

Point of View as a Factor of Content

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The departure point for this study is the distinction between character and content, which was introduced by David Kaplan from considerations of indexicals. The character of a sentence relativizes its meaning to the utterance, by fixing the designation of all context dependent elements such as tense and personal pronouns like I. What the sentence says then, relative to a fixed designation of the indexicals, is the content of the sentence.

In the present work, I will motivate a further factorization of content into point of view and attitude, again from considerations of indexicals. Evidence for this factorization is based on the analysis of the literary style known as Free Indirect Discourse (FID), the style pervasive in stream-of-consciousness novels. My claim will be that just as it is possible to do with the cover term meaning as long as one looks only at eternal sentences, it is possible to do with the cover term content as long as one deals only with relatively simple styles such as direct speech and subordinate indirect speech. But once one is confronted with more sophisticated literary styles such as FID, a further distinction is required.

I first present a characterization of Free Indirect Discourse (FID) as it appears in the Poetics literature. FID, one finds out in Dorrit Cohn's book Transparent Minds, "...may be most succinctly defined as the technique for rendering a character's thought in his own idiom while maintaining the third-person reference and the basic tense of narration" (Cohn 1978, p.100). Another description of FID found in Pascal's book, The Dual Voice, says "that the narrator, though preserving the authorial mode throughout and evading the 'dramatic' form of speech or dialogue, yet places himself, when reporting the words or thoughts of a character, directly into the experiential field of the character, and adopts the latter's perspective in regard to both time and place." (Pascal 1977, p.9)

The illustration in (1) is from Virginia Woolf's To the Lighthouse, and consists of two fragments of a passage where Lily Briscoe is settling to work on a painting she had wanted to do ten years before:

(1) "She fetched herself a chair. She pitched her easel with her precise old-maidish movements on the edge of the lawn, not too close to Mr. Carmichael, but close enough for his protection. Yes, it must have been precisely here that she had stood ten years ago. There was the wall; the hedge; the tree. The question was of some relation between those masses. She had borne it in her mind all these years. It seemed as if the solution had come to her: she knew now what she wanted to do.

But with Mr. Ramsay bearing down on her, she could do nothing. Every time he approached - he was walking up and down the terrace - ruin approached, chaos approached. She could not paint....

...She rejected one brush; she chose another. When would those children come? When would they all be off? she fidgeted. That man, she thought, her anger rising in her, never gave; that man took. She, on the other hand, would be forced to give. Mrs Ramsay had given. Giving, giving, giving, she had died - and had left all this. Really, she was angry with Mrs. Ramsay. With the brush slightly trembling in her fingers she looked at the hedge, the step, the wall." (p.168, 170)

The reader of this passage can get a fairly good idea of which sentences are written from the perspective of the narrator, and which sentences constitute, to a greater or lesser extent, a direct representation of Lily Briscoe's consciousness. These latter sentences are written in the style of Free Indirect Discourse. This style was first identified by Charles Bally in 1912, and was named by him 'style indirect libre'. It had evolved in the 19th century, and it is interesting to note that it developed independently in different languages.

There are different signs of FID in the Woolf passage. One stylistic sign is the choice of words. The expressions those children, they all, that man, reflect Lily Briscoe's inner way of referring to those people at that moment, and betray her irritation towards them, not the narrator's. The metaphors ruin approached, chaos approached, are Lily's, and so is the repetition: giving, giving, giving. Another stylistic sign is the use of exclamations, such as Yes, which normally appear in direct speech, not in narrative.

What characterizes FID sentences syntactically is that they are never embedded, but sometimes cooccur with parentheticals, such as she thought. Though these sentences are not embedded, they make use of "shifted tenses", typical of embedded clauses, such as past perfect and "future in the past": "Mrs. Ramsay had given" and "She would be forced to give."

Semantically, it is a very salient characteristic of FID that deictic expressions are anchored to the subject of consciousness (that is the character whose point of view it is), not to the narrator: "speech-act" adverbs such as really, locative deictics such as here, there, verbs with deictic elements such as approach, demonstratives such as these, those, temporal deictics such as now, ten years ago.

On the other hand, tense is anchored to the narrator. Hence the surprising effect of present and future time deictics cooccurring with the past tense. An example from the above passage is she knew now; in (2) you can find a striking example quoted in Ann Banfield's 1982 book Unspeakable Sentences, from D.H. Lawrence:

(2) 'Tomorrow was Monday, Monday, the beginning of another school week!' (Lawrence, Women in Love, p. 185).

More examples can be found in the 83 paper by Kamp and Rohrer, "Tense in Text". In FID then, temporal deictics are anchored to the character while tense is anchored to the narrator. In this, it differs from subordinate clauses, where both tense and deictics are normally anchored to the speaker. Thus, the truth of the embedded clause in (3)

(3) Gudrun said on Sunday that tomorrow was Monday

does not follow from the matrix clause, but depends on the time of utterance.

Ann Banfield in her book notices another formal characteristic of FID. Third person pronouns which are linked to the subject of consciousness are logophoric in the sense of Selts 1987. They can be reflexivized under the same conditions which normally hold only for first and second person pronouns, i.e. without an overt antecedent, as (4), from Mrs. Dalloway shows:

(4) That was one of the bonds between Sally and himself. (Woolf, Mrs Dalloway, p. 84)" (from Banfield 1982, p. 91)

Another descriptive point worth mentioning is that in French, the passé simple doesn't occur in the style indirect libre, only the imparfait. In fact, this used to be considered the most salient characteristic of this style in French. The example in (5) is quoted in Barfield:

- (5) 'Emma mit un chape sur ses épaules, ouvrit la fenêtre et s'accouda. La nuit était noire. Quelques gouttes de pluie tombaient...' (Flaubert, *Madame Bovary*, p. 374.) [Emma put a shawl round her shoulders, opened the window and leaned on her elbows. The night was black. A few drops of rain were falling.]

Moshe Ron has pointed out to me an additional semantic characteristic of FID. The narrator may use, to refer to an individual, definite descriptions that the subject of consciousness believes to pick out that individual, even though the narrator knows they don't. What I think this points out to is that in general, referential use of definite descriptions is connected to the speaker, while attributive use is connected to the subject of consciousness. So if the speaker is distinct from the subject of consciousness, both uses can be detected at once. Consider a specific example: in *The Marriage of Figaro*, there is a scene where Figaro sees Countess Almaviva, wearing his wife's clothes, approaching Count Almaviva in the dark. Then the FID portion of the text in (6) is a description of what Figaro sees, even though the mistaken description his wife is used:

- (6) 'Figaro froze in place. He couldn't believe his eyes. His wife had swooned into the Count's arms and was now kissing him passionately.'

This example shows that FID perception reports are very different from the two kinds of perception reports that were discussed by Barwise, like those in (7):

- (7) a Figaro saw his wife swoon into the Count's arms.
b Figaro saw that his wife had swooned into the Count's arms.

As was discussed in *Situations and Attitudes* for example, the embedded sentence in naked infinitive reports such as (7a) describes the situation seen without the mediation of the seer's consciousness. "See that" reports, like (7b), take one step into the seer's consciousness: they report the existence of an attitude of the subject's, but they deliver it anchored by the speaker. So in both these cases the narrator is the one responsible for the reference of the description his wife. FID

perception reports such as in (6) take one further step into the subject's consciousness: they deliver the attitude itself. The benefit is substantial: FID perception reports describe both the subject's consciousness and reality, all at once. This point is similar to the observation of Dorrit Cohn when she says that sentences of Free Indirect Discourse "can reflect sites and happenings even as they show a character reflecting on these sites and happenings." (Cohn 1978, 132)

The representation of FID in Situation Semantics

I now turn to an analysis of FID, which I formulate in the framework of Situation Semantics, in order to take advantage of this theory's articulated account of contextual factors. Also, since I want to talk about situations, I will be making the simplification assumption that the narratives in question describe reality; for FID, it makes no difference if the narrative is fiction or not.

Sentence meaning is represented in *Situations and Attitudes* as the three-place relation shown in (8):

- (8) $d, c[[\phi]]e$ where $d :=$ at $l(d)$: saying, $a(d)$, ϕ between d , c , and e . d is a discourse situation (where $a(d)$ is the speaker and $l(d)$ is the discourse location), e is the described situation, and c , the connections, is a partial function from referring expressions in ϕ to e .

Consider an example where ϕ is as in (9a):

- (9) a He was in love with her.
and where d is fixed, and c is fixed as in (9b),

- (9) b $c(\text{he}) = \text{Jerry}$, $c(\text{her}) = \text{Jill}$, $c(\text{tns}) = 1$

that is the function c applies to the pronouns and to the tense to yield the individual's Jerry and Jill and the location l respectively. Then all the situations described by this sentences will contain e in (9c):

- (9) c $e :=$ at l : be-in-love-with, Jerry, Jill

But the sentence in (9a) could, in addition to being a description of e , be a representation of different people's thoughts, maybe Jerry's, or Jill's, or maybe just the speaker's. Even though the sentence describes the same situations whoever the thinker is, it certainly describes totally different states of mind: that of the lover is different from that of the beloved, and both are different from that of a third party. These different states of mind is exactly what needs to be taken into account to explain FID. It would therefore be better to build them into the meaning relation, by letting it be defined not on the described situation itself but on different states of mind, which I will call "attitudes", which are situation-types with the indeterminates, or roles, "I" and "here", which represent the subject of consciousness and her location. The different attitudes will yield the same situation relative to their contexts. A context is a situation which I will call "point of view", where the indeterminates "I" and "here" are anchored.

If, for example, ϕ in (9a) describes the speaker's state of mind, it could be simply represented by e itself. The context can be trivially d . But if ϕ represents Jill's state of mind, the fact that the sentence is about herself, *de se* if you want, this fact is linguistically significant, as FID shows. Still, ϕ could correspond to different attitudes of Jill's. It could represent what Jill has in common with other people who are conscious of being loved, as in (10a), or with people conscious of being loved by Jerry (as in (10b)), or with people conscious of being loved by someone they think of as being called "Jerry", as in (10c), or many others. (E in (10) is the attitude, and indeterminates are signalled by preceding dots.)

- (10) a $E := \text{at } .h: \text{be-in-love-with, } .x, .i$
 b $E := \text{at } .h: \text{be-in-love-with, Jerry, } .i$
 c $E := \text{at } .h: \text{be-in-love-with, } .x, .i$
 refer-to, "Jerry", .x

In (11), an example is given of a point of view p . A point of view always assigns to "I" the role of being the subject of consciousness, that is the individual who has the attitude E at the location which anchors "here". Such a situation is called a "represented attitude" by Barwise and Perry in Situations and Attitudes. In (11) the subject of consciousness is Jill, at location l :

- (11) $p := \text{at } l: \text{has-attitude, Jill, } E$
 of, .x, Jerry

The remaining indeterminates in E , other than $.i$ and $.h$, will be anchored according to what is called the setting of p , which are equations like the second line of (11), which says that the indeterminate $.x$ in (10) is anchored to Jerry.

The different attitudes E in (10) are all anchored to the same situation by the point of view p in (11). Conversely, (12) shows that it is possible for an attitude E to be anchored to the same situation by two different points of view $p1$ and $p2$:

- (12) a Was he in love with her? Jill and Jerry both wondered.

These two characters are having the same thought, each from their own point of view:

- (12) b $E := \text{at } .h: \text{be-in-love-with, } .i, .i; ?$

$p1 := \text{at } l: \text{wonder, Jill, } E$ $p2 := \text{at } l: \text{wonder, Jerry, } E$
 of, .i, Jerry of, .i, Jill

"Real life" examples from actual novels are shown in a paper by Ron 1981, from The Portrait of a lady and others.

In order to account for FID, I therefore propose to relativize meaning not only to the discourse but also to the point of view, which represents the focus of consciousness. The meaning relation I propose is shown in (13),

- (13) $d, c[[\phi]]E, p$
 iff
 $Ae(Ep[f] \subseteq e \rightarrow d, c[[\phi]]e)$

a four-place relation between d , e , E and p . E is a situation-type with two indeterminates $.i$ and $.h$, p is a represented attitude which is a context for E (that is, a situation where the roles $.i$ ("I") and $.h$ ("here") are uniquely defined). The setting of p contains equations which define an anchor f for each additional indeterminate $.x$ in E .

(13) says in effect that for every situation e which includes the result of anchoring the situation-type E with p and f , e is an interpretation of ϕ according to the old three place meaning relation.

This puts us in the position to propose the explication in (14) for what it means to say that a sentence ϕ is a sentence of FID:

- (14) ϕ is interpreted as FID iff it is interpreted such that $p \neq d$.

In everyday discourse, typically, $p = d$, that is, in everyday discourse the speaker is also the subject of consciousness.

When we now look afresh at deixis, taking into account this more sensitive meaning relation, we see that the meaning of some deictic elements depends on the discourse, but that the meaning of others depends on the point of view. First and second person pronouns, for example, are discourse-situation sensitive but point-of-view insensitive, as in (15):

- (15) $d, c[[I]]a, E, p$ iff $a = a(d)$

According to (15), the interpretation of the pronoun I given d, G, E, and a is that individual a which is a(d), the speaker. Note that the interpretation of the pronoun "I" does not have to coincide with the subject of consciousness. The sentence in (16),

- (16) I should have realized that something had happened to her.

which I found quoted in the same paper by Ron, is from Henry Miller's SEXUS, which is a first-person narrative. (16) appears there as part of an FID passage written from the point of view of Mara, who is the referent of the third person pronoun her. Henry has just complained to Mara after she had stood him up, and he writes: 'She seemed surprised that I should get so upset over so trivial a thing. What had kept her? Oh, it was nothing at all. She had been out late, a rather wild party.... Yes, there had been a lot to drink and somebody had asked her to do the splits and she had tried.... well, and she had hurt herself a bit. That was all. I should have realized that something had happened to her. She wasn't the sort who made dates and broke them - just like that.' (Miller, SEXUS, Grove, p.69-70) So it is clear that the first person pronoun can refer to the speaker without referring to the subject of consciousness.

Demonstratives, unlike first and second person pronouns, are point-of-view sensitive but discourse-situation insensitive, as shown in (17):

- (17) $d, c[[this]]b, E, p$
if
in p : at $l(p)$: attending-to, $a(p)$, b

(17) says that the interpretation of this is an individual b that the subject of consciousness a(p) is attending to in the point of view situation. We saw an example above, where Virginia Woolf uses words such as this tree for something that Lily Briscoe is attending to. The denotation of this is therefore a function of the point-of-view, not of the discourse.

Third person pronouns are sensitive to both discourse and point of view, as can be seen in (18):

- (18) $d, c[[she]]b, E, p$
if

(1) $b \neq a(d)$ and $b \neq a(p)$
in which case attribution of feminine gender is part of p

or

(2) $b \neq a(d)$ and $b = a(p)$;
in which case attribution of feminine gender is part of d

According to (18), if she refers to the individual b, then b must always be distinct from the speaker, and could also be distinct from the subject of consciousness, as in (18.1), in which case the attribution of feminine gender is part of the point of view, but b could be equal to the subject of consciousness, as in (18.2), in which case gender attribution is part of d.

The difference in where gender is attributed is quite crucial. In case (1) of (18), the narrator can refer with the pronoun she to a masculine character, if the subject of consciousness thinks it's a woman. Examples like this are quoted by Ron from Balzac's Sarrasine, and I also found such a case in a Hebrew novel called Molcho, by Yehoshua.

On the other hand, if she is connected to the subject of consciousness, gender information cannot be attributed to her. Consider the difference in information between the direct discourse in (19a) and the FID in (19b):

- (19)a Robin thought: "I am tired."
b She was tired, thought Robin.

(a) does not contain the information whether Robin is female. The name Robin is unisex, and the first person pronoun is not marked for gender. But a third person pronoun is, therefore (b) is more informative than (a). This extra information cannot be attributed to Robin herself, because what she actually thought was: "I am tired," which does not imply that she is female. Gender information in this case clearly emanates from d, the

discourse situation, which is the situation of the narrator.

This last point, by the way, I believe settles a debate in the poetics literature about whether in FID, consciousness is represented unmediated by the narrator, (as Barfield for example believes), or whether the voice of the narrator blends in with that of the subject of consciousness. The latter view is called "the dual voice" position. The present work, considered in the perspective of this debate, actually gives an explicit formulation of the dual voice position: the narrator's voice "emanates" from \underline{d} , and the character's voice from \underline{p} .

We now move on to temporal deictics. These behave like demonstratives and not like first and second person pronouns, as seen in (20) and (21):

- (20) $d, c[[now]]1, E, p$ iff $1 \cdot 1(p)$
(read: 1 overlaps 1(p))
- (21) $d, c[[yesterday]]1, E, p$ iff $1 = \text{day preceding the day containing } 1(p)$.

Temporal deictics are not dependent upon the discourse situation but only upon the point-of-view.

Tense, on the other hand, like third person pronouns, depends both on the discourse situation and the point of view. This speaks in favour of a Reichenbach-type treatment of tense, whereby tense is a relation between $I(d)$ (discourse time), I (event time) and $1(p)$ (point of reference). The point of reference can be any event, but in cases of FID it coincides with the point-of-view.

- (22) $d[[present (prog.)]]1, p$ iff $1 \cdot 1(p)$ and $1(p) \cdot 1(d)$
 $d[[imparfait]]1, p$ iff $1 \cdot 1(p)$ and $1(p) \alpha 1(d)$
 $d[[passé simple]]1, p$ iff $1 \alpha 1(p)$ and $1(p) \cdot 1(d)$
 $d[[past perfect]]1, p$ iff $1 \alpha 1(p)$ and $1(p) \alpha 1(d)$
 $d[[will]]1, p$ iff $1(p) \alpha 1$ and $1(p) \cdot 1(d)$
 $d[[would]]1, p$ iff $1(p) \alpha 1$ and $1(p) \alpha 1(d)$

(The past tense in English is defined as the disjunction of *passé simple* and *imparfait*.)

Of the six tenses in (22), three are "simple", those where the point of reference overlaps the discourse time: present progressive, *passé simple* and the future. Simple tenses are not appropriate for FID, since FID always involves a point of reference, the point of view, different from the discourse

situation. The tenses found in FID are therefore the "complex" tenses, *imparfait*, past perfect and *would*. (as we've seen in the passages above)

The discrepancy between tense and temporal deixis in FID is therefore explained by the discourse-sensitivity of tense versus of this discrepancy follow in (23) and (24):

- (23) a He would return tomorrow.

In (23), the situation described is past in relation to the discourse, but future in relation to the point of view; the complex tense *would* is therefore used. *Tomorrow* is a relation independent of the discourse situation, it denotes the temporal relation between the described situation and the point of view. It is part of E, since it is part of the way the subject is thinking about the described situation:

- (23) b $d, c[[he \text{ would return tomorrow}]]E, p$
iff

$p := \text{at } 1: \text{has-attitude, a, E}$
of, .1, 1'
 $E := \text{at } .1: \text{return, .1}$
tomorrow, .1

where

$d[[would]]1, 1$

- (24) a Tomorrow was Monday.

In (24), the past tense denotes the *imparfait*: the described situation is past in relation to the discourse but cotemporal with the point of view. The situation described is such that the day following it is a Monday:

- (24) b $d, c[[tomorrow \text{ was Monday}]]E, p$
iff

$p := \text{at } 1: \text{has-attitude, a, E}$
of, .1, 1'
of, .t, 1'
 $E := \text{at } .h: \text{tomorrow, .1}$
be-Monday, .t
same, .t, .1

where

$d[[imparfait]]1, 1$

Lastly, we turn to the duality in the use of definite descriptions in Free Indirect Discourse. For that purpose, we return to the hypothetical example from "The Marriage of Figaro". Let ϕ be the sentence 'His wife was kissing the Count', as in (25). This sentence indeed describes the scene that Figaro sees, since the narrator is using the definite description his wife referentially, by connecting it to Countess Almaviva. The given E, ρ , d , and c in (25) therefore make the sentence describe the scene that Figaro relates to visually.

(25) d, c [[His wife was kissing the Count]] E, ρ
iff

E := at .h: kiss, .x, Count Almaviva

ρ := at l: see, Figaro, E
of, .x, Countess Almaviva

where c (his wife) = Countess Almaviva
 c (the Count) = Count Almaviva

But this same E in (26) interacts with other beliefs of Figaro, such as E' in (26):

(26) E' := at .h: wife-of, .z, .i
same, .z, .x

ρ' := at l: believe, Figaro, E'
of, .x, Countess Almaviva
of, .z, Susana

E' expresses the fact that Figaro applies his concept of his wife to the person that he sees kissing the Count. Notice that E + E' is internally coherent, and expresses Figaro's belief that he is watching his wife kiss Count Almaviva. This is how the sentence ϕ contains information on Figaro's state of mind despite the fact that ϕ does not describe any real situation which anchors E + E'. E + E' is actually impossible to anchor consistently, as it identifies two different people, Susana and Countess Almaviva, as one.

Conclusion

This paper investigates a phenomenon of the semantics of natural language which can be understood through the study of Poetics. Semanticists usually find their data, for reasons of simplicity, in every day discourse or in stylistically simple written narrative. In such styles, it happens that the point of view coincides with the utterance, which has prevented semanticists from recognizing the distinction. But, as known to scholars in Poetics, natural language supports more sophisticated styles just as easily. FID is interpreted by educated speakers without any special training. The study of deixis in FID reveals the oversimplification in existing semantic theories which is due to the identification of the point of view with the utterance.

Once we recognize that content must be factored into point of view and attitude, we must give up the simple picture according to which once the discourse situation is fixed, this already determines what is being said. What is said does not depend only on the discourse situation, but on the point of view as well. Moreover, as the reader may have guessed all along, this too is not enough. The attitude itself can in principle again be factored into point of view and another attitude, and so on. Examples of recursive FID are not so difficult to come by, and some were shown to me by Moshe Ron. In Henry James' The Portrait of a Lady, for one, examples abound, such as the excerpt in (27) from Isabel's meditations:

(27) 'It was in all this she had found her occasion. She would launch his boat for him; she would be his providence; it would be a good thing to love him. And she had loved him...' (Henry James, The Portrait of a Lady, Penguin Modern Classics, p. 427)

or to go back to Lily Briscoe, in a passage pointed out to me by Anita Mittwoch:

(28) 'Letting herself be helped by him, Mrs Ramsay had thought (Lily supposed) the time has come now, she would say it now. Yes, she would marry him. And she stepped slowly, quietly on shore. Probably she said one word only, letting her hand rest still in his... Time after time the same thrill had passed between them - obviously it had, Lily thought...' (Virginia Woolf, To the Lighthouse, Penguin Modern Classics, p. 225)

To conclude, determining what is being said is a recursive process, in principle unbounded.

Bibliography

- Banfield, A.: 1982, Unspeakable Sentences, Boston: Routledge & Kegan Paul.
- Barwise, J. and J. Perry: 1983, Situations and Attitudes, Cambridge, MA: MIT Press.
- Cohn, D.: 1978, Transparent Minds, Princeton, NJ: Princeton University Press.
- Doron, E.: 1990, 'Point of View', CSLI Report No. CSLI-90-143.
- Hamburger, K., trans. M. Rose: 1973, The Logic of Literature, Bloomington: Indiana University Press.
- Kamp, H. and C. Rohrer: 1983, 'Tense in Texts,' in R. Bauerli, C. Schwarze and A. von Stechow (eds.) Meaning, Use, and Interpretation in Language, Walter de Gruyter, Berlin.
- Pascal, R.: 1977, The Dual Voice, Manchester: Manchester University Press.
- Ron, M.: 1981, 'Free Indirect Discourse, mimetic language games and the subject of fiction', Poetics Today 2, 17-40.
- Sells, P.: 1987, 'Aspects of Logophoricity', Linguistic Inquiry 18, 445-79.

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Dynamic Interpretation and Hoare Deduction Extended Abstract

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1 Introduction

This paper presents a dynamic assignment language (called *DAL*) with η and ι assignments and generalized quantifiers, in the style of dynamic predicate logic [8]. The constructs for η and ι assignments allow us a straightforward analysis of indefinite and definite descriptions in natural language. The addition of quantifiers permit us to treat a wide variety of 'donkey' sentences.

Given a translation π of a natural language sentence S that maps pronouns to dynamically bound variables (see [2], [8]), we use ideas from Hoare's logic to calculate the static meaning of S as the weakest precondition for which program π can succeed. Here are some simple examples we claim we can treat correctly.

- (1) *If a girl has a boyfriend, she teases him.*
- (2) *Every girl who has a boyfriend teases him.*
- (3) *Most girls who have a boyfriend tease him.*

Our account gives (2) and (3) two possible readings, (these coincide with so-called *weak* and *strong* readings known from the literature for such examples). The strong reading of (2) is equivalent to the reading we get for (1). Our treatment of (3) does not suffer from the so-called *proportion problem* (see [10]). We can handle non-conservative quantifiers, provided they do not have internal dynamic effects. We cannot at present handle (4), because of the presence of the donkey anaphor in a non-conservative quantifier context.

- (4) *Only girls who do tease a boyfriend lose him.*

Our proposal for the treatment of quantifiers can be viewed as a compositional reformulation (and quite possibly a correction) of previous proposals for the definition of dynamic generalized quantifiers (see e.g. [13]).