

ON THE AMBIGUITY OF CONTRADICTIONARY EXPRESSIONS*

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1. Introduction

There has been a considerable amount of linguistic discussion over the last decade and a half concerning the ambiguity of sentences such as (1b) and (2b), which embed contradictory and tautological expressions (1a) and (2a) respectively.¹

(1) a. *Mary_i is taller than she_i is.²

b. John thinks Mary_i is taller than she_i is.

(2) a. *Mary is as intelligent as she is.

b. John doesn't believe Mary is as intelligent as she is.

Among the past studies which attempt to contribute more or less original ideas, rather than criticize or improve on proposed theories, may be counted McCawley(1970), Hasegawa(1972), Postal (1974), Jackendoff(1975), and Fodor(1970).³ Important as their contributions may be, however, they all seem to me to have a serious defect in common. That is, they strike me as being too quick to generalize on the basis of poorly observed facts. It would not be hard to imagine that such a generalization might lead to a biased if not entirely incorrect view of the factual situation. Indeed, I will demonstrate in the present work and a forthcoming paper that by examining a wider range of instances of the ambiguity we will be able to obtain a clearer, intuitively more plausible understanding of the nature of the phenomenon.

In the light of this, the primary task of section 4, which together with section 5 constitutes the main part of this paper, will be to observe as wide a range of linguistic facts as possible, and inquire into the condition under which the ambiguity of contradictory expressions does and does not arise. In section 5, certain exceptions to the condition will be noted first; then I will, instead of attempting the modification of the condition, address myself to the question: where does the ambiguity come from?

Before turning to the fuller analysis, however, I will in section 2 present a little more specific outline of the phenomenon and discuss certain aspects of the past treatments of it. Section 3 will be devoted to the definition of a few notions, in terms of which the condition in section 4 is to be stated.

2. An Outline of the Problem

Russell(1905) was the first to point out that apparently contradictory expressions⁴ may be interpreted in a noncontradictory manner when they appear in a suitable context. His example is (3b):⁵

(3) a. *Your yacht was larger than it was.

b. I thought your yacht was larger than it was.

Sentence (3a) is simply contradictory; on the other hand, (3b), which embeds (3a) as the complement of think, allows a non-contradictory interpretation which may be paraphrased as "The size that I thought your yacht was is greater than the size your yacht was", at the same time retaining the contradictory interpretation paraphrased as "I thought the size of your yacht was greater than the size of your yacht."⁶ (4) is another similar example:⁷

(4) a. *Mary didn't kiss the boy she kissed.

b. John said that Mary didn't kiss the boy she kissed.

Observing (1b), (3b), and (4b), one would notice that the presence of a verb of thinking or saying is crucial for a contradictory expression to be interpreted noncontradictorily. In fact, McCawley(1970) and Hasegawa(1972) based their theories upon this observation, although the overall linguistic frameworks within which they work are different.

Hasegawa(1972) notes two interesting facts. First, if first person pronoun I is substituted for John in (1b), the resulting sentence no longer is ambiguous: it only has a contradictory interpretation.

(5) *I think Mary is taller than she is.

Hasegawa successfully accomodates this point within his "assertor

theory". Second, if factive verb knows is substituted for thinks in (1b), the resulting sentence is unambiguously contradictory.

(6) *John knows that Mary is taller than she is.

Hasegawa attributes this fact to the lexical property of know with respect to the applicability of his "assertor assignment rule", although I do not consider this solution wholly viable.⁸ In any case, since Hasegawa's theory crucially involves the notion of "assertor" and he tries to analyze all his examples in terms of this, he may be taken as ascribing the ambiguity of contradictory expressions exclusively to the verbs of thinking and saying, to which the notion "assertor" seems to be applicable.

Postal(1975), however, draws our attention to a few examples which show that this assumption cannot be entirely correct. (7) is one of such examples:

(7) a. *It was hotter than it was.

b. The storm prevented it from being hotter than it was.

(7a) is contradictory, but (7b), which may probably be claimed to embed (7a) (in some sense of the term "embed"⁹), permits a non-contradictory interpretation as well, although the ambiguity does not seem to be attributable to any difference in assertor assignment. Postal goes on to argue that sentences of this sort should be treated along the same line as sentences like (1b), (3b), and (4b) (and for that matter sentences containing tautological expressions), and proposes a theory in which the derivations of unambiguously contradictory expressions (and unambiguously tautological expressions) are blocked by general syntactic constraints in a uniform manner.

Postal's work is indeed an ambitious and inspiring one, but I nevertheless cannot but feel that it is fundamentally on the wrong track on a lot of practical grounds. For, first, whether contradictory expressions are ambiguously interpreted or not depends upon the particular predicate within the context of which they occur; that is, not all embedded structures permit an ambiguous interpretation of contradictory expressions. Second, the possibility of an ambiguous interpretation depends also upon

certain factors other than the predicate itself. These two points were already noted with reference to examples (5) and (6) above¹⁰, and will become even clearer in the subsequent discussion. Next, there are cases which, unlike the comparative case, do not seem to involve any scope-bearing material, which Postal would want to claim to interact with other predicates such as think to produce an ambiguous interpretation of sentences which embed those contradictory expressions.¹¹ Moreover, we will see that there are also cases in which a noncontradictory interpretation of a contradictory expression is possible without embedding it within the context of any predicate or the like. Lastly, as will be shown in my forthcoming paper, tautological expressions show quite distinct properties than contradictory expressions and thus deserve a treatment of a different sort.

Possibly some of these particular facts might be accommodated within Postal's theory in some way or other, but I feel justified in claiming that such an attempt is nothing more than an ad hoc amendment of the theory. Rather, I would like to maintain that, when there turn out to be obvious, intuitively plausible semantic or pragmatic factors involved in the phenomenon under analysis, linguistic descriptions of the phenomenon should be given in terms of them. An important aim of the remainder of this work is to demonstrate that such a description in fact yields desirable results.

3. +contexts, -contexts, and \emptyset contexts

3.1 definition

In order to facilitate the discussion in the subsequent sections, I will here define three notions "+context", "-context", and " \emptyset context" as follows.

(8) A sentential context is called

- (a) "+context" iff the truth of sentences occurring in it is ensured;
- (b) "-context" iff the falsity of sentences occurring in it

- is ensured;
(c) "∅context" otherwise.

An illustration of the definition is in order.

3.2 +contexts

There are several ways in which the truth of expressions which occur in a given context can be said to be ensured.

Firstly, the speaker may normally be assumed to be committed to the truth of sentences he utters. It would be obvious that this follows directly from Gricean principle which requires that the speaker say what he believes true. For convenience I will refer to this fact by saying that the main sentence constitutes a +context, although I do not find this wording satisfactory.

Secondly, it is well-known that a certain group of predicates imply that the proposition expressed by the complement sentence is true. Such predicates include factive verbs (e.g. know, and its negated form do not know), implicative verbs (e.g. manage, persuade), and negated negative implicative verbs (e.g. do not fail) among others.¹²

Thirdly, although verbs like say and think basically belong to the category of verbs which ensure neither the truth nor the falsity of the embedded proposition, there are two exceptional cases in which the truth of the embedded proposition is ensured. One is the case where these verbs are used in the present tense form¹³ with a first person subject; thus he who utters (9b) or (9c) is committed to the truth of (9a):

- (9) a. John is stupid.
b. I say John is stupid.
c. I think John is stupid.

This may obviously be attributed to something along the line of Gricean principle mentioned above. The other case is where these verbs are used with adverbs like correctly, which indicates the speaker's commitment to the truth of the complement clause¹⁴; thus, he who utters (10b) is committed to the truth of (10a), whereas he who utters (10c) is not:

- (10) a. John is stupid.
b. Mary correctly thinks John is stupid.
c. Mary thinks John is stupid.

3.3 -contexts

As in the case of +contexts, several types of -contexts may be distinguished.

The first type of -context is determined by the property of the predicate. Negative if verbs (e.g. prevent), negative implicative verbs (e.g. fail), negated implicative verbs (e.g. do not manage) among others are of this type, and imply that the proposition expressed by the embedded sentence is false.

The second category of -contexts include verbs of saying or thinking accompanied by adverbs such as incorrectly: someone who utters (11) is committed to the falsity of the proposition that John is stupid.

- (11) Mary incorrectly thinks John is stupid.

Thirdly, to negate something is to assert the falsity of it; in other words, the proposition obtained by removing negation from a negative sentence is ensured to be false provided that the speaker is speaking sincerely. Thus, negation can be said to constitute a -context.

Lastly, counterfactual expressions logically imply, or strongly suggest to say the least, the falsity of the embedded proposition; hence the term "counterfactual". For example, someone who utters (12b) or (12c) is most likely to be committed to the falsity of (12a):

- (12) a. Mary is smart.
b. If Mary was smart, John would marry her.
c. John wishes that Mary was smart.

Therefore, there is a good sense in which we can say that counterfactual expressions constitute -contexts.

3.4 \emptyset contexts

Any context that is neither a +context nor a -context is a

∅context.

For example, verbs like say and think are ∅contexts; thus, the utterer of (13b) or (13c) is not committed to either the truth or the falsity of (13a):¹⁵

- (13) a. Mary is smart.
- b. John says Mary is smart.
- c. John thinks Mary is smart.

No doubt the reader would have realized that each of what I have categorized as +contexts, -contexts, and ∅contexts contains heterogeneous kinds of things, some of which come into a given category for a different reason than others; some by the logical property of the predicate while others by pragmatic considerations, for instance. This is what I actually intend, however, and the discussion in the next section will reveal that this categorization leads to a natural and compact statement of most of the distributional facts (or, equivalently, the possibility of an ambiguous interpretation) of contradictory expressions.

4. Ambiguity of Contradictory Expressions

4.1 condition (14)

Now we are in a position to discuss the ambiguity of contradictory expressions from a more general viewpoint than in the past work. In this section, I will demonstrate that the possibility of an ambiguous interpretation of an contradictory expressions is predicted by the following condition in most cases.

- (14) A contradictory expression may be interpreted noncontradictorily (as well as contradictorily) only if it does not occur in a +context, i.e., only if it occurs in a -context or a ∅context. When it occurs in a +context, it can only be interpreted contradictorily and thus cannot be used normally.

Note that if we remember the logical property of contradictory

expressions -- they can never be true --, this is an intuitively plausible condition since it inhibits the occurrence of contradictory expressions in +contexts, which ensure the truth of the embedded proposition.

I will take up the three cases of +contexts, \emptyset contexts, and -contexts in turn.

4.2 contradictory expressions in +contexts

According to condition (14), contradictory expressions cannot be interpreted noncontradictorily when they occur in +contexts.

First, condition (14) automatically explains the fact that contradictory expressions such as (1a), (3a), and (4a) cannot be accepted as independent utterances, since the main sentence constitutes a +context.

(14) also correctly excludes contradictory expressions as the complements of factive verbs, implicative verbs, if verbs, and not plus negative implicative verbs, all of which are categorized as +contexts. The following sentences are unambiguously contradictory.

(6) *John knows that Mary is taller than she is.

(15) *Mary managed/happened to kiss the boy she didn't kiss.

(16) *John persuaded/made Mary (to) kiss the boy she didn't kiss.

(17) *Mary didn't fail/didn't forget to kiss the boy she didn't kiss.

That Hasegawa's example (5) does not allow an ambiguous interpretation is also predicted, since I think is an instance of +context.

(5) *I think Mary is taller than she is.

Moreover, (18) is again unambiguously contradictory since correctly think constitutes a +context.

(18) *John correctly thinks that Mary is taller than she is.

4.3 contradictory expressions in \emptyset contexts

In this and next subsections, I will demonstrate that the range of contexts which allow an ambiguous interpretation of contradictory expressions is far wider than seems to have been assumed in the past discussions, and that all such contexts conform to condition (14).

First, verbs like think and say are \emptyset contexts and allow a noncontradictory interpretation of contradictory expressions, as has been widely known ever since Russell; hence the ambiguity of (1b), (3b), and (4b). The following seem to be similar examples:

- (19) a. *He had more money than he did.
b. He denied that he had more money than he did.
- (20) a. *Mary kissed the boy she didn't kiss.
b. John suspects that Mary kissed the boy she didn't kiss.

Verbs like accuse similarly constitute \emptyset contexts, since it is possible to accuse something on a mistaken belief. Thus, the ambiguity of (21b) is predicted.

- (21) a. *Mary dated a boy she didn't date.
b. John accused Mary of dating a boy she didn't date.

The next class of \emptyset contexts include want and try, for wanting or trying something does not necessarily imply its attainment. Thus they allow an ambiguous interpretation of sentences like (22b) and (23b):

- (22) a. *I'm smarter than I am.
b. My mother wants me to be smarter than I am.
- (23) a. *John proved that Mary didn't kiss the boy she kissed.
b. John tried to prove that Mary didn't kiss the boy she kissed.

Verbs like promise, ask, and tell also belong to this class; something that is promised or asked or told is in general not ensured to be performed. Thus (24a) is simply contradictory but (24b) and (24c) are ambiguous between contradictory and non-contradictory interpretations:

- (24) a. *The kids were more quiet than they were.
b. She told the kids to be more quiet than they were.
c. She asked the boys to be more quiet than they were.

Object in (25b) also permits a noncontradictory interpretation:

- (25) a. *He accepted more money than he did.
b. They objected to him accepting more money than he did.

Verbs like seem, look, and appear also constitute \emptyset -contexts; thus, they allow a noncontradictory interpretation of (26b):

- (26) a. *She is younger than she is.
b. She looks younger than she is.

Lastly, the main sentence sometimes constitutes a \emptyset -context, though in disagreement with the above mentioned generalization that the main sentence constitutes a +context. This is the case where the main sentence is accompanied by such expressions as according to ..., which indicates that the speaker is non-committal to the truth of the sentence. Thus, (27b) may be ambiguously interpreted:

- (27) a. *He's a father of two daughters, which he isn't.
b. According to the article, he's a father of two daughters, which he isn't.

although in this case, unlike all other examples given so far, it is necessary to employ nonrestrictive relative clauses (as in (27b)) or add expressions like actually or in fact, in order to clarify what part of the sentence is being stated upon the speaker's responsibility. Obviously, the ambiguity of sentences like (27b) is essentially of the same sort as that of sentences containing think or say, in that in both cases the speaker is not responsible for every description in the sentence.

4.4 contradictory expressions in -contexts

The ambiguity of Postal's (7b) is what is expected from condition (14), since negative if verb prevent constitutes a -context.

- (7b) The storm prevented it from being hotter than it was.

Similarly, verbs like pretend and fail may be considered -contexts and allow an ambiguous interpretation.

(28) a. *She didn't like the boy she liked.

b. She pretended that she didn't like the boy she liked.

(29) a. *John was faster than he was.

b. John failed to be faster than he was.

Next, verbs such as think and say accompanied by adverbs like incorrectly constitute -contexts and allow an ambiguous interpretation of contradictory expressions.

(30) *John incorrectly thinks Mary is taller than she is.

(31) *John incorrectly said that Mary kissed the boy she didn't kiss.

Note, however, that these verbs by themselves are \emptyset contexts and produce the ambiguity even without incorrectly, as was already noted with respect to (1b), (3b), and (4b).

In 3.3, negation was argued to constitute a -context; so we might naturally expect that contradictory expressions allow a noncontradictory interpretation when they are negated. However, this expectation is not borne out, as is seen in the following example:

(32) a. *She said more than she did.

b. *She didn't say more than she did.

Not only is sentence (32a) contradictory but also its negated counterpart (32b) is at best clumsy as an independent utterance. This might at first appear to be a counterexample to condition (14), but in fact I regard the unacceptability of (32b) as resulting from an essentially different source than the unacceptability of (32a) or all other unambiguously contradictory expressions discussed so far. What condition (14) was designed to perform was to ban contradictory expressions from occurring in a context where the truth of the embedded proposition is ensured. On the other hand, (32b) is unacceptable not because it is contradictory but because it expresses a tautological proposition as a whole.

As will be argued in my forthcoming paper, the use of tautological expressions is not inhibited by the same consideration as strictly inhibits the use of contradictory expressions, but by a pragmatic condition which requires utterances to be informative. This assumption is supported by the fact that (32)

is turned into a perfectly acceptable sentence if a suitable expression is appended so that it may have more information to convey; thus,

(33) She didn't say more than she did because she thought she shouldn't.¹⁶

In this respect, tautological expressions are clearly distinct from contradictory expressions, which can never be made acceptable by similar means.

Moreover, if this view on the unacceptability of contradictory and tautological expressions is accepted, it is easy to see why (34) is natural as an independent utterance while (32b) is impossible.

(34) She almost said more than she did.

That is, although almost is identical with not in that they both constitute -contexts logically, almost carries additional connotation; thus (34) is acceptable. For more detailed discussion of the interpretation of tautological expressions, see my forthcoming paper.

Last of all, counterfactual expressions allow contradictory expressions to be interpreted noncontradictorily; thus,

(35) If Mary was taller than she is, John would marry her.

(36) John wishes that Mary was taller than she is.

To these may be added examples like the following:

(37) a. To have more money than he does would be a plus for him.

b. Having more money than he does would be a plus for him.

4.5 a further remark on condition (14)

I will conclude this section by noting some cases in which a contradictory expression is first embedded in a +context, and then the resulting contradictory expression is embedded in a -context or a \emptyset context, thus producing a sentence which permits an ambiguous interpretation. The purpose of doing this is to show that it is not the case that contradictory expressions can never be embedded in +contexts.

Consider (38) and (39):

(38) a. *Mary kissed the boy she didn't kiss.

- b. *John persuaded Mary to kiss the boy she didn't kiss.
- c. John tried to persuade Mary to kiss the boy she didn't kiss (after all).

(39) a. *Mary kissed the boy she didn't kiss.

- b. *Mary managed to kiss the boy she didn't kiss.
- c. John thinks Mary managed to kiss the boy she didn't kiss.

In either case (a) is contradictory. And (b), which is obtained by embedding (a) in +contexts persuade or manage, is also unambiguously contradictory. But if we embed (b) in \emptyset contexts try or think, noncontradictory sentence (c) results.

5. Towards an Explanation for the Ambiguity

5.1 a class of apparent counterexamples to condition (14)

There is an important class of examples which appear to contradict condition (14), which inhibits the occurrence of contradictory expressions within +contexts. They involve verbs like become, get, turn, and make, all of which signify a change of a state of affairs. In spite of the fact that these predicates constitute +contexts in an obvious sense, they produce a noncontradictory interpretation of contradictory expressions, as is seen in the following examples:

(40) a. *The weather was worse than it was.

b. The weather turned worse than it was.

(41) a. *The girl was more unsociable than she was.

b. The girl got more unsociable than she was.

(42) a. *The room was hotter than it was.

b. The sunlight made the room hotter than it was.

In each case, sentence (a) may only be interpreted contradictorily, but (b) may be interpreted noncontradictorily as well.

It is noteworthy, however, that the proposition represented by each of these examples involves states of affairs at two distinct moments. That is, verbs of change, unlike other predicates discussed so far, tend to facilitate a reading in

which the two states of affairs expressed in the proposition are interpreted as occurring not simultaneously but at two distinct moments, making the proposition noncontradictory.¹⁷

In the remainder of this work, however, I will not attempt any modification of condition (14) or of the definition of +contexts to accommodate cases like (41)-(42). Instead, I would like to inquire into the source of the ambiguity exhibited by sentences containing contradictory expressions, hoping to obtain a deeper understanding of the true nature of the phenomenon.

5.2 three types of the ambiguity

Almost all of the examples¹⁸ that I have argued to involve an ambiguous interpretation of a contradictory expression seem to share a common property, which may be characterized as follows.

(43) In all cases in which an apparently contradictory expression may be ambiguously interpreted, the proposition represented by the apparently contradictory expression involves two distinct states of affairs rather than a single state of affairs.

Below I will demonstrate that instances of the ambiguity may be categorized into three subclasses, and point out some of the distinct distributional properties that the three subclasses exhibit, thereby indicating the linguistic significance of the categorization.

In the first type of instances, the two states of affairs involve the belief (or utterance) of the person designated by the subject and that of the speaker. Consider (1b).

(1b) John thinks Mary is taller than she is.
There is an intuitively clear sense in which we may say very informally that Mary is taller than represents John's belief whereas she is represents the speaker's belief. This kind of view is by no means novel or original; in fact it underlies many theories which have been proposed in various forms in the literature. In particular, McCawley(1970) and Hasegawa(1972) are representative instances of such theories.¹⁹

In addition to say and think, examples with verbs like deny, suspect, and accuse belong to this type. In each case, a part of the embedded proposition that represents the subject's belief or utterance is replaced by an expression that represents the speaker's belief. Cases involving according to ... would also be considered of this type.

The second class of the ambiguity includes cases in which a part of the embedded proposition which designates a state of affairs in a nonactual world is replaced by an expression designating a state of affairs in the actual world. Thus, in the following example,

(22b) My mother wants me to be smarter than I am.
the embedded proposition largely designates a state of affairs my mother wants to be realized, but (than) I am, a part of the proposition, represents a state of affairs either the speaker or his mother believes to be the case.

Besides want, verbs like try, promise, ask, tell, and wish all belong to this type. In cases involving these verbs, an expression designating a state of affairs in the real world appears as a part of the embedded proposition which designates a nonactual state of affairs, the realization of which the person designated by the subject promises, asks, wishes, etc. Semantic and syntactic similarity²⁰ of counterfactual expressions to wish suggests that they also belong to the same class.

Furthermore, verbs like prevent, refuse, and object may be regarded as this type, for they are used to mean that someone prevents, refuses, etc. a possible state of affairs which is not yet realized in the actual world.

There is a crucial difference between the first and the second types. In the first type, it is essential that two different persons -- the speaker and the person designated by the subject -- are involved. In the second type, there is no such requirement. The only requirement in the second type is that two states of affairs -- one actual and the other nonactual -- are involved: two distinct persons need not be involved as in the first type. Hence the difference in the following sets of examples:

- (44) a. John thinks Mary is taller than she is.
b. *I think Mary is taller than she is.
- (45) a. John wants Mary to be taller than she is.
b. I want Mary to be taller than she is.

In the first type, the subject must designate someone other than the speaker, whereas there is no such constraint in the second type.

The third type involves cases with verbs of change discussed in 5.1. In such cases, states of affairs in the same world (which may or may not be the actual world) at two distinct moments are involved. In examples of this type, neither two distinct persons nor two distinct worlds need be contrasted. Because two persons need not be contrasted, the first person subject is possible as in the second type:

- (46) a. She became healthier than she was.
b. I became healthier than I was.

The fact that two distinct worlds need not be involved is undoubtedly related to the observation made in 5.1 that contradictory expressions may appear as the complement of verbs of change in spite of the fact that they constitute +contexts, thus constituting counterexamples to condition (14).

6. Conclusion

In this paper, I have tried at some length to demonstrate that:

- (47) a much wider range of contexts produce an ambiguous interpretation of contradictory expressions than has been assumed in the past work, where such contexts seem to have been confined to verbs of saying and thinking, and only a few other verbs like prevent,

and that:

- (48) in most cases, the possibility of an ambiguous interpretation of contradictory expressions is predicted by an intuitively plausible condition (14), which inhibits the occurrence of contradictory expressions in what I defined

as +contexts.

Furthermore, it was argued with a view to obtain a deeper insight into the nature of the ambiguity that:

- (49) the ambiguity of contradictory expressions results from (at least) three distinct sources, which yield differences in the distribution of the ambiguity.

NOTES

- * This is a revised version of Chapter 3 of my M.A. thesis, Kyoto University. In a forthcoming paper of mine, which substantially represents Chapter 4 of the thesis, I deal with the ambiguity of tautological expressions. The two papers are to be regarded as complementary to each other.
1. Examples (1) and (2) are taken from Ross and Perlmutter(1970) and Postal(1974), respectively.
 2. The subscripts indicate the coreferentiality of the two NP's Mary and she. Such indices will be left out throughout the rest of the paper since which interpretation is meant will be obvious in each case.
The asterisk tagged to (1a) indicates that the sentence is contradictory; the asterisk tagged to (2a) indicates that the sentence is tautological. One and the same symbol is being employed since there will be no fear of confusion.
In assigning an asterisk to a sentence, I do not wish to be understood as implying that it is syntactically ill-formed and thus can never be used. It is important to stress this point because in certain cases the use of tautological expressions is inhibited not by the same logical requirement as strictly inhibits the use of contradictory expressions but by a sort of pragmatic condition which does permit violations. For more details on this point, the reader is referred to my forthcoming paper.
 3. For a brief exposition of some of these studies and several remarks on them, see Tanomura(1984).
 4. It is no easy task to define in a rigorous, consistent way "contradictory expression" or "sentence which embeds a contradictory expression". There are several questions to be settled to give a complete definition.
First, what sort of constructions is it that make sentences contradictory? All examples cited in this paper as contradictory expressions involve either comparative constructions (e.g. (1a) and (3a)) or relative clause constructions (e.g. (4a)). However, examples like the following also

are eligible as contradictory expressions, and exhibit identical properties with respect to the possibility of an ambiguous interpretation.

(i) *His brother is a woman.

(ii) *Everyone read the book that no one read.

On the other hand, I will not regard sentences like (iii) as contradictory, simply because actually it may be interpreted noncontradictorily.

(iii) The boy's mother is not a mother.

It goes without saying that a more substantial argument is necessary to show that cases like (iii) are distinct from other cases which I consider contradictory. I will not elaborate on this point any further in this paper, however.

Second, when some material is added to a contradictory expression, the resultant expression may lose a contradictory meaning. For example, (iv) is contradictory but (v) and (vi) are not.

(iv) *Mary was funnier than she was.

(v) Mary was funnier today than she was yesterday.

(vi) Mary is funnier than she was.

It is today and yesterday that makes (vi) noncontradictory; in (vi) the change of tense makes the sentence noncontradictory. This fact concerning (iv)-(vi) becomes important when we treat cases like the following, which I will regard as involving contradictory expressions.

(36) John wishes that Mary was taller than she is.

(40b) The weather turned worse than it was.

Obviously this second point also demands a more careful treatment.

Third, it is not obvious in every case whether a given allegedly embedded structure indeed involves the embedding of a contradictory expression. For example, while few people would wish to deny that the underlined part in (1b) is embedded as the complement of think,

(1b) John thinks Mary is taller than she is.

there would remain questions in cases like the following.

(7b) The storm prevented it from being hotter than it was.

(21b) John accused Mary of dating a boy she didn't date.

(25b) They objected to him accepting more money than he did.

Note, however, that although whether the underlined portions in these examples even make up constituents or not is debatable, there is a good semantic sense in which they may be understood to form (contradictory) propositions. Moreover, by treating these examples as involving embedding just like examples such as (1b), we will be able to treat the interpretation of a variety of contradictory expressions in a uniform manner. Therefore, I will simply assume in the present work that these instances in fact involve the embedding of contradictory expressions.

5. In fact, Russell's original example is:

(i) I thought your yacht was larger than it is.

I substituted was for is in the comparative clause to

keep the tense consistent.

6. As Fodor(1970) points out, it is not obvious what it means to to say that someone believes a contradictory proposition like (3a), or for that matter, whether such a contradictory belief is indeed possible. Here I will leave these questions open, however.
7. Taken from Hasegawa(1972).
8. See Tanomura(1984) for a detailed discussion.
9. See note 4.
10. Jackendoff(1980) also discusses problems inherent in the attempt to ascribe the possibility of an ambiguous interpretation simply to the embedding structure.
11. Postal proposes to analyze the ambiguity of (1b) as resulting from the interaction of the main verb think and an abstract predicate MORE, which he considers present in the embedded sentence. In cases like (4b), where a relative clause is involved, it is again an abstract predicate SAME which Postal thinks interacts with predicates like think.

Not only are these abstract predicates in themselves dubious, but also there are cases for which any analogous analysis in terms of the interaction of two scope-bearing expressions does not even seem possible. Thus, although sentence (ia) from note 4 allows an ambiguous interpretation when it is embedded as the complement of predicates like think, just as sentences like (1a), (3a), and (4a) do,

(i) a. *His brother is a woman.

b. Mary thinks his brother is a woman.

I do not see what sort of abstract analysis might be possible for cases like this.

12. A detailed analysis of the entailment relation that holds between a sentence and its complement sentence was provided by Karttunen(1970,1971,1972).

His analysis may be roughly summarized as in the following chart, where "v" stands for the predicate in question, "S" for its complement sentence, "v(S)" for sentences with v as the main verb taking S as the complement. "~" and "⊃" are used as in the standard logical tradition.

	$\sim v(S) \supset ?$	$\sim v(S) \supset \sim S$	$\sim v(S) \supset S$
$v(S) \supset ?$	say, think, accuse, want, try, be possible, (& many others)	ONLY-IF-VERBS (can, be able, be in a posi- tion, etc.)	

(continued on the next page)

$v(S) \supset S$	IF-VERBS (cause, make, force, persuade, make sure, etc.)	IMPLICATIVE-VBS (manage, happen, bother, etc.)	FACTIVE-VERBS (know, realize, regret, be odd, etc.)
$v(S) \supset \sim S$	NEGATIVE-IF-VBS (prevent, dissuade, etc.)		NEGATIVE- IMPLICATIVE-VBS (fail, forget, avoid, etc.)

Take negative-if-verb prevent for an example. According to the above chart, it belongs to the category with the following properties: (i) $v(S) \supset \sim S$, and (ii) $\sim v(S) \supset ?$. That is to say, (i) if a sentence with prevent as the main verb is true, then the sentence obtained by negating the complement sentence is true (in other words, the complement sentence is false); (ii) if a negative sentence with prevent is true, neither the truth nor falsity of the complement sentence is decidable without extralinguistic information. " $\supset ?$ " means that neither the truth nor the falsity of the complement sentence is entailed. For more detailed information, see Karttunen's works cited above.

It would be obvious that the classification of predicates in terms of " $\supset S$ ", " $\supset \sim S$ ", and " $\supset ?$ " corresponds to the categorization of sentential contexts into +contexts, -contexts, and \emptyset contexts respectively, although the latter categorization is more general in that it is effected also by considerations other than the property of the predicate, as will be seen in the subsequent discussion.

13. Actually it is not correct to say "present tense". The following sentence, for instance, is acceptable unlike (9c):
(i) Sometimes I think John is stupid, although in fact he isn't.
This obviously indicates the need to take into account the aspectual property of the predicate.
14. Lehrer(1975) calls this sort of adverbs "complement-oriented adverbs".
15. ... although there seems to be a tendency for the utterer to be interpreted as suggesting that he doubts Mary is smart.
16. A few similar examples were firstly noted by Lakoff(1970), although I believe her analysis of them incorrect. See my forthcoming paper for details.
17. Cf. note 4, where I noted a case in which a change of tense turns a contradictory expression into a noncontradictory one.
18. Negative not and almost discussed in 4.4 are excepted.
19. Therefore, Hasegawa and others are correct in seeing this first type of ambiguity; their problem lies in the fact they failed to realize the existence of the other types of

ambiguity to be discussed below.

20. Syntactically, they both take complement sentences in the subjunctive mood.

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