interpretation that they consumed all alcohol at the bar. (44b) also means "Kyoko cried awfully." Since the sentence₁ HODO sentence₂ form is not a simple sentence and receives its consequential interpretation from the word HODO, this is also a case of word-dependent resultative expression.

3.3 Summary of this section

This section examined four types of Japanese resultative expressions that have similar meanings of corresponding English resultative constructions.

(45) Four types of Japanese resultative expressions

(i) Pseudo-resultative construction (with a change-of-state transitive verb)

Kenji-wa kabin-o konagona-ni kowashi-ta ≒ Kenji broke the vase into pieces

(ii-1) compound verb: V2 is a change-of-state transitive verb

Bill-wa Lisa-o yusuri-okoshi-ta ≒ Bill shook Lisa awake

(ii-2) compound verb: V2 is an intransitive verb

Kyoko-wa asobi-tsukare-ta ≒ Kyoko played herself tired

(iii) event 1 TE event type 2

Bill-wa karada-o kunerase-TE ana-o tot-ta ≒ Bill wiggled himself through the hole

(iv) event 1 HODO event type 2

Sensei-wa wareware-ga azento suru HODO shabet-TA≒ The professor talked us into a stupor.

We now examine where the causality comes from in each of the four types.

(i) CAUSE in the pseudo-resultative construction derives from the meaning of transitive verbs.

(ii-1) In the case of the compound verbs where V2 is a transitive verb, its CAUSE comes from V2.

(ii-2) In the compound verbs whose V2 is intransitive, the function FROM derives from the meaning of V2.

(iii) In S_1 TE S_2 form, TE creates a relationship between the two events, implying their simultaneity.

(iv) In S_1 HODO S_2 form, HODO creates a relation between the two events, indicating their related extent.

All Japanese resultative expressions derive their causal relationship from a word, not from the construction. Therefore, we can safely claim that the Japanese language has no resultative constructions but has lexical resultatives.

4. Conclusion and Future Issues

4.1 What we have accomplished so far

So far, we have clarified the following points. First, there are two types of construction: m-construction and f-construction. The m-construction has a specific structure and meaning pair, and the f-construction has a structure but no specific meaning. Second, there are two types of resultatives: resultative constructions whose causality derives from the construction and word-dependent resultatives in which the causal function arises lexically. The English resultative construction is a type of m-construction whose argument structure is determined by the construction. We conclude that English has both types, but Japanese has only the latter: word-dependent lexical resultatives. Japanese resultative expressions, including S_1 TE S_2, and S_1 HODO S_2 patterns, have four types. All of them derive their causality lexically.

4.2 Which CAUSE?

There are still some issues that need to be addressed to make our analysis even more compelling. Causality has traditionally been represented by the CAUSE function, but it has not been given an accurate, logical definition. Below is the list of cases where CAUSE appears in the conceptual representation of our treatise.

(46) i. Mary shook her husband awake. (Type: English resultative construction)
     c-sub: Mary CAUSE [her husband BECOME awake]
     MEANS: v-sub: [Mary shake her husband]
  ii. John broke the vase into pieces. (Type: English word-dependent resultative expression)
     John's action on the vase CAUSE [the vase BECOME broken] + [adjunct into pieces]
  iii. Ken-wa kabin-o konagona-ni kowashi-ta (Type: Japanese pseudo resultative construction)
     Ken's action on the vase CAUSE vase BECOME broken] + [adjunct into pieces]
  iv. Ken-wa kuma-o uchi-koroshi-ta (Type: Japanese compound verb resultative)
     Ken CAUSE bear BECOME dead by shooting

As Kratzer (2005) points out, the function CAUSE in a resultative expression is different from the relationship indicated by the lexical causative verbs such as *make* and *cause*. Causal relationships depicted by *cause* and *make* are indirect because they may allow a long causal chain. For example, it is possible that Mary's cynical remark an hour ago made John unhappy now. On the other hand, the causal relationship in the resultative expressions generally is more direct. It is inconceivable that Mary's shaking her husband an hour ago awoke him now. Therefore, CAUSE in (46) is direct, so its causal chain should not have intermediate elements between its cause and effect.

4.3 What does CAUSE stand for?

Furthermore, CAUSE may be different in each type of resultative expression. Note that in (46) above, (46i) is a resultative construction with CAUSE derived from the construction. Other sentences (46 ii, iii, iv) are all cases of word-dependent lexical resultatives where CAUSE derives from each verb. In order to see what the CAUSE function stands for, let us consider Lewis's causal dependency theory (1973, 1986, 2004). Lewis's original theory relies on the analysis of counterfactuals (47). In this definition, "A□→C" stands for "if A were the case, C would be the case."

(47) A□→C means that it is true iff either
  (i) there are no possible A worlds (vacuously true), or
  (ii) some A-world where C holds is closer to the actual world than any A-world where C does not hold.

His idea is that the counterfactual "if A were the case, C would be the case" is true when it takes less of departure from actuality to render the antecedent true with the consequent than to make the antecedent true without the consequent. With this definition, his stipulation of the causal dependency is given in (48). If *c* and *e* are actual events, and C and E the corresponding propositions that they occur, then *e depends causally on c* iff the following counterfactuals hold:

(48) a. C □ →E   "if *c* were to occur, then *e* would occur."
   b. ~C □ →~E   "If *c* hadn't occurred, then *e* wouldn't have occurred."

Following this theoretical framework, we can verify the causality of resultatives in (46).

(49) Verification of causality of "*Mary shook her husband awake*."
    Her husband's becoming awake causally depends on *Mary's shaking him* is true iff
  (i) [Mary shaking him] □→ [Her husband becoming awake]
  (ii) ~ [Mary shaking him] □→ ~ [Her husband becoming awake]

Both (49i) and (49ii) hold true, therefore, *her husband's becoming awake* causally depends on *Mary's shaking him*.

(50) Verification of causality of "*Ken-wa kabin-o konagona-ni kowashi-ta.*"
    Kabin becoming broken into pieces causally depends on *Ken's action on the vase* iff
    (i) [Ken's action on the vase] $\square\rightarrow$ [The vase's becoming broken into pieces]
    (ii) ~ [Ken's action on the vase] $\square\rightarrow$ ~ [The vase's becoming broken into pieces]

Both (50i) and (50ii) hold true, therefore, *Kabin becoming broken into pieces* causally depends on *Ken's action on the vase*. Note that the counterfactual analysis covers all of the resultatives in (46). However, interestingly, unlike Lewis's theory, Hume's constant regularity theory of causal dependence (Hume 1978a/1739-40, Psillos 2009) covers only some, but not all. His view of causation is stipulated as in the following (Psillos 2009:131).

(51) *e is causally dependent upon c* iff
    i. *c* is spatiotemporally contiguous to *e*.
    ii. *e* succeeds c in time.
    iii. events of type *C* (events that are like *c*) are regularly followed by events of type *E* (events like *e*).

Causal dependency specified in (51) seems to work well for (46 ii, iii, iv). For example, in (46ii), "*John broke the vase into pieces,*" *John's action on the vase* corresponds to *c*, and *the vase's becoming into pieces* to *e*. Naturally, event *c* is spatiotemporally adjacent to event *e*, and the constant conjunction of two similar events is also tenable. The regular conjunction of similar events coordinates with the law-like regular linkage between the cause and its effect by the lexically incorporated CAUSE. However, this causal theory does not endorse an involvement of causality in (46i). "*Mary shook her husband awake*" does not satisfy the condition (iii). Similar actions of shaking may not make her husband awake next time.

In summary, the resultative with lexical CAUSE satisfies both Lewis's causality rule and Hume's. However, the resultative with constructional CAUSE can meet Lewis's causality rule but not Hume's.

Table 1. Correspondence between causalities and types of CAUSE

	lexical CAUSE	constructional CAUSE
Lewis's causality	✓	✓
Hume's causality	✓	X

Our tentative conclusion is that the correspondence between causality and CAUSE appears to reflect the differences in the nature of the two CAUSE functions. However, we need further research to confirm this view.

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