Adverbial Modification and the Argument Structure of Adjectives*

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1 Introduction

It has been part of the main concern in the study of adverbs to classify them appropriately. Traditionally, adverbs are roughly classified into two classes: sentence and manner adverbs. However, since each class contains adverbs with semantically and/or syntactically different features, a number of more detailed classifications have been made. Among them, Jackendoff's (1972) classification is broadly accepted in the literature. He observes that some adverbs change their meanings depending on where they appear. This is a well-known phenomenon, but an essential question is why these different interpretations are available. Since most adverbs with such meaning change are classified as subject-oriented adverbs by Jackendoff, answering this question requires examination of the behavior of subject-oriented adverbs.

The aim of this paper is to explain how subject-oriented adverbs receive more than one interpretations, where each meaning comes from and how their interpretations and positions are related. In order to solve these problems, I will explore the possibility of deriving the functions and properties of adverbs from those of their adjectival counterparts in some consistent way. Therefore, it is also necessary to examine the behavior of the relevant adjectives, especially the mechanism of attributive modifica-

tion by them.

This paper is organized as follows. Section 2 will outline the subclassification of subject-oriented adverbs in some previous studies in order to examine their semantic properties. Section 3 will discuss the argument structures of the adjectives corresponding to subject-oriented adverbs. Section 4 will make a comparison of attributive and predicative constructions, and discuss how attributive modification by adjectives is achieved in terms of their argument structure. Section 5 will attempt to reveal the nature of adverbial modification by relating the functions of adverbs to those of their corresponding adjectives. Section 6 will present the conclusion of this paper.

2   Subject-Oriented Adverbs

Subject-oriented adverbs (SOAs) constitute a quite problematic class. It is not easy to capture their nature or characterize their status with respect to adverbs of other classes. Jackendoff (1972) defines SOAs as sentence adverbs exhibiting "subject orientation." In (1a) the adverbs *cleverly* and *clumsily* are interpreted as commenting on the subject of the sentence in some way.

(1) a . {Cleverly/Clumsily}(,) John dropped his cup of coffee.

    b . John {cleverly/clumsily} dropped his cup of coffee.

    c . John dropped his cup of coffee {cleverly/clumsily}.

(2) a . It was {clever/clumsy} of John to drop his cup of coffee.

    b . The manner in which John dropped his cup of coffee was{clever/ clumsy}.   (Jackendoff 1972: 49)

The paraphrase in (2a) demonstrates the existence of this orientation in (1a). Note that adverbs which serve as SOAs also may function as manner adverbs. In (1c), the adverbs do not show subject orientation at all: they

describe the manner of the action denoted by the verb rather than the subject's disposition. Therefore, (1c) can be paraphrased as (2b). Note also that the meanings of the relevant adverbs depend on their positions. (1b) is ambiguous between the subject-oriented and manner interpretations. Apart from their meaning change, adverbs themselves that can function as SOAs are not restricted in terms of their positions, as the examples in (1) show.

   Although SOAs are consistent in their subject orientation, the class seems to contain adverbs with rather different properties. For this reason, a number of attempts to subclassify it have been made in the literature. Geuder (2000) distinguishes "transparent adverbs" from "agentive adverbs" on the grounds of their semantic differences.[1] The former transparently express the psychological state of the subject, whereas the latter express the subject's disposition or will and exhibit agent orientation. The examples of each class that he gives are as follows:[2]

(3)   Transparent Adverbs
       angrily, sadly, happily, gladly, proudly, nervously, hungrily, contentedly . . .

(4)   Agentive Adverbs
       stupidly, intelligently, carelessly, clumsily, intentionally, reluctantly,
       . . .[3]   (cf. Geuder 2000)

In addition, Geuder further distinguishes two functions of transparent adverbs from a semantic viewpoint. In (5), the adverbs express the subject's emotion which is arising in the course of the action, while in (6), the adverbs express the emotion which motivate the subject to do the action. He refers to the former and the latter as "causal adverbs" and "motivational adverbs," respectively.

(5) a. John angrily read the review.   (Geuder 2000: 204)
    b. John left sadly.   (ibid.: 205)
    c. He read the apology contentedly.   (ibid.)

(6) a. John angrily wrote a letter to the editor.

　　b. John nervously fidgeted with the pencil.

　　c. He hungrily opened the fridge.   (ibid.: 205)

The differences between causal and motivational adverbs are not limited only to their semantics. They are also distinct in syntactic terms: the latter cannot follow the main verb as in (7), whereas the former are not restricted in this respect as in (8).

(7) a. ? The boy returned to his parents hungrily.

　　b. * He shouted at them angrily. (ok with manner reading)

                                                                    (ibid.: 211)

(8)　　John read the article angrily.   (ibid.: 210)

Moreover, this classification of SOAs strongly suggests the correlation between the syntactic behavior of SOAs and their lexical semantics. Since Geuder's analysis of adverbs also attempts to clarify the relation between their properties and those of their adjectival counterparts, his classification of adverbs is simultaneously that of adjectives. If we apply Geuder's classification of adverbs to their adjectival counterparts, we may get a rough generalization of the relation between each class of adjectives and possible arguments of adjectives belonging to it. Adjectives corresponding to transparent adverbs may have experiencer subjects, while the subjects of adjectives corresponding to *stupidly*-type agentive adverbs receive some other theta-role, which is referred to as the "Mental Property" theta-role by Stowell (1991). Although it is very hard to take adverbs as modifying elements in the same way as predicative adjectives, their modification probably depends on the argument structure of their base adjectives in some way. In section 3, I will discuss the relation between arguments of adjectives and their attributive uses and consider how adverbial modification is achieved.

3   Arguments of Two Classes of Adjectives

Since it would be undoubted in morphological terms that -*ly* adverbs, including subject-oriented adverbs, are derived from adjectives, it is desirable that the functions of adverbs be derived from their adjectival counterparts. To examine this possibility, it is necessary to consider how adjectives are linked with other elements in the sentence.

Traditionally, two uses of adjectives are distinguished, i. e., predicative and attributive uses. It is generally assumed that attributive adjectives are connected with modified elements by different means from theta-marking by predication. This view is supported by the existence of adjectives which only serve as predicates, as in (9), and those which only behave attributively, as in (10).

(9) a . She's very much afraid./He is content with his life./I'm sorry.

b . *an afraid girl/*a content man/*a sorry girl

(10) a . *That hammer is wooden./*That custom is eastern./*The lip is upper.

b . That is a wooden hammer./That's an eastern custom./the upper lip

(cf. Declerck 1991: 348, 349)

It is obviously impossible to regard attributive structures as immediately derived from their predicative counterparts, as assumed in some early studies. However, it seems unlikely that the two uses of each particular adjective are specified independently of each other. Some attempts have been made to derive the two uses of an adjective from the same argument structure. Higginbotham (1985), for example, proposes two mechanisms which connect arguments of attributive adjectives with their head nouns. In the remainder of this paper, I will focus mainly on adjectives from which transparent and agentive adverbs are derived and observe what kind of arguments they take. On the basis of this observation, I will further

consider the theta-roles of the head nouns modified by attributive adjectives.

3.1 MP Adjectives

Stowell (1991) discusses the structural positions of arguments of adjectives such as *clever* and *mean*, whose adverbial derivatives are classified as *stupidly*-type agentive adverbs in our classification. Stowell calls adjectives in this class "mental property (MP) adjectives." The most conspicuous feature of MP adjectives is that they may appear in various configurations. Consider the following paradigm:

(11) a. John is *clever/mean*.

b. John was *clever/mean* to punish the dog.

c. It was *clever/mean* (of John) to punish the dog.

d. Punishing the dog was *clever/mean* (of John).

e. That was *clever/mean* of John.   (Stowell 1991: 106)

In each of (11), regardless of its surface position, *John* serves as a sentient argument whose mental properties the MP adjective is predicated of. The theta-role this argument receives is called the "MP theta-role." In addition, MP adjectives may select another argument which denotes some action. Stowell identifies this action-denoting argument as the Event argument of an MP adjective, which is assumed to be assigned Kratzer's (1995) Event theta-role. When MP adjectives select an action-denoting argument, they are necessarily interpreted as stage-level predicates. As illustrated in (11), MP adjectives select an MP argument obligatorily, whereas they select an action-denoting argument only optionally. When they select only an MP argument, as in (11a), the sentence receives ambiguous interpretations: (11a) attributes cleverness to John as an individual property or attributes it to him only with respect to his certain implied action. Stowell argues that this ambiguity comes from the possibility that the Event argument occurs

implicitly.   On the other hand, the MP argument needs to be implicitly understood even when it does not occur overtly.

Furthermore, he discusses the structural positions of the two arguments of MP adjectives and argues the two arguments are both externally generated, assuming the shell structure which is constituted of two distinct adjectival projections.   The structure that Stowell assumes is illustrated below.

(12) $[_{AP} [_{A'} A_i\text{-}A [_{AP} \text{(of) MP} [_{A'} t_i]]]$ Event]   (ibid.: 128)

He offers some facts as evidence for his structure:

(13) a. %? When$_i$ was it stupid of John [to eat dinner t_i]?

   b. %? When$_i$ was John stupid [to eat dinner t_i]?   (ibid.: 123)

(14) a.   * How stupid of John to leave town was it?

   b.   * How stupid to leave town was it of John?

   c.   * How stupid to leave town was Bill?   (ibid.: 125)

(15) a.   How stupid was John to leave town?

   b.   How stupid of John was it to leave town?   (ibid.: 126)

   c. %? How stupid was it of John to leave town?   (ibid.: 125)

(16)   * It was stupid to wash the car of John.   (ibid.: 122)

As seen in (13), extraction of an adjunct from the Event argument of MP adjectives is marginal.   This means that the Event argument is not a true complement of MP adjectives.   The ungrammaticality of the examples in (14) shows that the Event argument of MP adjectives cannot be pied-piped in *wh*-questions.   On the other hand, pied-piping of the MP argument is always possible, and often preferred as shown in (15).   The contrast between the two arguments in pied-piping suggests that the MP argument resides within AP while the Event argument is external to AP.   The contrast is consistent with the fact illustrated in (16) that the Event argument never precedes the MP argument when the adjective remains *in situ*.   Moreover, it follows from the observations in (17-18) that the MP argument differs from a typical genitive complement of a (non-MP) adjective.   Unlike the

latter, the former cannot be *wh*-moved, regardless of whether *of* is stranded or not.

(17) a . ? *Who was leaving town stupid of?

　　b. 　*Of whom was leaving town stupid? 　　　　　(ibid.: 126)

(18) a . ? *I spoke to the man that it was stupid of to leave town.

　　b. 　*I spoke to the man of whom it was stupid to leave town.

(ibid.: 127)

Although Stowell confines his discussion to the constructions in which the MP and the Event theta-roles are involved, MP adjectives may assign some other theta-roles. In (19), the MP adjectives coocur with the argument that specifies the domain where the disposition of the subject is displayed besides the MP argument.

(19) a . He is clever at mathematics.

　　b. He is very mean to me.

　　c. Mary was kind to her people.

　　d. We must be careful with dynamite.

The argument in question is regarded as limiting the range where the MP argument displays the disposition denoted by the adjective. Some similar examples that Pesetsky (1995) offers are as follows:

(20) a . John was careful with the electrodes.

　　b. Bill was wary of snap judgments.

　　c. Mary was stingy with her prize money.

　　d. Bill was reckless with his money. 　　　　(Pesetsky 1995: 65)

Note that examples in (20) contain adjectives that do not fall within Stowell's class of MP adjectives: not all of them exhibit the full paradigm shown in (11). Nevertheless, they all fall under the class of adjectives from which agentive adverbs are derived. For want of a better term, I will call the relevant argument seen in (19-20) the "Domain" argument. And hereafter, adopting Geuder's (2000) terminology, I will refer to adjectives of this

class and those from which transparent adverbs are derived as "agentive adjectives" and "transparent adjectives," respectively.

3.2 Transparent Adjectives

Now, let us consider arguments of transparent adjectives. As seen in (21), transparent adjectives can select an argument which is referred to by Pesetsky as Target or Subject Matter (SM) in addition to Experiencer.

(21) a. John was proud (of his son).

   b. Bill was angry (at the government).

   c. Sue was nervous (about the exam).

   d. Bill was sad (about John).   (Pesetsky 1995: 64)

Moreover, many transparent adjectives may select *to*-infinitive clauses in parallel with agentive adjectives. These transparent adjectives are usually capable of selecting *that*-clauses, too. Observe (22) and (23).

(22) a. He was sad to leave Mary.

   b. John was angry to read that it is being tested on animals.

   c. Sue was very glad to receive a letter from him.

   d. They were happy to hear her success.

(23) a. He was sad that Mary left him.

   b. John was angry that he hadn't received protection earlier.

   c. Sue was very glad that her son passed the examination.

   d. They were happy that Mary returned unhurt.

The *to*-infinitives in (22) and the *that*-clauses in (23), however, appear to differ in thematic status. The latter express the state of affairs that is noticed by the subject and invoke its emotion denoted by the adjective. These are exactly what Pesetsky refers to as Subject Matter. On the other hand, the *to*-infinitives in (22) seem to serve as Causer: their main verbs are often perception verbs. In (22d), for example, it is not their hearing her success, but her success itself that they attribute their happiness to. Rather,

the action of hearing is what caused their happiness.   The *to*-infinitives illustrated above do not appear to be the complements of the adjectives: the extraction of adjuncts from these *to*-infinitives is generally bad as seen below.

(24) a. ? *Where were you sad to quarrel with him?

　　 b. ? *Where were they happy to hear the news?

　　 c. ? *Where was Mary glad to receive a letter from John?

To explain this impossibility, we may assume that transparent adjectives have a similar structure to that of agentive adjectives.   Given Stowell's analysis of agentive adjectives, the structure of transparent adjectives is shown in (25).

(25)　$[_{AP} [_{A'} A_i\text{-}A [_{AP} \text{Experiencer} [_{A'} t_i]]] \text{Causer}]$

Although the precise structural position of each argument is not the main concern of this subsection, here I further assume that the Domain argument of agentive adjectives and the Target/SM argument of transparent adjectives occupy the complement position of the inner AP.

3.3　The Affix *SUG*

In addition to the configurations seen above, Pesetsky (1995) observes that agentive and transparent adjectives generally may appear in another kind of construction where they establish a distinct theta relation with their arguments.   Consider the following examples.

(26) a. John's manner was careful.

　　 b. Bill's remarks were wary.

　　 c. Mary's behavior was stingy.

　　 d. Bill's expression was reckless.　　　　　　　　(Pesetsky: 65)

In each example, it does not seem to be the MP-theta role that the agentive adjective assigns to the subject.   Rather, each sentence describes through her or his behavior someone's disposition which is denoted by the adjective.

At the same time, Pesetsky points out that transparent adjectives also have a similar extension of function. In (21) above, transparent adjectives describe the subject's emotion. On the other hand, each sentence in (27) suggests that the subject harbors the emotion denoted by the adjective, by describing the subject's behavior.

(27) a. John's manner was proud.

b. Bill's remarks were angry.

c. Sue's behavior was nervous.

d. Bill's words were sad.   (ibid.: 64)

Pesetsky assumes that the adjectives in (26) and (27) are actually derivatives which are derived from adjectives by attaching a null derivational affix *SUG* to them and that this derivational process suppresses the MP and Expericencer theta-roles and the derived adjectives assign the "Suggestor" theta-role to the subject. What is important here is that the same process of attaching a null derivational affix may apply both to agentive and transparent adjectives and that as a result of the affixation, they can select the "Suggestor" argument independently of their inherent argument structures.

The next section examines which of the arguments observed here can be attributively modified by the relevant adjectives, by exploring the relation between predicative and attributive adjectives in more general terms.

4   Restrictions on Attributive Modification by Adjectives

The properties of adverbs appear more similar to those of attributive adjectives. Travis (1988) observes that adverbs are more restricted in their capability of taking complements than their corresponding adjectives. Hoshi (1999) points out that a similar restriction is placed on attributive prenominal adjectives. Consider the following examples:

(28) a． proud of their achievements

　b． *proudly of their achievements   (Travis 1988: 287)

　c． *the [proud of his son] man   (Abney 1987: 280)

Moreover, it should be pointed out that the relative order of attributive adjectives is restricted in a parallel way to the restriction on that of attributive adverbs:

(29) a． the probable quick passing of the bill

　b． *the quick probable passing of the bill   (Shaer 1998: 398)

On the basis of these similarities, I will begin by examining the possibility that adverbial modification is achieved in a parallel way to the modification by attributive adjectives. This section is the preliminary stage of the above examination. I will discuss possible modification by attributive adjectives in the following.

4.1　Attributive Modification and Theta-Roles

Even in the cases of adjectives that may function both predicatively and attributively, the fact that a certain element can appear in the predicative construction does not necessarily mean that the element can be attributively modified by them. In general, not all the arguments of a particular adjective may serve as the head noun of its attributive counterpart. Then, which of the arguments of an adjective can be modified attributively?

An answer to this question that seems most promising is that the arguments which can be the subjects in the predicative construction can also be modified attributively. The relations as follows obtain between attributive transparent adjectives and their head nouns:

(30) a． "X (human) which has the emotion denoted by the adjective"

　　　a happy man —— The man is happy.   [Experiencer]

　b． "X (the state or movement of the agent's body) which suggests that its agent or possessor has the emotion denoted by the adjective"

      a glad smile —— His smile was glad.   [Suggestor]

  c. "X (proposition) which invokes someone's emotion denoted by the adjective"

      a sad story —— The story is sad.   [Target/SM]

  d. *"X (action) which causes its agent's emotion denoted by the adjective"

      *(his) sad discovery —— *His discovery was sad.   [Causer]

               (cf. Mary was sad to discover that he was gullible.)

The interpretations of the head nouns in (30) are represented by the theta-roles on the right. Similarly, this correspondence between predicative and attributive adjectives holds in the case of agentive adjectives, as in (31).

(31) a. "X (human) which has the disposition denoted by the adjective"

      a clever man —— That man was clever.   [MP theta-role]

  b. "X (the state or movement of the agent's body) which suggests that the agent has the disposition denoted by the adjective"

      a stupid behavior —— His behavior was stupid.   [Suggestor]

  c. *"X (domain) in which the agent's behavior demonstrates that the he has the disposition denoted by the adjective"

      *(his) clever money —— *(His) money was clever.   [Domain]

                 (cf. He was clever with money.)

  d. *"X (action) on the basis of which the speaker thinks that the agent has the disposition denoted by adjective"

      *(his) clumsy destruction of the papers —— *His destruction of the papers was clumsy.   [Event theta-role]

    However, other classes of adjectives provide apparent counterexamples against this correspondence. Adjectives such as *certain* and *sure* may be predicated of an Experiencer subject, whereas they cannot modify it attributively:

(32) a. The student is certain of her winning.

　b． Her winning is certain.

(33) a． The student is sure of her success.

　b． Her success is sure.

(34) a． *a certain student (of her victory)

　　　[as a paraphrase of 'a student who is certain of her victory']

　b． her certain victory

(35) a． *a sure student (of her success)

　　　[as a paraphrase of 'a student who is certain of her success']

　b． her sure success

The adjectives shown in (32-35) are those which Cinque (1990) calls "ergative adjectives." By offering various pieces of evidence, he argues that ergative adjectives have a structure similar to ergative verbs, in which the Theme argument occupies the complement position as an internal argument, while the Experiencer argument optionally occurs externally. Given the shell structure of transitive verbs, which is broadly accepted in the recent literature, this parallelism between ergative adjectives and ergative verbs is reflected in the structure as follows:

(36)　$[_{aP}$ Experiencer $[_{a'} A_i\text{-}a \ [_{AP} t_i$ Theme$]]]^{4,5}$

Adopting this structure of ergative adjectives leads us to a new generalization on attributive modification. As mentioned above, the Event argument of agentive adjectives, which cannot occur as the head noun of attributive agentive adjectives, occupies the specifier position of the outer AP. This argument and the Causer argument of transparent adjectives occupy the same structural position and are incapable of being modified by the relevant adjectives. Therefore, it would be argued that arguments which occur outside the inner AP cannot be modified by attributive adjectives. Recast in terms of the shell structure in (36), the structures assumed above for agentive and transparent adjectives will be as in (37a, b), respectively:

(37) a． $[_{aP} \ [_{a'} A_i\text{-}a \ [_{AP} MP \ [_{A'} t_i$ Domain$]]$ Event$]$　　(agentive adjective)

b. $[_{aP} \, [_{a'} \, A_j\text{-}a \, [_{AP} \, \text{Experiencer} \, [_{A'} \, t_i \, \text{Target/SM}]] \, \text{Causer}]$

(transparent adjective)

4.2 Cooccurrence Restrictions on Arguments

It should be pointed out, however, that the occurrence of arguments of transparent and agentive adjectives is restricted in another respect, i. e., two kinds of cooccurrence restrictions are observed among arguments in the predicative construction of the relevant adjectives. It is worth considering how the existence of these restrictions is related to the possibility of attributive modification. The first restriction involves the affix *SUG*. As mentioned above, *SUG* is attached to transparent or agentive adjectives, suppresses their Experiencer or MP arguments and adds Suggestor to their argument structures. Pesetsky (1995) observes that there is a cooccurrence restriction between the Suggestor and the Target/SM or Domain arguments. Consider (38) and (39).

(38) a．John's manner was proud (*of his son).

   b．Bill's remarks were angry (*at the government).

   c．Sue's behavior was nervous (*about the exam).

   d．Bill's words were sad (*about John).   (Pesetsky 1995: 64)

(39) a．John's manner was careful (*with the electrodes).

   b．Bill's remarks were wary (*of snap judgments).

   c．Mary's behavior was stingy (*to every detail).

   d．Bill's expression was reckless (*with his money).   (ibid.: 65)

Although I do not pursue the precise way that occurrence of the Target/SM and Domain arguments is blocked, it is not *SUG* itself that prevents the arguments in question from occurring. They are not obligatory elements: there are no circumstances under which they necessarily appear. Nonetheless, it is appropriate to regard them as arguments rather than adjuncts, which indicates that they are prevented from occurring by some other

factor.

This view is suggested by the second cooccurrence restriction: the outermost and innermost arguments in (37) cannot cooccur with each other. In other words, the Domain argument cannot appear with the Event argument, and the Target/SM argument cannot appear with the Causer argument. To consider this restriction, it should be pointed out that agentive receive somewhat different interpretations, depending on whether the Domain argument appears or not. This is observed clearly in the case of agentive adjectives like *clever*:

(40) a. John was clever.

b. John was clever at arithmetic.

c. John was clever to burn the papers.

In (40a), *clever* describes some property that John immanently has, which is displayed through his behavior, but is not directly observed from the outside, whereas *clever* in (40b) describes his skill in doing some specific thing.[6] This difference suggests that *clever* in (40a) has a different argument structure from *clever* in (40b), i. e., the former does not select the Domain argument, whereas the latter takes Domain argument as an obligatory element. In other words, the Domain argument can never be implicit. Now consider (40c), where the adjective takes the Event argument. As in the case of *clever* in (40a), *clever* in (40c) describes the property that John displays in determining what he does and that the Event argument clearly specifies which of his decisions demonstrates John's cleverness. Hence, it is plausible to conclude that the outer *a* head, which introduces the Event argument, only selects the inner AP in which the Domain argument does not appear. All the argument structures that agentive adjectives like *clever* can have are illustrated in (41).

(41) a. $[_{AP}$ MP A$]$

b. $[_{AP}$ MP $[_{A'}$ A Domain$]]$

c. $[_{aP} [_{a'} A_i\text{-}a [_{AP} MP t_i]]$ Event]

Note that since the Event argument occurs both overtly and implicitly, as mentioned in section 3.1, the structure of (40a) may be (41a) or (41c).

Then, how about transparent adjectives? It is quite unclear whether transparent adjectives show different interpretations like agentive adjectives, but the Target/SM argument also cannot cooccur with the Causer argument:

(42) a. He was sad {about Mary/to leave Mary}.

b. *He was sad about {Mary/her} to leave {her/Mary}.

Therefore, I assume that Target/SM is not involved in the argument structure of transparent adjectives when it does not appear, and its implicit occurrence is disallowed. That is, transparent adjectives have the parallel paradigm of argument structure to that of agentive adjectives in (41):

(43) a. $[_{AP}$ Experiencer A]

b. $[_{AP}$ Experiencer $[_{A'}$ A Target/SM]]

c. $[_{aP} [_{a'} A_i\text{-}a [_{AP}$ Experiencer $t_i]]$ Causer]

This explanation of the second restriction provides a possible explanation of the incompatibility of the Suggestor argument with the Domain or Target/SM argument (see (38) and (39)). If the affix *SUG*, as well as the outer a head can only selects the inner AP that has the structure in (41a) or (43a), affixation of *SUG* makes the Domain and Target/SM arguments unavailable. Recall also that the MP and Experiencer arguments cannot appear under affixation of *SUG* either, because *SUG* suppresses them.

4.3   Modified Elements as the Arguments of Attributive Adjectives

In the preceding subsections, we observed that arguments generated in the outer aP cannot be modified by attributive adjectives and discussed the cooccurrence restrictions, which reveal the properties of the *SUG* and suggest that the MP and Experiencer arguments may occur solely in the

argument structure of adjectives. On the basis of these observations, we can make a more appropriate generalization as follows:

(44)   Only the arguments which can be the only arguments of predicative adjectives can be the head noun of its attributive counterpart.

Since the MP argument of agentive adjectives and the Experiencer argument of transparent adjectives may be their only arguments, they can be the head nouns of attributive adjectives, as shown in (30a) and (31a). On the other hand, the Experiencer argument of ergative adjectives cannot appear without Theme: it can be never their only argument. When it does not appear overtly, it must be understood implicitly:

(45)   John is certain. (necessarily interpreted with an implicit Theme argument)

Hence it cannot be modified by attributive adjectives. The structures assumed for agentive, transparent and ergative adjectives are summarized in (46).

(46) a . $[_{aP}$ $[_{a'}$ A_i-a $[_{AP}$ MP $[_{A'}$ t_i Domain]]] Event]

   b . $[_{aP}$ $[_{a'}$ A_i-a $[_{AP}$Experiencer $[_{A'}$ t_i Target/SM]]] Causer]

   c . $[_{aP}$ Experiencer $[_{a'}$ A_i-a $[_{AP}$ t_i Theme]]]

   When adjectives with the argument structure including only one argument modify nouns attributively, they need to have neither complements nor specifiers within their projections, because it is the nouns modified by them that serve as their only argument. If the generalization in (44) is correct, i. e., only adjectives with an argument are attributive, it would be argued that attributive adjectives can have neither complements nor specifiers. In other words, only the adjectives that project no phrasal category may be attributive. This view is consistent with Higginbotham's (1985) analysis of adjectival modification and its application to adverbs by Travis (1988). If attributive modification is constituted of more than one adjectival heads, it is derived by repeating adjunction to the next higher head. Each argument is

modified by attributive adjectives that have the following structures:

(47) transparent adjective

    a. A   →(Target/SM)

    b. A   →(Experiencer)

    c. $*[_{a'} [\text{A-}a]_i [_{AP} \text{Experiencer } t_i]]$→(*Causer)

    d. A-*SUG*   →(Suggestor)

(48) agentive adjective

    a. *A   →(*Domain)[7]

    b. A   →(MP)

    c. $*[_{a'} [\text{A-}a]_i [_{AP} \text{MP } t_i]]$ →(*Event)

    d. A-*SUG*   →(Suggestor)

(49) ergative adjective

    a. A   →(Theme)

    b. $*[_{a'} \text{A}_i\text{-}a [_{AP} t_i \text{ Theme}]]$ →(*Experiencer)

In the next section, I will discuss the relation between adverbs and elements modified by them, by comparing it with the relation between adjectives and their arguments.

5 Adverbial Modification

5.1 Comparison with Adjectival Modification

As mentioned in section 1, some adverbs, including those which can be SOAs, have more than one functions. Generally, it appears to be possible to attribute the meaning of an adverb to one of the interpretations available to its adjectival counterpart. It is therefore natural to assume that elements modified by adverbs are qualified as arguments of their adjectival counterparts. In this section, I will consider how each of the meanings that an adverb can have is related to the argument structure of the adjective corresponding to it and examine whether all adverbial functions are actu-

ally attributed to adjectival ones.

Let us begin with agentive adverbs. Adverbs in this class may function as manner adverbs. The adverbs in (50) are both interpreted as describing the manner of action.

(50) a . John dropped his cup of coffee cleverly.   (Jackendoff 1972: 49)

　　 b . He closed the notebook carefully.   (Konishi 1989: 364)

It should be pointed out that this interpretation is similar to that of the agentive adjectives in the following examples.

(51) a . John's conversation is clever.

　　 b . John's manner was careful.

As discussed above, the subjects in (51) serve as the Suggestor arguments of the adjectives. Given the similarity in interpretation between (50) and (51), the elements modified by the adverbs in (50), *dropped his cup of coffee* and *closed the notebook*, seem to function as the Suggestor arguments of the adverbs. This view is supported by the appropriate paraphrases of the sentences in (50). They can be paraphrased as follows:

(52) a . John dropped his cup of coffee in a clever manner.

　　 b . He closed the notebook in a careful manner.

As shown in (26a), *manner* is a typical instance of nouns which may function as the Suggestor argument of agentive adjectives. In addition to this reading, agentive adverbs have the subject-oriented reading. For example, the adverbs in (53) are interpreted as expressing the speaker's evaluation of the subject and the action denoted by the verb rather than the manner of the action.

(53) a . Cleverly, John dropped his cup of coffee.   (Jackendoff 1972: 49)

　　 b . Carefully, he folded the sheets.

This reading of agentive adverbs is taken to be related to the Event theta-role of agentive adjectives. Event arguments appear in the paraphrases of sentences with subject-oriented agentive adverbs such as those in

(53):

⒁a. John was clever to drop his cup of coffee.

   b. He was careful to fold the sheets.

The paraphrases in (54) are the same in fundamental semantics as the adverbial expressions corresponding to them: they also express the speaker's evaluation of the subject and the action denoted by the verb. Hence, the elements that the adverbs modify in (53) are also regarded as the Event arguments of the adverbs.

   Now let us turn to transparent adverbs. Adverbs in this class also have the manner reading. For example, the transparent adverbs in (55) describe the manner of action that suggests the subject's emotion.

⒂a. Bill shouted at them angrily.

   b. Mary walked sadly away.

This means that the manner reading of transparent adverbs corresponds to the meaning of their adjectival counterparts with the affix *SUG*. In other words, elements that transparent adverbs modify are taken to serve as the Suggestor arguments of the adverbs. Here again, this view is supported by their possible paraphrases. The manner reading of transparent adverbs are paraphrased by "in an *Adj*. manner," as shown in (56).

⒃a. Bill shouted at them in an angry manner.

   b. Mary walked away in a sad manner.

Another possible reading that transparent adverbs have is the causal reading, which is a kind of subject-oriented reading. In (57), the adverbs express the subject's emotion caused by the action that the verb denotes.

⒄a. He read the review angrily.   (Geuder 2000: 207)

   b. He sadly discovered the solution to be incorrect.   (ibid.: 212)

The causal meaning seems to be related to the Causer argument of the transparent adjectives. That is to say, the elements modified by the adverbs in (55), *read the review* and *discovered the solution to be incorrect*, appear to

function as the Causer arguments of the adverbs. In fact, the following sentences can be the paraphrases of the sentences in (57).

(58) a. He was angry to read the review.

  b. He was sad to discover the solution to be incorrect.

Furthermore, transparent adverbs may also function as speaker-oriented adverbs, as shown in (59). The examples in (59) mean that the fact denoted by the parts of the sentences which follow the adverbs invoke the speaker's emotion denoted by the corresponding adjectives.

(59) a. Sadly, they sent their resignation last week.

                                    (Greenbaum 1969: 173)

  b. Curiously enough, he does not insist on his rights.   (ibid.: 229)

This function seems to be related to the Target/SM argument of transparent adjectives. Here the relevant adverbs are regarded as taking the Target/SM arguments. This view is supported by the paraphrases in (60).

(60) a. It is sad that they sent their resignation last week.   (ibid.: 173)

  b. It is curious enough (that) he does not insist on his rights.

                                            (ibid.: 229)

In (61-62), ergative adjectives and their adverbial counterparts exhibit a similar correspondence, where the relevant argument is Theme.

(61) a. Certainly, he will attend the meeting.

  b. Surely, he will succeed.

(62) a. I'm certain that he will attend the meeting.

  b. I'm sure that he will succeed.

  The above observations suggest that adverbs have the same underlying argument structures as their adjectival counterparts and that they modify elements which serve as their arguments depending on their interpretations.[8] Now, let us compare the functions of adverbs and their corresponding attributive adjectives and examine whether they are restricted in a parallel way. The correspondence between functions of

adverbs and the modified elements is illustrated below.

(63)   transparent adverb

    a. [speaker-oriented]   — (Target/SM)   ← A

    c. [subject-oriented]   — (Causer) $(←^*[_{a'} [A\text{-}a]_i [_{AP} \text{Experien-} \text{cer } t_i]])$

    d. [manner]   — (Suggestor)   ← A-SUG

(64)   agentive adverb

    c. [subject-oriented]   — (Event) $(←^*[_{a'} [A\text{-}a]_i [_{AP} \text{MP } t_i]])$

    d. [manner]   — (Suggestor)   ← A-SUG

(65)   ergative adverb

    a. [speaker-oriented]   — (Theme)   ← A

The structures shown on the right are those of attributive adjectives that take the relevant arguments.   Recall that attributive adjectives cannot modify nouns that serve as the Causer and Event arguments (see (47c) and (48c)), which are assumed to be related to the subject-oriented reading of adverbs.   If the correspondence shown above is correct, the fact that the subject-oriented reading is available to adverbs suggests that adverbial modification is not always achieved in the same way as attributive modification by adjectives.   It is not unreasonable to suppose that adverbs as well as adjectives can be both attributive and predicative.   Subject-oriented adverbs are taken to be predicated of some element within the verbal projection.   The differences in distribution between the classes of adverbs are conceived of as reflecting the structural positions where the elements which may be arguments of the relevant classes of adverbs are available.

5.2   The Distribution of Adverbs and Theta-Roles

As Jackendoff (1972) observes, adverbs with the speaker-oriented reading must precede ones with the subject-oriented reading:

(66) a.   Happily, Max cleverly was climbing the walls of the garden.

    b．*Cleverly, Max happily was climbing the walls of the garden.

<div align="right">(Jackendoff 1972: 89)</div>

(67) a．{Happily/Cleverly}, Max was climbing the walls of the garden.

    b．Max {happily/cleverly} was climbing the walls of the garden.

<div align="right">(ibid.: 88)</div>

This suggests that the Causer and Event arguments are available in a lower position than the Target/SM and Theme argument are. Furthermore, Travis (1988) points out that either subject-oriented or manner reading is available in a particular position, as illustrated below:

(68) a．Reluctantly Mary was instructed by Joan. [subject-oriented]

<div align="right">(McConnell-Ginet 1982: 145)</div>

    b．Mary reluctantly was instructed by Joan. [subject-oriented]

<div align="right">(ibid.: 154)</div>

    c．Mary was reluctantly instructed by Joan. [manner]   (ibid.: 148)

    d．Mary was instructed reluctantly by Joan. [manner]

<div align="right">(Travis 1988: 292)</div>

Adverbs with the manner reading appear in lower positions than ones with the subject-oriented reading.

    It is plausible to assume that in order for a verbal projection to serve as the argument of an adverb, the adverb must enter into some uniform structural relation with them. Suppose that adverbs are adjoined to projections that can be their relevant arguments. The fixed relative order of adverbs with the three readings is derived if the Causer and Event arguments are required to be a higher projection than the Suggestor argument is, and the Target/SM and Theme arguments must be a higher projection than the Causer or Event argument. This view is also suggested by semantic and syntactic properties of those arguments of corresponding adjectives. The Suggestor argument only specifies the kind of action, whereas the Causer and Event arguments indicate specific actions. Therefore, it seems

reasonable to think that the latter need to have more projections than the former, and that the Target/SM and Theme arguments, which have propositional content, contain much higher projections (See (33-34)).   In addition, the realization of these arguments in different forms, of course, supports such structural differences: the Causer and Event arguments are typically realized as *to*-infinitives, as shown in (11) and (23), the Target/SM and Theme arguments occur as that-clauses, as in (23) and (62), or DPs with propositional content, as in (30c) and (32-33), and the Suggestor argument is usually a derived nominal or a noun like *manner* and *remarks*, as seen in (26-27).[9]

Although it seems undoubted that the distribution of adverbs depends on what verbal projection the relevant argument requires, the precise mechanism of adverbial modification is still quite unclear. Specifically, it should be made clear what structural requirements must be satisfied by attributive and predicative adverbs and their arguments, and which positions in the sentence structure adverbs occupy. I will leave these questions open for future research.

6   Concluding Remarks

In this paper, I have attempted to explore the nature of adverbial modification by considering how the properties of adverbs are related to those of adjectives. The detailed examination of subject-oriented adverbs, which exhibit variations in meaning and function, and their adjectival counterparts revealed that the functions of adverbs crucially depend on those of the corresponding adjectives. Specifically, it turned out that the semantic and syntactic differences between agentive and transparent adverbs follow from their different argument structures, and that the element that they modify basically corresponds to one of their arguments. More than one interpreta-

tions that subject-oriented adverbs receive are derived from more than one arguments their adjectival counterparts take and their capability of being predicative. Furthermore, it was argued that the distribution of adverbs depends on where the elements modified by them are available.

Notes

*   I would like to thank Masachiyo Amano, Tomoyuki Tanaka, and IVY reviewers for their helpful comments. Needless to say, all the remaining errors are mine.

1   Geuder relates the function and interpretation of adverbs to those of adjectives and gives a parallel classification and terminology to the latter. For example, adjectives from which transparent adverbs are derived have the parallel function and interpretation to the corresponding adverbs and constitute the class of "transparent adjectives," as mentioned later.

2   A similar distinction is made by Nakau (1980) in quite different terms. As evidence for his subclassification, Nakau points out that the two subclasses of SOAs exhibit distinct syntactic behavior in some respects, for example, in their capability of occurring under the scope of negation.

3   Precisely, Geuder further classifies agentive adverbs into the two subclasses exemplified in (i).

   (i) a. *stupidly*, *intelligently*, *carelessly*, *clumsily*, . . .

        b. *intentionally*, *reluctantly*, . . .   (cf. Geuder 2000)

Although adverbs in both subclasses behave somewhat differently, I will leave this distinction out of consideration because it is irrelevant to the discussion in this paper.

4   Pesetsky (1995) subdivides the arguments involved in psychological predicates that are all usually regarded as Theme into three distinct arguments: Causer, Target and Subject Matter. *Certain* and *sure* are clearly psychological predicates because they involve the Experiencer argument. But since distinguishing the internal argument of adjectives like *certain* from that of transparent and agentive adjectives does not have any effect on the discussion here, I will not

pursue the precise status of the argument and use the traditional term "Theme."

⁵   A similar proposal is made by Osawa (1999) on independent grounds. She points out some similarities in behavior between the genitive object of adjectives and the accusative object of verbs and argues that they take parallel courses of derivation and some adjectives can be transitive.

⁶   This difference in interpretation is based on the following difference. That is, if John conducts himself intentionally for some purpose, John's whole behavior consists of two distinct processes: the process of deciding what kind of action he will or will not perform, and the process of actually performing the action in some manner (, if he have decided to do it). Then, (38a) means that John displays his cleverness in the former process, i. e. in selecting the action he performs. On the other hand, (38b) denotes that John displays his cleverness in the manner of doing something. The reason why *clever* in (38b) cannot be predicated of the property which John displays in the former process may be that the Domain argument presupposes the selection of a certain action.

⁷   Although the Domain argument of agentive adjectives occupies the parallel structural position to the Target/SM argument of transparent adjectives, unlike the latter, the former cannot be attributively modified. This difference will have to do with the question of which categories function as the relevant arguments. In the construction which involves agentive adjectives with the Domain argument, DPs following prepositions define the domain where the subject displays the disposition denoted by the adjective, they behave differently in doing so:

(i) a. John is clever at making excuses.

   b. Mary was clever at mathematics.

   c. Bill is clever in the field of public relations.

   d. Sue was clever with her pen.

In (ia), the gerund directly specifies the action through which John shows cleverness, whereas in (ib-d), the DPs express the kind of activity that demonstrates the subject's cleverness much more vaguely. If this argument is on the right track, it follows that in the relevant construction, the whole PP rather than only the DP serves as the Domain argument. If agentive adjectives are to modify the Domain argument attributively, it would lead to the attributive modification of PP, which is impossible. On the other hand, it is DP rather than PP that

functions as the Target/SM argument of tranparent adjectives, because the
Target/SM argument does not appear to exhibit different semantic relations to
transparent adjectives depending on the kinds of preposition.

[8]   However, it should be pointed out that the complete correspondence
between adverbs and their adjectival counterparts is unavailable: adverbs that
attributively modify elements functioning as the MP and Experiencer arguments
are not found, and the theta-role that the elements modified by motivational
adverbs receive is not available from the argument structure of their adjectival
counterparts. The reason why the elements modified by adverbs cannot be the
MP and Experiencer arguments is clear. Since these arguments are required to
denote human beings or animate objects (see (28-29)), they cannot be realized as
verbal projections. Most adverbs cannot modify nominal categories. On the
other hand, it is quite unclear where the motivational reading of transparent
adverbs comes from. However, there is a possibility that motivational adverbs
are not derived from transparent adjectives. As Geuder (2000) points out, not all
transparent adverbs may be interpreted motivationally. Transparent adverbs
like *sadly* and *gladly* usually disallow the motivational reading. The restricted
distribution of motivational adverbs suggests their idiosyncrasy.

[9]   Mizuno (2000) argues that manner adverbs are adjoined to v' on the basis of
their relative order to floating quantifiers. This position is compatible with the
semantics of the Suggestor argument. The argument in question must be an
expression that denotes an intentional action, as we saw above. Given the
introduction of agentivity by the v head, it appears to be plausible that the
adverbs are adjoined to a constituent that includes this head. For the Causer and
Event arguments, it should be pointed out that they may be perfect infinitives:

(i)a. He was sad to have lost.   (Konishi 1989: 1589)

   b. I am proud to have served him.   (ibid.: 1459)

(ii)a. John was clever to have left early.   (ibid.: 418)

   b. I was very foolish to have been son scared.   (ibid.: 730)

If auxiliary *have* is generated as the head of a distinct projection, it might be
suggested that the relevant arguments are uniformly this projection, which
appear between vP and TP, and that adverbs with the subject-oriented reading
are adjoined to it.

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Synopsis

Adverbial Modification and the Argument Structure of Adjectives
Hiroki Maezawa

Adverbs that serve as subject-oriented adverbs (SOAs) may also serve as manner adverbs. As shown in (1), adverbs like *cleverly* and *clumsily*, which fall under Jackendoff's (1972) first class of adverbs, are ambiguous between the subject-oriented and manner readings depending on where they occur.

(1) a. {Cleverly/Clumsily}(,) John dropped his cup of coffee.

   b. John dropped his cup of coffee {cleverly/clumsily}.

(Jackendoff 1972: 49)

In (1a), the adverbs are interpreted as SOAs, whereas in (1c), they are interpreted as manner adverbs. On the other hand, the class of SOAs includes adverbs with different semantic and syntactic properties and requires to be further subclassified. Geuder (2000) distinguishes two classes of SOAs, as illustrated in (2) and (3).

(2) Transparent Adverbs

   angrily, sadly, happily, gladly, proudly, nervously, hungrily, contentedly . . .

(3) Agentive Adverbs

   stupidly, intelligently, carelessly, clumsily, . . .   (cf. Geuder 2000)

In this paper, I attempt to explore the nature of adverbial modification by considering where these different interpretations of SOAs come from, and argue that the functions of adverbs are closely related to those of their adjectival counterparts. The differences between transparent and agentive adverbs are derived from the different argument structures of the corresponding adjectives, and the meaning change that they show is accounted for in terms of the elements that they take as their arguments. When transparent or agentive adverbs modify the elements that serve as their Causer or Event arguments, they function as SOAs. On the other hand, when they modify the elements that serve as their Suggestor arguments, they function as manner adverbs. In addition, the comparison of adverbial modification and attributive modification by adjectives

suggests that adverbs as well as adjectives can be both attributive and predica-tive. It is argued that the subject-oriented reading of adverbs is achieved predicatively, because the Causer and Event theta-roles, which are related to this reading, are not available for attributive modification by adjectives. Further-more, I claim that the elements that adverbs take as their arguments determine where they appear in the sentence.