Semantics of Perspectival Utterances

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Abstract

Perspectival utterances are analyzed within *Situation Semantics* framework. Perspectival expressions are expressions speakers use when they describe facts from certain standpoints within their environments. Uses of perspectival expressions have two significant characteristics, *bi-directional contextual dependency,* and *perspectivity transfer.* Relational conception of meaning and mental states central in situation semantics is shown to be particularly useful in explicating perspectivity phenomena. A model is then presented which (1) attributes perspectivity to agents' mental states, (2) introduces the notion of point of view parameter in mental states, and (3) incorporates a general picture of linguistic communication. The model is shown to capture correctly our intuitions behind the uses of perspectival expressions.

1 Introduction

Suppose that I am standing face to face to you and showing you a picture of me taken with several other people, and utter a sentence "Mr. Tanaka is standing left of me." There are three possibilities for what information I could intend the utterance to convey. Namely, the information that Mr. Tanaka is standing left of me, viewed from my position, from where I am now speaking, or the information that Mr. Tanaka is standing left of me, viewed from your position, from where you are now listening to my talk, or the information that Mr. Tanaka is standing left of me, viewed from my location in the picture. I may describe the location of Mr. Tanaka from either of these three perspectives.

Or consider a case where a girl Hanako, after having read a story about a boy Taro, uttered in describing the plot of the story to her friend, "Taro had his belly, button stolen by Mr. Thunder." She was empathizing with the story protagonist Taro, and was describing the incident from his perspective.

These examples show that, there are a certain class of expressions, the utterances of which not only describe external objective facts but also convey to hearers pieces of information about speakers, namely, from whose perspectives or points of view speakers are describing external facts.[1] These expressions are called *perspectival expressions.*

Uses of perspectival expressions have following two significant characteristics. (1) *Bi-directional contextual dependency:* Information on point of view can either be supplied from context of utterances, or be specified explicitly by the form of utterances and added to ongoing context. (2) *Perspectivity transfer:* Perspectivity usually transfer from speakers to hearers in normal linguistic communications and hearers typically end up in states where they take on speakers' original points of view.

Perspectival expressions have studied recently in relation to spatial reasoning and interpretation of spatial prepositions[Ilerskovits, 1986][Rcts-Schmidt, 1988]. Most of the researches, however, have concentrated on classification of uses of spatial relation expressions and have not addressed the issue of basic mechanisms underlying the uses of perspectival expressions. There have also been works on perspectivity in linguistics field[Kuno and Kaburaki, 1977][Sells, 1987]. But th ey are focusing mainly on the problem of elucidating conditions on anaphoric dependencies for reflexive pronouns, and have not addressed the mechanism issue either.

We will argue in this paper that basis of the uses of perspectival expressions is our situatedness in the environment, which is reflected in our perspectival mental states, and that perspectival utterances with the above-mentioned characteristics can adequately be modeled by deploying notions central in situation semantics, namely, the relational conception of meaning and mental states, together with a general model of linguistic communication.

2 Characteristics of perspectivity phenomena

Look at these sentences.

(1) Hanako's house is across the street.

(2) Taro went/came to school.

(3) Taro was hit by Hanako.

In an utterance of the sentence (1), the speaker seems to be describing the location of Hanako's house from a certain point in space, not explicitly mentioned in the

I will use the words "perspectivity" and "point of view" interchangingly in this paper.

sentence. In (2), the speaker is describing Taro's action from either the source or the goal of the movement, depending on the choice of the verb. Point of view (POV) location is made explicit by the choice of lexical items. In (3), the speaker is describing the hitting incident from the standpoint of the person who was hit, i.e., Taro. POV location, in this case, is made explicit by the choice of a certain syntactic form.[2]

Information on POV locations could be supplied by the ongoing and surrounding contexts of utterances. In sentences like (1), POV locations are behaving as implicit arguments. Contents of utterances of this type of sentences are only underdetermined by the expressions themselves and depend on what exactly fill the implicit arguments. They are in many cases filled with speakers by default, but contextually relevant elements can supply other values under certain circumstances. Uttered as an answer to the query "Where's Hanako's house?" by a person standing by a street, (1) should be taken from the hearer's perspective.

Information on POV locations, on the other hand, could be made explicit by the forms of expressions, e.g., uses of specific lexical items or the choice of certain syntactic constructions. Certain verbs of movement and transfer, such as come/go, give/take, buy/sell, inherently assume point of view on either the source or the goal of the actions described. Passive and causative constructions can be used with points of view on the subject noun phrase denotations. POV locations thus established could become a part of ongoing discourse context and supply default POV values for implicit arguments in succeeding perspectival utterances.

Any theory on perspectival utterances has to account for this bi-directional dependency between perspectival utterances and surrounding contexts.

Upon hearing a perspectival utterance, the usual reaction on the part of the hearer to comprehend it would neither be to simply reconstruct the perspective-free objective interpretation, nor to reinterpret the information from the hearer's own point of view. Perspectivity, in most cases, transfers from the speaker to the hearer, and the hearer typically temporarily switches to the perspective presumed by the speaker in the utterance. So, in my previous example, when I tell you "Mr. Tanaka is standing left of me." from my own perspective, showing you a picture, you will probably imagine as if you were J and try to identify who is on the left. POV location functions as if it were a center of coordinates, shared by the speaker and the hearer, for the recognition and the description of the outside world.

[2]Some readers might feel reluctant to admit that (3) is perspectival in any sense. But Japanese has a type of passive constructions which normally signal strong perspectivity with POV locations on patients. They almost always implicate that the events described have negative import to the patients. The following sentence describes Hanako's crying incident from the patient's (Taro's) perspective.

Taro-wa Hanako-ni naka-reta.
TOP IOBJ cry PASS
(Taro was adversely affected by Hanako's crying.)

3 Perspectival mental states

Perspectivity relates to the fact that agents are situated in the world and grasp their surrounding environment from where they are located in that environment. The way how they grasped the environment are reflected in what mental states they are in. An evidence that mental states are related to perspectivity is found in the fact that subjects of attitude reports can fill POV implicit arguments, while other entities referred to in a sentence but not marked explicitly as POV elements may not fill POV implicit arguments. We will assume here, for simplicity, that these mental states reflecting agents' perspectives are belief states.

Beliefs have two aspects, belief states and belief contents. Belief states are cognitive states that are private to each agent, while belief contents are propositional, public, and independent of individual belief holders. A situation in which Jiro is in a belief state whose propositional content is that Hanako hit Taro is, under a situation semantic framework, classified by the following conjunctive state of affairs(SOA)[Barwise and Perry, 1983].

$$\langle\langle \mathbf{B_r}, \mathbf{Jiro}, [\dot{s}|\dot{s} \models \langle\langle \mathbf{hit}, \dot{\mathbf{h}}, \dot{\mathbf{t}} \rangle\rangle] \rangle\rangle$$
$$\wedge \langle\langle \mathbf{Of}, \dot{\mathbf{h}}, \mathbf{Hanako} \rangle\rangle \wedge \langle\langle \mathbf{Of}, \dot{\mathbf{t}}, \mathbf{Taro} \rangle\rangle$$

The first conjunct classifies Jiro's belief state *per se,* where h and t are called parameters, and correspond to Jiro's mental entities, e.g., concepts of Hanako and Taro, respectively. This portion is called a *frame of mind* of Jiro. The next two conjuncts indicate that both of Jiro's concepts in his belief state are respectively anchored to real individuals Hanako and Taro. This portion is called a *setting* for his belief. Frame of mind and setting combined, the SOA as a whole designates that the content of this Jiro's belief is the proposition that Hanako hit Taro.[3]

Belief states and belief contents constitute two different levels of classifying belief situations and they do not map one-to-one with each other. Belief states can in a sense be more fine-grained than belief contents. A person who believes that Cicero was a famous Roman orator does not necessarily believe that Tully was also a famous Roman orator [Bar wise and Perry, 1983]. Even though Cicero and Tully are one and the same person, and hence two beliefs have the same propositional content, she might have two different concepts for Cicero and Tully, and might not notice their identity. On the other hand, belief contents can be more fine-grained than belief states. Belief states of each people who just noticed that a lion is approaching to her must have something in common, although belief contents are all different since lions are different in each cases.

Difference and relationship between belief states and belief contents could also be illustrated in terms of a relational picture of mental states. Agents' cognitive belief states themselves do not uniquely determine their propositional contents. They simply provide us with a relation

[3]We will ignore, for the sake of simplicity, the temporal and aspectual information both in belief states and in their propositional contents in this paper. But, our framework could be extended to include the problem of tense and aspect.

between the way how agents' mental entities are embedded in their environment, on the one hand, and the propositional contents of the beliefs, on the other. Belief states are directly related to agents' behaviors, and are classified by uniformities with respect to perception and action across states of different agents and also across states of a single agent at different times. Agents' mental entities, i.e., concepts, are individuated belief-internally by facts about what functional roles they play in agents' sets of beliefs.

There are several concepts that are playing specific roles in each agent's set of beliefs. One of the most salient among them is the concept of self, or "I". The concept is individuated within an agent's beliefs by the fact that the concept is always associated with beliefs in which it plays either the role of the perceptual center or that of the source of causal effects. Beliefs involving this concept form a class of what Perry called "self-locating" belicfs[Perry, 1977]. The concept of "I" should always be anchored to the owner of the concept, except in an extremely unusual agent with missing self-identity.

Another special concept is the concept of "you". The concept is individuated by the fact that it is always associated with the belief that the agent is addressing herself to the person whom it is the concept of. Unlike the concept of "I", the anchor for this concept varies from time to time. The concept of "you" behaves as a variable in the agent's beliefs.

We can extend this framework to perspectival mental states. The idea is to introduce a specific parameter for the concept of agents' point of view locations. Call it a *point of view parameter or* a *POV parameter,* for short. Frame of mind classifying perspectival mental states will have a complex relation with a POV parameter, free in it, as its relation constituent. A situation where Jiro is empathizing with Taro and is in a perspectival belief state whose content is that Hanako's house is across the street from his locus of empathy, Taro, would then be classified by the following SO A.

$$\begin{aligned}&\langle\langle \mathbf{B_r}, \mathbf{Jiro}, [\dot{s}|\dot{s} \models \langle\langle [\dot{x}|\langle\langle \mathbf{across\text{-}street}, \dot{x}, \dot{\mathbf{pov}}\rangle\rangle], \dot{a}\rangle\rangle \\ &\qquad\qquad \langle\langle =, \dot{\mathbf{pov}}, \dot{t}\rangle\rangle]\rangle\rangle \\ &\quad \wedge\langle\langle \mathbf{Of}, \dot{a}, \mathbf{House}\rangle\rangle \\ &\quad \wedge\langle\langle \mathbf{Of}, \dot{t}, \mathbf{Taro}\rangle\rangle\end{aligned}$$

The complex relation [x|((across-street, x, pov))] classifying Jiro's belief state has only one argument x. It is the relation of being across the street seen from the point of view pov hidden in the relation. The POV parameter pov corresponds to Jiro's concept of POV location. The concept is individuated as a uniformity across his beliefs formed with respect to certain points of view. The concept pov is similar to the concept of "you" in that POV location in Jiro's beliefs also moves from time to time depending on circumstances. The concept pov is identified with the concept of Taro, t by Jiro himself in the example above, but the concept pov, in many cases, should be identified with the concept of "I" by default. We take POV parameters, like parameters for "I" and "you," as something which are to be anchored to individuals, not to locations nor to situations.

4 Meaning constraint for perspectival expressions

One of the basic tenets of situation semantics is its relational conception of meaning. A sentence Φ specifies a relation among situations involved in an utterance and its content, most salient being the utterance situation *u* and the propositional content *p* of the utterance.

$$u[\phi]p$$

Same sentence can mean different things depending on who, where, and under what conditions the utterance is issued. Upon hearing an utterance, hearers can acquire information not only on its propositional content but on other situations involved in the utterance exploiting this relation.

In ordinary cooperative sincere uses of language, when a person utters a declarative sentence, she normally has a belief whose propositional content is the same as that of the utterance. Call this belief an *utterance-supporting belief.* An utterance-supporting belief plays a central role in an utterance. Hearers rely primarily on the relation between utterances and utterance-supporting beliefs to extract information from utterances. When this relation does not obtain, hearers may get misinformation, a state of deception. Thus, we can extend the meaning relation to include an utterance-supporting belief 6.

$$u, b[\phi]p$$

Perspectival utterances are issued when agents are recognizing and describing their surrounding environment from certain points within the environment. Hence, utterance-supporting beliefs behind the utterances themselves are perspectival in these cases. We have already noted that POV locations and utterances are bi-directionally related. POV locations agents' are assuming are reflected in utterance-supporting beliefs 6, and supply, through the meaning relation, the POV values for implicit arguments in the propositional contents of utterances. This corresponds to the direction from POV locations to utterances. On the other hand, forms of expressions used in utterances can explicitly signal POV locations speakers are assuming. This corresponds to the direction from utterances to POV locations.

5 Perspectivity in communication

General picture of linguistic communication

Normal linguistic communication, with a declarative sentence, consciously intended by a speaker proceeds, in rough approximation, through the following steps.

1. The speaker has a certain utterance-belief whose propositional content is P.
2. The speaker intends to convey to the hearer the information that *P.*
3. The speaker utters a sentence with the propositional content *P.*
4. The hearer forms a shared belief that the speaker believes that *P.*

5. The hearer takes steps of mental acceptance actions.
6. The hearer forms a shared belief that *P.*

We assume the following two kinds of mental acceptance actions for the step 5 above.

(i) *Concept replacement:* The hearer replaces her concepts about the speaker's concepts with her own concepts.

(ii) *Belief state acceptance:* The hearer accepts as her own beliefs what she first takes as the speaker's beliefs. The hearer's belief states change from beliefs about the speaker's beliefs about something to beliefs about that something.

Consider an example where Jiro utters a sentence "Taro loves Hanako" in talking to his wife Kaoru. Successive belief situations in the process of communicating this piece of information would be classified by the following SOAs. Shared beliefs are represented by the fixed points r, *T*", r" of the equations (b)-(d) below[Barwise, 1988].

(a) Jiro's (the speaker's) utterance-supporting belief situation before the utterance,

$$\langle\langle B_r, \mathtt{Jiro}, [\dot{s}|\dot{s} \models \langle\langle \mathtt{love}, \dot{t}, \dot{h}\rangle\rangle]\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{t}, \mathtt{Taro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{h}, \mathtt{Hanako}\rangle\rangle$$

Jiro has two concepts t and h for Taro and Hanako, respectively, and he is in a belief state whose propositional content is that Taro loves Hanako.

(b) Kaoru's (the hearer's) belief situation after hearing the utterance,

$$\tau \wedge \langle\langle \mathtt{Of}, \dot{j}, \mathtt{Jiro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{t}', \mathtt{Taro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{h}', \mathtt{Hanako}\rangle\rangle$$

where

$$\tau = \langle\langle B_r, \mathtt{Kaoru}, [\dot{s}'|\dot{s}' \models \langle\langle B_r, \dot{j}, [\dot{s}|\dot{s} \models \langle\langle \mathtt{love}, \dot{t}, \dot{h}\rangle\rangle \wedge \tau]\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{t}, \dot{t}'\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{h}, \dot{h}'\rangle\rangle]\rangle\rangle$$

Kaoru is in an iterated belief state whose propositional content is that Jiro believes that Taro loves Hanako. There are five concepts in Kaoru's belief state, j for Jiro, t' and h' for Taro and Hanako, and t and h for Jiro's concepts of Taro and Hanako. Kaoru's concepts of Jiro's concepts, t and h, correspond, in Kaoru's belief state, to her own concepts t' and h', respectively. This shows that Kaoru identifies who she thinks Jiro is referring to with her own concepts. Thus, she is thinking that she is recognizing who Jiro is talking about.

(c) Kaoru's belief situation after her concept replacement operation,

$$\tau' \wedge \langle\langle \mathtt{Of}, \mathtt{j}, \mathtt{Jiro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \mathtt{t}', \mathtt{Taro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \mathtt{h}', \mathtt{Hanako}\rangle\rangle$$

where

$$\tau' = \langle\langle B_r, \mathtt{Kaoru}, [\dot{s}'|\dot{s}' \models \langle\langle B_r, \dot{j}, [\dot{s}|\dot{s} \models \langle\langle \mathtt{love}, \dot{t}', \dot{h}'\rangle\rangle \wedge \tau']\rangle\rangle]\rangle\rangle$$

Using her beliefs about correspondence of concepts, Kaoru replaces her concepts of Jiro's concepts, t and h, with her own concepts, t' and h', of Taro and Hanako, respectively.

(d) Kaoru's belief situation after her belief state acceptance operation,

$$\tau'' \wedge \langle\langle \mathtt{Of}, \dot{j}, \mathtt{Jiro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{t}', \mathtt{Taro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{h}', \mathtt{Hanako}\rangle\rangle$$

where

$$\tau'' = \langle\langle B_r, \mathtt{Kaoru}, [\dot{s}'|\dot{s}' \models \langle\langle \mathtt{love}, \dot{t}', \dot{h}'\rangle\rangle \wedge \langle\langle B_r, \dot{j}, [\dot{s}|\dot{s} \models \tau'']\rangle\rangle]\rangle\rangle$$

Kaoru accepts what she first thought Jiro was believing, Taro's loving of Hanako. This amounts to the insertion of ((love, t', h')) at the top level of Kaoru's belief, which, in turn, creates a one-sided mutual belief in Kaoru.

After the hearer's two mental actions, concept replacement and belief state acceptance, the hearer's belief state becomes type identical to the initial belief state of the speaker's, except that the former has an additional structure which indicates that the belief is a shared one. By going through these steps, the propositional content of the initial belief state of the speaker, namely,

s = ((love, Taro, Hanako)) for a certain situation *s*,

was transmitted from the speaker to the hearer, and shared among them. There still remains a possibility of miscommunication. When t and t', or h and h' have different anchors, *viz.* Jiro and Kaoru are thinking of different people by the same names, the propositional contents of belief states of these two people will turn out to be different, even though belief states themselves are type identical.

Communication with perspectival utterances

Suppose, as another example, that Jiro is reporting to his wife, Kaoru, what he has finally found after searching many hours for Hanako's house. He utters a sentence "Hanako's house is across the street" from his own standpoint in so reporting. Jiro's and Kaoru's belief situations in successive stages of communication would then be classified by the following SOAs.

(a) Jiro's (the speaker's) utterance-supporting belief situation before the utterance,

$$\langle\langle B_r, \mathtt{Jiro}, [\dot{s}|\dot{s} \models \langle\langle [\dot{x}|\langle\langle \mathtt{across\text{-}street}, \dot{x}, \dot{pov}\rangle\rangle], \dot{a}\rangle\rangle \langle\langle =, \dot{pov}, \dot{i}\rangle\rangle]\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{a}, \mathtt{House}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \dot{i}, \mathtt{Jiro}\rangle\rangle$$

Jiro's perspectival belief state is classified by a SOA with a complex relation with a hidden POV parameter pov. The POV parameter pov is equated in Jiro's belief to the self parameter i, which stands for the concept of self of Jiro.

(b) Kaoru's (the hearer's) belief situation after hearing the utterance,

$$\tau \wedge \langle\langle \mathtt{Of}, \mathtt{j}, \mathtt{Jiro}\rangle\rangle \wedge \langle\langle \mathtt{Of}, \mathtt{a}', \mathtt{House}\rangle\rangle$$

where

$$\tau =$$
$$\langle\langle \mathbf{B}_r, \mathbf{Kaoru},$$
$$[\dot{s}'|\dot{s}' \models$$
$$\langle\langle \mathbf{B}_r, \dot{\mathbf{j}},$$
$$[\dot{s}|\dot{s} \models \langle\langle [\dot{\mathbf{x}}|\langle\langle \mathbf{across\text{-}street}, \dot{\mathbf{x}}, \dot{\mathbf{pov}}\rangle\rangle], \dot{\mathbf{a}}\rangle\rangle$$
$$\wedge \langle\langle =, \dot{\mathbf{pov}}, \dot{\mathbf{i}}\rangle\rangle \wedge \tau]\rangle\rangle$$
$$\wedge \langle\langle \mathbf{Of}, \dot{\mathbf{a}}, \dot{\mathbf{a}}'\rangle\rangle$$
$$\wedge \langle\langle \mathbf{Of}, \dot{\mathbf{i}}, \dot{\mathbf{j}}\rangle\rangle$$

Kaoru forms an iterated belief with a variety of concepts, j for Jiro, a' for the house, and i and a for Jiro's concepts of self and the house. Kaoru's concepts of Jiro's concepts a and i correspond in her belief state to her own concepts a' and j .

(c) Kaoru's belief situation after her concept replacement operation,

$$\tau' \wedge \langle\langle \mathbf{Of}, \dot{\mathbf{j}}, \mathbf{Jiro}\rangle\rangle \wedge \langle\langle \mathbf{Of}, \dot{\mathbf{a}}', \mathbf{House}\rangle\rangle$$

where

$$\tau' =$$
$$\langle\langle \mathbf{B}_r, \mathbf{Kaoru},$$
$$[\dot{s}'|\dot{s}' \models$$
$$\langle\langle \mathbf{B}_r, \dot{\mathbf{j}},$$
$$[\dot{s}|\dot{s} \models \langle\langle [\dot{\mathbf{x}}|\langle\langle \mathbf{across\text{-}street}, \dot{\mathbf{x}}, \dot{\mathbf{pov}}\rangle\rangle], \dot{\mathbf{a}}'\rangle\rangle$$
$$\wedge \langle\langle =, \dot{\mathbf{pov}}, \dot{\mathbf{j}}\rangle\rangle \wedge \tau']\rangle\rangle]\rangle\rangle$$

Using her beliefs about correspondence of concepts, Kaoru replaces her concepts of Jiro's concepts, a and i with her own concepts, a' and j, respectively. Note that the parameter pov in the complex relation is not to be replaced, even though it is equated to i, because it is hidden in the relation, and is not a direct constituent of the SOA.

(d) Kaoru's belief situation after her belief state acceptance operation,

$$\tau'' \wedge \langle\langle \mathbf{Of}, \dot{\mathbf{j}}, \mathbf{Jiro}\rangle\rangle \wedge \langle\langle \mathbf{Of}, \dot{\mathbf{a}}', \mathbf{House}\rangle\rangle$$

where

$$\tau'' =$$
$$\langle\langle \mathbf{B}_r, \mathbf{Kaoru},$$
$$[\dot{s}'|\dot{s}' \models \langle\langle [\dot{\mathbf{x}}|\langle\langle \mathbf{across\text{-}street}, \dot{\mathbf{x}}, \dot{\mathbf{pov}}\rangle\rangle], \dot{\mathbf{a}}'\rangle\rangle$$
$$\wedge \langle\langle =, \dot{\mathbf{pov}}, \dot{\mathbf{j}}\rangle\rangle$$
$$\wedge \langle\langle \mathbf{B}_r, \dot{\mathbf{j}}, [\dot{s}|\dot{s} \models \tau'']\rangle\rangle]\rangle\rangle$$

Kaoru accepts what she first thought Jiro was believing, namely, that the house is across the street from Jiro's perspective. This amounts to the insertion of two conjuncts at the top level of Kaoru's belief. Informational content transmitted and shared through these steps is a proposition,

$$s \models \langle\langle [\dot{\mathbf{x}}|\langle\langle \mathbf{across\text{-}street}, \dot{\mathbf{x}}, \mathbf{Jiro}\rangle\rangle], \mathbf{House}\rangle\rangle$$
$$\text{for a certain situation } s,$$

which is equivalent to the proposition,

$$s \models \langle\langle \mathbf{across\text{-}street}, \mathbf{House}, \mathbf{Jiro}\rangle\rangle.$$

Note that the value of the implicit argument, not explicitly expressed in the utterance, Jiro, is provided by the POV parameter. The propositional content itself is partly determined by the speaker's perspectival mental state associated with the utterance.

The hearer's belief state after the two mental actions is almost type identical to the speaker's initial belief state, again except that the former has an additional structure which indicates that the belief is a shared one. The only significant difference is that the parameter pov is equated to the speaker's concept of self i in his initial belief state, whereas it is equated to j, the hearer's concept of Jiro, the speaker, in her final belief state. This correctly captures our intuition that in a usual communicative situation, the hearer temporarily switches to the speaker's standpoint when comprehending a perspectival utterance.

6 Perspectivity and property self-ascription

There is an attempt to explicate perspectivity phenomena in terms of proper ty self-ascription [Mitchell, 1986]. It is argued that perspectivity phenomena can be explained in analogy to self-identity, or the uses of quasi-indicators in attitude reports. The core of the explanation seems to be the underlying similarity among the uses of the sentences below.

(4) The bank is nearby.

(5) John knows that *he** is a baseball player.

(6) John believes that the bank is nearby.

In an utterance of (4), the speaker, who is speaking from her own perspective, is self-ascribing to herself the property of being nearby from the bank. An utterance of (5) also states that John is self-ascribing the property of being a baseball player, whenever *he** is used as a quasi-indicator, i.e., John is not amnesiac and knows who he is. (6) can also be used to describe that John is self-ascribing the property of being nearby from the bank. The subject of the belief report, John, can fill in the implicit argument in (6). Implicit arguments in perspectival sentences and quasi-indicators in attitude reports have the same underlying structure, namely, property self-ascription.

The notion of property self-ascription and our uses of complex relations with hidden pov parameters have certain similarity. They are both aiming to capture the intuition that we are situated in the world and recognize our environment from inside. But notice that the property to be self-ascribed and the fact of self-ascription itself are different things. The speaker's belief state behind an utterance of (4) could be classified by the following SOA with a complex relation.

$$\langle\langle [\dot{\mathbf{x}}|\langle\langle \mathbf{nearby}, \dot{\mathbf{pov}}, \dot{\mathbf{x}}\rangle\rangle], \mathbf{the\text{-}bank}\rangle\rangle$$

This SOA corresponds to the property to be self-ascribed. But the fact of self-ascription itself is to be classified by another SOA,

$$\langle\langle =, \dot{\mathbf{pov}}, \dot{\mathbf{i}}\rangle\rangle$$

which amounts to the equation of the POV concept to the self concept within the speaker's beliefs.

The point of perspectivity phenomena is that SOAs and complex relations with pov parameters are a kind of uniformities we can grasp, describe, and communicate. That pov parameters tend to be anchored to speakers or belief holders is not a necessary fact, but only holds by default. There are objective uniformities in our perspectival recognition of our environments, and the value of the uniformities lies in the fact that they are public and not strictly tied to their original discoverers.

7 Concluding remarks

We presented a model for perspectival utterances based on situation semantics framework. The model attributes perspectivity to agents' mental states, introduces the notion of point of view parameter in mental states, and incorporates a general picture of linguistic communication. We showed that the model correctly captures our intuitions behind the uses of perspectival expressions, e.g., bi-directional contextual dependency and perspectivity transfer. No further mechanisms were necessary to explicate the process of perspectival belief state transfer other than two mental acts on the part of the hearer, concept replacement and belief state acceptance, which were anyway necessary to explicate communication by non-perspectival utterances.

Two general characteristics have to be noted of our explanatory framework, (1) an incorporation of the speaker's and the hearer's mental states into the account of perspectivity phenomena, and (2) a relational conception of both meaning and mental states. They have two significant advantages over conventional content-based conceptions, of perspectivity in particular, and of semantics in general.

Firstly, since belief states can play two different roles, the utterance-supporting beliefs and the contents of belief reports, we could give uniform explanations to two types of different but intuitively related phenomena, perspectival utterances, like an utterance of (4), on the one hand, and reports of perspectival beliefs, like an utterance of (6), on the other, by assuming perspectivity at the level of agents' mental states.

Secondly, an utterance with explicit marking of point of view by linguistic means, usually implicates that the speaker is feeling certain familiarity with the person filling the POV location. But, it would be embarrassing if we had to think that this piece of information constitutes a part of what is said in such an utterance. This sort of implicative information is, within our framework, collected by the hearer from various situations involved in meaning relation, and need not be considered as forming a part of the content of the utterance. This way of thinking would open up a new way to investigate the role of implicative information in utterances.

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