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► **To cite this version:**

Isidora Stojanovic. Situation Semantics. chapter for the volume Introduction to the Philosophy of John Perry, ed. by Raphael van Riel and .. 2011. <ijn_00629850>

HAL Id: ijn_00629850

https://jeannicod.ccsd.cnrs.fr/ijn_00629850

Submitted on 6 Oct 2011

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Situation Semantics

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chapter draft for the volume *Introduction to the Philosophy of John Perry*
ed. by Albert Newen and Raphael van Riel

1. Introduction

In the early 80's, John Perry engaged in a close and fruitful collaboration with the logician Jon Barwise (1942 – 2000). Together, they developed a new theoretical framework known as Situation Theory. The scope of the framework was very wide, going from ontology and metaphysics, via logic, to theories of informational content, content of attitudes (such as beliefs) and of other cognitive states and faculties (such as perception), and, perhaps most importantly, theory of meaning. *Qua* theory of linguistic meaning, the framework came to be known as *situation semantics*, although the term, as used nowadays, applies to a larger class of semantic frameworks, which all have in common the use of 'situations' as a core theoretical notion (or, at least, an important technical device), but many among which, at the end of the day, do not have that much in common with the original Barwise-Perry framework.¹ The framework was laid out in *Situations and Attitudes*, first published in 1983 by MIT Press, followed by an augmented edition, by CSLI Publications in 1999.²

It is fair to say that *Situations and Attitudes* was an extremely influential book, even if the original framework itself did not survive to become a major semantic framework in the current linguistic landscape, and even if Perry himself has abandoned it in his more recent writings. It is also fair to say that while some of the philosophical ideas underlying Perry's and Barwise's approach have been incorporated into many among the contemporary theories of content (information

1 For instance, the term *situation semantics* as used by contemporary semanticists will be more easily taken to refer to frameworks such as those discussed e.g. in Kratzer (2007), including Kratzer's own account (cf. Kratzer 2011), which certainly originate with the ideas put forward in Barwise and Perry (1983), but still diverge in important ways from the Barwise-Perry framework, as much in technical details as by their failure to endorse many among the underlying philosophical ideas.

2 In particular, the CSLI 1999 edition includes "Shifting Situations and Shaken Attitudes" (Barwise and Perry (1985)), written as an imaginary interview in which Barwise and Perry reply to the various comments and criticisms addressed to situation semantics.

content, attitude content, semantic content), like, for instance, certain insights regarding the *efficiency* of language, a number of other ideas have remained ignored, misinterpreted, or simply underestimated. This may be because of a failure to recognize how deeply the approach advocated by Perry and Barwise calls into question some fundamental philosophical assumptions inherited from the Fregean tradition. In this respect, situation theory, when considered with all its bits and pieces with which it was delivered in the early 80's, remains a largely unexplored treasure. Its founding fathers (Perry and Barwise) were probably right when they feared that situation semantics was "perhaps ahead of its time".³

My goal in this chapter will be to bring to the foreground the main tenets of situation semantics. I hope that the reader will get a fair sense of the theoretical motivations that were driving the framework, and that continue to be of major significance to Perry's larger philosophical enterprise. I will thus be more concerned with the ideas themselves than with the way in which they were implemented in the formal framework of situation semantics. The chapter is organized as follows. I will start by rehearsing some of the central aspects of what can be described as the *Fregean heritage*, that is, the approach pursued by Gottlob Frege (1848-1925), who is often characterized as the "father" of modern logic, semantics, as well as philosophy of language of the analytic tradition.⁴ This will be important in order to understand the context in which situation semantics saw light, and to appreciate the almost revolutionary nature of some of the ideas behind it. Indeed, certain tenets of situation theory may be viewed as reactions directed against some of the central aspects of Frege's doctrine, well-established in the logical, semantic, and even cognitive theories that dominated the scene in the early 80's and that, albeit with some amendments, have persisted as the main stream up to our days. After having clarified the background, I will turn to one of the main motivations behind situation semantics (and, arguably, behind Perry's long-term project as well): the search for an account of meaning that relies upon an account of information, where the latter is crucially driven by the task of explaining how cognitive agents like us are led to *act* in ways they do, given how they are attuned to their environment. In other words, theory of meaning, theory of information, and theory of action become intertwined and even unseparable. With that in the back of our minds, I will articulate the exposition of situation semantics around eight themes:

(a) **the primacy of situations**: the idea that, both from an epistemological and a metaphysical point of view, reality consists primarily of situations, while other categories, such as individuals, properties, or locations, arise as *uniformities* across

3 Barwise and Perry (1999) p. xxx.

4 For logic, the most relevant source is Frege's *Begriffsschrift* (1879; occasionally translated in English as *Ideology*), while for language, it is *Über Sinn und Bedeutung* (1892; translated in English at times as *On Sense and Denotation*, at others as *On Sense and Reference*).

situations.

(b) **partiality**: the idea that information is, as a matter of rule rather than exception, *partial*: it tells us something only about a certain part of reality, leaving the rest open.

(c) **the efficiency of language**: the idea that the same words can be used in different contexts to mean different things (and that this, too, is a rule rather than exception).

(d) **a relational theory of meaning**: the idea that meaning should be seen as a relation between situations, rather than some kind of independent entity, detachable from both the world and the language (or other representational systems).

(e) **uniformities and constraints**: the idea is that agents get attuned to various kinds of uniformities, which allow them to classify the reality in ways that enhance their capacities for action and help them "cope with the new situations that continually arise" (p. 10); constraints are then seen as uniformities that arise among the ways in which situations relate to one another, while attunement to such constraints enables cognitive agents to "pick up information about one situation from another" (ibid.).

(f) **the reference relation and its relata**: an account of reference that departs from the standard account on (at least) two scores: instead of taking reference to be a relation between a *sentence* and its *truth value*, it takes it to be a relation between *utterances* and (other) situations; secondly, instead of taking reference to be relation between a *name* (or another singular term) and an *individual*, it takes it to be a relation again between utterances (of those terms) and other situations, and grounds it upon relations that hold among the individuals involved in those situations (the speaker, on the one hand, and the things and people to which/whom she is referring, on the other).

(g) **truth as a uniformity across situations**: the idea that truth is merely a device that helps us classify situations; truth partitions situations of a certain type, in particular utterance situations, in terms of a certain property that they share, viz. that there is some (appropriately related) situation that they accurately describe.

(h) **semantic innocence and attitude reports**: an account of the semantics of attitude reports, involving constructions such as 'believes that', 'sees' (used with 'that' or with an infinitival clause), and the like, for which one of the main motivations is that the embedded clause (i.e. the sentence that comes after 'that') should have the same meaning as it does when it occurs on its own.

Among these eight themes, five have already been singled out by Barwise and Perry in their *Preface* to the reedition issue, namely (b), (c), (d), (e) and (h) (with (c) and (d) getting merged under a single theme). I have added the other three themes, because, with hindsight, they appear to be as important and innovative as the other

five. I hope that articulating situation semantics around these eight tenets will prove helpful for the exposition; but before we get there, let us first briefly describe the background from which situation theory emerged.

2. Breaking off with the Fregean heritage

In order to better understand the programme of situation semantics, we need to remind ourselves of what the philosophical and logical landscape looked like in those times. The 60's and 70's were very fruitful years for the development of analytic philosophy. It was also in those years that the one of the discipline of linguistics, known today as *formal*, or *model-theoretic semantics*, developed at the interface of logic and philosophy, as a result of using the tools of logic to study natural language. Among the figures engaged in that sort of programme let us mention Rudolf Carnap, Alonzo Church, Saul Kripke, Richard Montague, David Lewis, Jaakko Hintikka, Max Cresswell, and David Kaplan.⁵ They all came from a broadly Fregean tradition, taking on board many elements constitutive of Frege's view, without questioning them.⁶

Caricaturing somewhat, here are the four foundational corners of Frege's picture:

(i) **sense** (Frege's *Sinn*): this is, figuratively speaking, the glue that serves to connect the world, the mind and the language. A linguistic expression *expresses* a sense, the mind *grasps* it, and the sense, in turn, "determines" something out there in the world. Senses themselves are not the world's citizens like the other things that surround us; rather they belong to the "Third Realm" (which is a bit like Plato's realm of ideas).

(ii) **reference** and **truth**: sense determines reference; in particular, when the linguistic expression at stake is a sentence, it expresses what Frege calls a thought (*Gedanke*), and it has a truth value as its reference. There are two truth values, the True and the False. All true sentences share the same reference, and so do all false sentences. As Frege himself put it, at the level of reference "all that is specific is obliterated".⁷

5 See e.g. Carnap (1960); Cresswell (1973); Hintikka (1967); Kaplan (1989); Kripke (1963); Lewis (1970); Montague (1970a, 1970b) (for Montague's programme, see also Partee 1997); .

6 Some readers might protest against including Kripke among these authors: after all, wasn't one of his most famous contribution to philosophy of language, viz. his *Naming and Necessity* (1972), precisely an attempt to demolish Frege's view on proper names?! Though this may be right, it is fair to still see Kripke as working within a broadly Fregean tradition. Let us also note that Kripke is a pioneer of possible world semantics (indeed, providing a uniform semantics for the various modal logics that, until his work, only existed as axiomatic systems, was his most famous contribution to logic), and that situation semantics was, among other things, put forward as an alternative to possible world semantics.

7 Frege (1892): "If now the truth value of a sentence is its reference, then on the one hand all true sentences have the same reference and so, on the other hand, do all false sentences. From this we see that in the reference of the sentence all that is specific is obliterated." Frege's choice of truth values as the reference for sentences results, at least partly, from an argument that came to be know as "the slingshot", to which we will

(iii) **eternalism**: senses are "eternal": they do not come into or go out existence, they do not exist *in time*. Even more importantly, they do not determine reference *in time*; that is to say, a reference determined by a sense has always been, and will always be, so determined. In particular, a true sentence is atemporally true, hence it has always been and will always be true. Reference (and, in particular, truth value) is fully determined by sense. What is more, any given sentence uniquely expresses such an eternal sense. Thus if we consider the sentence "I am a philosopher" as uttered by John Perry in 2011, and the sentence "I am a philosopher" as uttered by Jon Barwise in 1991, we are led to conclude that, appearances notwithstanding, these are not the same sentence after all! Rather, they are different sentences, since context is, for Frege, a constitutive part of the linguistic expression itself.⁸

(iv) **compositionality**: the idea that the meaning of a complex expression is "composed" of, or determined by, or is a function of, the meanings of its constituent expressions, given the way they are put together.⁹

It is worth pointing out another remarkable feature of Frege's view; not so much an element on its own as one that falls out from the other assumptions, and more specifically from the interaction of (ii) and (iv) above: it is the feature sometimes called 'semantic ascent', namely, the idea that in opaque contexts, such as embedded clauses in belief reports, the reference of a sentence isn't a truth value, but rather, the customary sense of the clause at stake. Frege maintained that compositionality held not only at the level of sense, but also at the level reference, and, consequently, he maintained that if an element of a sentence is replaced by another one with the same reference, the reference of the whole sentence will remain intact. But now, consider the report "John believes that Paris is the capital of France" and replace the embedded clause with some true other sentence – for instance, "John believes that it is sunny in Paris on April 20, 2011". While the former may be true, the latter may be false, for John may rationally believe, albeit mistakenly, that it wasn't sunny in Paris on that day. Frege's way out was to say that in such contexts, the sentence refers no longer to a truth value, but to its customary sense. Note that repeated embeddings will each time shift the reference, so that in "Mary knows that John believes that Paris is the capital of France", the embedded sentence has a meaning different both from the one it has when on its own and the one it has in " John believes that Paris is the capital of France" alone. It is against the idea that words get to mean different things

return in Sect. 3.

8 See e.g. Frege (1918, p. 332): "[T]he time of utterance is part of the expression of the thought". Among Frege scholars, there is still a lot of controversy as to what was Frege's view on context-dependence. What is fairly uncontroversial is that Frege regarded context-dependence as a flaw of natural language, and considered the latter to be defective. He wrote e.g.: "If our language were logically more perfect, we would perhaps have no further need of logic, or we might read it off from the language. But we are far from being in such a position. Work in logic just is, to a large extent, a struggle with the logical defects of language" (1915, p.323).

9 How exactly compositionality is to be formulated is an open and hotly debated question in philosophy of language, which, for our purposes, we may leave open, since nothing of significance will hinge on that.

depending on how deeply they are embedded that Davidson's request for 'semantic innocence' is directed. That will be the last of the eight themes around which I will discuss situation semantics.¹⁰

As we will see in greater detail in the next section, all of these elements, except for a certain version of compositionality, were called into question and consequently rejected by the Perry-Barwise approach. Nevertheless, it may still be said that situation semantics belongs to the same broader programme of model-theoretic semantics for natural language to which we were alluding a couple of paragraphs above. Barwise and Perry themselves are careful to note that "[they] want conserve [...] recent insights and the powerful methods of traditional model-theoretic analysis" (1999, xii). But while situation semantics shares the aim of laying down a rigorous framework for the study of meaning in language and its relationship to cognition, it does not endorse the burden of the Fregean heritage that many other frameworks, such as those of Montague or Kaplan, have, perhaps inadvertently, taken on board.

Already in his groundbreaking article "Frege on Demonstratives" (1977), Perry put forward serious concerns regarding Frege's theory of sense as a theory of cognitive states such as beliefs. One of the upshots of Perry's early work was to show that the Fregean notion of sense cannot at the same time accomplish the two tasks that Frege devised it for: (1) account for how mental states get to be *about* the real, concrete things that surround us; (2) account for *cognitive significance* in a way that accurately explains action and behavior. To illustrate with an example, suppose that I point to a cup and say "This cup is full of water". The first task is to account for how I can thereby express a belief about that very cup (rather than about some mental image of mine or, as Russell might have it, a sense-datum); the second, for how, if I am thirsty and want water, I will reach towards the cup at stake provided that I think of it as *this* cup, but I need not behave the same way if I merely think of, say, the cup from which I drank last night that it is full of water, without realizing that that's the cup in front of me.

The proposal that Perry outlines in those early articles (1977, 1979) is often interpreted as a proposal to divide, as it were, Frege's notion of sense into two distinct notions:

(i) a coarse-grained notion that serves to connect the mind with the world, and to account for what our beliefs have in common when we are thinking of the same object, even though we are differently related to the object and thus think of it differently (this would be what Perry called *objects of belief*, and what Kaplan called *content*);

(ii) a finer-grained notion that serves to account for cognitive significance and its

¹⁰ On a historical note, when Perry and Barwise met, Barwise had been developing an account of constructions involving verbs of perception (like 'see') that he argued could not be fitted into a Fregean account of attitudes.

role in motivating action (this would be what Perry called *belief states*, and what Kaplan called *character*).

I believe that such an interpretation of Perry's early view is, if not outright mistaken, then certainly opposed to the spirit of Perry's approach.¹¹ Admittedly, it is not our task in this chapter to set straight a proper understanding of Perry's views on mind and action. But it is one of our tasks to set straight the driving motivations behind situation semantics, and one of them is clearly the aim of providing a theory of meaning (perhaps even a theory of intentionality, in Brentano's sense) that should be able to explain how agents like us can acquire and exchange information about the world around us and, as a result of that, act on this world in a way most suitable to our well-being.¹² And the first step towards such a theory lies in recognizing the extent to which Frege's appeal to senses, those third realm entities that are supposed to connect world, mind and language, is flawed.

The picture that Perry and Barwise invite us to contemplate exploits the idea that agents get to be *attuned* to the various regularities that they encounter in their environment. Such regularities constitute *uniformities* across situations, with the help of which agents are able to classify various aspects of reality, to anticipate novel situations, and to act for the purpose of their own well-being. Among such uniformities are those that systematically relate certain situations to others. For example, whenever there is smoke, there is fire nearby. An agent who is attuned to this uniformity is better off than others who aren't, since for such an agent, a situation involving smoke carries the information that there must be fire around, and makes it possible for the agent to act appropriately (look for a fire-extinguisher, call firemen, etc.).

Uniformities across *relations* between situations are, in the Barwise-Perry terminology, *constraints*, and come in different types. For instance, the systematic connection between smoke and fire will be a nomic constraint, since it derives from the laws of physics and the causal links between fire and smoke. But constraints can also be conventional: for instance, the sound of a fire-alarm also carries the information that there is fire around. Yet, unlike the case of smoke, attunement to this constraint requires that the agent be familiar with a certain convention in place. Conventional constraints are by their very nature *conditional* on the conventions that they exploit.

11 It is true that Perry (1977) lends itself to such an interpretation. Indeed, in his afterward to Perry (1979), Perry himself notes: "In [(1977)] I was trying to construct a conservative modification of Frege's view to take care of the problems I saw indexicals and demonstratives posing for it, while in [(1979)] I was putting forward my own view" (1993: p. 43). Also, what makes such an interpretation recalcitrant may be the too frequent confusion between Kaplan's character vs. content distinction, which indeed, as applied to belief and cognition along the lines of the suggestions that one can find in Kaplan (1989), can arguably be seen as a division (or, if you prefer, a duplication) of Frege's notion of sense, and the distinctions that Perry draws.

12 The emphasis on agents or, as they prefer to say, *organisms*, acting for their own *well-being*, is a recurrent theme in Barwise and Perry (c.f. e.g. p. 10 and later chapters).

Now, in this picture, meaning is merely a type of constraint – and linguistic meaning, in particular, is merely a type of conventional constraint. Thus a situation in which someone says "There is fire" carries, as before, the information that there is fire, conditional upon the conventions associated with the expressions 'there', 'is', and 'fire', and upon the assumption that the person who is saying this is a competent, sincere and well-informed speaker.

Situation semantics, in a nutshell, is an attempt to provide a rigorous framework within which such a 'relational' theory of meaning may be developed and systematized.¹³ While Frege and his heirs saw meaning as something out there in the "third realm" that we express through language and grasp through thought, for Perry, Barwise, and their heirs, meaning is all around us.

3. Situation semantics: its tenets and motivations

Now that we have described the philosophical context in which situation theory was born, with its constant need to call into question assumptions that philosophers and logicians who had been raised in the same context used to take pretty much for granted, and now that we have presented, albeit in rough lines, the picture that Perry and Barwise were proposing as an alternative to the Fregean picture, let us take up one by one the eight themes listed earlier and, by elaborating on them, offer a (still rather rough) reconstrual of the framework of situation semantics.

(a) **The Primacy of Situations.** For Perry and Barwise, situations are the most basic units of reality, both from an epistemological and from a metaphysical point of view. They are epistemologically primary in the sense that, as agents, we perceive and experience, first and foremost, situations; it is only at a later stage that we experience other ontological categories, such as objects, properties, locations, or time. And they are metaphysically primary in the sense that all those other ontological categories are derived from situations, by abstracting over properties of situations and relations among them.

Now, it is a fairly common assumption, among those working in contemporary situation theory as well as those working in other frameworks, that situations have internal structure. This assumption, appearances notwithstanding, was not shared by Barwise and Perry, who insisted that, on the contrary, such a structure is imposed on situations from an external perspective, by getting attuned to similarities and uniformities across situations. Individuals, properties, relations, space-time locations, are uniformities that enable us to cluster situations together, and to classify

¹³ The idea that meaning arises from the interaction of an agent with his or her environment was inspired, partly at least, by ideas that, at about the same time, were developed in the neighboring areas, in particular Gibson's theory of perception (see e.g. Gibson 1979) and Dretske's theory of information (Dretske 1981).

them in various ways. Now, the widespread idea that a situation will, typically, consist of a number of individuals standing in various relations to one another, at a certain time and at a certain place, may indeed be traced back to *Situations and Attitudes*. But it is important to realize that the idea applies only to *abstract* situations, which are a technical device deployed by the framework, not to those situations of which reality consists and that we encounter, perceive or act upon. As Barwise and Perry write, "we view *real* situations as metaphysically and epistemologically prior to relations, individuals, and locations. But relations, individuals, and locations are metaphysically and epistemologically prior to *abstract* situations. The latter are build out of the former as sets of various kinds" (p. 58). Thus, the semantic primitives of situation semantics are individuals, relations and space-time locations, while the primitives of the metaphysics and epistemology of situation semantics are, rather, situations themselves.

(b) **Partiality.** This core feature of situation semantics exploits the idea that information content is always partial. Consider a piece of information that tells us that Mary insulted Bill. It tells us something about Mary, and something about Bill. But it tells us nothing about Bill's mother or Mary's sister or, for that matter, anyone else in the world. Situations, by their very nature, are sources of information that give partial such information only, and are, in that respect, very different from possible worlds. A world tells us everything about everyone. If we ask of two given objects whether they stand in some relation, it will give us a definite answer – Yes or No. Situations, by contrast, give a definite answer only on a limited number of issues. For one, if the objects at stake do not even belong to the situation at stake, it is likely that the situation we are looking at won't be able to decide whether they stand in a given relation or not. But, importantly, even when the objects belong to a situation, there may be issues that the situation does not decide. It is thus possible to be have a situation in which Mary and Bill stand in the relation of insulting, but one that does not tell us *how* it is that she insulted him – whether it was with words, with a gesture, or in some other way. The way in which the idea is cashed out is by defining situation-types in terms of *partial* functions from n -ary relations and sequences of n individuals to 0 and 1 (or to False and True). A function is *partial* (as opposed to *total*) when there are inputs on which it is undefined – which is tantamount to saying that for certain sequences of individuals, it simply doesn't tell us whether they stand in a given relation or not.

(c) **The Efficiency of Language.** The term 'efficiency' was introduced, by Barwise and Perry, to group together several phenomena that are tightly linked to what is nowadays preferably called 'context-dependence'. The general idea is that natural language provides means that enable the speaker to exploit various contextual factors in order to communicate information. Expressions like pronouns are a paradigmatic example of efficiency. Thus with the same linguistic device, e.g. the

pronoun 'he', I can convey information about an indefinite number of individuals. If I say "He is French" in a context in which the most salient person is François, I will tell you something about François, but if I use the very same sentence in a different context, e.g. one in which we have been talking about Paul, then it is about Paul that I will say something (viz. that he is French).

For Barwise and Perry, efficiency is one of the essential properties of languages, and one that, in turn, (also) accounts for the productivity of language, i.e. the fact that with a finite vocabulary and a finite number of syntactic operations we can express infinitely many things. Note though that productivity does not coincide with efficiency. Indeed, another essential property of language that (also) accounts for productivity is compositionality, i.e. the fact that with a finite vocabulary, and a finite number of syntactic operations, we can construct infinitely many well-formed and meaningful expressions, and thereby express infinitely many things. Compositionality (which Perry and Barwise, like Frege, accept at the level of meaning, but, unlike Frege, not at the level of reference) and efficiency are complementary phenomena that together account for full productivity of language.

Efficiency itself covers a family of phenomena, just as context-dependence, as we use the term nowadays, does. The sort of efficiency, or context-dependence, that pronouns such as 'he' or 'I', and adverbs such as 'here' or 'today', illustrate, is better known under the term 'indexicality', and has been widely studied and discussed in the linguistic and philosophical literature. A feature that distinguishes indexicality from other forms of efficiency is the fact that the way in which the expression exploits various contextual cues is built into the expression's meaning itself. Thus it is constitutive of the meaning of the first person pronoun 'I' that it should be used for the very person who is using the pronoun (viz. the speaker). In the framework of situation semantics, this is cashed out through the way in which the interpreter exploits the constraints between utterance situations and described situations. Thus if I say "I am French", the meaning of the sentence encodes (or, if you prefer, partly consists in) the constraint that my utterance should be related to the described situation(s) by having in common that the same individual (me) should figure in both situations: in the one, in the quality of the speaker, and in the other, in the quality of the subject-matter, i.e. the individual about whom something is being said (viz. that the person is French). Although a proper discussion of the account of indexicals that one finds in situation semantics deserves a chapter of its own, the spirit of the proposal, and the idea that the meaning of indexicals deploys a certain conventional relation between the utterance and the person or object that the utterance is about, have persisted into Perry's recent theorizing about the topic (see Perry 2001).

As mentioned earlier, indexicality is a special case of efficiency. Two other forms of efficiency are worth mentioning. One is what is nowadays referred to as *polysemy*, namely, an essential feature of language that makes it possible for words to acquire

new meanings. For example, in the past the word 'folder' used to stand for a certain class of material objects, characterized by their shape and function, but with the development of computers, it acquired a novel meaning on which it (also) stands to a certain class of electronic objects.¹⁴

Another form of efficiency worth mentioning is perspectival relativity, illustrated with expressions like 'behind'. Consider someone uttering "The table is behind the sofa". The informational content carried by this utterance exploits not only the constraints that come with the meaning of the sentence, but also the perspective from which the content is accessed and evaluated for truth. If the table is between me and the sofa, then from my perspective, the utterance is true, but if you are on the other side, and the sofa is between you and the table, from your perspective, the utterance is not true. Now, one could stipulate that expressions such as 'behind' privilege the speaker's perspective, in which case the perspectival relativity would work very much like indexicality, and the above utterance would be true if the sofa is between the speaker and the table. In the literature, one often finds expressions like 'behind' assimilated to indexicals. But, for one thing, perspectival expressions display a wider range of patterns than indexical pronouns. For another, perspectival relativity is an important feature not only of language, but also of the contents of beliefs and other mental states that cannot be reduced to (linguistic) indexicality.¹⁵

The phenomena of indexicality, polysemy, perspective-dependence, and other forms of context-dependence, and the relationships among these phenomena, are in the heart of current studies in semantics, pragmatics and philosophy of language.¹⁶ What matters to the present discussion is not so much the account that Perry and Barwise proposed of those phenomena, but rather, their recognition of all these phenomena as essential features of language that call for a rigorous analysis. Let us remind ourselves that the context in which situation semantics saw light was that of Frege's followers, and that for Frege, natural language was imperfect and defective precisely because of features such as ambiguity and context-dependence. Perry's and Barwise's insistence that these are features of *efficiency* rather than defectiveness marks an important turn in the history of semantics.

(d) **A Relational Theory of Meaning.** The idea of a *relational* theory of meaning

14 Barwise and Perry do not talk of polysemy but of ambiguity (see 1983: p. 40). But I think it is helpful to put the emphasis on polysemy rather than ambiguity, since lexical ambiguity is typically accidental, while polysemy is systematic and constitutes a powerful mechanism that makes it possible to recycle the existing vocabulary in order to express new concepts. In either case, what matters is that instead of viewing ambiguity and polysemy as *defective* features of language, we see them, as Barwise and Perry write, "as another aspect of the efficiency of language. Expressions are, after all, just uniformities across certain kinds of situations, utterances. That an expression can be used in more than one way is just another feature of that expression." (ibid.)

15 For a discussion of the perspectival relativity in thought, see Perry (1986). See also Recanati (2007).

16 For collections of articles that demonstrate how large the scope of these phenomena is, see e.g. Kamp and Partee (2004), and Recanati, Stojanovic and Villanueva (2010).

is one of the aspects of situation semantics that remain most prominent in Perry's subsequent work, but also one that departs most strikingly from the Fregean tradition. At a first glance, one might have thought that Frege's view, too, endorses some version of a relational theory of meaning, to the extent that a sentence is *related* to a sense, or a thought, which constitutes its meaning. This is not what we mean when we speak of a *relational* theory of meaning. For Frege, meaning is an (abstract) *entity*, while sentences (of languages that we speak and in which we formulate our thoughts) are related to *it* through the relation of expressing. For Perry and Barwise, meaning *is* a certain relation, one that relates situations to situations (which, as emphasized in (a), are the basic units of reality). In the case of linguistic meaning, the relata are, on the one side, *utterance* situations, and, on the other, *described* situations (which can themselves be utterance situations, as in the case of reported discourse, such as "Mary said that it was raining").

One basic difference between situation semantics and traditional Fregean frameworks is, then, that the former sees meaning as a relation, while the latter sees it as an abstract thing or entity. There is another, related difference: the former takes meaning to be an independent and autonomous entity; thus if there were no languages or other devices to express them, meanings would still exist. For the latter, on the other hand, meaning is not really a detachable entity, since it boils down to the way in which situations relate to, and carry information about, other situations; without those very situations, the relations that hold among them and that constitute meaning would not exist either.

Let me illustrate the idea of a relational theory of meaning with an example (simplifying some aspects of the account). Suppose that I point at Paul and say "He is French". My utterance has the meaning it has in virtue of the there being a relation between the utterance situation and other situations such that one and the same individual, Paul, appears in both, and that in the former, he is a salient male individual referred to by the speaker, and in the latter, he belongs among the French. Note that, given that I may be misinformed, or lying, the latter need not be real situations, but may be merely hypothetical situations in which Paul *is* French.

Let me end by briefly connecting this relational theory of meaning to the one that we find in Perry's reflexive-referential theory (2001). There too, meaning arises from the relations that utterances bear to the various things and events about which they convey information (or, as the case may go, *misinformation*). For example, if Paul says "I am French", his utterance, we might want to say, *means* that Paul is French. In the reflexive-referential framework, the utterance gets to have such a meaning in virtue of the fact, among others, that the individual that the utterance is about (that is, Paul) stands in a certain relation to the utterance itself (*viz.* the relation of producing the utterance). Such relational components are explicit in what Perry calls the *reflexive* truth conditions of the utterance, and, even though they are no longer visible in what

he calls the *referential* truth conditions, still, given that the latter are always derived from the former, such "incremental" levels of meaning ultimately rest upon the relations in which the utterance stands with respect to various other objects and, more generally, situations.¹⁷

(e) **Uniformities and Constraints.** I have already introduced the notions of uniformity and constraint, which are central notions in situation theory, not only at the levels of language, attitudes (belief, desires, etc.) and action, but also at the level of ontology. As pointed out in the section on the Primacy of Situations, the ontological categories of individuals, properties and relations are derived from uniformities that we encounter across situations. For instance, the relation of hitting emerges merely as a regularity that we observe across all the situations that have something in common, those that with our language we would describe as involving an agent and a patient, with the former acting upon the latter in a certain way. Observing such regularities, or uniformities, and getting attuned to them, is what agents like us rely on to *classify* reality in ways that make it possible to anticipate novel situations, as, for instance, to anticipate the fact in situations of hitting in which the patient is a person (or an animal), the patient usually gets harmed, and to appropriately avoid being involved (*qua* patient) in such situations. Attunement to such uniformities, as Perry and Barwise put it, makes it possible to "cope with the new situations that continually arise", but also to "pick up information about one situation from another" (p. 10). In the latter case, the uniformities involve two or more situations; uniformities that are themselves relational are called *constraints*.

We have already seen that constraints can be of various types, e.g. *nomic* when the constraint is based on a law of nature, as in the example of smoke meaning fire (i.e. smoke situations being constrained to be, or to appropriately involve, fire situations), but also *conventional* when the constraint is based on a convention, as in the example of fire alarm meaning fire, and, more generally, in the case of linguistic communication. The idea is that the use of language generates uniformities across situations, and across pairs and, more generally, n-tuples of situations, i.e. constraints. Such constraints, in turn, provide language users with efficient means of conveying information (or, for that matter, misinformation), by exploiting their addressee's attunement to the constraints at stake. Suppose that I want to communicate to someone that Paul is French, in a situation in which Paul is present and I have reasons to believe that my addressee doesn't know that Paul's name is Paul. I will then likely exploit the constraint that is conventionally associated with the pronoun 'he', viz. that a situation in which an utterance of 'he' occurs constrains the described situations to be such that the individual talked about is the same as the male individual that the speaker is referring to in the utterance situation, and will

¹⁷ The lack of space prevents me going into more details regarding the relational foundations of the reflexive-referential theory of meaning; for further discussion, see the Chapter on Reference in the present volume.

say, pointing at Paul, "He is French". Note that my utterance means that Paul is French, that is, correlates with situations in which Paul is French, only *conditionally* upon the conventions associated with the words used. The very same utterance can mean, say, that Paul works in continental philosophy, conditionally upon a different possible convention, on which 'French' would be used for continental philosophers.

In the same way in which the relational theory of meaning is preserved in Perry's recent theorizing, so are the underlying motivations behind uniformities and constraints (even if he is no longer using the same vocabulary). In particular, the idea that utterances have meaning, and convey information, only *conditionally* upon various conventions and other facts, plays a crucial role in the reflexive-referential theory. Thus even the level of *reflexive* truth conditions associated with my utterance of "He is French" hinges upon the assumption that the utterance is one of an English sentence in which the words 'he', 'is' and 'French' are used the way they are normally used: in the parlance of Perry (2001), *given* the conventions governing the use of 'he', 'is', and 'French', my utterance of "He is French" is true if and only if the male individual to whom I am referring with my utterance of 'he' belongs among those to whom I am referring with my utterance of 'French'. From such reflexive truth conditions, we get referential content by assuming further facts about the utterance: *given* those conventions, and *given that* I am referring to Paul with my utterance of 'he', and to the French with my utterance of 'French', my utterance is true iff Paul is French. The point to be stressed is that meaning, constraints, and information more generally, are conditional upon further assumptions and facts and are, in that respect, undetachable from their contextual setting.

(f) **The Reference Relation and its Relata.** As already noted, situation semantics does not assign reference to linguistic expressions directly, the way Fregean theories and other traditional frameworks do. To be sure, even in those frameworks, due to context-dependence, reference is not assigned to indexical expressions like 'he' on their own, but rather, to pairs consisting of an expression and a context of use (or some other appropriate parameter). But even if expressions only have a reference assigned relative to a context, it is still linguistic expressions that, in those frameworks, primarily enter into the reference relation. Situation semantics rejects this idea. For one thing, it is not expressions, but particular utterances of expressions, *qua* concrete bits of reality, that can enter into the reference relation. For another, the way in which a particular utterance of e.g. the pronoun 'he' can be said to refer to a given individual, say Paul, is derivative upon a more basic notion of reference, in which it is the speaker using the pronoun who is referring to the individual at stake. The basic status of the relations that individuals from a given situation bear with respect other individuals (possibly in other situations), in accounting for the notion of reference, is yet another aspect on which situation semantics departs from not only Fregean theories, but from any view that insists on a distinction between *speaker* reference and

semantic reference (cf. Kripke 1977).

Situation semantics also departs from the Fregean and other mainstream view when it comes to question of what *sentences* refer to, and what their semantic values are. Since Frege, it is customary to take the semantic value (reference, extension, denotation) of sentences to be truth values. As pointed out in section 2, Frege held that at the level of reference, "all that is specific is obliterated", and was led to the view that all true sentences have the same reference, and that so do all the false ones. In situation semantics, once again, it is not sentences (not even fully interpreted sentences, or, for that matter, propositions), that have reference. Rather, it is utterances and other concrete situations. Furthermore, what an utterance of a sentence refers to is not a truth value, but one or more (other) situations, namely, the situation(s) described by the utterance. Note that when the utterance is false, as e.g. "It rained in Paris on June 1st 2011", the described situations are counterfactual situations, rather than any real and concrete situation.¹⁸

(g) **Truth.** It may be said, in all generality, that truth is a key notion in contemporary semantics – or, at least, in model-theoretic semantics. A semantic theory assigns semantic values to expressions and, in particular, assigns values of truth and falsity to sentences. As noted previously, such values are not assigned to sentences on their own, but rather, to sequences consisting of a sentence and a certain number of other parameters, such as contexts, possible worlds, or points of evaluation more generally. It may be said, too, that while semantics deploys the notion of truth, it typically stays neutral on the *theory* of truth. In other words, values of truth and falsity are semantic primitives, on a par with other semantic primitives such as individuals or worlds, and in formal semantics the values assigned to sentences are often not the 'True' and the 'False', but numbers 1 and 0, which clearly indicates the non-committal nature of those frameworks to any theory of truth.

Now, what about situation semantics? On this score again, it departs radically from those other frameworks. For one thing, as we have already seen, the semantic values that it attaches to (utterances of) sentences are not truth values, but situations. For another, the notion of truth that one finds in situation semantics comes with a certain conception of truth, and one, moreover, that is not likely to be met with general agreement. Truth, for Barwise and Perry, is, again, just another uniformity across situations, and so is falsity. A way of explaining the idea would be to say that truth makes a partition over situations into two classes: those in which there is an utterance such that, given the constraints at play, there is one or more real situations described by the utterance, vs. the rest; while falsity, in turn, partitions situations also

¹⁸ In the philosophical literature, there is an argument, known as the Slingshot Argument, that goes back to Frege but has been endorsed and elaborated by others (such as the logician Kurt Gödel), aiming to demonstrate that sentences can only refer to truth values and cannot be consistently taken to refer to anything more specific (as would be propositions, or sets of worlds, or situations). It falls beyond the scope of this paper to explain how Barwise and Perry have resisted the argument. For discussion, see Perry (1996).

in two classes: those in which there is an utterance such that, given the constraints at play, there are one or more abstract, *but no real* situations described by the utterance, vs. the rest.

It takes little to see that the two partitions need not coincide, since situations in which there is no utterance (or at least none that is interpretable) will count among "the rest" on either partition. More importantly, just as we saw that constraints are often *conditional* upon conventions and assumptions of various sorts, truth and falsity are also uniformities that will be conditional on other things, and, in particular, on the constraints in which the situation at stake is involved. Thus consider again the example of an utterance of "There is fire", made in a situation in which there is indeed fire. This utterance situation may be classified under the truth-uniformity, *conditional upon* the conventions associated with the words 'there', 'is' and 'fire'. Yet the very same situation may be classified under the falsity-uniformity, conditional upon another possible convention, such as one that would associate the word 'fire' with, say, situations in which it is sunny, on the assumption that it is *not* sunny in that situation.

To bring the point home, when it comes to truth, we see again a considerable departure not only from Frege's own approach, but also from assumptions and, one could even say, *practices*, shared by a majority of existing frameworks. Within those frameworks, truth is a primitive notion. Furthermore, the question of what are the primary bearers of truth is seen as substantive, and it is often taken for granted that it is propositions, or contents, that bear a truth value, and to which the truth predicate primarily applies. For Barwise and Perry, on the other hand, truth is derivative: it is just a regularity to which agents get attuned, that helps them classify reality and retrieve information in ways useful in anticipating novel situations and planning action. The question of what are the primary bearers of truth value becomes ill-conceived, and to the extent that it has an answer, it is situations that are susceptible of being true or false. There is thus nothing special about truth: simply, situations can be classified as true or false, just as they can be classified as e.g. evening situations, situations of hitting, or situations 2km North of London. Of course, an agent's capacity to classify a given situation as true rather than false can prove particularly useful; but so can an agent's capacity to classify a given situation as dangerous rather than harmless. Just as danger falls out as a uniformity across situations, to which agents get attuned, and which they can exploit in acting for their own well-being, so do truth and falsehood.

(h) **Semantic Innocence and Attitude Reports.** To close this presentation of situation semantics, let me turn to a particular application of the framework, namely to *attitude reports* (broadly speaking), such as "John believes that Mary used his car", but also reports involving verbs of perception, such as "John saw that Mary used his car" or even "John saw Mary use his car". As we have seen, Frege's own approach

was particularly implausible when it came to accounting for attitude reports, for he assumed compositionality at the level of reference and, given that sentences that merely coincide on their truth value cannot be safely substituted for one another within attitude reports, was led to the view that in such contexts, sentences have as their reference not a truth value, but what would have been their sense if they were not embedded. Even though this feature of Frege's view did not survive to the present days, it is still true that broadly Fregean frameworks have difficulties when it comes to attitude reports. Now, it is beyond the aim of this chapter to present Perry and Barwise's semantics of attitude reports, so let me simply point out some features of their framework that make it superior both to Fregean frameworks and to possible world semantics (such as the one developed e.g. by Jaakko Hintikka). As pointed out previously, the semantic values that situation semantics associates with sentences are not truth values, nor are they senses, or propositions, or sets of possible worlds, but rather, situations. An attitude report of the form 'A Vs (that) S' (where A is a singular term, V a verb of attitude or perception, and S a sentence) requires that the agent A stands in relation V to the situation(s) to which S makes reference. Thus whether a sentence occurs on its own or as a 'that'-clause in an attitude report (however deep embedded) does not impinge on the sentence's meaning; in either case, its reference (in the sense discussed in sect. (f) above) will consist of one or more situations, which is what makes it possible for Barwise and Perry to preserve our "semantic innocence" (as Davidson aptly coined the phrase). Now, it should be noted, too, that situation semantics, although "semantically innocent", rejects nevertheless compositionality at the level of reference. Thus there can be attitude reports of the form 'A Vs that S' and 'A Vs that S*' in which S and S* happen to refer to the same situations yet the one report is true but not the other; the standard Hesperus-Phosphorus cases fall into this category. However, in *direct* perception reports, sentences referring to the same situations may be substituted for one another *salva veritate*. Thus suppose that Mary is Mrs. Jones, but that John is confused and thinks that "Mrs. Jones" is someone other than Mary. Then "John believes that Mary used his car" may be true without "John believes that Mrs. Jones used his car" being *ipso facto* true. On the other hand, if "John saw Mary use his car" is true, then "John saw Mrs. Jones use his car" will also be true.

As a final remark, let me point out an aspect in which situation semantics of attitude reports is also superior to the frameworks inspired by Kripke's possible worlds semantics for modal logics. Such frameworks are known as Hintikka-style semantics (cf. Hintikka 1962), or as doxastic-epistemic logics. In those frameworks, 'A believes that S' is true iff S is true in all the worlds that A takes to be possible (or, as it is customary to speak, iff S is true in all of A's doxastic alternatives for the actual world); similarly, 'A knows that S' is true iff S is true in all the worlds that are, from A's perspective, indistinguishable from the actual world. Such possible world frameworks face the so-called problem of logical omniscience. Consider something

that is a truth of logic or mathematics. Since such truths hold in all possible worlds, *ergo* in all of the doxastic alternatives of a given agent as well, Hintikka-style semantics is committed to the view that it is true to report such an agent to *believe* the truth at stake, which goes against the intuitions. For, there are many logical and mathematical truths that we fail to know and thereby fail to believe. Situation semantics has some advantage in this respect, too, for the logical or mathematical sentence at stake will, just like any other sentence, have as its reference one or more situations, and if the agent at stake is not appropriately related to those situations, the belief report may come out false, as expected. For reasons of space, I must abstain from discussing the issue of what sort of situations mathematical sentences describe, but let us simply consider what seems to be a fairly trivial truth of logic, such as "Paula used John's car or she didn't use his car". Suppose furthermore that John has no idea who Paula is, and has no connection to her. Then, in situation semantics, to report John to believe that very truth need not come out as a true report. For that report to be true, John would need to be related to either a situation in which Paula used his car or to one in which she didn't, hence on either option, to a situation that involves Paula, which, by hypothesis, isn't the case.

What I have tried to do in this chapter is to offer a survey of situation semantics, by developing it around the above eight themes. I hope to have shown to what a large extent situation theory was an ambitious programme that departed from the mainstream approaches in radical ways. While the pioneering work of Barwise and Perry was extremely influential, it is also fair to say, with the hindsight, that situation semantics did not become a widely pursued programme, and that its contemporary off-spring (such as Kratzer's semantics) comes much closer to the mainstream views than the original Barwise-Perry framework. Now, my aim in this chapter was not so much to present situation semantics in all the details of its sophisticated machinery, but rather, dwell more on the underlying philosophical ideas, among which there are several that, as I tried to show, continue to occupy a central place in John Perry's long-term philosophical enterprise.*

* I would like to thank Raphael van Riel and Albert Newen for their invitation to contribute to the present volume and for their helpful comments, and Neil van Leeuwen for suggesting me as a contributor. On a personal note, I would like to express my immense gratitude to John Perry. Finally, let me acknowledge participation and partial funding from the following projects: "Semantic Content and Context-Dependence", MICINN, Spanish Government, grant n° CSD2009-0056; "Context, Content and Compositionality", European Community's Seventh Framework Programme (FP7/2007-2013), grant n° 229 441-CCC, and "Perspectival Thoughts and Facts" (PETAF), EC-FP7/2007-2013, grant n° 238 128.

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