

Modal adverbs again

Christopher Piñón

<http://pinon.sdf-eu.org/>

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Here are examples of modal adverbs:

- (1) probably, possibly, evidently, certainly, surely, undoubtedly

And this is the plan of the talk:

- Three properties of modal adverbs
- Two previous accounts: Bellert (1977), Nilsen (2004)
- A different direction: modal adverbs modify assertions

1 Three properties of modal adverbs

Bellert (1977) points out two intriguing properties of such adverbs. The first is they cannot be negated:

- (2) $\left\{ \begin{array}{l} \text{Probably} \\ \text{Possibly} \\ \text{Evidently} \\ \text{Undoubtedly} \end{array} \right\}$, the socialists won the elections.

- (3) # $\left\{ \begin{array}{l} \text{Improbably} \\ \text{Impossibly} \\ \text{Not evidently} \\ \text{Doubtfully} \end{array} \right\}$, the socialists won the elections.

More generally, they do not occur in the scope of negation (putting aside the case of metalinguistic negation):

- (4) The conservatives $\left\{ \begin{array}{l} \text{probably} \\ \text{possibly} \\ \text{evidently} \\ \text{undoubtedly} \end{array} \right\}$ didn't win the elections.

- (5) #The conservatives didn't $\left\{ \begin{array}{l} \text{probably} \\ \text{possibly} \\ \text{evidently} \\ \text{undoubtedly} \end{array} \right\}$ win the elections.

The second property is that they do not occur in questions:

- (6) #Did the socialists $\left\{ \begin{array}{l} \text{probably} \\ \text{possibly} \\ \text{evidently} \\ \text{undoubtedly} \end{array} \right\}$ win the elections?

Bellert notes that if modal adverbs were synonymous with the corresponding modal adjectives (*probable, possible, evident, certain, sure*, etc.), the standard view since Jackendoff (1972) (see also Ernst 2002; Jacobson 1978), then these distributional properties would be unexpected, for the modal adjectives do not exhibit these restrictions:

- (7) It is $\left\{ \begin{array}{l} \text{probable} \\ \text{possible} \\ \text{evident} \\ \text{undoubtedly} \end{array} \right\}$ that the socialists won the elections.

- (8) It is $\left\{ \begin{array}{l} \text{improbable} \\ \text{impossible} \\ \text{not evident} \\ \text{doubtful} \end{array} \right\}$ that the socialists won the elections.

- (9) Is it $\left\{ \begin{array}{l} \text{probable} \\ \text{possible} \\ \text{evident} \\ \text{undoubtedly} \end{array} \right\}$ that the socialists won the elections?

A third property, not noted by Bellert, is that modal adverbs, in contrast to the corresponding modal adjectives, do not occur in the protasis of conditional sentences:

- (10) #If the socialists $\left\{ \begin{array}{l} \text{probably} \\ \text{possibly} \\ \text{evidently} \\ \text{undoubtedly} \end{array} \right\}$ win the elections, the rich will worry about a luxury tax.

- (11) If it is $\left\{ \begin{array}{l} \text{probable} \\ \text{possible} \\ \text{evident} \\ \text{undoubtedly} \end{array} \right\}$ that the socialists will win the elections, the rich will worry about a luxury tax.

However, they may occur in the apodosis:

- (12) If the socialists win the elections, the rich will $\left\{ \begin{array}{l} \text{probably} \\ \text{possibly} \\ \text{evidently} \\ \text{undoubtedly} \end{array} \right\}$ worry about a luxury tax.

How to best account for these three properties of modal adverbs?

2 Two previous accounts: Bellert (1977), Nilsen (2004)

2.1 Bellert (1977)

Bellert (p. 345) proposes that “modal adverbs should be interpreted as predicates over the truth of the proposition expressed by the respective sentence, and that sentences with modal adverbs express two propositions; whereas the corresponding modal adjectives are predicates over the fact, event, or state of affairs referred to by the sentence, and sentences with modal adjectives express one complex proposition.”

(13) It is $\left\{ \begin{array}{l} \text{probably} \\ \text{possibly} \\ \text{evidently} \\ \text{undoubtedly} \end{array} \right\}$ true that the socialists won the elections.

(14) #The truth that the socialists won the elections is $\left\{ \begin{array}{l} \text{probable} \\ \text{possible} \\ \text{evident} \\ \text{undoubted} \end{array} \right\}$.

For Bellert, modal adverbs are metalinguistic because they qualify the truth of a proposition, in contrast to the corresponding modal adjectives, which do not.

Commentary. Although there is something intuitively attractive about Bellert’s idea, her proposal is problematic as it stands. First, (15) sounds better than (14), but this is unexpected:

(15) It is a $\left\{ \begin{array}{l} \text{probable} \\ \text{possible} \\ \text{evident} \\ \text{undoubted} \end{array} \right\}$ truth that the socialists won the elections.

Second, replacing *truth* with *fact*, *event*, or *state of affairs* in (14) does not help, although it should if her proposal were correct:

(16) #The $\left\{ \begin{array}{l} \text{fact(?)} \\ \text{event} \\ \text{state of affairs} \end{array} \right\}$ that the socialists won the elections is $\left\{ \begin{array}{l} \text{probable} \\ \text{possible} \\ \text{evident} \\ \text{undoubted} \end{array} \right\}$.

Third and finally, it is not clear which “two propositions” are expressed in sentences with modal adverbs (see quote above). For example, since modal adverbs are not veridical, it would *not* be feasible to analyze the sentences in (2) as follows:

(17) (the socialists won the elections) and (it is $\left\{ \begin{array}{l} \text{probable} \\ \text{possible} \\ \text{evident} \\ \text{undoubted} \end{array} \right\}$ that the socialists won the elections)

In sum, Bellert’s account is not especially promising in its current formulation.

2.2 Nilsen (2004)

Nilsen offers the first explicit analysis of modal adverbs, which he regards as *positive polarity items*. He takes the following kind of contrast to be revealing of the semantic difference between modal adjectives and the corresponding modal adverbs:

- (18) a. It's possible that the socialists will win, even though they certainly won't.
 b. #The socialists will possibly win, even though they certainly won't.

In a nutshell, Nilsen claims that *possibly* when applied to a proposition p expresses a higher (epistemic) plausibility than *possible*, relative to an agent and a belief state. More specifically, his claim is that the meaning of *possible* ascribes at least a *low* plausibility to p , whereas the meaning of *possibly* ascribes a greater-than-*low* plausibility to p .

(19) General assumptions:

- a. the probability of p is *high* iff the probability of $\neg p$ is *low*
 b. the probability of p is less than *high* iff the probability of $\neg p$ is greater than *low*

(20) Specific lexical assumptions:

- a. the meaning of 'possible(p)' states that the plausibility of p is at least *low*
 b. the meaning of 'possibly(p)' states that the plausibility of p is greater than *low* (first version)
 c. the meaning of 'certainly(p)' states that the plausibility of p is at least *high*

- (21) a. It's possible that the socialists will win, even though they certainly won't (= (18a)) \leadsto
 possible(the-socialists-will-win) \wedge certainly(\neg the-socialists-will-win)
 (consistent due to (19a), (20a), and (20c))
 b. #The socialists will possibly win, even though they certainly won't (= (18b)) \leadsto
 possibly(the-socialists-will-win) \wedge certainly(\neg the-socialists-will-win)
 (inconsistent due to (19a), (19b), (20b), and (20c))

Although the analysis thus far accounts for the contrast in (18), it does not yet make *possibly* a positive polarity item:

- (22) the meaning of 'possibly(p)' states (i) that the plausibility of p is greater than *low* and (ii) that a linguistic context that embeds the meaning of 'possibly(p)' entails the same linguistic context with the meaning of 'possible(p)' instead; otherwise the meaning of 'possibly(p)' is undefined in that context (final version; cf. (20b))

Technically, Nilsen uses a mechanism of *domain narrowing*, basically the inverse of the mechanism of *domain widening* that has been used to account for negative polarity items (for the latter, see Kadmon and Landman 1993 and Chierchia 2001).

- (23) a. The socialists possibly won.
 possibly(the-socialists-won) \models possible(the-socialists-won)
 b. The socialists possibly didn't win.
 possibly(\neg the-socialists-won) \models possible(\neg the-socialists-won)

- c. #The socialists didn't possibly win.
 \neg possibly(the-socialists-won) $\not\models$ \neg possible(the-socialists-won)
(entailment fails!)

More generally, the entailment test for *possibly* will fail in downward entailing contexts, which is what makes *possibly* a positive polarity item.

Commentary. Although Nilsen's account is ingenious, it crucially depends on the claim that modal adverbs are semantically stronger than the corresponding modal adjectives. However, it is difficult to accept this claim.

- (24) a. It's possible that the socialists won. In fact, it's certain that they won.
b. The socialists possibly won. In fact, they certainly won.
- (25) a. It's possible that the socialists won. In fact, they certainly won.
b. #It's possible that the socialists won. In fact, they possibly won.

If Nilsen's claim were correct, it would be a puzzle why *possible* cannot be sensibly strengthened by *possibly* in (25b).

For consistency, Nilsen should extend his strategy to all modal adverbs, though he does not actually do this for *certain* vs. *certainly* (cf. (20c)). However, the idea that *certainly* is semantically stronger than *certain* is also not very promising:

- (26) #It's certain that the socialists won. In fact, they certainly won.

If modal adverbs are not semantically stronger than the corresponding modal adjectives, then Nilsen's account loses the motivation that it crucially depends on. But this, in turn, means that the contrast in (18) must have another explanation.

3 A different direction: modal adverbs modify assertions

Note that modal adverbs can be used like *yes/no* to answer *yes/no*-questions:

- (27) Did the socialists win the elections?
a. {Yes, No}
b. {Probably, Possibly, Evidently, Certainly, Undoubtedly}
c. #{It's probable, ?It's possible, It's evident, It's certain, It's undoubted}

The new direction is to take modal adverbs to modify *assertions*, which constitute one of various illocutionary forces in speech act theory (others are commissives, directives, declaratives, and expressives; see Vanderveken 1990, 1991). More specifically, the idea is that modal adverbs modify or qualify the *sincerity condition* of assertions that the speaker believes the propositional content that he/she asserts.

- (28) a. $\mathcal{A}_x(p)$ 'x asserts p'
b. sincerity(p, p', x, \mathcal{A}) 'p is a sincerity condition of an assertion by x of p'
- (29) a. $assert \rightsquigarrow \lambda p[\mathcal{A}_x(p) \wedge sincerity(\exists d[\text{believe}(d, x, p) \wedge d \geq \text{high}], p, x, \mathcal{A})]$
b. $assert(\text{The socialists won}) \rightsquigarrow$
 $\mathcal{A}_x(\text{the-socialists-won}) \wedge$
sincerity($\exists d[\text{believe}(d, x, \text{the-socialists-won}) \wedge d \geq \text{high}],$
the-socialists-won, x, \mathcal{A})

- (30) a. possibly $\rightsquigarrow \lambda p[\mathcal{A}_x(p) \wedge \text{sincerity}(\exists d[\text{believe}(d, x, p) \wedge d \geq \text{low}], p, x, \mathcal{A})$
 b. possibly(The socialists won) \rightsquigarrow
 $\mathcal{A}_x(\text{the-socialists-won}) \wedge$
 $\text{sincerity}(\exists d[\text{believe}(d, x, \text{the-socialists-won}) \wedge d \geq \text{low}],$
 $\text{the-socialists-won}, x, \mathcal{A})$
- (31) a. certainly $\rightsquigarrow \lambda p[\mathcal{A}_x(p) \wedge$
 $\text{sincerity}(\exists d[\text{believe}(d, x, p) \wedge d \geq \text{very-high}], p, x, \mathcal{A})$
 b. certainly(The socialists won) \rightsquigarrow
 $\mathcal{A}_x(\text{the-socialists-won}) \wedge$
 $\text{sincerity}(\exists d[\text{believe}(d, x, \text{the-socialists-won}) \wedge d \geq \text{very-high}],$
 $\text{the-socialists-won}, x, \mathcal{A})$

If modal adverbs modify the sincerity condition of assertions, then the three properties in section 1 plausibly follow, precisely because none of those contexts are assertive contexts.

$$(32) \quad \forall d \forall d' \forall x \forall p [(\text{believe}(d, x, p) \wedge d' \leq d \wedge d' \geq 0) \rightarrow \text{believe}(d', x, p)]$$

Here is another account of Nilsen's contrast in (18):

- (33) s-w $\stackrel{\text{def}}{=} \text{the-socialists-will-win}$
- (34) a. *assert*(It's possible that the socialists will win), even though they certainly won't (= (18a)) \rightsquigarrow
 $\mathcal{A}_x(\diamond \text{s-w}) \wedge \text{sincerity}(\exists d[\text{believe}(d, x, \diamond \text{s-w}) \wedge d \geq \text{high}], \diamond \text{s-w}, x, \mathcal{A}) \wedge$
 $\mathcal{A}_x(\neg \text{s-w}) \wedge \text{sincerity}(\exists d[\text{believe}(d, x, \neg \text{s-w}) \wedge d \geq \text{very-high}], \neg \text{s-w}, x, \mathcal{A})$
 (consistent)
- b. #The socialists will possibly win, even though they certainly won't (= (18b)) \rightsquigarrow
 $\mathcal{A}_x(\text{s-w}) \wedge \text{sincerity}(\exists d[\text{believe}(d, x, \text{s-w}) \wedge d \geq \text{low}], \text{s-w}, x, \mathcal{A}) \wedge$
 $\mathcal{A}_x(\neg \text{s-w}) \wedge \text{sincerity}(\exists d[\text{believe}(d, x, \neg \text{s-w}) \wedge d \geq \text{very-high}], \neg \text{s-w}, x, \mathcal{A})$
 (inconsistent due to (32))

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