Definite Descriptions and Attitude Reports in Situation Semantics

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Youngsoon Cho. 1999. Definite Descriptions and Attitude Reports in Situation Semantics. *Language and Information 3.1*, 83–95. In this paper I will seek to show that situation theoretic analysis of the attitudes can finely describe references of definite descriptions in attitude reports: co-reference, mis-reference, and speaker's reference. Situation theoretic concepts of a proposition and a resource situation provide excellent means to account for these references: Proposition, which is the combination of a type and an assignment, can combine linguistic and non-linguistic information; Resource situation, sometimes realized as speaker's wrong knowledge situation about an individual, can serve to explain idiosyncratic aspects of attitude reports. **(Yosu National University)**

1. Introduction

Attitudes are taken to be different mental states the agent has towards a proposition commonly expressed with verbs such as *know, believe, think,* etc. If a speaker utters (1), the agent Cathy is reported to have certain attitudes - in case of (1a) namely that of belief, and in case of (1b) that of doubt that John is handsome.

(1) a. Cathy believes that John is handsome.

b. Cathy doubts that John is handsome.

Attitude reports have raised many issues semantic theories should answer. Among others, the puzzle about the replacement of one noun phrase by a co-referential one, such as Frege's old example of the agent who believes (2a), yet does not believe (2b), where Hesperus and Phosphorus are both the same planet, Venus, has provoked many accounts.

(2) a. Hesperus is seen in the morning.

b. Phosphorus is seen in the morning.

This substitution puzzle has been treated and solved in very different forms (Frege (1952), Hintikka (1962), Kripke (1972), Asher (1986), Kamp (1990)). Hence, as Cooper (1993) indicates, in and of itself presenting a solution to this puzzle is not a big deal these days. Rather it is something any adequate modern theory of semantics should be able to accommodate.

Attempts have been made in situation semantics to treat attitudes (e.g. in Barwise and Perry (1983); Barwise and Perry (1985) and Cooper (1993); Cooper (1996a)) and proved that, as one of modern theories of semantics, situation semantics is equipped with beautiful means to describe the attitudes. They incorporate linguistic information and contextually determined non-linguistic information, which is applied to explain the substitution puzzle.

Substitution puzzles in attitude reports, however, are not limited to co-referential noun phrase replacement as has been treated in many attitude analyses. Mis-reference and speaker's reference are also the problems attitude analyses should answer. In this paper I will, based on Cooper (1996a)'s treatment of the attitudes, explain many kinds of noun phrase reference in attitude reports and show situation semantics provides fine-grained tools to incorporate subtle contextual information as well as linguistic information.

The rest of the paper is organized as follows: in section 2, I will explain aspects of noun phrase reference in attitude reports; I will then sketch a few situation theoretic tools which we need in order to describe attitude reports in section 3; section 4 presents the situation semantic account of definite descriptions; in section 5, I will explain the situation theoretic account of attitude reports and show how such a treatment, incorporated with the account of definite descriptions, can be used to analyze many aspects of definite reference in attitude reports; and finally I summarize the discussion.

2. Definite Descriptions and Attitude Reports

Definite descriptions include proper nouns (3a), possessive pronouns (3b), and noun phrases (NPs) with the definite article (3c).

(3) a. Mary, John, Clark Kent, London, ...

    b. my wife, Nancy Reagan's husband, your dog, ...

    c. the president, the morning star, the evening star, ...

The fact that sometimes there exist irregular reference relations between these expressions and their referents has troubled many linguists. Two reference relations have been focused on: the one-to -many relation, and the many-to-one relation.

Names are typical examples having the one-to-many relation: there are many Mary(s) in the world; if somebody says, "Mary is pretty", we need to identify which Mary he denotes. Some NPs with the definite article also have the one-to-many relation as opposed to Russell's assumption that an NP with the definite article means there exists only one referent in the world; thus, if somebody says of *the senator from California*, we need to identify which senator she means since there is not just one senator from California.

While one-to-many relations have not been dealt much in regard to attitude reports, since it doesn't pose the problem restricted to attitude reports, many-to-one relations have been dealt widely with the interaction of attitude reports. Not only *the morning star* but also *the evening star* denotes the same planet, Venus, but (4a) cannot be regarded as having the same meaning as (4b) since the possibility exists that John doesn't know the fact. *London* in English and *Londres* in French co-refer to the capital city of England, London, but a misguided Frenchman who heard about a city called Londres when he was growing up and formed the belief that it was beautiful, but who then moved to London in later life, not realizing London and Londres are the same city, can form a different belief about the same city as shown in (5).

(4) a. John believes the morning star is the morning star.

    b. John believes the morning star is the evening star.

(5) Pierre believes that Londres is beautiful and that London is not beautiful. (Kripke (1979))

According to possible worlds semantics, sentences denote a set of possible worlds, and an embedded clause of an attitude report denotes the set of worlds in which the sentential complement of the attitude verb is true. In our actual world, the morning star is the evening star, but there can be other worlds that cannot be true. Therefore (4b) is different from (4a), whose embedded proposition should be true in all possible world.

Such an explanation is not fine-grained enough to explain Pierre's belief in (5). Pierre's belief is wrong because in the actual world, *Londres* and *London* co-refer to the city London, but seems entirely rational under the assumption that two different names usually refer to different objects. Pierre's internally coherent but externally wrong belief as well as the similarity and the difference between the two sentences in (4) should be captured in any responsible attitude accounts.

Definite descriptions having many-to-one reference relations can also pose another problem in attitude reports. (4b) is true only if John has some beliefs on the morning star and on the evening star, and (5) is true only if Pierre has some beliefs on *Londres* and *London*. In contrast, although Sally has no beliefs associated with the name 'Clark Kent', Bill's utterance (6) is true if she believes that Superman will save the world and if Bill knows Superman and Clark are the same person.[1]

(6) Sally believes that Clark Kent will save the world. (Saul (1993))

The notion of Clark Kent in (6) is the speaker's, and this reference has been called speaker's reference. (6) can be true although Sally is not aware of Clark Kent. Attitude accounts should be fine-grained enough to explain this phenomenon.

Free indirect speech is a peculiar kind of attitude reports sometimes shown in novels. Speakers in novels can take a character's viewpoint and describe some part of a situation with that point of view.

(7) 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.* (The marriage of Figaro, quoted from Doron (1990))

In (7) the content in the italicized sentence is not the speaker's thought, but Figaro's one. Figaro has a wrong belief, mistaking Countess Almaviva, who was wearing his wife's dress, for his wife.[2] The speaker, the narrator, having the omnipotent viewpoint, knows Figaro believes something false. This knowledge reflects the actual world. However Figaro firmly believes who that he sees is his wife.[3] The appropriate interpretation of the italicized sentence should include not only the fact that Figaro's belief is wrong, but also the strong emotion he might have, because Figaro might have taken a very different attitude if he had thought Countess Almaviva kissed her husband, Count Almaviva.

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1. In fact Saul (1993) discusses this example in a slightly different way. Bill utters this as an example of something false since he isn't aware that Clark and Superman are the same person, but in actual world it turns out to be true.
2. Free indirect speech can involve different points of view. For instance, in (7) *his* in *his wife* is speaker's expression, but *now* is Figaro's expression.
3. In contrast, the speaker thinks Sally believes something false in Saul (1993) 's original example. This thought contrasts with the actual world.

3. Situation Theoretic Tools

In this section, I introduce some situation theoretic tools which will enable us to make the points relevant to this paper.[4] Among situation theoretic objects, the basic information unit, infon, is composed of a relation, and objects participating in the relation. When an infon holds in a specific situation or the situation supports the infon, it is a fact. It is represented with a proposition.

(8)
> love(John,Mary)

(9)
> S
> love(John,Mary)
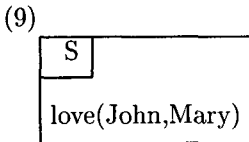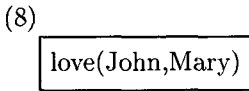
(8) is an example of an infon and (9) is an example of a proposition about the situation s where John loves Mary. Proposition (9) is true just in case the situation s supports the infon $\ll$ love, John, Mary, 1$\gg$.

Infons and Propositions can contain not only constant terms, for instance *John* and *Mary* in the infon and the proposition above, but also parameter terms. Infons with parameters are called parametric infons and propositions with parameters are called parametric propositions.

(10)
> love(X,Mary)

(11)
> S
> love(X,Mary)
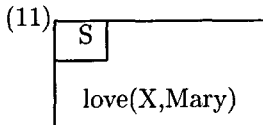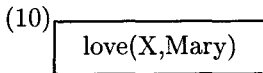
(10) is the parametric infon representing somebody loves Mary and (11) is the parametric proposition about situation s: s supports parametric infon (10). Only after parameters in parametric infons and parametric propositions are anchored to real objects by anchors, or functions from parameters to constants, can their factness and truthness be discussed.

Parameters can be restricted like X in (12).

(12)
> s
> love(X,Mary)   R
>   called(X,John)

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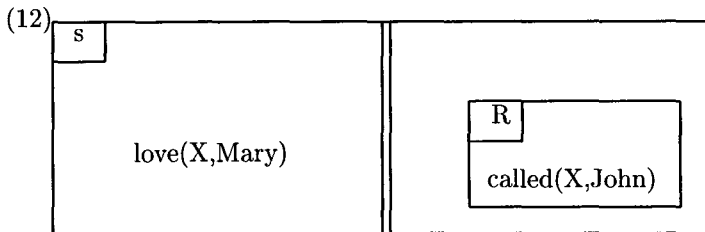
4. However I will assume readers' familarity with the situation theory and notations, and make only those remarks relevant to this paper.

The box on the right contains a restriction on parameter X. If an anchor anchors this parameter X to a constant term a, a should be the individual who is named John in the resource situation.[5]

Parameters in parametric infons and parametric propositions can be abstracted over. In situation theory, abstraction has two peculiar features. First, any number of parameters in a parametric object may be abstracted simultaneously. Second, we need to index indeterminates when they are abstracted over, because in the case where more than one parameter has been abstracted over we have to determine how arguments are to be assigned to the abstracts.

Infon abstracts are called relations and proposition abstracts are called types.

(13)
r→X
love(X,Mary)

(14)
r1→X
s
love(X,Mary)
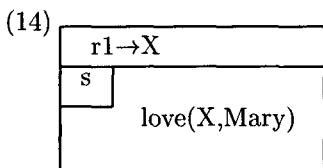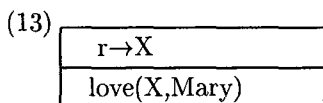
(13) is the relation of loving Mary, and (14) is the type of individuals loving Mary in situation s. Relations and types can be predicated of assignments.[6] An assignment for an abstract is a function whose domain includes the role indices of the abstract. Predication means that we use relations and types to form infons and propositions.

(15) is an assignment for an abstract which assigns the individual constant *John* to the parameter in (14). (16) is obtained by predicating the type (14) of the assignment (15).

(15) [r1 → John]

(16)
S
love(John,Mary)
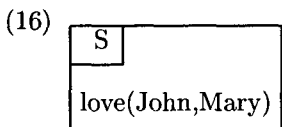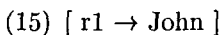
4. Definite Noun Phrases and Resource Situation

Situation semantic treatments of NPs make a distinction between singular NPs and general NPs.[7] Singular noun phrases, i.e. indefinite and definite descriptions, essentially

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5. Resource situations will be discussed presently.

6. To represent their special status as abstracts that are predicates, we represent them with tabs going all the way across the top of the boxes. They are different from abstracts below which do not have special status as predicates.

r1→X
love(X,Mary)

r1→X
s
love(X,Mary)
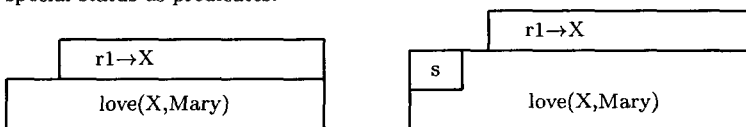
7. Barwise and Perry (1983); and Gawron and Peters (1990). This contrasts with classical generalized quantifier theory in Montague (1974) and Barwise and Cooper (1981)

pick out an individual,[8] and general noun phrases such as "no fish" and "every man" are analyzed as generalized quantifiers (Cooper (1996b)). In this paper, I will pay attention only to definite descriptions such as proper nouns, possessive NPs and NPs with the definite article, and treat them as designating individuals.

Definite NPs are used to designate a particular individual whom speakers intend to refer to. If we speak of "Mary", we denote not every Mary in the world, but a specific Mary in mind and if we say of "the senator from California", we refer to a specific senator from California in mind. There are many Marys in the world and there is not just one senator from California. But we refer only to the one we have in mind when we speak of Mary uttering a sentence like "Mary is pretty".

Resource situations are exploited by the speaker when referring to a particular individual using definite noun phrases. If John says, "The man I saw running yesterday is at the door", then John is using a situation that he witnessed the day before, the resource situation, to identify the man at the door (Devlin (1991)). When we utter proper names such as *Mary,* we also exploit the resource situation where a particular individual is called *Mary.*

Hence, meaning of "Mary" is a relation between utterance situation u and an individual a if resource situation r supports the infon, $\ll$ named, a, Mary,1 $\gg$

(17) u [Mary] a
       iff

$$\boxed{\begin{array}{l} r \\ \\ \text{named(a,Mary)} \end{array}}$$

Meaning relation (17) shows that the speaker refers to the one specific Mary in mind when speaking of Mary by restricting that the individual a should be named Mary in the resource situation she exploits.

The resource situation the speaker exploits here is the oracle of the individual called *Mary.* The oracle of individual a is the situation comprising the entire body of knowledge that concerns a. If a were an individual, then *Oracle(a)* would support all the facts that pertain to that individual: her name, height, age, parents, marital status, lovers, etc.

Resource situations can become available for exploitation in various ways Devlin (1991). Background knowledge can also form a resource situation, and we sometimes have wrong background knowledge or beliefs about an individual. A speaker could have misconception of individual a named *Mary* as being named *Chris,* and utter "Chris is pretty" describing a, Mary, not b, Chris. The meaning of the proper name "Chris" is

(18) u [Chris] a
       iff

$$\boxed{\begin{array}{l} r \\ \\ \text{named(a,Chris)} \end{array}}$$

The speaker intends to refer to a, Mary, but the resource situation exploited is different from the Oracle(Mary), a situation that comprises the real world, because the oracle does not support the infon $\ll$ named, a, Chris, 1$\gg$. In this case, the resource

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8. But Cooper (1996b) treats indefinite noun phrases as generalized quantifiers.

situation is the speaker's (wrong) knowledge situation about Mary, not a situation that comprises the actual world.[9]

The misinformed person, Figaro, confuses Countess Almaviva with his wife. Accordingly, the person a designated by the expression "his wife" in example (19) should be Countess Almaviva existing as Figaro's wife in Figaro's resource situation.

(19) u [his wife] a
      iff

```
┌─────────────────────────────┐
│ ┌───┐                        │
│ │ r │                        │
│ └───┘                        │
│                              │
│          his wife(a)         │
└─────────────────────────────┘
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The misguided person in Kripke's example, Pierre, forms different notions, or concepts of the same city London. His notions of *Londres* and *London* involve the different resource situations.

(20) u [Londres] c
      iff

```
┌─────────────────────────────┐
│ ┌───┐                        │
│ │ r │                        │
│ └───┘                        │
│                              │
│        named(c,Londres)      │
└─────────────────────────────┘
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(21) u [London] c
      iff

```
┌─────────────────────────────┐
│ ┌───┐                        │
│ │ r │                        │
│ └───┘                        │
│                              │
│        named(c,London)       │
└─────────────────────────────┘
```

(20) and (21) have distinct resource situations, r1 and r2. They could be Pierre's different mental situations, but these different situations have information about the same object *c*, the city of London.

Situation semantics can represent the meaning relation of definite expressions properly, as shown so far: an individual who a speaker has in mind can be picked out by the resource situation that the speaker uses. Sometimes she uses a situation that comprises the real world, the oracle of an individual, but sometimes she exploits a situation that contrasts with the real world. The latter case reflects speaker's idiosyncratic knowledge of the world. By including that knowledge or notions, we can describe speaker's misconception of an object. An individual the speaker wants to refer to and the wrong concepts she has about that individual can be rightly described in terms of an individual constant in the meaning relation and a resource situation in which condition(s) of the relation hold(s), respectively.

5. Attitude Reports and Noun Phrase Reference

The attitudes are traditionally called "propositional." The verbs embed a sentence, and the semantic contribution of the embedded sentence to the whole is traditionally taken

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9. Sometimes we can have different concepts about properties. For instance, two persons can think differently about one person named Mary. One person thinks "Mary is pretty", but the other thinks "Mary is not pretty". They have different conception of prettiness. Difference of property concepts also means there exist different resource situations that people exploit regarding property.

to be a "proposition" (Barwise and Perry (1983)). According to this traditional view, an attitude is a relation between an agent and a proposition as represented in (22). For example, if somebody says of John's belief, uttering such as "John believes Mary is pretty", the speaker's belief about John's belief is represented as in (23).

(22) believe(agent, proposition)

(23)

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┌─────────────────────────────────────┐
│ ┌────┐                               │
│ │mss │                               │
│ └────┘                               │
│         ┌────┐                       │
│         │msj │                       │
│ believe,j, └────┐                    │
│         │  pretty(m) │               │
│         └───────────┘                │
└─────────────────────────────────────┘
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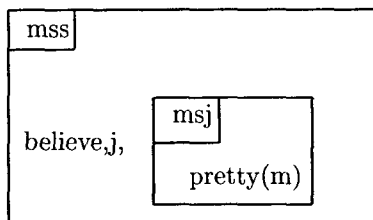
mss represents the speaker's mental state, and *msj* represents John's mental state. The speaker is in the mental state where John is in the mental state where Mary is pretty.

In situation semantics, a proposition can be represented with a type and an assignment. Sentential meanings can be taken to be the kind of objects that need context to provide information in order to determine a proposition. Such an object is a type. Information provided by the context is represented by an assignment. Thus a type and an assignment together will determine a proposition, namely the result of applying the type to the assignment.

With a type and an assignment, the situation semantic view of attitude can also be represented like (24), as a relation between an individual and two other arguments, a type and an assignment. The type is the internal state of the agent and the assignment represents the way in which this internal state is embedded in the real world.

(24) believe(agent, type, assignment)

The internal state of an agent, which is represented with a type, can show feelings across people.[10] For instance, when somebody sees a dog being bitten by another dog, she might have a feeling that any man generally has seeing the same kind of scenes. But when she sees her own dog being bitten by another dog, she might have a quite different and very strong feeling. These distinct feelings are the results of seeing the different types of situations: the type of situation where a dog is biting another dog and the type of situation where a dog is biting her own dog (Barwise and Perry (1983)).

Splitting a proposition into a type and an assignment can also provide a method to explain various NP references in attitude reports. The morning star is the evening star, but the attitude reports in (25) can have various interpretations. (25a) means either that John believes x, named the morning star, is identical with itself, or that John believes x, named the morning star, is identical with y having the same name. In (25b) John's belief involves two things, the morning star and the evening star, and he believes they are the same.

Situation semantic meaning representations can describe these various interpretations. With types and assignments, propositional contents of the two embedded clauses

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10. This is common-sense psychology or folk psychology which is not absolute one, but rather general one which is common in a folk.
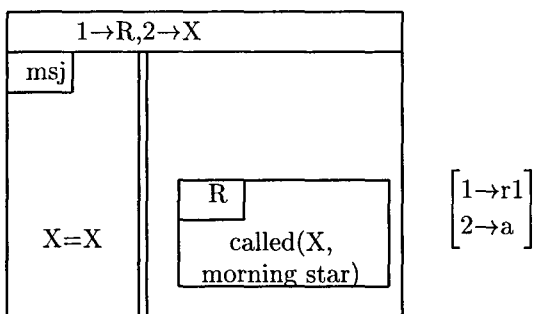
in (25) are represented as in (26a), (26b), and (26c).[11] Predicating the types of the assignments turns out to be the same proposition as in (27).

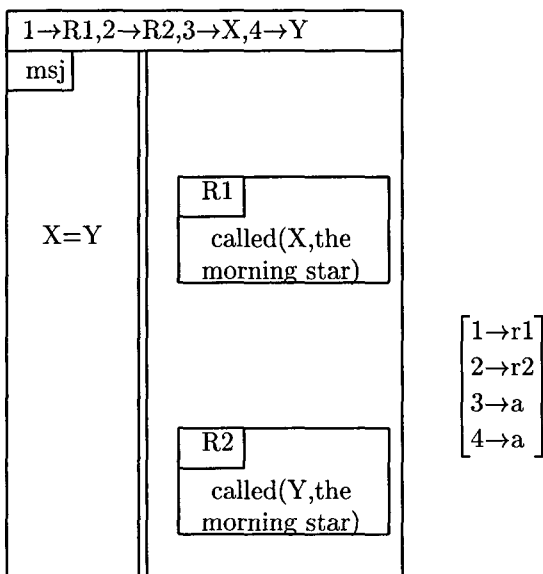(25) a. John believes the morning star is the morning star.

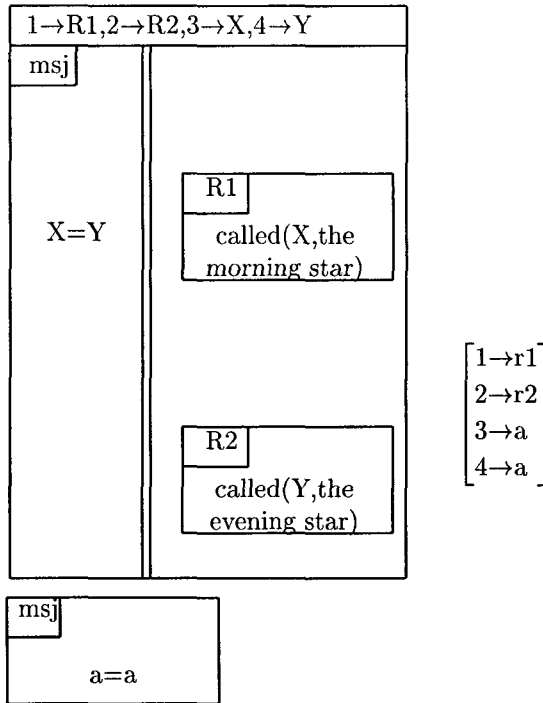   b. John believes the morning star is the evening star.

(26)

a.

$$
\begin{array}{|ll|}
\hline
\multicolumn{2}{|c|}{1{\rightarrow}R, 2{\rightarrow}X} \\
\hline
\boxed{\text{msj}} & \\
 & \boxed{\begin{array}{l} R \\ \text{called}(X, \\ \text{morning star}) \end{array}} \\
X{=}X & \\
\hline
\end{array}
\begin{bmatrix} 1{\rightarrow}r1 \\ 2{\rightarrow}a \end{bmatrix}
$$

b.

$$
\begin{array}{|ll|}
\hline
\multicolumn{2}{|c|}{1{\rightarrow}R1, 2{\rightarrow}R2, 3{\rightarrow}X, 4{\rightarrow}Y} \\
\hline
\boxed{\text{msj}} & \\
 & \boxed{\begin{array}{l} R1 \\ \text{called}(X,\text{the} \\ \text{morning star}) \end{array}} \\
X{=}Y & \\
 & \boxed{\begin{array}{l} R2 \\ \text{called}(Y,\text{the} \\ \text{morning star}) \end{array}} \\
\hline
\end{array}
\begin{bmatrix} 1{\rightarrow}r1 \\ 2{\rightarrow}r2 \\ 3{\rightarrow}a \\ 4{\rightarrow}a \end{bmatrix}
$$

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11. Any situation theoretic parameters can be abstracted over. For simplicity, we will abstract over just individual parameters and resource situation parameters. But mental states can also be represented as parameters and abstracted over.
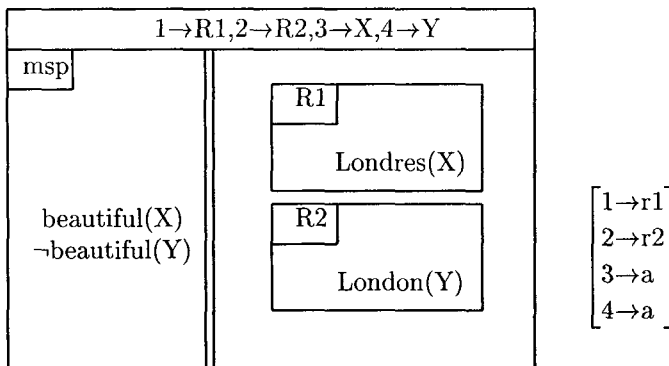
c.

$$\begin{array}{|l|}\hline 1\to R1, 2\to R2, 3\to X, 4\to Y \\\hline \begin{array}{|l} \hline \text{msj} \\\hline \end{array} \qquad \begin{array}{|l|} \hline \begin{array}{l}\hline R1 \\ \hline\end{array} \\ \text{called(X,the} \\ \text{morning star)} \\\hline \end{array} \\ X=Y \\ \qquad \begin{array}{|l|} \hline \begin{array}{l}\hline R2 \\ \hline\end{array} \\ \text{called(Y,the} \\ \text{evening star)} \\\hline \end{array} \\\hline \end{array} \qquad \begin{bmatrix} 1\to r1 \\ 2\to r2 \\ 3\to a \\ 4\to a \end{bmatrix}$$

(27)

$$\begin{array}{|l|}\hline \text{msj} \\\hline \qquad a=a \\\hline \end{array}$$

John's belief in (26a) is of the type that the thing X is identical with itself. X is anchored to *a* in the real world, the *morning star*, and that the star is named the morning star is supported by John's resource situation, r1. John's belief in (26b) is of the type that the two things having the same name are the same. X and Y are anchored to the same object *a* in the real world, and that that star is named the morning star is supported by the resource situations r1 and r2, where the two situations may be one and the same, the oracle of Venus. John's belief in (26c) is of the similar type to one in (26b). Though the two things are anchored to the same object, their names are different and the resource situations, r1 and r2, are possibly the same situation, the oracle of Venus. All of these belief types turn out to be externally the same as in (27).

Many-to-one reference relations can cause people to have contrary beliefs about the same object as in (28). Pierre believes the two cities are distinct. In the same vein with the above, Pierre's contrary beliefs can be easily described in terms with a situation semantic representation of an embedded propositional content. Pierre's internal mental state in (29) shows that the two roles are distinct, and the assignment shows that they are the same object.[12] The result of applying the type to the assignment, i.e. (30), is the content of Pierre's belief. Pierre's internal mental state, represented in (29), is rational, but its content in (30) is inconsistent because the two distinct roles are externally connected to the same object.
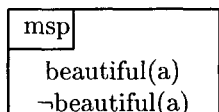
(28) Pierre believes that Londres is beautiful and that London is not beautiful.(=5)

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12. I will treat negation by simply putting the negation marker ¬ in front of an infon.

(29)

1→R1,2→R2,3→X,4→Y	
msp	
	R1
	Londres(X)
beautiful(X)	R2
¬beautiful(Y)	London(Y)

$$\begin{bmatrix} 1 \to r1 \\ 2 \to r2 \\ 3 \to a \\ 4 \to a \end{bmatrix}$$

(30)

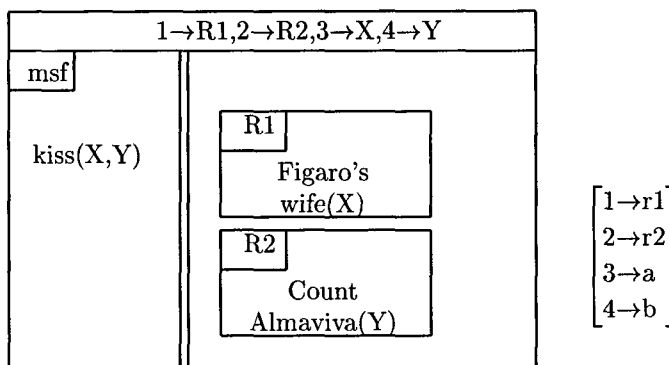| msp |
|---|
| beautiful(a) |
| ¬beautiful(a) |

Pierre's notions of Londres and London are about the same city, *a*. But this city *a* is conceived differently in R1 and R2, anchored to Pierre's different resource situations, r1 and r2 and they reflect Pierre's different notions of Londres and London.

Mis-reference can fall into the many-to-one reference relation. Countess Almaviva, misrecognized by Figaro as his wife, is an example. Figaro's wife in (7) and Countess Almaviva co-refer to one individual. Figaro's internal mental state and his misconception can be properly accounted for.

(31) 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. (=7)

(32)

1→R1,2→R2,3→X,4→Y	
msf	
	R1
	Figaro's wife(X)
kiss(X,Y)	R2
	Count Almaviva(Y)

$$\begin{bmatrix} 1 \to r1 \\ 2 \to r2 \\ 3 \to a \\ 4 \to b \end{bmatrix}$$

Countess Almaviva, *a*, is Figaro's wife in Figaro's resource situation, r1. Individual *b* is Count Almaviva in the resource situation, r2. This situation is possibly the oracle Count Almaviva or Figaro's own knowledge situation, and they don't make any difference in this case.
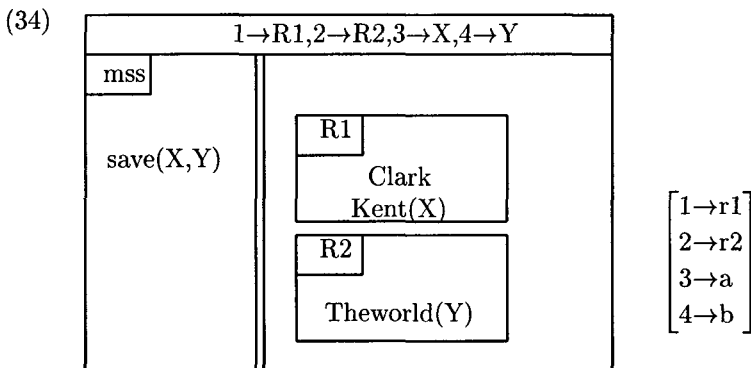
In (32), Figaro's strong emotions, the result from his seeing his wife kissing a person other than himself, is represented in terms of the type and his misconception in terms of the assignment.

The embedded clause in an attitudinal sentence usually expresses the attitude of agent's thought, belief, or cognition, not the speaker's. Therefore, a referent in the embedded clause, is what the agent intends to refer to. Hence, the agent's resource situation, not the speaker's, should support the reference relation. If a speaker utters "John believes Mary is pretty", Mary is usually the person whom John wants to refer to with the name.

However, if we consider the speaker's reference, where a referent is an object the speaker has in mind, the speaker's resource situation, not the agent's, should support the reference relation. For instance, when a speaker utters the same sentence above, Mary can be the name the speaker wants to use. John may not know that the person's name is Mary, and only has the belief that a certain individual is pretty, while the speaker knows that person is called Mary.

The speaker's reference can also be explained in situation semantics. Sally's belief in (33) is said by the speaker who knows Superman and Clark Kent are the identical person. The speaker's reference of Clark Kent should be supported in the speaker's resource situation, not Sally's resource situation.

(33) Sally believes that Clark Kent will save the world.(=6)

(34)

1→R1,2→R2,3→X,4→Y

mss

save(X,Y)

R1
Clark Kent(X)

R2
Theworld(Y)

$$\begin{bmatrix} 1 \to r1 \\ 2 \to r2 \\ 3 \to a \\ 4 \to b \end{bmatrix}$$

The abstracted situation parameter R1 is anchored to the speaker's resource situation, r1. Hence, the individual Clark Kent is named in the speaker's resource situation, not in Sally's resource situation r2.[13] Sally need not know the name 'Clark Kent' in this representation, but she has the belief that the individual the name refers to will save the world.

With making a type by abstracting over parameters from a proposition, and with forming a proposition as the result of applying a type to an assignment, situation semantics can show the typical feelings an agent might have, and explain many kinds of reference relations noun phrases have in attitude reports as well.

6. Conclusion

Attitude report analyses have concerned the substitution puzzle which involves two different descriptions referring to one and the same object. Definite descriptions in attitude reports, however, also involve mis-reference and speaker's reference.

The notions of the resource situation and the proposition in situation semantics can be used to explain the definite description references in attitude reports. Resource situations are exploited by the speaker when she utters definite descriptions. They are usually

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13. It is also possible that r2 is identical with r1, speaker's resource situation.

oracles of individuals which are compatible to the real world, but they can also include the speaker's sometimes wrong knowledge situations about individuals. Situation theoretic proposition is considered to be the combination of a type and an assignment; A type represents linguistic information, agent's mental states, and an assignment represents non-linguistic information, real world referents; They can combine to explain the propositional content of attitude reports.

References

Asher, N. 1986. Belief in discourse representation theory. *Philosophical Logic*, 15:127–189.

Barwise, J. and R. Cooper. 1981. Generalized quantifiers and natural language. *Linguistics and Philosophy*, 4.

Barwise, J. and J. Perry. 1983. *Situations and Attitudes*. The MIT Press, Cambridge, MA.

Barwise, J. and J. Perry. 1985. Shifting situations and shaken attitudes: an interview with Barwise and Perry. *Linguistics and Philosophy*, 8.

Cooper, R. 1993. Towards a general semantic framework, situation theoretic grammar. *Linguistic Institute Packet*, 183.

Cooper, R. 1996a. The attitude in discourse representation theory and situation semantics. In J. Seligman and D. Westerstahl, editors, *Logic, Language and Computation*. CSLI Publications, Stanford, CA.

Cooper, R. 1996b. The role of situations in generalized quantifiers. In Shalom Lappin, editor, *The Handbook of Contemporary Semantic Theory*. Blackwell, Cambridge, MA.

Devlin, K. 1991. *Logic and Information*. Cambridge University Press, Cambridge.

Doron, E. 1990. *Point of View*. CSLI Publications, Stanford, CA. CSLI Technical Report CSLI-90-143.

Frege, G. 1952. On sense and reference. In P. T. Geach and M. Black, editors, *Translations from the Philosophical Writings of Gottlob Frege*. Blackwell, Oxford.

Gawron, J. M. and S. Peters. 1990. *Quantification and Anaphora in Situation Semantics*. CSLI Publications, Stanford, CA.

Hintikka, J. 1962. *Knowledge and Belief: An Introduction to the Logic of two Notions*. Cornell University Press, Ithaca, NY.

Kamp, H. 1990. Prolegomena to a structural theory of belief and other attitudes. In C. A. Anderson and J. Owens, editors, *Propositional Attitudes: the Role of Content in Logic, Language and Mind*. CSLI Publisher, Stanford, CA.

Kripke, S. 1972. Naming and necessity. In D. Davidson and G. Harman, editors, *Semantics of Natural Language*. Reidel, Dordrecht.

Kripke, S. 1979. A puzzle about belief. In A. Margalit, editor, *Meaning and Use*. Reidel, Dordrecht, pages 239–283.

Montague, R. 1974. The proper treatment of quantification in ordinary English. In R. Thomason, editor, *Formal Philosophy: Selected Papers of Richard Montague*. Yale University Press, New Haven.

Saul, J. M. 1993. Still an attitude problem. *Linguistics and Philosophy*, 16.4:423–435.