

Why Epistemic and Manner Modification are Exceptional

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WHY EPISTEMIC AND MANNER MODIFICATION ARE EXCEPTIONAL  
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1. Introduction.

In the last twenty years or so, enough research has been done on English adverbs to see that there is a clear and systematic distinction between sentential adverbs and predicate-modifying adverbs. In (1), for instance, appropriately takes the sentence in its scope in (a) but modifies the predicate handle Jay's lawsuit in (b):

- (1) a. Appropriately, Carol handled Jay's lawsuit (since she was his best friend).  
 b. Carol handled Jay's lawsuit appropriately (doing everything as it should be done).

The two sentences have different truth conditions: for example, (1a) might be true even though Carol did many inappropriate things during the course of the suit, in which case (1b) would be false.

The pattern seen in (1) repeats itself with a wide range of adverb subtypes:

- (2) a. Stupidly, the spy answered the question.  
 b. The spy answered the question stupidly.  
 (3) a. Absent-mindedly, Pat swam out to the island (forgetting that she had a dentist appointment at 4).  
 b. Pat swam out to the island absent-mindedly (not even noticing the \$100 bills floating on the surface).  
 (4) a. Surgically, this procedure is not at all difficult.  
 b. The doctors cured him surgically, instead of using chemotherapy.  
 (5) a. Likewise, the Social-Democrats will have to retrench.  
 b. Ken did likewise.

In each of (2)-(5), the first sentence has a sentential reading of the adverb, while in (b) the adverb is a predicate modifier. In general, sentential adverbs occur to the left of the main verb, especially in initial position with 'comma-intonation', although they also often occur on either side of an auxiliary verb if one is present. Predicate modifiers may occur either to the immediate left of the main verb (although in this position they represent backgrounded information) or inside the VP--that is, to the right of the verb with no 'comma intonation'. (Sentential adverbs may also occur postverbally, but here they

almost always require 'comma intonation'.) Syntactically, then, it is easy to justify putting predicate modifiers into VP, and to consider sentential adverbs to be daughters of S (or, depending on one's analysis of auxiliaries, daughters of nodes higher than the lowest VP).

Despite the systematic nature of the paired readings shown in (1)-(5), there are two classes of adverbs which do not show this pattern, namely Epistemic and (pure) Manner adverbs:

- (6) a. Undoubtedly, the contest is rigged.
- b. \*The contest is rigged undoubtedly.
- (7) a. \*Loudly, you must blow the trumpet.
- b. You must blow the trumpet loudly.

In this paper I wish to show that these asymmetries can be explained on the basis of the lexical semantics of these words, and therefore that the dual pattern of sentential and predicate modification is the unmarked value of semantic composition for adverbs of this general type--that is, that Epistemic and Manner modification are motivated exceptions to the overall pattern, and need not be arbitrarily stipulated as exceptions.

## 2. The Compositional Semantics of 'Quality' Adverbs.

When I say that Manner modification is exceptional, it must be understood that I am referring to a much smaller class of adverbs than is usually included in the label 'Manner'. As demonstrated in Ernst (1984), the class of Manner adverbs, as traditionally conceived, is not a coherent lexical class--instead, it is a collection of predicate-modifying readings from a large number of diverse lexical classes. Thus in (1)-(5), the (b) sentences are not members of a lexically-marked Manner class, as many writers (e.g. Jackendoff 1972, Quirk et al. 1972) would state. The lexical class will be the same in each pair of sentences; the perceived manner reading of the (b) case is created through the interaction of the word's semantics and the rule combining it with the predicate.

Let us take (1) as an example. I assume that appropriately is represented as in (8), with an essentially adjectival semantics:

$$(8) \lambda n (\text{APPROPRIATE } (n))<sup>1</sup>$$

I also adopt a Davidsonian approach, following Parsons' 1985 adaptation where 'eventualities' (symbolized 'e') includes all of events, states, and processes, and not just events as in Davidson 1967 (see also LePore and McLaughlin 1985 and references therein). Thus (1a) can be represented as in (9):

$$(9) \exists e [E(e, \text{HANDLE } (c, j)) \ \& \ \text{APPROPRIATE } (e)]$$

'E' symbolizes 'is an eventuality of'. (9) states that there is an event of Carol handling Jay's lawsuit, and that this event was appropriate (in that context).

Crucial to the present account is the following rule for predicate-modifying adverbs (henceforth 'PM Rule'):

- (10) Predicate Modification Rule (informal version):  
 For any adverb modifying a predicate  $\beta$ , there is an entity  $g$  which is a property of/aspect of/'something about' the eventuality of  $\beta$ -ing (by the subject) such that ADV ( $g$ ).<sup>2</sup>

Given this rule, (1b) can be represented as shown in (11), where the PM Rule specifies that  $g$  is some property of Carol's handling Jay's lawsuit:

- (11) HANDLE ( $c, j$ ) & ( $\exists g$ ) APPROPRIATE ( $g$ )

Thus it is something about Carol's handling the lawsuit, rather than her doing it per se, that is appropriate.

This mechanism allows the correct interpretation of the other pairs as well. Agent-Oriented adverbs like stupidly, wisely, cleverly, rudely, and so on may be characterized by the template shown in (12):

- (12)  $n$  is such as to justify judging Agent as ADJ in relation to  $n$ , where the Agent could have avoided  $n$ .<sup>3</sup>

Representing (12) schematically as  $\lambda n$  (ADJ ( $x, n$ )), where  $x$  will stand for the agent, (2a-b) come out as follows:

- (13) a.  $\exists e$  [E ( $e, \text{ANSWER} (s, q)$ ) & STUPID ( $s, e$ )]  
 b. ANSWER ( $s, q$ ) & ( $\exists g$ ) STUPID ( $s, g$ )

(Once again, I am omitting the technical machinery which identifies  $g$  as a property or 'manner' of the spy's answering the question.)

Once we have a generally applicable predicate modification rule like (10) and have correctly formulated senses for the adverbs involved in this dual pattern of S- and predicate-modification, it is then possible to state the generalization in (14):

- (14) The unmarked value for Quality adverbs is to combine either with sentences or predicates.

Speaking very roughly, Quality adverbs are those which express the speaker's judgment on some qualitative scale--as opposed to

time, place, degree ('Quantity' adverbs) or more functional, 'logical' adverbs such as even and only.<sup>4</sup> I cannot pretend to give a more rigorous definition of 'Quality adverb' at this point, although the idea should be intuitively clear.

It is now possible to see why the traditionally-conceived class of Manner adverbs is not parallel to classes like Evaluative, Agent-Oriented, or Domain adverbs (as in (1), (2), and (4), respectively). These and the others shown in (1-5) are defined by lexicosemantic features, irrespective of their combinatory possibilities. When they modify predicates, the PM Rule provides a manner reading. It will be important to bear in mind that manner readings are the result of this rule--not of a lexical specification per se. What remains in the (new) Manner class is the group of adverbs which only have a manner reading, and no sentential reading. Part of the goal of this paper is to explain why this restriction to just manner readings exists.

An important aspect of the semantics of Quality adverbs is that most of them are gradable, as shown by the possibility of such modifiers as very and quite in (15):

- (15) a. Quite intelligently, he refrained from committing himself.  
b. Egbert was behaving very oddly.

I assume here what is perhaps the standard analysis of adjectival semantics, where the individual in question is mapped onto a scale of intelligence, oddness, rudeness, stupidity, appropriateness, or whatever is expressed by the adverb root. It will be mapped in relation to a contextual norm (henceforth cn) for the type of individual in question (cf., among others, Bierwisch 1971, Lehrer and Lehrer 1982). That is, in an expression like (16), this room is mapped on a scale of messiness above the cn (of messiness) for rooms:

- (16) This is a messy room.

Of course, the cn is contextual in the sense that its precise value will be affected by what we know about the room, its occupant, and other contextual factors--for example, if an eight-year-old lives there the cn will probably be somewhat higher than if the room is in a military barracks.

In the case of adverbial modification, the cn will be determined in rather different ways for the two combinational possibilities. Let us examine (1a)-(2a) again:

- (1) a. Appropriately, Carol handled Jay's lawsuit (since she was his best friend).  
(2) a. Stupidly, the spy answered the question.

As noted above, for (1a) the argument of appropriately is Carol's handling Jay's lawsuit. Ontologically this is an eventuality (state of affairs), and the cn will be established for all such possible eventualities in the context. Similarly, in (2a) the spy is judged to be stupid because, of all the things he could have done, he answered the question.

By contrast, for predicate modification the adverb's argument is a property of a particular type of eventuality:

- (1) b. Carol handled Jay's lawsuit appropriately (doing everything as it should be done).
- (2) b. The spy answered the question stupidly.

In (1b) (cf. (11)), what is mapped onto the scale of appropriateness is a 'way' of handling Jay's lawsuit, and this property *g* is higher on the scale than the cn for such 'ways' (i.e. ways of handling Jay's lawsuit). (2b) works similarly (cf. (13b)): the way in which the spy answered is asserted to be better than average (i.e. the cn) justification for calling the spy stupid, considering other ways in which the question could have been answered. The type of eventuality defined by the predicate is thus the major restriction on the cn for predicate modification cases.<sup>5</sup>

### 3. Epistemic and Manner Modification.

We are now in a position to see why there are two classes of exceptions to the general pattern for Quality adverbs.

Epistemic adverbs include probably, possibly, obviously, evidently, definitely, perhaps, undoubtedly, and a number of others, as exemplified in (17)-(19):

- (17) She probably did it.
- (18) We're definitely going to be out of town when Reagan comes to give his speech.
- (19) Undoubtedly, this is the worst wurst I've tasted.

Contrary to the model-theoretic tradition, I take such adverbs to be predicates representing the speaker's epistemic judgment as to whether (or to what degree) the argument obtains, i.e. in (17)-(19) the degree of truth that the speaker ascribes to the sentence without the adverb. There may be additional nuances besides this core, of course; for example, obviously and clearly emphasize the ease with which one can perceive that the state of affairs obtains.

To take one example of a sentential reading, (20) represents (17):

- (20) PROBABLE  $\exists e$  [E (e, DO (she, it))] 6

This indicates that it is probable that there is such an eventuality as her doing it.

As mentioned above, Epistemic adverbs do not occur in positions where they could have a predicate-modifying reading:

- (21) \*She did it probably.
- (22) \*We're going to be out of town definitely when Reagan comes to give his speech.
- (23) \*This is the worst wurst (I've ever tasted) undoubtedly.

Given the mechanisms proposed here, the explanation for the lack of this reading is straightforward. To take (21) as an example, a predicate-modifying reading would have to look like (24):

(24)  $\exists e [E(e, DO (she, it)) \& (\exists g) PROBABLE (g)]$

(As above, I omit the specification of *g* as a property of *e*.) Immediately we can see that (24) embodies a contradiction; it claims that *g* exists, yet PROBABLE (*g*) states that it is only probable that *g* exists. This would not be a contradiction if PROBABLE were taken as a standard modal-logic operator, but it is if PROBABLE represents a speaker's epistemic judgment. With the very act of using a predicate modifier, the speaker commits himself to the existence of some (relevant) property of the action, process, or state (etc.) represented by the predicate. Epistemic adverbs, by the Maxim of Quantity, will not be used unless there is some reason to doubt that their argument in fact obtains. Therefore the use of Epistemics as predicate modifiers is a violation of the Maxim of Quality: it is like saying 'It exists but I'm not sure it exists.'

The revised class of Manner adverbs contains such items as loudly, deftly, brightly, painfully, and smoothly. They do not occur with sentential readings:

- (25) \*Loudly, you must blow the trumpet.
- (26) \*The sun brightly had been shining that morning.
- (27) \*Everything smoothly was running.

(I have avoided sentence-initial position in (26)-(27) because predicate adverbs may sometimes occur there for emphasis or contrast.) In each of (25)-(27) the adverb would be acceptable inside the VP; in that case they would perform the normal predicate-modifying function of describing a property of the act of blowing a trumpet (loud), shining (bright), etc., acting essentially as restrictive modifiers.<sup>7</sup>

Semantically, it is difficult (if not impossible) to imagine how these could be sentential modifiers. The reason for this lies in the gradable, adjectival semantics sketched above.

Recall that the argument of the adjectival predicate is mapped on the scale representing degrees of ADJ-ness, onto a position (in the unmarked case) above the cn for entities of the appropriate type. For predicate modification, the cn is determined for properties ('ways') of the type of eventuality denoted by the predicate. Thus in (28), this particular way of blowing a trumpet has a higher sound volume than is the norm for people blowing trumpets (modulo contextual factors, as always):

(28) You must blow the trumpet loudly.

We can think of the cn as determined by a survey of all such possible acts of trumpet-blowing, where each act is checked for volume level, and some sort of average computed. To take another example, in (29) the way the sun was shining is plotted on a scale of light intensity, and interpreted in relation to a cn computed across the set of instances of the sun shining, each of which has some level of light intensity:

(29) The sun had been shining brightly that morning.

In contrast to predicate modification, sentential adverbs involve mapping the eventuality denoted by the sentence onto a scale where the cn is determined for all possible eventualities in that context. To take (1a) again,

(1) a. Appropriately, Carol handled Jay's lawsuit (since she was his best friend).

Carol's-handling-Jay's-lawsuit is implicitly compared to anything else that could have happened in that context: nobody taking the lawsuit, Carol doing an entirely different Law School assignment, etc. The only restrictions are contextual, in this case imposed by the previously-established topic (presumably Jay's lawsuit, or what Carol was to do).

Suppose an adverb like loudly or brightly were to be forced into sentential modification. It would 'try' to map an eventuality like Carol's-handling-Jay's-lawsuit onto a scale of sound volume or light intensity. Let us even assume the best case, where we could say that this handling of the lawsuit was loud. How can a cn be computed? Given sentential modification, it must be determined by surveying all possible eventualities in context--but few of these, if any, will have anything to do with sound or light. Imagine, for example, that we were to say (30) instead of (1a), in a context where Carol's choice of action is the topic:

(30) Appropriately, Carol waited three days before deciding.

There is no possibility of judging light or sound level here. And there will be an infinite number of such possibilities; therefore, it will be impossible to compute a cn, and manner modification is ruled out.

It is no accident that true Manner adverbs--for the most part, those Quality adverbs with only a predicate-modifying reading<sup>8</sup>--usually involve perceptual qualities: light, sound, taste, physical action, and so on. These are the ones whose selectional restrictions can only be satisfied by eventualities of a certain type, i.e. those denoted by predicates involving these perceptions. While other Quality adverbs, such as cleverly or oddly, 'select' in their own way (for example, Agent-Oriented adverbs like cleverly require an intentional agent; oddly requires a set of expectations of the norm) these restrictions can be satisfied irrespective of the predicate. Therefore they potentially participate in sentential modification; inherently Manner adverbs do not.

#### 4. Conclusion.

Above I have sketched an analysis of a large class of adverbs in English--'Quality adverbs'--in which it is not necessary to consider a pair of sentential and predicate-modifying occurrences to be 'homonyms'. Rather, they can be represented as two readings of one lexical item. The predicate-modifying reading is a result of both the adverb's lexical meaning and the rule which combines it with the predicate.

This system has two important implications. First, it becomes possible to say that this class is lexically unspecified for sentential versus predicate modification (or, in a formal semantics where all compositional possibilities must be specified, that in the unmarked case they are specified for both). Second, it can now be seen that the (lexical) class of Manner adverbs is much smaller than has been presumed, and that once so restricted, has the peculiar property of being exclusively made up of predicate modifiers.

Finally, this brings us to the main conclusion, which is an attempt to answer the question why these Manner adverbs--and Epistemics, which have the complementary restriction to sentential modification--depart from the general pattern of Quality adverbs. The answer is not that there is some arbitrary marking for this behavior, but that the fundamental meaning of the adverbs in these subclasses makes them incompatible with one of the two compositional options:

- (31) a. Epistemic adverbs reflect the speaker's judgement about the certainty of something obtaining, and by pragmatic principles are only used when there might be reason to doubt this certainty. Thus

- they can serve no communicative purpose in predicate modification, where what would be their argument is already logically entailed, removing all possible doubt about its existence.
- b. Manner adverbs are those which represent a quality specifically linked to a certain type of predicate (e.g. those involving sound, movement, etc.). Since their adjectival semantics requires plotting a cn for eventualities of this type only, it is impossible for them to partake of sentential modification because here all types of eventuality are possible, so the cn cannot be computed.

This being the case, it can now be seen that the system of Quality adverbs in English makes no systematic, arbitrary specifications about the kind of modification possible for individual lexical items. It has compositional rules for both sentential and predicate modification, and it is only an incompatibility between individual word-meanings and the requirements of these rules that sets Manner and Epistemic adverbs apart as exceptional.

#### NOTES

<sup>1</sup>In instances where the English adverb and its morphologically related adjective differ in meaning (cf. Bowers 1975), I take the adjectival form in a representation like (8) to include the aspects of meaning associated with the adverb.

<sup>2</sup>The PM Rule is formalized as follows:

(i) Predicate Modification Rule:

For any Quality adverb  $\alpha$  and predicate  $\beta$ ,  $\alpha'\beta'$  =

$\lambda x [ \exists z [ W_{\beta}(x)(z) \ \& \ \alpha'(z) ] ]$ ,

where  $W_{\beta} = \lambda r \lambda w [ (\exists g)(\exists v)(\exists e) [ \beta^*(e, v) \ \& \ g(e) \ \& \ w=g \ \& \ v=r ] ]$

and  $\beta^*$  = 'is an eventuality of  $\beta$ -ing by'

See Ernst 1986 for further explanation and discussion.

<sup>3</sup>A number of desirable results fall out from this template, including being able to predict 'faking' readings such as that in (i) below, and avoiding certain difficulties inherent in other approaches to adverbial semantics, e.g. McConnell-Ginet 1982. See Ernst 1986 for detail.

- (i) Stupidly, Alice answered the question intelligently, and blew her cover as an inmate of the insane asylum.

<sup>4</sup>In semantic terms, the class of Quality adverbs corresponds approximately to what Greenbaum 1969 calls 'Attitudinal disjuncts', although his method of classification, of course, restricts them to the sentential cases ('disjuncts').

<sup>5</sup>Although I have adopted a 'scalar' analysis of gradable adjectival semantics, one could also use an approach like that of Klein 1980. What is described here as a 'restriction on the cn' has roughly the same function as Klein's 'comparison class'.

<sup>6</sup>Note that in contrast to (9) and (13a), where the sentential adverbs appropriately and stupidly occur within the scope of the existential quantifier which introduces the eventuality-variable e, Epistemic adverbs have wide scope with respect to the quantifier. This means that adverbs of this class will be combined with sentences via a different rule from appropriately and stupidly. In fact, there will have to be a number of slightly different rules for sentential adverbs, which are part of the motivation for having separate lexical classes. However, this does not affect the present analysis, since adverbs from all of these classes will equally undergo the PM Rule when combining with predicates, where their specification for a particular rule of sentential modification is irrelevant.

<sup>7</sup>McConnell-Ginet 1982 presents an illuminating discussion of this aspect of predicate modification, where--parallel to nominal objects--adverbs genuinely 'modify' or further specify the predicate, carving out a subset of the acts/processes/states denoted by that predicate. Although I reject McConnell-Ginet's formal treatment of adverbs, her rule for 'VP-internal adverbial modification' (58) (p. 169) captures essentially the same notion that my PM Rule (10) is designed to.

<sup>8</sup>I take Manner adverbs as excluding the very small number of adverbs such as differently and well which have only a predicate-modifying reading, but whose semantics clearly marks them as being in one of the other classes. Such adverbs are simply exceptional cases of Exocomparatives, Evaluatives, or whatever, arbitrarily marked to exclude them from combination with sentences.

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