Fragment Integration in a Dynamic Model of Syntax
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Abstract

Fragmentary expressions of the early stages of language acquisition remain even at the final stage. That is, the relation of "is based on" is preserved in the adult grammar the child attains. Looking back from the complex adult grammar of a language, L, every element of L is initially a fragment. When you look into what is happening at the primitive stage of a language from a cross-linguistic perspective, it could even be argued that there is no raison d'être of sentences. The interpretation of fragments crucially involves the central system integrating information from language and extralinguistic sources such as vision, memory or inference, as defended in Stainton (2006). This paper argues that the fragment integration plays an important role in analyzing resultatives and other constructions.

1. The Importance of Fragments

Suppose that languages start at a stage where one-word utterances are concatenated without ever forming phrases nor clauses although various semantic relations might bind these utterances. Furthermore, even fragmental linguistic elements may persist at the stage of adult grammar. When two or more people describe the same entity they see in the same situation, they often characterize the entity with one word by uttering its name, its shape, or its color and so on. You just connect one word after another in sequence. Words are related temporally. A new thing which appears in the situation is a variable. *Wh*-questions must have originated from fragments like "What's that?"

Words expressing things and those expressing an activity might be put together as the subject-predicate relationship, which expresses the meaning of predication. A word denoting a thing and a word denoting a color might be united as an adjectival pharse. Then, phrases and clauses are formed, the clauses are embedded in other clauses and so on, giving rise to the grammar of a language L which "separates the *grammatical* sequences which are the sentences of L from *ungrammatical* sequences which are not sentences of L (N.B. Chomsky 1957: Ch.2)." However, when you cannot understand the reason why a certain linguistic fact is as it is by merely looking at the complex adult grammar attained, you can understand it if you add the process-

oriented perspective of how the grammar was acquired/constructed over time (N.B. Kajita 1977, 1997, 2004). This shows "the importance of the role that grammars of the nonfinal stages play in explaining the course of development and the uniformity and diversity of adult grammars (Kajita 1997: 378)." There might be languages which have not formed Noun Phrases, languages which has no clauses, languages which have no embedding of a clause into another clause, languages which has such embedding and so forth (cf. Heath 1986). The complex phrases and complex clauses do not come into being out of the blue but they are formed gradually, minimizing the changes in grammars in proceeding from one (nonfinal or intermediate) stage to the next, thus preserving most of the old properties in the new grammar (N.B. Kajita 2004:388). Basic sentence structures has nothing extra when a language is at at the stages where clauses might be combined by means of intonation instead of using complementizers, infinititival forms used exclusiviely for the clausal embedding have not yet developed, and there are very few construction-specific semantic rules. Such basic sentence structures are combined with various meanings in the salient contexts. That a semantic rule specific to each construction arises at the later stages can be confirmed by linguistic facts. For example, in the following expression, a mere NP might be construed as expressing "condition" in the mere juxtaposition of NP and a clause.

(1) [$_{NP}$ One more beer] [$_{cl.}$ I will leave]

Going through processes such as these, the complex grammar arises. If possible, it is desirable to reduce everything to these processes. Those elements which indicate the course of development from the primitive (or early) stage are so called "fragments," namely sub-sentential speech. Looking back from the steady state complex grammar, every element of a language is at first a fragment. In other words, every linguistic element could be a fragment at each nonfinal stage of the language development. Here is an example. Suppose you hold a letter and say to your partner "from Spain." You could be understood on the scene, even if your utterance is just a fragment (Stainton 2006: 6). Thus, on the way of the development of the grammar of a language, a lot of fragments are used. But in many cases the only corpus linguists take up tend to be the class of "perfectly ordinary sentences," of the kind that must be found in academic writings and legal documents, and thus grammr might be characterized as nothing but rules of sentence-formation. You tend to think that adult speakers produce complete (ordinary) sentences. But a question may arise as to whether it is true. Shouldn't you also direct your attention to spoken spontaneous speech? This type of speech might display the primitive stages of a language. When

you look into what is happening on the primitive stage of a language from a cross-linguistic perspective, it could even be argued that there is no raison d'être of sentences. Therefore, it is necessary to research how fragments are made use of to what degree in speech. This is because speakers do not always produce complete sentences.

1.2. Fragmental Expressions Preserved in the Adult Grammar of a Language

Fragmentary expressions of the early stages of a language acquisition are preserved in adult speech or utterances. That is, the relation of "is based on" is preserved in the new grammar of an adult. In other words, in the developmental context, given that some structure (or some property of a grammar) is introduced, on the basis of some other structure (or some other property of a grammar), and given that certain general properties of the system of language learning, SLL, have the effect of minimizing the changes in grammars in proceeding from one stage to the next, most of the old properties of grammars of some of the earliest stages might be preserved in the new grammar of the final stage (N.B. Kajita 2004:388).[1]

Consider the following example.

(2) John and his parents are coming.

The example (2) involves both the rule of agreement and that of coordination. Coordination in English comes in two varieties: the *and*-coordination and the *or*-coordination. It is the *or*-coordinaion like (3) that would cause trouble.

(3) a. [John or his parents] { is/are } coming.

     b. NP_1 or NP_2 Aux/Copula V-*ing*

The rule of subject-auxisiliary verb agreement specifies that an auxiliary verb agrees with its subject in number (and person). However, when there are more than one subject and the obvious agreement rule cannot be applied, an auxiliary verb agrees with its "nearest" NP in number (in the example (3), the copula *are* is chosen). The rule that an auxiliary verb or a verb agrees with its nearest NP in number, which holds at some of the earliest stages, reappears in the adult grammar. Generally speaking, in the language developmental contxt, when the changes in grammars begins at the "one-word" stage, through the "phrasal-fragment" stage, to the "(complete) sentence" stage, the sentence-using stage preserves the rules of the phrasal-fragment stage, based on which complex sentence structures are generated. When speakers can get along without using sentences, they do not use complete sentences but fragments like the following instance.

(4) He clearly had a lot on his mind, and she wasn't <u>ready to discuss things</u>. <u>Not here,</u>

not now. Not in her present state of mind. [Khoury. Th Sanctuary. Signet Book. 2008.]

This could be likened to the process of every animal building itself from a single-cell, which divide, migrate, and die, giving rise to hundreds of different cell types, and developing each body part of an organism, as is argued in developmental biology (namely, a science of process) which studies the initiation and construction of organisms (see Gilbert 2012, inter alia).

1.3. Breaking the Mold of "Sentence Primacy"

What consequences do emerge when the claim is confirmed that nonsentential fragments can be propositional and force-bearing? The answer is that such a claim rebuts arguments to the effect that an ordiary sentence always underlies speech acts, namely "sentence primacy" (N.B. Stainton 2006:4).
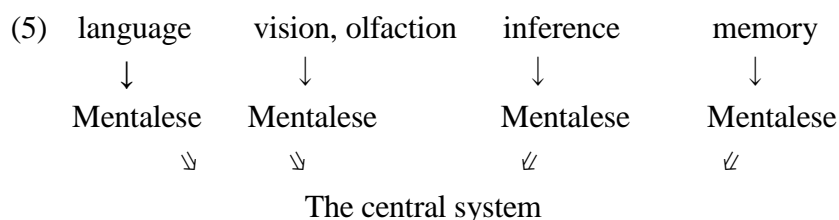
Aside from differences in theoretical details, Chonskyan generative grammar asserts that the initial symbol is *S(entence)*, and what emerges from rewriting *Sentence* is (the derivation of) a sentence (structure) of a language. Grammar is taken to be a device marking the contrast between well-formed sentences and ill-formed ones. Semantics also considers meanings corresponding to sentences, ultimately judging whether the sentences are true or false. The semantic system, constructed on the basis of (formal) logic, is designed to explore the meanings of "sentences."

The purpose of logic, or science for that matter, is to separate an adequate inference from an inadequate inference. Logicians tried to construct a language system which allows you to draw correct inferences based on a premise assumed to be true. What is important is that a fully determinate (i.e. truth-evaluable) inference can be drawn but it is unavailabe without implementing it in terms of a sentence.

When exploring natural language semantics in 1960's, there was no reliable theory. Thus, linguists applied the system of logic to natural language semantics. But logical semantics does not connect with the meaning of natural language expressions at times. Montague have made an attempt to correctly represent the meaning of natural language expressions (e.g. semantic types like <e, t>). But Montague Semantics carries over many of the logical assumptions into linguisitic semantics. One such example is that Montague Semantics explores the meaning of languages only through 'sentence.' Chomskyan linguistic theory adds the "syntactocentric" view to sentence supremacy.

However, Stainton (2006) defends the claim that correct inferences can be drawn on the basis of sub-sentential speech (i.e. fragments). Here is an example quoted from Stainton (2006: 22): "Suppose Sanjoy had in previous days been debating with Silvia

(who hates everything Cuban) about whether anything really fabulous had been recently produced in Cuba. Silvia knows and appreciates fine cigar. Then, Sanjoy holds up a cigar and says 'From Cuba' to a person, who will recognize the inherent value in the displayed cigar. In this example, Silvia draws inferences on the basis of the cigar proposition, concluding that her proposition, i.e. nothing fabulous is being produced in Cuba, is incorrect." The crucial point is that a fragmentary expression can serve as a premise in an argument and must have a logical form. Logical inference is applied to the pragmatic representation. When you understand a sentence in your mind and when you consider something, what kind of language do you use? Do you draw inferences in English? Is much of human conscious thinking conducted in the medium of a natural language as it is? Or is it translated into a language of thought called "Mentalese"? Stainton (2006:43, 160, 177ff.) says yes. Faculties of various kinds, including one for language and at least one for integrating mental representations from various sources, namely perceptual faculty (e.g. vision), memory, or inference – these are translated into Mentalese representations. These Mentalese transltions are sent to the central system that can integrate information from various domain specific faculties (Stainton 2006: 43, 160). Stainton (2006) doesn't want to say that there is a different representational system from a language and fragments allows one to draw inferences in terms of a language only. Then the question is which parts are connected to which parts in a human brain.

(5) language   vision, olfaction   inference   memory
         ↓   ↓   ↓   ↓
     Mentalese   Mentalese   Mentalese   Mentalese
          ⇘   ⇘   ⇙   ⇙
                        The central system

To illustrate, Stainton (2006:156) gives interesting, attested examples like 'Nova Scotia,' said on a cold, cloudy day, which show that the propositional content of sub-sentential (fragmental) speech acts is arrived by grasping (i) the content of the linguistc item uttered and (ii) the content from the environment (or memory, or inference, etc.) rather than from language, and the it is combined with the content of linguistic item uttered without invoking syntax and semantics as intermediaries (Stainton 2006:155-159). Then, varioust aspects of sentence supremacy are compromised, which claims that although fragments are true sub-sentences, both syntactically and semantically, these sub-sentences are complete sentences at the level of paragmatics. Then, the issue is how the content from language is put together with the content from inference (or memory or environment etc.).

The existence of fragments eliminates some of the competeing theories, and let those theories, which are compatible with the fact that a language starts from fragments and can communicate a proprosition by uttering a fragment, survive. That's a general question of how to derive full-fledged sentences from fragments, and why do speakers/hearers talk this way at all using "fragments" (which can be verified in the corpus) despite the fact that "sentences" arise gradually through changes in grammars in proceeding from one stage to the next. This article reviews everything, starting at a stage of one-word utterances.

1.4. A Dyanmic Theory of Syntax – Taking One-Word Stage (Fragments) as the Starting Point

In the previous framework of a dynamic theory of syntax, basic models as well as derived structures are construed in terms of "sentence," thus unable to be free from the bind of the notion of sentence (e.g. Kajita 1977). In the new framework, the starting point is "one-word stage." Note, however, that in an actual analysis very special constructions at the fairly advanced stages of a language are easy to verify, so we will think in terms of a unit of sentence for convenience' sake.

Let me explain the one-word (or "fragment") stage of the language development in the concrete. Fragments like "rabbit" and "fox" constitute (one-word) utterances. Using the knowledge of the background or paragmatics, each word is interpreted and related one another. There might be cases in which you cannot get a single meaning or you may miss the speaker's intention. Even with the use of a one-word utterance you can make a good interpretation of the one-word utterance within a tribe or a family. If a language proceeds from such a one-word utterance (or a fragment) stage to a little advanced "sentence" stages, then it is conceivable that there may be a stage at which fragments are put together to as NPs but they are en route to be (united as) S(entences). Evidence supporting this claim is the fact that some of the old properties, reflecting the starting point of the language development, are preserved even in the adult grammar. Note also that, for this process to be successful, the prelinguistically given language learning, SLL, has to satisfy grammar-dependent constraints which specify the ways in which the current grammar affects the formation of the grammar of the next stage (Kajita 1997: 379).

To take an example, forms like "S, NP," in which NP is loosely combined with S, are preserved in the adult grammar. Here, the NP is not just an NP but it may be in the middle of evolving into a (complete) sentence (but may have stopped a few stages before being a sentence). Note especially that the NP occuring in sentence (6a)

expresses the resultant state of the main clause.

(6) a. President Johnson withdrew troops, the result 1000.

    b. He cured a desperately ill person, a miracle.

Thus attested examples can be found which is shown to preserve the old properties (i.e. the properties of the initial stage in the developmental context) in the new (adult) grammar. There is so-called the developmental laws which enable a grammar to be developed into the grammar of the next stage, given certain conditions are met.

    Resultative constructions in a broad sense (what Goldberg (1995) calls the caused-motion construction) can be verified to be a fragment at some of the earliest stages by the children's utterance data of Tomasello (1992), as is shown in the following examples. It might be argued that child languages are coded in the expressive mode of coding (focus-first) because children tend to utter what comes first to their minds without thinking carefully before they speak – the opposite of expository mode of coding.

(7) a. 18.25 OFF –wants Daddy to taking her scarf off (two times)

    b. Use in combination:

      18.19 NECKLACE OFF – taking it off herself

      20.16 PAPER OFF THIS MINE SILK – taking paper off her silk (Tomasello 1992: 317-319)

At the next stage of the language development, a verb appears to be placed before an NP-P(P) but it might be the case that it is an instance of mere concatenation of words irrespective of their syntactic categories with the force specific to giving an order, as in (8). The reason might be that the form is tightly connected with the scene where the child wishes/asks/orders the partner to do something. I also presume that the verb MOVE and the preposition/particle OFF share the theme PAJAMS and form a covalent bond (N.B. Parsons 1990:79).

(8) 20.17 MOVE PAJAMS OFF THIS – moving them off chair

                                  (Tomasello 1992: 317-319)

    There is a possibility that the following attested example of the caused-motion construction (9) (the resultative construction in a broad sense) might also be the case in which the form NP-P(P) (e.g. "wood stain all over the court") is a fragment preserving some of the old properties of the starting point of the language development embodied in a fragment like "Necklace off" in the example (7b) in that motion is expressed not by a verb but by a prepositional/particle element.

(9) … as if a giant sneezed wood stain all over the court.

                               (*The International Herald Tribune*, 03/21/2013)

In addition, the NP-P(P) in (9) is a fragment and intrinsically an independent structure but it is incorporated into the subject-intransitive verb combination (e.g. "… a giant sneezed") which will be genereated by the adult grammar, as "an NP (fragment)" which is in the process of evolving into a sentence but stopped a few stages before acquiring a sentencial structure, as in (6).[2] To be more precise, the "causing (sub-)event" meaning of the form "a subject + an intransitive verb," (e.g. *a giant sneezed*, henceforth S-IV) and the "effected (sub-)event" meaning of the form "NP + Prepositional Phrase/Particle" (e.g. *wood stain all over the court*, henceforth NP-P(P)) are "compressed/combined" with the meaning of caused-motion supplied in the central system integrating Mentalese expressions of various sources. The example (9) is on par with the example (6) with the from of "S, NP" in that S-IV might initially be loosely combined with what looks like NP-P(P), structurally independent of S-IV. But note that at the early stages fragments are integrated irrespective of the types of syntactic categories. This claim is evidenced by the fact that an utterance string "S-IV. NP-P(P)" at the stage where S-IV and NP-P(P) have not combined/compressed are observed in the English corpus.

(10) We're waiting for the elevator and all of sudden Sarah whips her head my way
     and sneezes. The result? Snot.on.my cheek.   (Lauren Como@laurencomo)

In the adult grammar *Snot on my cheek* with the intended meaning "snot clung to my cheek" (without being supported by a verbs like *cling*) is hard to accept. Such a form is acceptable when it expresses "attendance circumstances" lacking a causal relationship with a main verb event, as in the expressions like *The room was extremely noisy: children shouting, the tv on, the record player on, and little Jimmy kicking a cat*. (Aarts 1989:282). But when the whole string is restructured as an NP (possibly a predicate nominal) like "Snot.on.my cheek," it might be easier to accept. Note that at the early stages the linguistic items as a whole interact each other and are combined without looking at the internal structures, thus it might be presumed that the whole string "Snot.on.my cheek" was initially concatenated with *sneeze* and later its constituents are divided into NP and P(P) to interact with *sneeze* in a part-to-part relation (e.g., "argument-"sharing among heads, namely between *sneeze* and P(P)). Note also at the point of hearing *a giant sneezed* or *Sara … sneezes*, a hearer might evoke or anticipate some result (i.e. fragments like *woodstain all over the court* and *Snot.on.my.cheek*).

Consider next the caused-motion constructions like (11a) describing an unexpected result.

(11) a. Watch as <u>Ferguson sneezes his head right off his shoulders</u> to the horrors of

everyone around him.

b. One minute you're walking down an alleyway minding your own business...
and then you bump into <u>a man who sneezes</u> and <u>his head</u> falls <u>off</u>. And then
he tries to re-attach it to his body.   [EMS 1.com]

When (11a) and (11b) are compared, it might be argued that the caused-motion construction (11a) with a magician named *Ferguson* as a subject/an agent was constructed on-line from the configuration (11b). It seems difficult to argue that (11a) is derived by leaving only *his head off* with deleting the discontinuous constituent *and … fall*(*s*) or that (11a) is derived by gapping the position of *fall*(*s*) (together with *and*) or positing null elements corresponding to (*and* and) *fall*. Rather, it might be natural to suppose the following process: ① presenting the topic by uttering *a man who sneezes*, followed by *and his head falls off*, and then ② compressing the latter expression, ③ carving out a sentential fragment [*his head off*] and ④ integrating it with the preceeding sentence *The man who sneezes*.

When two fragments are combined, one is the main element and the other is absorbed into the former. What decides such integration? The above examples show that the nature of grammar can be explained by with recourse to the nature of discourse. Although there has already been an analysis proceeding from discourse to grammar in order to explain the grammars, a dynamic view of language presented in Kajita (1977, 1997, 2004) and empirical works of other researchers view grammars of languages including the "fragment" integration in terms of how the grammars proceed from the grammars of the early stages of language learning through the grammars of the next stages to the grammars of the subsequent stages, minimizing the effected changes.

To reiterate the point, the fragment NP-P(P) can be seen as the remnant of the utterances like "Necklace off" which is observed at the early stage of language learning. But the result or the trace of compression/combination is hardly visible in the adult grammar (due to the operations like reanalysis, merger and so forth). To give a supplementaly explanation, the original source of the expressions like *red flower* is "something could be a Value of both *flower* and *red*." Two expressions of type $<$**x, t**$>$, like 'red' and 'flower,' can combine to form a phrase of the same type, but since adjunction matters semantically, the adjoined predicate is inrterpreted as though it had a different type. In other words, when you conjoin *flower* and *red*, it can be said that the head is *flower* and it is *red*, and consequently you get the relation of "among *flowers*, it is *red*." Pietroski's (2002) claim that everything can be decomposed into a

predicate in the semantic analysis. Then, "Snot.on.my cheek" in the example (10) is something that could be a Value of both *snot* and *on my cheeck*. When two expressions of <**x, t**>, like 'snot' and 'on my cheek,' combine, the head is *snot* and it is on your cheek, and consequently you get the relation of "among tokens of *snot*, it is *on my cheek*."

Another piece of evidence, which corroborate the claim that NP-P(P) (e.g. "wood stain all over the court") is originally structurally-independent of S-IV (e.g. "…as if a giant sneezed") in the examples like (9), is the following facts.

Sneeze belongs to verbs of substance emission such as *spit*, *sneeze* and *leak*. Normally, substance emitted by sneezing is "(exhaled) breath" or "air." This "air" is "the absent participant interpreted as indefinite" called the unspecified object or Indefinite Null Interpretation (INI: see Croft 2012:333). The INI participant may be realized in the following constructions.

(12) … why a cat sneezes phlegm constantly.   (www.catchannel.com)

(13) Don't sneeze your ridiculously volka-vapor breath across your cigarette.
                    (www.reddit.com/r/gifs/comments/19wqje/fire_sneeze/)

But in the caused-motion construction, the INI participant is obligatorily unrealized.

(14) *a giant sneezed <u>his volka-vapor breath</u> wood stain all over the court.

This fact suggests that the INI participant (which is emitted from within the agent's body) intervenes between *as if a giant sneezed* and *wood stain all over the court*. Therefore, the fact that *sneeze* can not *take wood stain* alone as a complement as in (15a) can be given the explanation that the INI participant has already been selected as the complement of *sneeze*, precluding the redundant addition of another complement (e.g *wood stain*).

(15) a. *… as if a giant sneezed wood stain.

   b. cf. … as if a giant INI wood stain.

And it can be argued that the reason why *sneeze* can take *wood stain* as a complement when followed by the path expression *all over the court* is that *wood stain* is a part of NP-P(P) (which is developmentally on the way to become a sentence) and so does not compete with INI of *sneeze*+INI.[3] But you might ask why the expressions like **a giant sneezed <u>his volka-vapor breath</u> wood stain all over the court* are excluded. The answer is that it is due to the fact that in the caused-motion construction *sneeze* of the subject+*sneeze* and the path expression *all over the court* share the argument *wood stain* to form a covalent bond. When *sneeze* and *all over the court* combine, they must share the same (theme) argument *wood stain*, and so if the INI participant is realized as *his volka-vapor breath* (or *some blood*), it intervenes between *sneeze* and *wood*

stain, with the result that the covalent bond is hampered.[4]

Thus, in this paper I posit the type of the dynamic extension that might be called "the Fragment Interpretation" in the instances like S, NP or S-IV NP-P(P), although the operation might be sometimes better be called "the Fragment Absorption." The idea is that a language starts from the sequence of one-word utterances, is organized into groups later, and yields the (most complex) sentence structures step by step. We might then suppose the following process. Suppose a language arrives at the intermediate stage of the development, where utterances are still at the one-word stage but some of them are in the process of being organized into a group, on which a certain kind of process acts on. These utterances in turn absorb the other fragments and form a larger fragments. At the stage close to the final stage, two or more clauses are combined into more complex clause structures, the process taken up and studied in ordinary grammar. The phenomenon that a sentence (as a main clause) combines with another sentence (as a subordinate clause) is a case in point. At the in-bewteen stage, an Adjective and a Noun can combine (e.g. *tall* is combined with *that boy*) to form a larger group of the elements. The process goes on from a smaller fragment groups to larger ones. When they are combined, it is not always the case that an S(entence) and an S(entence) combine. Looking back from the "final stage" grammar, combination of the kind least expected arises at the intermediate stage. This is the relation obtaining in the discourse. When talking about the different aspects of the same object, the fragments tend to be combine as an NP. When they denote an event on the whole, the fragments describing one situation and the fragments describing another combine to yield a clause.

When explaining the final-stage, complex grammatical or linguistic phenomenon, previous studies have not done the reduction to this extent. The basic is uttering linguistic expressions faithfully reflecting their syntactic structures without doing more than necessary, but it is fragments that you are much more likely to encounter in daily casual speech.
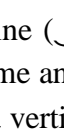
1.5．Case Studies of the Fragment Integration

In this section I will consider the cross-linguistic examples of the Fragment Integration. Chichewâ (one of Bantu languages) allows discontinuous constituents, every one of which is marked so that the relationship among each constituent can be understood even if the word order is scrambled. Information structure is mapped into the discontinuous elements in Chichewâ, too. In addition, Chichewâ has developed the gender system. To put it concretely, Chichewâ is one of those languages which

allow each part of an expression "that red flower" can be scattered everywhere in a sentence. If you take a perspective that a sentence is a nonspontaneous but planned written language, then it is a normal case that *that red flower* appears as a constituent, and discontinuous appearance of each element of *that red flower* is due to a different operation (i.e., it is a result of a redundant operation if constituents are put together and then broken down).

On the other hand, starting from the fragment sequence, discontinuous constituents are closer to the origin of a language. They are reordered in accordance with the function of Topic, Focus and Contrastive Topic: Contrastive Topic is placed at the beginning of the sentence and Old Information is at the end of the sentence. Moreover, each language has a rule of placing Topic at a specific position in an expression. For example, as *red* is Topic, it can be placed at the beginning of a sentence. When *that red flower* as a whole is contrasted with *this brown leave* (namely, in the case of Contrastive Topic), *that red flower* as a whole is placed at the beginning of an expression. When *that flower* is an understood element between the speaker and the hearer, and *red* is "contrast," then the latter is placed at the beginning. There is also analysis which claims that every fragment is given its own function in information structure (see Shaer et al. Michombo and Morimoto 2009). To sum up, linguistic principles look elegant in terms of fragment sequence.

Next, let us return to linguistic phenomena in English. Secondary predicates involve instances in which there is secondary predication (i.e., the subject-predicate relation) in addition to primary predication in the same clause. Taking a closer look at Depictive and Resultative Predicate (the two kinds of secondary predication) in terms of semantics, some aspects of them show that the fragment sequence is brought over from grammars at the earlier stages. In the following, I will concentrate on resultative constructions. Resultative constructions (F_1-F_2; where the form F_1 is generated by the adult grammar but the form F_2 is a fragment) in definition describe the pragmatically plausible result state the participant of the event expressed by F_1 ends up in. That is, the result state is associated with the main event expressed by F_1.

(16) He hammered <u>the metal</u> <u>flat</u>.

In (16) *flat* is predicated of the object *the metal*. The metal was not initially flat but it became flat, as a result of hammering it. (16) would be given the smplified event representation in (17).[5] A corrugated line (‿‿‿) represents the exertion of force, where the activity continues through time and terminates at the end of the line. The arrow (→) shows a lapse of time and a vertical arrow (↑) indicates the result state added by a speaker.

(17)   ↑

ㅤㅤ~~~~~~~~~~~
ㅤㅤ————————————→
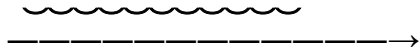
It is unclear what shape is the metal at the point of time when you just utter/hear *He hammered the metal*. When an adjective *flat* is added to the expression, it becomes clear that the shape (the result state) of the metal is flat. When you include the reading that "the action ended" in the expression *He hammered the metal*, then the association that the metal is in some state affair is evoked. F_2 *flat* further specifies the result state of the object of F_1. The new event (=the second state of affair(s)) expressed by F_2 is totally different from the results stemming from the procession of the event expressed by F_1 (=the event expressed by the main predicate). Note, in passing, "special" structural dimension might be added to the event representation of the caused-motion construction, as in (9) in §1.4.

ㅤㅤTraditionally, rules of aspect can be stated in formal semantics. The rules of formal semantics have been proposed for resultative/secondary predication. Consider the following secondary predication – namely, an instance of subject-oriented deptictive predication.

(18) John left the room angry.

As a part of rules of interpretation of a sentence, information about temporal adjacency and overlapping of two events are included in it. There is also a condition that the understood (semantic) subject of *angry* should be identical with one of the arguments of *leave*. Condtions like the argument-sharing are formally included in the semantic rules. These are stated in a formal but extremely difficult way of wording. This type of analysis posits the semantic rules for each and every construction and reiterate the argument-sharing redundantly. However, without explaining the reason why the rules are as they are, the analysis will end up in just description/stipulation (cf. Omuro 1990, 1991).

ㅤㅤHowever, it should be pointed out that the underlying event analysis proposed by Parsons (1990) provides clues to the early stages of fragment integration. Parsons (1990) claims that every sentence describing an event is dominated by an existential quantification over an event which does not surface, thus it is called "underlying" quantification. And Parsons' (1990) Event Semantics treats all major parts of speech – not only verbs, adjectives, and adverbs but also participant roles as predicates taking the event variable *e* as one argument. So the semantics of a simple sentence such as *Brutus stabbed Caesar violently with a knife* requires a form of the following complexity: 'For some event e, e is a stabbing & the agent of e is Brutus & the theme

of e is Caeser & e is in a violent manner & the instrument 'with' of e is a knife & e culminated at some time in the past.' When we regard this 'Conjunctivist' form of semantic representation as a starting point of the language development, we can infer the early stages of fragment integration from which adjectives, adverbs and so forth have emerged or diverged. Fragments are either a predicate or an argument, and ① given a predicate it is is interpreted with its argument supplemented, whereas ② given an argument it is interpreted with its predicate supplemented in the central system integrating information from various domain specific faculties, including one for language and others for perception, memory or inference.

Given this background, an alternative analysis to formal semantic approaches proposed for secondary predication might be as follows. Suppose there are several events most likely to be evoked at the time of utterance of an expression and all the grammar has to do is to decide which event to grammaticalize without having to stipulate the information in the grammatical/semantic rules redundantly. This is the essence of functional explanation. Susumu Kuno's Functional Grammar is one such analsyis and everything is taken for granted. Without trying to explain the linguistic fact on the basis of these matters, the formalists have to incorporate stipulations into the syntactic and semantic rules. This might be the fundamental flaw of the formalists' analsyses. It is redundant to duplicate that the same reason why such and such is as it is at the level of grammar, at the level of semantics, and at the level of pragmatics. Fredrick Newmeyer knows both the claims of the formalist and the functionalist and makes remarks beneficial to both camps.

Discourse conditions that are universal and easy to be incorporated into the grammar are 'tag questions', 'secondary predication', 'cognate object' and so forth. In the flow of thought, it is common for one to ask oneself and to find the anwer oneself. This gives rise to 'tag questions.' *Wh*-questions being asked without a clue (e.g. *What are you talking about?*) is an exception. This can be likened to the situation in western philosophy where paradox arises when one asks a quesion with a certain answer in mind but the question is too difficult and the answer is wrong.

In the case of 'secondary predication,' the $event_1$ introduced by the main preciate/the $form_1$ (F_1) invokes the related state of $affairs_2$ expressed by the secondary predicate/the form (F'_2). For example, in the case of *He hammered the metal flat*, you can hammer the metal as long as you like. Nowhere is written what happens if hammering ends nor when it ends. The speaker himself adds how he flattened the metal.

The following example is the resultative construction in a broad sense.

(20) The scientist froze the solution <u>solid</u>.

This sentence means that the scientist froze the solution and as a result the solution got solid. The meaning 'getting solid at the end of freezing' is included in the mening of the verb *froze*, which is the predicate expressing accomplishment. That is, the end state of the event is a part of the meaning of the verb *froze*. Alternatively, as a result of being grammaticalized, the result state of affairs has come to be included in their semantics of verbs like *freeze*. Thus, in the examples like (20), just hearing the utterance *The scientist froze the solution*, the result state is evoked in the mind of the hearer because the verb meaning of *froze* already specify the result state *solid*, which just elaborates the event expressed by F_1 and no other associated event is added to it. Therefore, not much extra information is necessary to get a sensible meaning. However, Croft (2012:328) points out the cases where there appears to be an Adjunct Resultative like "freeze … solid" but the verb does not in itself entail a result state such as *wipe* or *paint*, which might cause the above analysis into problems.

In this paper, I claim that the process of the fragment *solid* being integrated into the sentence *The scientist freezed the solution*, expressing or adding the result state. This can be represented as in (21):

(21) S # Fragment
　　　　　↓
　　　　Result

Mentalese-wise, the language specific faculty decodes the expression *The scientist froze the solution*, and sends a Mentalese translation of it to the central system, to which other faculties like perceptual faculty (e.g. vision), or memory (of experiments or ice cream in a refrigerator), or inference, also sends a Mentalese expression. So mental representations from various sources are integrated in the central system to evoke the result state in the mind of hearer when he or she hears just the first half of the sentence (20), namely *The scientist froze the solution*. Therefore, the first half of the sentence *The scientist freezed the solution* and the added fragment *solid* call out to each other. This can be represented as in (23).

(22) [s S　　　Fragment]
　　　　　↓　　　　↑
　　　　Result in concert with

From the perspective of neurolinguistics, the different regions of the brain are activated according to whether an end state is incorporated into a language itself (i.e. the interpretation is automatic) or it is inferred. In other words, it is predicted that inference and free association are processed in the different regions of the brain.

When the day comes when all the specific details about language processings are revealed in psycholinguistics and when the experiment confirms that there is difference in processing time between the evocation of the result in semantics and the evocation of the result through association, the fragment integration will be corroborated. In principle, there is a possibility of being able to measure the difference between the processing time of the mere fragment sequence and that of the construction which has already introduced the result into its meaning. Thus, it has turned out that adopting the "fragment incorporation" broadens the range of the applicability of "dynamism" or dynamic theories of language.

Next, let us consider the direct object restriction to the effect that the resultatives can be directly predicated only of direct objects (Simpson 1983, inter alia). Typically, the patient (the object) changes when there are both the agent (the subject) and the patient (the object). That is, it is natural to attach the mark indicating what happens as the result of the change to the object. That resultatives are strictly object-oriented (namely, the restriction that resultatives are attached only to the grammatical object) does not mean that grammaticalization has made progress tremendously. Resultative constructions are constructions which get a free ride on semantic and pragmatic factors.

However, there are counter-examples which infrinnge the direct object restriction. Some resultatives may be predicated of subjects. Consider the following example taken from a novel. This sentence is used in a scene of a man (=*He*) being interrogated, confronted with crucial evidence.

(23) He had collapsed entirely, cooperative and cowed.

[Arthur Hailey, *The Money Changers*, p.121.]

In this example, the secondary predicates *cooperative and cowed* describe the result states, being predicated of the subject *He*. Note that the analysis should be modified a little if you admit *collapse* is an unaccusative verb, and thus the subject is in the object position in the deep structure, because the surface subject/object is indecisive as to whether the object restriction is valid or not. The distincition between unergative verbs and unaccusative verbs is the semantic one which varies across languages. There might be some languages which have not arrived at the stage where the resultative predicate may be predicated only of the grammatical object. That is, they have progressed partway in grammaticalization. In the case of those languages which frequently use the object-oriented resultatives have arrived at the advanced stage of grammaticalizaion. In other words, languages which do not obey the object restriction, allowing the structures like (23), have not yet arrived at the advanced stage where

resultatives are restricted to be predicated of purely grammatical objects. There are grammars at intermediate stages. Which shows the importance of the role that the grammars of the nonfinal stage play in explaining the course of development and the uniformity and diversity of adult grammars (Kajita 2004:378). In order to recognize interstage constraints that make reference to two or more consecutive stages requires the process-oriented approach to the problem of defining the notion of the set of possible gramars (N.B. Kajita 2004: 383).

This is an important issue in relation to a general linguistic theory. A general linguistic theory tries to answer the question as to what is the set of possible grammars human beings are born to acquire – namely, the question of what are possible grammars. The *output-oriented* approach to language learning (such as Chomskyan generative grammar) accepts the idea that the output of language learning is largely predetermined, and tries to extend the proposed output constraints to the grammars of nonfinal stages and so <u>this approach considers only those types of constraints that have been proposed to output grammars</u> (i.e. adult grammars). The extreme variant of this model claims that the children's grammars are essentially the same as adult grammars throughout the course of language development (Kajita 1997: 382). On the other hand, the *process-oriented* approach, which is taken in a dynamic model of syntax, accepts the idea that the real regularities of language reside in the process that leads to the outputs, not in the outputs of learning (Kajita 1997:382). Grammar as a whole is not learned at once from the totality of the data but it gradually approaches the adult grammar, starting at the prelinguistic period and going on through the stages of one-word, two-words and so forth. It is assumed that proceeding from the grammar G_i at one stage to the next stage grammar G_{i+1} is not arbitrary but obey the constraints or the law of development, thus it is natural that the intermediate stages are admitted concerning grammaticalization in this model.

Note that there are resultative constructions involving unergative verbs, as in (24) (N.B. Carrier and Randall 1992, inter alia).
(24) The joggers ran the pavement thin.
Intransitive resultatives like (24) are extremely derivative or marginal. Once transitive resultatives like *He hammered the metal flat* are established, intransitive reultatives are derived by adapting themselves to the transitive resultative template. The reason is that there are some speakers who say "He hammered the metal flat," but does not say "The joggers ran the pavement thin." Note that it is a separate issue whether you use intransitive reultative yourself or not.[4]

Let us further consider the issue of resultative predicates.

(25) He shot her <u>dead</u>.

(26) They {beat／knifed} him {to death/to the death}.

(27) a.　Aisukurimu-wo kachi-kachi-ni koorasu. (lit. "I freeze the icecream solid.")

　　b. *Kinzoku-wo taira-ni tataku. (lit. "I hammer the metal flat.")

　Not only adjecives which appear to be predicates but also prepostitions which do not appear to be predicates can occupy the positions of the resultative predicates. For example, in expressions like *break* NP *into pieces* the verb *break* which has already incorporated the resultant state as one of its meanings and *into* which is the mark of the process leading to the result state call to each other or strengthen the result state. The adjective *dead* in (25) is inherently used as a predicate. PP in (26) is an adjunct expressing a spacial movement toward a place, a goal, or development. This is a predicate in the final analysis but it is actually a grammatical adjunct. When PP is used as a result phrase, the use as an adjunct is overlapped and it leans toward an adjuct rather than adjectives like *dead* and *flat*. On the other hand, in the Japanese example (27a) an adjective is only used as a predicate. Other instances like (27b) are constrained and adverbials should be used. To take another example, in Japanese you should say "takaku tobu (meaning fly high)" where "takaku" is an adverb in Japanese. The complement of English inchoative verb *become* is a predicate but even the Japanese counterpart "naru (become)" should take an adverbial as a complement as in "ookiku-naru (to become large)." Researchers of Japanese linguistics study how to analyze these adverbials. There is a possibility that the combination of "*ku*-form" adjectives and result predicates has a different meaning from that of "*ni*-form" adjctive and result predicates. For example, an English sentence corresponding to a Japanese sentence "aka-ku naru (to become red/blush)" is (29), in which an adjective is used.

(28) Mary blushed <u>red</u>.

1.6. Concluding Remarks

　This paper has argueed that the fragment integration plays an important role in analyzing resultatives and other constructions, with construal of this sort of talk in terms of Mentalese. The remaining problems are as follows. Firstly, what linguists can do is to analyze individual construction but it is an undeniable fact that such analyses prone to fall into peripehrism. Secondly, the present approach to the fragment integration uses constructions as tools instead of fragments, as to the investigation of the early stages of grammars and so the approach is indirect. It is desirable to be able to argue that fragments are actually used in the grammars at the

actually developing stages of a language based on the primary data (see Meir (2010).
I would like to leave these issues to further research.

Notes

[1]Some of the constraints might be STAGE-SPECIFIC (Kajita 2004:380).

[2]This structrure bears some resemblance to the circumstantial use of the form ''(*With*) NP P(P).'' Note also expressions like (9) might be derived, being based on semantically proximate *blow*-sentences like the following:

(ii) Clark's sneeze BLOWS THE CAB SIDEWAYS OFF THE ROAD INTO A COLLISION WITH A FIRE HYDRANT.
(www.zen134237.zen.co.UK/:LOIS&CLARK The New Adventures of Superman)

[3]The complements of the verb *sneeze* might form the following hierarchy:

(i) [ø] → [NP]→ [NP PP] → [PP] → [NP']
               ↘

              [NP PP] (Caused-motion)   (cf. Asakawa 1986:66)

[4]It can be argued the fronted *Whose handerchief* in *wh*-questions like *Whose handkerchief did Frank sneeze off the table?* may not be originated from the true direct object position of *sneeze*. The same argument might apply to *What* in *What did Frank sneeze off the table*? It might be only after the subject+*sneeze* and the path expression *off the table* share the argument *wood stain* to form a covalent bond that *wh*-movement can be applied to the caused-motion construction.

[5]See Miyakoshi (2010) and Croft (2012) for the proper representation of events.

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