Clefts, Discourse Representations, and Situation Semantics
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*Proceedings of the Twelfth Annual Meeting of the Berkeley Linguistics Society* (1986), pp. 135-146

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## 1. Opening Remarks

In this paper I propose to consider the well-known construction exemplified in (1):

(1) It's Maria John likes.

Let us divide (1) into two pieces, the focus (Maria), and the property, (being an x such that John likes x). It has often been observed that the above construction carries with it a presupposition that the property is instantiated. Thus, (1) is only appropriate in contexts in which it is given that there is someone that John likes. Contextual requirements of this sort have sometimes been called conventional implicatures. Two properties are generally considered criterial of such implicatures: (1) they are not cancellable; and (2) the negation of (1) ("It's not Maria that John likes") has the same presupposition.

What I propose to do in this paper is to account for some of the well-known properties of sentences like (1) in an augmented version of situation semantics. Basically, I want to draw an analogy between the presuppositions associated with definite NP's like *the pen on my desk* in (2)

(2) The pen on my desk is out of ink.

and the clefted individual. The claim will be, in effect, that clefts involve a very special sort of definite reference, and that the discourse function of (1), and its relation to (2), might be made transparent in a paraphrase like (3):

(3) The one who John likes is Maria.

I will use the term salient to designate that property of entities, whatever it may really be, that makes them specifiable with a definite description in a discourse. In order to draw the analogy between definite descriptions and clefts I will need to make reference to both discourse salient properties and discourse salient individuals. I will present a system in which properties will not be available to be discourse salient unless there is some individual they are true (or false) of. The situation for salient individuals will be exactly symmetric: individuals will not be available to be salient unless there is some property "under which" they are salient -- or perhaps better -- some aspect under which they are relevant.

So in a phrase like "the property of being a unicorn" the property of being a unicorn is not functioning as a discourse salient property. Rather it's a discourse salient individual, one that is salient under the aspect of being the (one and and only) property of unicornhood. (Compare this to Frege's "The concept 'horse' is not a concept.")

At a certain point, it will become clear that the analogy between clefted (or focused) individuals and definite referents will break down, chiefly because of the fact that in (1), there is no presupposition that Maria is *commonly identifiable* via the

property of being someone John loves; indeed, in any context in which someone would ordinarily SAY (1), Maria is not so identifiable. In (2), on the other hand, the object in question must be commonly identifiable via the property of being a pen and on my desk.[1] Once we have made this difference in status between the two phenomena precise, I will still insist on a similarity. In particular, as has often been noted, the focus must be contextually unique in instantiating the property. It must exhaust the list of contextually relevant property-bearers. In a similar way, the referents of definite NP's must be the contextually unique bearers of their identifying property.

## 2. Situation Semantics

Situation Semantics (Barwise and Perry 1984) is a framework which proposes to give a general account of information flow, whether in sentences, computers, mathematical proofs, mental states, or causally connected events. One of the central ideas of the framework, drawn from the work of David Kaplan, is that meaning underdetermines content. The simplest examples of such underdetermination are sentences involving deixis:

(4) I like linguistics.

(4) carries different information depending on who utters it. Although a number of different semantic accounts have been offered for sentences like (4), many of them by model theoretic semanticists (see, for example, Bar-Hillel 1954 and Montague 1974), situation semantics (SS) is unique in that it builds the machinery for handling discourse sensitive phenomena into the foundations; it is central to the account of information transfer that meaningful regularities carry information only once they are anchored into a context.

To make this clearer, I outline some features of the theory of linguistic meaning (sketched in Barwise and Perry 1985). In Situation Semantics, meaning is portrayed as a constraint holding between a discourse situation type and a described situation type. Following is a rough representation of the meaning constraint for (4):

$$\langle a \text{ says "I like linguistics"};1\rangle \Rightarrow_d \langle \text{like, a, linguistics};1\rangle$$

The above constraint can be roughly glossed "*a* saying 'I like linguistics' involves describing a situation in which *a* likes linguistics." The double-arrow is what is being read as *involves*. The d-subscript (for description) is intended to distinguish it from other constraints, involving a very different sort of involvement. These other constraints describe nomological or necessary regularities in the world, for example:

$$\langle \text{kissing,a,b};1\rangle \Rightarrow \langle \text{touching,a,b};1\rangle$$

One limitation of SS accounts of discourse sensitive phenomena is that until now they have been limited to cases which can be conveniently dealt with as anchorings of a parameter. As far as I can see, the conventional implicature in (1) is not such a case; what I propose to do in this paper is sketch a modified situation semantics in which meanings are given enough structure to deal with conventional implicatures like (1).

Two related points are worth mentioning here. First, one might wonder, why invoke situation semantics at all to handle phenomena involving definiteness and discourse saliency. Although Barwise and Perry 1984 offers a treatment of what they call singular NP's (names, definites and indefinites, as opposed to NP's with quantifiers like *every),* they make no effort to distinguish among the singular NP's. That is, they propose no way of distinguishing definites from indefinites -- and that is precisely the sort of distinction which (I have claimed) is at issue in dealing with (1). The reason to turn to SS, I think, is not that SS has an appropriate analysis ready to hand, but rather because it gives the appropriate degrees of freedom. It doesn't set out with commitments to possible worlds or full function hierarchies, nor does it methodologically rule out abstract semantic components as uninteresting. Instead the sorts of "funny" commitments one has to make are ontological; whether one is a "realist" about these commitments or not, I think there is a growing sense among linguists that one can't do semantics without appealing to all sorts of funny objects (be they cognitive or uniformities in the world) which can combine in various complicated ways (and not just by function-argument application).

These claims about degrees of theoretical freedom bring me to a somewhat more controversial point. I want to claim that, from a linguist's point of view, SS doesn't even commit one to a particular theory of meaning. Now this claim might at first hearing unsettle Barwise and Perry, but it is, I think, relatively benign. Barwise and Perry's articulation of a theory of meaning was given in the context of a general theory of the flow of information. That account has been focused on certain linguistically pregnant phenomena (like the attitudes), but there is no reason that it should be particularly suitable to the sort of meaning linguists have in mind when they talk about discourse. There is no reason why linguistic types (sentences, NP's, words) shouldn't enter into various sorts of constraints, some the sort that B&P have in mind when they talk about meaning, others that might be more relevant to theorists of discourse. In this sense there might be many different kinds of "meaning" into which linguistic objects enter. Thus an account of meaning as discourse-function can be entirely consistent with an account of meaning as describing function (the B&P sense of meaning). On the one hand, the account I propose will still involve something like a constraint, and all constraints capture "meaningful" relations; on the other, the word "meaning" is appropriate, because what is at issue seems to be meaning in an important sense for linguists.

In what follows I assume a version of Situation Semantics somewhat different from much of the published work. In particular, following some recent suggestions by Barwise, I dispense with the "abstract" situations of B&P 1984 and assume situations are simply primitive objects which are determined by a set of facts. Facts are just a special case of *states-of-affairs*. To put it another way, the states-of-affairs can be thought of as including all possible facts, including the ones that actually ARE facts, that is, the ones that actually hold in some situation. To express the fact that some state-of-affairs, say one in which John is running, holds in some particular real situation *s*, I will write:

(5) $s \models \langle run,John;1 \rangle$

The states-of-affairs form a complete lattice. So we can form complex states-of-affairs like the following:

(6) <run,John,:1> ∧ <sleep, Maria;0>

(6) is a complex state-of-affairs in which John is running and Maria is not sleeping. In addition, there are states-of-affairs which are vague, in the sense that one or more argument positions of the relation are left unspecified:

(7) ∃ x<run,x;1>

This is a state-of-affairs in which someone is running.

### 3. Discourse Transition Constraints

Following a suggestion of Mats Rooth's, I begin the search for the right treatment of clefts with some unabashed borrowing of the insights in Heim (1982 and 1983). Heim 1983 notes that her system, initially proposed to deal with the problem of definites and indefinites, provides a general framework for dealing with conventional implicatures. Clefts, too, involve conventional implicature and an adequate treatment should be embedded in a framework that is at least a start on an adequate treatment of conventional implicatures in general.

Heim's system takes as a starting point the idea that sentence meaning can be represented as a File (Context) Change Potential (FCP), essentially an operation from files to files which encodes the discourse advancing function of the sentence. The meaning of sequences of sentences in discourse is the composition of their FCP's. Each file in the domain or range of a FCP is in turn a function from worlds to sets of partial variable assignment functions. (Heim 1983) Sentences using definite NP's like *the man* impose two sorts of constraints on FCP's: (1) the "input" file includes only assignment functions defined over some particular variable (say, *x1);* (2) for each world the file includes only assignments which assign a man to *x1*.

We import a similar idea into SS as follows: sentence meanings will be constraints on something called a discourse transition. A discourse-transition is a state-of-affairs of the form given in (9):

<next-discourse-state U1,S1,S2;1>

U1 in (9) is an utterance state-of-affairs, rather like the utterance situations in Barwise and Perry 1984; it contains information about who says what to whom, and S1 and S2 are discourse-states, in a sense to be explained shortly. A state-of-affairs of the form in (9) is a fact when the utterance situation U1 is real, and it is immediately preceded by S1 and immediately followed by S2. This, then, is like a snapshot of one of Heim's FCP functions. I assume that discourse-states (DS) are states-of-affairs holding at critical points in a discourse; they include information about points of time, or relatively short intervals. Each discourse-state will belong to a unique discourse. (10) gives an example of the sort of information one might expect to find in a DS:

(10) <t,just-uttered, 'John liked Mary' ;1>

(10) represents the information a particular sentence was just uttered. A discourse-state might well include information about all the utterances from the "beginning" of the relevant discourse (if the notion of a discourse-beginning can be well defined).

Another sort of information that will certainly be relevant is that some fact is common knowledge in a discourse:

(11) <common-knowledge, <1,like,John, Mary;1>;1>

It will be convenient to have an abbreviation that says that a discourse-state *s1* already includes some fact as common-knowledge. In that case we will write:

(12) <includes,s1, <like,John,Mary;1>;1>

Of course, these examples are offered only as a hint of what characterizing the informational state in a real conversation would involve. I will make no further commitments here about what sorts of information really needs to be included in a fully adequate discourse-state. Rather, I will concentrate on relations that take discourse-states as arguments.

(13) gives the form of a Discourse Transition Constraint (DTC):

(13) <next-discourse-state U1, S1, S2> ==>
<... S1...>∧<... S1...> ... <... S2...>∧<... S2 ...>

A Transition Constraint consists of discourse-transition on the left and a conjunction of states-of-affairs about the input and output states on the right. What a DTC gives, then, is the requirement a sentence makes on its input discourse states, and the changes it requires in the output. On this view, the distinction between assertion and presupposition is recast into the distinction between input requirements and additions to the output common knowledge.[2] As we shall see, there are other changes a sentence can make on the output besides adding to the common knowledge.

**4. Definites and Indefinites**

Turning now to referential NP's, we will characterize referential salience with a relation *salient* holding among a discourse-state, a property, and an individual. So a certain dog might be characterized as salient in discourse-state *s1* with the following state-of-affairs:

(14) <salient, s1,a, dog;1>

In the case of complex properties like being someone that John likes, I will write:

(15) <salient, s1,a,[x|<likes,john,x;1>];1>

So (15) is a state-of-affairs true when some individual *a* is salient in discourse state *s1* under the property of being someone John likes. We will also assume the following constraints:

(I) <salient, s1,a,P;1> ==><includes,s1,<P,a;1>;1>
(II) <next-discourse-state,u1,s1,s2;1>∧<salient,s1, a,P;1> ==>
<salient,s2,a,P;1>

What (I) says is that when *a* is salient in *s1* under property *P*, then the state-of-affairs of *a* having property *P* must be common-knowledge in the discourse-state. What (II) says is that once something is salient in a discourse, it continues to be. This is clearly too strong, but it will serve as a first approximation; the chief function of (II) in what follows will be to save some typing. We will see an example below.

The apparatus introduced thus far is sufficient for a very preliminary treatment of the discourse-differences between definite and indefinite NP's. For definites, we will require that their referents be salient in the input discourse-state:

<salient,s1,a,P;1>

Constraint II guarantees continued salience in the output. For indefinites, we will require that their referents not be salient in the input state and salient under the relevant property in the output:

<salient, s1,a;0>
<salient,s2,a,P;1>

Thus, an indefinite will be unable to have the same referent and property as a preceding definite. To give an example of how this works, we want (16) but not (17) to be a well-formed discourse, on the interpretation where the subject NP's are co-referential:

(16) A dog entered. The dog left.
(17) The dog entered. A dog left.

Consider the following DTC's for the discourse in (17) omitting tense:

DTC(17)

<next-discourse-state, <says,a, "The dog entered";1>, s1,s2;1>
==>
<salient,s1,b,dog;1>
<includes,s2, <leave,b;1>;1>

<next-discourse-state, <says,a, "A dog left";1>, s1,s2;1>
==>
<salient,s1,b;0>
<salient,s2,b,dog;1>
<includes,s2, <leave,b;1>;1>

The first sentence is only appropriate if the referent of the definite NP is salient in the input-discourse-state. By Constraint II, that referent continues to be salient in the output. But the DTC for the second sentence requires that the referent of the indefinite NP not be salient in its input discourse-situation. So discourse (17) does not cohere. Like definites, proper names also trigger output salience, as do indefinites, by overt stipulation rather than via II (the right generalization seems to be that reference triggers salience). So discourses like:

(7a) Fido came in. A dog left.
(7b) A dog came in. A dog left.

will also be predicted to have only the interpretations on which the subjects of the sentences are disjoint in reference.

Their differing input conditions, as Heim notes, will also be responsible for capturing the contrast between definites and indefinites in licensing backwards anaphora. Consider, for example, the contrast between *every man who meets it likes the donkey* and *every man who meets it likes a donkey*. In the latter, coreference between the pronoun and indefinite is impossible, presumably because the pronoun renders its referent salient.

## 5. Clefts

To extend this sort of account to clefts, we stipulate that clefts require that the clefted individual and property be salient. So the DTC for (1) will be:

DTC(1)

<next-discourse-state, <says,a, "It was Maria John loved";1>, s1,s2;1>
= = >
<salient,s1,b,[x|<love,John,x;1>];1>
<salient,s1,c,named-Maria;1>
<equal,b,c;1>
<includes,s2,<love,John,c;1>;1>

Looking at the part of the constraint following the arrow, the first state-of-affairs requires that some *b* be salient in the input *s1* under the aspect of being loved by John. This is what captures the cleft presupposition mentioned at the outset. The presupposition of (1) is that there is someone that John loved; since some *b* is salient in *s1* under the aspect of being loved by John, it is common knowledge in *s1* (by I) that some *b* has that property. The second and third states-of-affairs in DTC(1) will require that there be a *c* in *s1* salient under the aspect of being named Maria, and that *b* equal *c*. The last state-of-affairs simply represents the content of (1) and inserts it into the output state.

Given our treatment of indefinites, DTC(1) makes an immediate prediction: sentences like (19) ought to be unacceptable:

(19) It was a nurse that John loved.

To see why, we need to look at the Transition Constraint for (19):

DTC(19)

<next-discourse-state, <says,a, "It was a nurse John loved";1>, s1,s2;1>
= = >
<salient,s1,b,[x|<love,John,x;1>];1>
<salient,s1,c;0>
<equal,b,c;1>
<salient,s2,c,nurse;1>

<includes,s2,<love,John,c;1>;1>

The cleft construction requires that *b* is salient in s1, and moreover guarantees that *b* and *c* are equal. But the indefinite NP makes the requirement that its referent not be salient in the input DS, seen in the fact <salient,s1,c;0>. To satisfy this constraint, the same individual must both be salient in s1 and not salient in s1. These two clashing requirements can't be met, so (19) should be out. Is it in fact out? My claim is that it is -- on the reading where the entire NP is focused. But there is a closely related sentence which is not unacceptable:

(20) It was a NURSE that John loved.

(20) represents a reading on which what is focused is the property of being a nurse, appropriately uttered, say, in an environment where someone has just claimed that John loved a cab driver. (20) involves a kind of pied-piping. That is, the focused material has brought some of its syntactic environment along with it into the clefted position. An appropriate DTC for (20) would be:

DTC(20)

<next-discourse-state, <says,a, "It was a NURSE John loved";1>, s1,s2;1>
==>
<salient,s1,P,[PROP|<hold,PROP,b;1> <love,John,b;1>];1>
<salient,s1,b;0>
<salient,s2,b,nurse;1>
<equal, P, nurse;1>
<includes, s2, <hold,nurse,b;1> <love,John,b;1>;1>

Here *P* is the parameter for the property salient in *s1*, the property that held of some *b* John loved. But note that while *P* is salient in *s1*, *b* is not, under any aspect. *b* does not become salient (under the nurse aspect) until *s2*.

In proposing this Pied-piping view of some cleft constructions, I am agreeing in spirit with the analysis in Chomsky 1970 and Jackendoff 1972. For a somewhat different view of what is at issue in such constructions, see Rooth 1985.

The idea of property focusing extends quite naturally to clefts involving non-NP's:

(21) It was eating fish that John objected to. (Rooth 1985)
(22) It was under the table that John hid the book.
(23) It was yesterday that John phoned.

The semantics for (21) look very much like (20); a property has been focused, this time with no pied-piping made syntactically necessary. (22) differs a bit. Following Gawron 1985, I treat adjunct PP's as properties of situations:

DTC(22)

<next-discourse-state,
<says,a, "It was under the table that John hid the book";1>, s1,s2;1>

==>
<salient,s1,P,[PROP|<hold,PROP,s;1> < s,<hide,John,b;1>;1>];1>
<salient,s1,b,book;1>
<equal,[x|<under,x,b;1>],P;1>
<includes,s2, <hold,[x|<under,x,b;1>],s;1> < s,<hide,John,b;1>;1>];1>

(23) will look much like (22), with the temporal property of situations replacing the spatial one.

We have seen that both individuals and properties can be focused. Is there anything that can not be? Apparently so. Sentences like *It was every concession John objected to* are quite peculiar, and seem to be salavageable only if some sort of property focusing is resorted to: *It was every CONCESSION John objected to.* On the current approach, these facts seem to be representable fairly straightforwardly as restrictions on the possible "focus" arguments of the *salient* relation.[3]

## 6. Salience: A Closer Look

There is a serious problem with the treatment offered thus far. The problem stems from the ordinary interpretation of constraints in situation semantics. I repeat the right hand side of the constraint proposed as the meaning for (1):

==>
<salient, s1, a, [x|<love,John,x;1>];1>
<salient,s1,b,named-Maria;1>
<equal,a,b;1>
<included, s2, <love,John,b;1>;1>

The problem is that the only situations that can satisfy this right hand side will be situations in which some specific individual is salient in s1 under the given property. But then Constraint I will apply, and, by the definition of *included,* we will have a larger situation in which (24) is a fact:

(24) <common-knowledge,<love,John,a;1>;1>

And moreover, *a* will be anchored to the same individual as *b,* which is to say, Maria. Then it will be common knowledge OF Maria that she is loved by John. But, of course, this is precisely what ISN'T common knowledge when someone says (1). What we want instead is (25):

(25) <common-knowledge,$\exists$y<love,John,y;1>;1>

In contrast, when we make referential use of the definite article, as in (2), we are exploiting the fact that it is common knowledge -- knowledge of a certain object -- that it is a pen and on my desk. This strongly suggests that the relation we want the property-bearers of clefts to bear to their discourse states is not the saliency relation, but some weaker relation. Let us call it *specifiability.* We can characterize the relation with two new constraints:

(III) <specifiable, s1,a,P;1> ==> <includes,s1,$\exists$x<P,x;1>;1>

(IV) <salient, s1,a,P;1> ==> <specifiable,s1,a,P;1>

Constraint (III) gets the facts right about common knowledge; having a specifiable property holder only means that we know THAT someone holds the property, not that we know OF someone that they hold it. (IV) captures the relationship between saliency and specifiability. If we now strengthen the semantics of an indefinite so that instead of requiring <salient,a;0> of the input state, it requires <specifiable, a;0>, then a sentence like (19) will still make incompatible requirements on the input discourse-state. This means we will still require that clefted indefinites involve some sort of property focusing.

With this fine point out of the way, we can turn to a more general question: what is the real pay-off of trying to relate facts about definiteness to facts about focus? One benefit, I think, has already been demonstrated: we have an account of why clefts generally involve definites, and why clefted indefinites are special. But there is another property of focused elements that I think offers a better argument. This is the oft-noted fact that focused elements seem to be contextually unique bearers of the cleft property; and this contextual-uniqueness is something that has also been remarked of definite referents. So, just as Maria in (1) needs to be the only contextually relevant person John loves, the pen in (2) needs to be the only contextually relevant pen on my desk.

We can capture both these facts with a single constraint:

(V) <specifiable,s1,a,P>∧<specifiable,s1,b,P> ==> <equal, a,b;1>

Since both definites and clefts will involve specifiability (definites will involve specifiability via constraint (IV)), both will require contextual uniqueness.

## 7. Conclusion

I have proposed a modified version of situation semantics rich enough to model certain facts about definiteness and focus, and proposed an account which allows the two phenomena to be related in a principled way. In particular, the proposed analysis of clefts claims that they involve a weakened variety of salience I have called specifiability.

I have said nothing about how the compositional semantics of the examples in this paper is to be specified. A detailed demonstration will have to be the subject of further work. One point worth mentioning here: that semantics appears to inevitably involve specifying semantic properties of a construction, rather than simply collecting the semantics of independent constituents in some construction-independent fashion. That is not a particularly earthshaking fact: it appears, for example, to be universally conceded for questions; but it may be that on further investigation semanticists find that construction-specific semantics is a far more pervasive phenomenon than they had at first thought. Some recent work (see Fillmore, Kay, and O'Connor 1985 and Lambrecht 1984) suggests that this is the case. If so, discovering the relations of the semantics of particular constructions to semantics found elsewhere in the grammar may become a far more pressing concern, the genus for the particular variety of concern I have addressed in this paper.

*Notes*

1. At this point, I am only dealing with referential or value-loaded uses of definite NP's. Attributive uses, although they seem to carry an existential presupposition as well, seem to function somewhat differently in discourse. In particular, there seems to be no presupposition that the referent is someone OF whom the description is *known (de re)* to be true. Nor is it necessarily common knowledge that someone (de dicto) uniquely fits the description (which is what I will claim later in this paper is true of clefts and what I call *specifiability).* I can say "the man with the martini glass in his hand" to my confederate at a party without assuming that she has ever noticed the existence of such an entity. I discuss common knowledge and identifiability in the last section of this paper.

2. Rob Chametzky points out that this does not explain why or even predict that conventional implicatures are subject to metalinguistic cancellation, but what is asserted is not. To describe THAT difference we might very well have to write out two different constraints with two different sorts of arrows.

3. Chuck Fillmore points out that a more illuminating view here might be to tie focus saliency in with the existence of some sort of list of possible, but mutually exclusive, candidates for bearers of the property. Since quantifier NP's like *every concession* don't pick out members of such lists, they can not be focused. This contrast-set view of focus might also help explain another property of it-clefts pointed out by another questioner. Unlike wh-clefts, they are peculiar discourse initially.

*Acknowledgements*

The work described here was completed while I was a Post-Doctoral Fellow at the Center for the Study of Language and Information. I want to thank Mats Rooth for much of the inspiration for this paper, which stems from a series of valuable discussions about the focus, presupposition, and the work of Heim, whose influence is evident throughout, but who has never indicated any leanings in the direction taken here. I also want to thank Joan Bresnan and Sam Mchombo, whose paper on Chichewa first sparked my interest in focus. All the parties just named are hereby absolved of any responsibility for the paper at hand.

*References*

Bar-Hillel, Y. 1954. "Indexical Expressions." Mind 63:359-79.

Barwise, Jon and John Perry. 1984. Situations and Attitudes. Cambridge: MIT Press.

Barwise, Jon and John Perry. 1985. Shifting Situations and Shaken Attitudes. CSLI Report.

Baker, C.L. 1970. "Notes on the Description of English Questions: the role of an abstract question morpheme." Foundations of Language 6, p. 197-219.

Bresnan J. and S. Mchombo. 1985. Topics, Pronoun,and Agreement in Chichewa. Manuscript: Stanford University.

Chomsky, Noam. 1970. Deep Structure, Surface Structure, and Semantic Interpretation. In R. Jakobson and S. Kawamoto (eds) *Studies in General and Oriental Linguistics*. Tokyo: T.E.C. Corporation.

Fillmore, Charles, Paul Kay, and Mary Catherine O'Connor. 1985. Regularity and Idiomaticity. Manuscript: UC Berkeley.

Gawron, Jean Mark. to appear. Situations and Prepositions. Linguistics and Philosophy.

Heim, I. 1982. The Semantics of Definite and Indefinite Noun Phrases. Unpublished Ph.D. Dissertation. UMass at Amherst.

Heim, I. 1983. "On the Projection Problem for Presupposiitons." In Barlow, Michael, et al. (eds) Proceeding of the West Coast Conference on Formal Linguistics, Volume 2.

Jackendoff, Ray. S. 1972 Semantic Interpretation in Generative Grammar. MIT Press: Cambridge.

Lambrecht, Knud. 1984. "Formulaicity, frame semantics and pragmatics in German binomial expressions." Language 60, 4. 753-796.

Montague, Richard. 1974. "Pragmatics." In Thomason. R.(ed) Formal Philosophy: The Collected Papers of Richard Montague. New Haven: Yale University Press.

Rooth, Mats. 1985. Association With Focus. PhD Dissertation, University of Massachusetts: Amherst.