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**SUCCESS, SATISFACTION AND TRUTH**  
**IN THE LOGIC OF SPEECH ACTS AND FORMAL SEMANTICS**

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There has been much controversy about the role and place of speech act theory in the study of language. Following Morris [1938], *semiotics* is traditionally divided into three branches : syntax, semantics and pragmatics: *Syntax* deals with relations that exist only between linguistic expressions (e.g. the rules of formation of sentences), *semantics* with relations that exist between linguistic expressions and their meanings (e.g. their senses or their denotations) and *pragmatics* with relations that exist between linguistic expressions and their meanings and uses in contexts of utterance. Because speakers use language in order to perform speech acts, most philosophers and linguists following Carnap have first tended to place speech act theory in pragmatics rather than in semantics.

Moreover, up to the present time, the contemporary philosophy of language has been largely divided into two trends. The *logical trend* founded by Frege and Russell and later developed by Carnap, Montague and others studies how language *corresponds* to the world. It concentrates on the analysis of truth conditions of declarative sentences. The *ordinary language analysis trend*, founded by Wittgenstein and Austin and later developed by Searle and Grice, studies how and for which purposes *language is used* in discourse. It concentrates on speech acts that speakers perform by uttering all types of sentences. As Austin [1962] pointed out, by uttering sentences under appropriate conditions, speakers characteristically perform *illocutionary acts* such as assertions, promises, requests, declarations and apologies. Moreover, when their utterances have effects on the audience, they also occasionally perform *perlocutionary acts*. For example, they can convince, influence, please, amuse or embarrass the hearer. **Like Austin and Searle, I think that the primary units of meaning in the use and comprehension of language are not propositions or isolated truth conditions but rather complete illocutionary acts.** By making a

meaningful utterance a speaker always attempts to perform an illocutionary act. This is part of what he means and intends to communicate to the hearer. In the case of a literal utterance, the speaker means to perform the illocutionary act expressed by the sentence that he uses in the context of his utterance. As Searle [1969] pointed out, most elementary illocutionary acts are of the form F(P) : they consist of an *illocutionary force* F<sup>1</sup> with a propositional content. Austin discovered illocutionary forces by paying attention to the fact that certain sentences e.g. “I order you to come”, “I swear to tell the truth” can be used *performatively*: their literal utterances in appropriate conditions constitute the very performance of the action named by their verb. Austin called these sentences *performative sentences* in opposition to others that he called *constative sentences*. However Austin came soon to notice that all kinds of sentences whether performative or not serve to perform illocutionary acts. So the study of illocutionary acts turned out to be needed not only for the analysis of performative sentences but also for the general theory of meaning and communication. If it is not possible to express a propositional content without an illocutionary force then most elementary sentences whose logical form is completely analyzed contain an *illocutionary force marker* in addition to a *clause* expressing a proposition. As linguists and grammarians had long acknowledged in their classification of *sentential types*, verb mood, word order and punctuation signs are the most common features of illocutionary markers. Thus declarative sentences serve to make assertions. Imperative sentences serve to give directives to the hearer, interrogative sentences to ask questions and exclamatory sentences to express the speaker’s attitudes.

Using logical formalisms, philosophers of the logical trend have greatly contributed to the theory of sentence meaning. They have analyzed the logical form and truth conditions of propositional contents of utterances and they have formulated a general logic of sense and denotation. In particular they have explicated the meanings of important words and syncategorematic expressions such as truth, modal and temporal connectives and quantifiers which serve to determine the truth conditions of propositional contents. However, because they have ignored illocutionary aspects of meaning, they have failed to analyze the meaning of expressions such as force markers and performative verbs which serve to determine the illocutionary forces of

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<sup>1</sup> The term of force was first used by Frege [1914,1918].

utterances.

Morris' division of semiotics was mainly programmatic. The need for a more precise characterization of the delimitations between semantics and pragmatics has become clear in recent years. New philosophical logics such as the logic of demonstratives and illocutionary logic have analyzed the logical form of expressions whose linguistic meaning is systematically related to use. First, contexts of utterance and moments of time were introduced in semantic interpretations of the logic of demonstratives and temporal logic in order to analyze the linguistic meaning of *indexical expressions* like the pronouns "I" and "you" and adverbs of time and location like "now" and "here" whose senses and denotations are systematically dependent on contextual features such as the identity of the speaker and hearer and the time and place of utterance. Since D. Kaplan [1979] worked on demonstratives, the study of indexical expressions which was first assigned by Bar-Hillel [1954] and Montague [1968] to pragmatics is now commonly assigned to semantics .

Similarly, the systematic analysis by Searle and myself in 1985 of English performative verbs and illocutionary force makers has shown that their meaning contributes systematically to the determination of the forces of utterances in which they occur. Thus, the identification of sentence meaning with truth conditions is now challenged in the philosophy of language. Many philosophers and linguists no longer accept the thesis that the meaning of linguistic expressions only contributes to determining the propositional content and truth conditions of utterances.

### **Section 1. Principles of illocutionary logic**

I have formulated such principles in various papers and with Searle in *Foundations of Illocutionary Logic* [1985]. I have used proof and model theory in *Meaning and Speech Act* [1990-91] in order to proceed to the formalization. As Searle and I pointed out, language use not only consists in the performance of *elementary illocutionary acts* with a force and a propositional content. It also consists in the performance of more *complex illocutionary acts* whose logical form is not reducible to that of elementary speech acts. Illocutionary denegations, conditional speech acts and conjunctions of illocutionary acts are the three basic kinds of complex illocutionary acts. From a logical point of view, acts of *illocutionary*

*denegations* are of the form  $\neg A$  ; their linguistic aim is to make explicit the non performance by the speaker of an illocutionary act  $A$  . For example, a rejection is the illocutionary denegation of the acceptance of an offer. *Conditional speech acts* are of the form  $(P \Rightarrow A)$  ; their linguistic aim is to perform an illocutionary act  $A$  not categorically but on the condition that a proposition  $P$  be true. Thus, an offer is a promise that is conditional on the hearer's acceptance. Finally, *conjunctions* of illocutionary acts are of the form  $(A \& B)$  ; their aim is to perform simultaneously two illocutionary acts  $A$  and  $B$ . For example, an alert is the conjunction of an assertion that some imminent potential danger exists and of a warning to the hearer to prepare for action against that danger. Sentences containing *illocutionary connectives* serve to perform such complex illocutionary acts. For example, "If" and the semi-colon play the role of illocutionary connectives of conditional and conjunction in the two sentences "If it is difficult, help me!" and "Paul is leaving; are you going with him?".

**By nature illocutionary acts are intentional actions.** Speakers who perform illocutionary acts always attempt to perform these acts by making meaningful utterances. **As is the case for human actions in general, attempts to perform illocutionary acts can succeed or fail.** Firstly, speakers must use appropriate sentences in order to express their attempted illocutionary act in the context of their utterance. Secondly, that context must be appropriate for the performance of that illocutionary act. For example, an attempt to threaten someone is not successful when the speaker speaks to the wrong person or when he is in a situation where it is obvious that he has not the least intention to do what he threatens to do. **Moreover, illocutionary acts are directed at objects and states of affairs, and, even when they are successful, they can still fail to be satisfied, when the world does not fit their propositional content.** Thus successful assertions can be false, successful promises can be broken and successful requests can be refused.

The *conditions of success* of an illocutionary act are the conditions that must obtain in a context of utterance in order that the speaker succeed in performing that act in that context. Thus, a condition of success of a promise is that the speaker commit himself to carrying out a future course of action. *Failure* to perform an illocutionary act is a special case of lack of performance which occurs only in contexts where the speaker makes an unsuccessful attempt to perform that illocutionary act. The *conditions of satisfaction* of an illocutionary act are the conditions that must

obtain in a possible context of utterance in order that the act be satisfied in the world of that context. For example, a condition of satisfaction of a promise is that the speaker carry out in the world the promised course of action. The notion of a condition of satisfaction is a generalization of the notion of a truth condition which is necessary to cover all illocutionary forces. Just as an assertion is satisfied when it is *true*, a command is satisfied when it is *obeyed*, a promise when it is *kept*, a request when it is *granted*, and similarly for all other illocutionary forces.

According to Searle and me, one cannot understand the nature of illocutionary acts without understanding their success and satisfaction conditions. Moreover, **the two types of success and satisfaction conditions of elementary illocutionary acts are not reducible to the truth conditions of their propositional contents. Consequently, the two single most important objectives of the logic of speech acts and semantics of ordinary language are to develop *new theories of success and of satisfaction integrating the classical theory of truth for propositions.*** One reason why earlier attempts to analyse formally non declarative sentences and performatives have failed is that they have tended to identify illocutionary acts with their conditions of satisfaction and to reduce satisfaction to truth. However, as I have argued repeatedly, one cannot leave out the general notion of success in the analysis of the logical form of actions in general and of speech acts in particular. Moreover, as we will see later, the notion of satisfaction is richer than the notion of truth.

The fundamental philosophical concepts of success, satisfaction and truth are logically related. On the one hand, the satisfaction of elementary illocutionary acts requires the truth of their propositional content. There is no satisfaction without correspondence. On the other hand, the successful performance of declaratory illocutionary acts brings about the truth of their propositional content. Any successful declaration constitutes the performance by the speaker of the action represented by the propositional content. Notice that Searle and I have analyzed each performative utterance as being a declaration by the speaker that he performs by virtue of his utterance the illocutionary act that he represents. In this view, any successful literal utterance of a performative sentence is performative because a successful declaration makes its propositional content true and the propositional content in this case is that the speaker performs the illocutionary act expressed by the performative verb. Thus by a successful literal utterance of “I request your

help” a speaker requests help by way of primarily declaring that he make that request. As one can expect, speakers whose utterances constitute successful, non defective and satisfied illocutionary acts are felicitous. So in Austin’s terminology illocutionary acts have felicity conditions.

Searle and I did not analyze the logical form of propositional contents in *Foundations*. We contributed to the theory of success of illocutionary acts. Our main objective was to study *illocutionary commitment* as it is determined by types of illocutionary act. By virtue of their logical form, certain illocutionary acts *strongly commit* the speaker *to* others: it is not possible to perform them without *eo ipso* performing the others. Thus supplications and invitations contain requests. However, sometimes illocutionary commitment is weaker. The successful performance of the illocutionary act *weakly commits* the speaker to another act that he does not openly perform. For example, someone who gives an order to a hearer is committed to giving him the corresponding permission even if he does not give openly that permission. Such a weak illocutionary commitment shows itself in the fact that one cannot simultaneously give an order and denegate the permission. It is paradoxical to say “I order you and I do not permit you to go away”

Most propositions are true or false no matter whether they are expressed or not. All depends upon whether the things are in the world as they represent them. On the contrary, an illocutionary act cannot be performed unless a speaker attempts to perform it and expresses his intention in an utterance. A performed illocutionary act is always an illocutionary act that the speaker succeeds in performing. Unlike truth, success is then inseparable from thought. **For that reason, the theory of success of illocutionary logic is much more effective (finite and decidable) and innate than that of truth and satisfaction.** Certain illocutionary acts are *not performable* in the sense that they cannot be performed in any possible context of utterance. We know that *a priori* by virtue of competence and we never attempt to perform them. So we never speak literally when we use an *illocutionarily inconsistent* sentence like “I order and forbid you to come” which expresses a non performable illocution. We mean something other than what we say. However many *unsatisfiable illocutionary acts* (for example, many necessarily false assertions) are performable. So we can use with success *truth conditionally inconsistent* sentences like “Whales are fishes” expressing unsatisfiable illocutions.

As Wittgenstein pointed out, **meaning is well determined.** “It seems clear that what we

mean must always be sharp” (*Notebooks* p. 68)<sup>2</sup> So each speaker always knows which illocutionary act he primarily attempts to perform by his utterance. Moreover each speaker also knows which other illocutionary acts he would perform if his utterance were successful. He knows to which illocutionary acts he is strongly committed in each context of utterance. Whenever an illocutionary force  $F_1$  contains another force  $F_2$  (for example, the force of prediction contains that of assertion), we know that by virtue of competence so that each speech act of the form  $F_1(P)$  commits us to performing the corresponding act  $F_2(P)$ . Similarly, whenever we know by virtue of competence that a proposition  $P$  cannot be true unless another proposition  $Q$  is also true, illocutionary acts of the form  $F(P)$  whose force is primitive and non expressive strongly commits us to performing corresponding acts of the form  $F(Q)$ . Thus we cannot assert a conjunction  $P \wedge Q$  without asserting each conjunct  $P$  and  $Q$ . So the speaker’s strong illocutionary commitments are well known and, for that reason, well founded, decidable and finite.

Here are brief explanations of the basic principles of illocutionary logic.

**A. Each illocutionary force can be divided into six types of component which serve to determine the conditions of success and satisfaction of the illocutionary acts with that force.**

The notion of illocutionary force is too complex to be taken as a primitive notion. In illocutionary logic, it is derived from a few simpler notions. Thus, each force is divided into six types of components: an illocutionary point, a mode of achievement of illocutionary point, propositional content, preparatory and sincerity conditions and a degree of strength. **Two illocutionary forces  $F_1$  and  $F_2$  with the same components are identical.** For all illocutionary acts of the form  $F_1(P)$  and  $F_2(P)$  serve the same linguistic purposes in the use of language.

#### *Illocutionary point*

The principal component of each illocutionary force is its illocutionary point. For that point determines the *direction of fit* of utterances with that force. **There are exactly five illocutionary points that speakers can attempt to achieve in expressing a propositional content with an illocutionary force: the assertive, commissive, directive, declaratory and expressive points. They correspond to the four possible directions of fit that exist between words and things in language use :**

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<sup>2</sup> See also the *Tractatus logico-philosophicus* 3.251 and section 99 of his *Philosophical Investigations*.

*The words-to-things direction of fit.*

When the force has the words-to-things direction of fit, the illocutionary act is satisfied when its propositional content fits a state of affairs existing (in general independently) in the world. **Illocutionary acts with the assertive point** (e.g. conjectures, assertions, testimonies and predictions) **have the words-to-world direction of fit.** Their point is to represent how things are. Thus, in the case of assertive utterances, the words must correspond to the objects of reference as they stand in the world.

*The things-to-words direction of fit.*

When the force has the things-to-words direction of fit, the illocutionary act is satisfied when the world is transformed to fit the propositional content. **Illocutionary acts with the commissive or directive point have the things-to-words direction of fit.** Their point is to have the world transformed by the future course of action of the speaker (commissives) or of the hearer (directives) in order to match the propositional content of the utterance. In this case, the things in the world have to be changed to correspond to the words uttered in the performance of the illocutionary act. Promises, threats, vows and pledges are commissive illocutions. Requests, questions, invitations, orders, commands and advice are directives.

*The double direction of fit*

When the force has the double direction of fit, the illocutionary act is satisfied when the world is transformed by an action of the speaker to fit the propositional content by virtue of the fact that the speaker represents it as being so transformed. **Illocutionary acts with the declaratory illocutionary point** (e.g. resignations, definitions, condemnations and blessings) **have the double direction of fit.** Their point is to get the world to match the propositional content by saying that the propositional content matches the world. In successful declarations, objects of reference are then changed to correspond to words in the very utterance of these words. As Austin pointed out, in such utterances, we do things with words.

*The empty direction of fit*

For some illocutionary acts, there is no question of success or failure of fit and their propositional content is in general presupposed to be true. **Such are the illocutionary acts with the expressive point** e.g. thanks, apologies, congratulations and boasts. **They have the empty**

**direction of fit.** Their point is just to express a mental state of the speaker about the state of affairs represented by the propositional content. Thus, in expressive utterances, speakers do not attempt to establish a correspondence between words and things. They just want to manifest their feelings about the ways in which objects are in the world.

Each illocutionary point serves one linguistic purpose in relating propositions to the world. So different illocutionary points have different conditions of achievement. For that reason, the type of an illocutionary point  $\Pi$  is that of a function which associates with each possible context of utterance  $c$  and proposition  $P$  the value *success* when the speaker achieves the illocutionary point  $\Pi$  on proposition  $P$  in context  $c$  and the value *unsuccess* otherwise.

All forces with the same illocutionary point do not play the same role in the use of language. For example, orders, commands, requests, supplications, questions, recommendations and demands are directives to be made in different conditions.

(2) *Mode of achievement*

Illocutionary points, like most purposes of our actions, can be achieved in various ways. The mode of achievement of an illocutionary force determines how its point must be achieved on the propositional content where there is a successful performance of an act with that force. For example, in a command the speaker must invoke a position of authority over the hearer, whereas in a request he must give the option of refusal to the hearer. Such modes of achievement are expressed in English by adverbs such as “please” and “whether you like it or not” in imperative sentences. From a logical point of view, the mode of achievement of a force restricts the conditions of achievement of its point by requiring certain specific means or ways of achievement. Formally a mode of achievement  $\mu$  is a restriction function which has the same type as illocutionary points.

(3) *Propositional content conditions*

Many illocutionary forces impose conditions on the set of propositions that can be taken as propositional contents of acts with that force in a context of utterance. For example, the propositional content of a prediction must represent a fact which is future with respect to the moment of utterance. Such conditions are propositional content conditions. The type of a propositional content condition  $\theta$  is that of a function which associates with each possible context a set of propositions. Some propositional content conditions are determined by illocutionary point.

For example, all commissive illocutionary forces have as a condition that their propositional content represent a future course of action of the speaker. Other propositional content conditions are specific to certain illocutionary forces. For example, a proposal is a directive speech act with a *special* propositional content condition. To propose that a hearer carry out an action is to suggest that he accept doing that action. Propositional content conditions are expressed by syntactic constraints on the grammatical form of the clauses of elementary sentences. For example, the main verb of imperative sentences must be in the second person and in the future tense.

(4) *Preparatory conditions*

By performing an illocutionary act, the speaker also *presupposes* that certain propositions are true in the context of the utterance. For example, a speaker who promises to do something presupposes that his future action is good for the hearer. The preparatory conditions of an illocutionary force determine which propositions the speaker would presuppose if he were performing acts with that force in a possible context of utterance. So the logical type of a preparatory condition  $\Sigma$  is that of a function which associates with each context  $c$  and proposition  $P$  a set of propositions. Many, but not all, preparatory conditions, are determined by illocutionary point. “Yes” and “No” are often used in English to express preparatory conditions regarding the fact that the speaker gives a positive or negative to a previous question.

(5) *Sincerity conditions*

By performing an illocutionary act, the speaker also *expresses* mental states of particular modes about the fact represented by the propositional content. For example, a speaker who makes a request expresses a desire and a speaker who offers thanks expresses gratitude. The sincerity conditions of each illocutionary force  $F$  determine the *particular psychological modes* of the mental states that the speaker would have if he were sincerely performing an illocutionary act with *that* force. Thus, a sincerity condition is just a set of modes of propositional attitudes. Some sincerity conditions are common to all forces with the same illocutionary point. For example, each commissive force has the sincerity condition that the speaker intends to do what he commits himself to doing. But other sincerity conditions are independent of illocutionary point. For example, to agree to do something is to accept to do it with the *special* sincerity condition to the effect that one is in agreement with the person who has requested that action. In English, adverbs

like “alas”, “O.K.” express sincerity conditions. As I have pointed out [1990-91], the sets of modes of achievement, propositional content, preparatory and sincerity conditions have the formal structure of a Boolean algebra. Thus there are a neutral and an absorbent component of these types of components.<sup>3</sup>

(6) *Degree of strength*

The mental states which enter into sincerity conditions are expressed with different degrees of strength depending on the illocutionary force. For example, the degree of strength of the sincerity conditions of a promise is greater than that of an acceptance. A speaker who promises to do something expresses a stronger intention than a speaker who simply agrees to do it. Degree of strength is often orally expressed by intonation contour. The formal structure of the set of degrees of strength is that of an Abelian group.

The existence of preparatory and sincerity conditions is illustrated linguistically by *Moore's paradox*: it is paradoxical to attempt to perform an illocutionary act and to deny simultaneously one of these conditions. Thus utterances like "It is raining and I do not believe it" and "I promise to help you and I am absolutely unable to do it" are paradoxical and self defeating.

**B) The set of illocutionary forces of possible utterances is recursive**

**There are five primitive illocutionary forces.** These are the simplest possible illocutionary forces : they have an illocutionary point, no special mode of achievement of that point, a neutral degree of strength and only the propositional content, preparatory and sincerity conditions which are determined by their point. The five primitive forces are : (1) the *illocutionary force of assertion* which is named by the performative verb "assert" and realized syntactically in the declarative sentential type; (2) the *primitive commissive illocutionary force* which is named by the performative verb "commit"; (3) the *primitive directive force* which is realized syntactically in the imperative sentential type; (4) the *illocutionary force of declaration* which is named by the performative verb "declare" and expressed in performative utterances; and finally (5) the *primitive expressive illocutionary force* which is realized syntactically in the type of exclamatory sentences.

**All other illocutionary forces are derived from the primitive forces by a finite number**

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<sup>3</sup> The neutral propositional content condition associates with each context of utterance the set of all propositions and the absorbent propositional content condition the empty set.

**of applications of five simple logical operations on forces which consist in adding new components or in changing the degree of strength. There are four operations which add components; they consist in restricting the mode of achievement of the illocutionary point by imposing a new mode and in adding new propositional content, preparatory or sincerity conditions. (From a logical point of view, these operations are Boolean operations of intersection or of union.) The fifth operation on forces consists in increasing or decreasing the degree of strength. (It is like addition in an Abelian group.)**

Here are some examples of derived illocutionary forces. The illocutionary force of *promise* is obtained from the primitive commissive force by imposing a special mode of achievement of the commissive point involving the undertaking of an obligation. The illocutionary force of a *renunciation* has the special propositional content condition to the effect that it is a negative commitment. In the commissive use of renouncing, to renounce something is to commit oneself to pursue no longer certain activities. The illocutionary force of a *pledge* is obtained from the primitive commissive force by increasing the degree of strength of the sincerity conditions. The illocutionary force of a *threat* is obtained from the primitive commissive force by adding the preparatory condition that the future course of action represented by the propositional content is bad for the hearer. Finally, to *consent* to do something is to accept to do it with the added sincerity condition that one is reluctant to do it. As one can expect, it is possible to make a systematic analysis of illocutionary verbs of natural languages on the basis of this recursive definition of the set of possible forces. The same holds for force markers. Some syntactic types of sentence e.g. the declarative, imperative and exclamatory types express primitive forces. Others like the conditional and interrogative types express derived forces. For example, conditional sentences like “I could do it, if you want” and “He would like that” are used to assert with reserve and a weak degree of strength how things will be later if specified or unspecified future facts happen.

### **C. Basic definition of success**

The conditions of success of elementary illocutionary acts are a function of the components of their illocutionary force and of their propositional content. Thus an illocutionary act of the form  $F(P)$  is *successfully performed* in the context of an utterance if and only if, firstly in that context, *the speaker succeeds in achieving the illocutionary point of force F on proposition P with the mode*

of achievement of F, and P satisfies the propositional content conditions of F, secondly the speaker succeeds in presupposing the propositions determined by the preparatory conditions of F and finally he also succeeds in expressing with the degree of strength of F the mental states of the modes determined by the sincerity conditions of F about the fact represented by the propositional content P. Thus a speaker makes a promise in a context of utterance when (1) the point of his utterance is to commit himself to doing an act A (illocutionary point), (2) in his utterance, the speaker puts himself under an obligation to do act A (mode of achievement), (3) the propositional content of the utterance is that the speaker will do act A (propositional content conditions), (4) the speaker presupposes that he is capable of doing act A and that act A is in the interest of the hearer (preparatory conditions) and finally (5) he expresses with a strong degree of strength an intention to accomplish such an act (sincerity conditions and degree of strength).

A speaker can presuppose propositions which are false. He can also express mental states which he does not have. Consequently, successful performances of illocutionary acts may be *defective*. For example, a speaker can mistakenly make a promise that is not beneficial at all to the hearer. A speaker can also make an insincere promise that he does not intend to keep. In such cases, the performed promise is defective. The hearer could reply by pointing out such mistakes. From a logical point of view, an illocutionary act is *non defectively performed* in a context of utterance when it is successfully performed and its preparatory and sincerity conditions are fulfilled in that context. Austin with his notion of *felicity conditions* did not distinguish clearly between utterances which are successful but defective and utterances which are not even successful. In our terminology, we can say that an illocution is *felicitous* when it is successful, non defective and satisfied.

#### **D) The basic definition of satisfaction**

The notion of a condition of satisfaction is based on the traditional *correspondence theory of truth* for propositions.<sup>4</sup> Whenever an elementary illocutionary act is satisfied in an actual context of utterance, there is a *success of fit* or *correspondence* between language and the world,

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<sup>4</sup> One can find a first formulation of the classical theory of truth by correspondence in Aristotle's *Metaphysics*. See also G. Frege [1918-19] and A. Tarski [1944].

because the propositional content of the illocutionary act corresponds to an actual fact in the world. Thus, an elementary illocutionary act of the form F(P) is satisfied in an actual context of utterance only if its propositional content P is true in that context. However, there is more to the notion of a condition of a satisfaction than the notion of truth-condition. In order that an elementary illocutionary act be satisfied, the correspondence between words and things must be established following the proper direction of fit of its illocutionary force.

When an illocutionary act has the words-to-things direction of fit, it is *satisfied* in a context of utterance when its propositional content is *true* in that context. In such a case, the success of fit between language and the world is achieved by the fact that its propositional content represents a fact which exists (in general independently) in the world. On the other hand, when an illocutionary act has the things-to-words or the double direction of fit, it is *satisfied* in a context of utterance when its propositional content P is true in that context *because of* its performance. Unlike assertive utterances, commissive and directive utterances have self-referential conditions of satisfaction. An assertive speech act is *true* when its propositional content corresponds to an existing fact no matter how that fact came to exist. But strictly speaking, a pledge is *kept* or a command is *obeyed* only if the speaker or hearer carries out in the world a future course of action stemming from the pledge or the command. Thus truth predicates cannot be used to evaluate the satisfaction of speech acts with the world-to-words direction of fit like pledges or commands. A pledge or a command is not true or false. A pledge is either *kept* or *broken*. Similarly, a command is either *obeyed* or *disobeyed*. It is a mistake to attempt to reduce the theory of satisfaction of illocutionary acts to the theory of truth of propositions.<sup>5</sup>

#### **E) Success conditions of complex illocutionary acts**

Any successful performance of an illocutionary act in a context somehow restricts the set of possible contexts of utterance which are illocutionarily compatible with that context. By definition two contexts are *illocutionarily compatible* when all illocutionary acts performed in one could be performed in the other. As Searle and I pointed out, this accessibility relation is

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<sup>5</sup> Logicians and philosophers like Rescher [1966] and Belnap and Steel [1976] who have constructed earlier logics of speech acts such as the logic of commands and the logic of questions have neglected success and satisfaction in favour of truth in their analyses.

Brouwerian: reflexive and anti-symmetrical. A speaker succeeds in performing an illocutionary denegation of the form  $\neg A$  in a context when he attempts to perform that act and  $A$  is not performed in any possible context that is illocutionarily compatible with that context. Similarly, a speaker succeeds in performing a conditional illocutionary act of the form  $P \Rightarrow A$  in a context when he attempts to perform that conditional illocutionary act and he performs illocutionary act  $A$  in all possible contexts which are illocutionarily compatible with that context where proposition  $P$  is true.

## **Section 2. The logical form of propositional contents**

In my approach, propositions have a double nature. On the one hand, propositions are units of sense of a fundamental logical type that are expressed by sentences and have truth values. On the other hand, propositions are also the contents of conceptual thoughts such as illocutionary acts and attitudes which are representations rather than presentations of facts. As Frege already noticed, the two constitutive aspects of propositions are not logically independent. Thus, every proposition which is the sense of a sentence in a possible context of utterance is also the propositional content of the illocutionary act that the speaker would attempt to perform if he were literally using that sentence in that context. For example, the proposition which is the common sense of the sentences "John will help me" and "Please, John, help me" in a context of utterance is also the propositional content of the assertion or request that the speaker of that context would mean to make if he were using literally one of these sentences in that context.

Until now contemporary logicians have overall paid attention to the role that propositions play as senses of sentences rather than as contents of thought. Moreover, they have tended under the influence of Carnap to reduce propositions to their actual truth conditions in reality. Thus the type of a proposition in classical logic is that of a function from the set of possible circumstances (the term from Kaplan) to the set of truth values. (Circumstances can be moments of time, possible worlds, contexts, histories, etc. depending on the logic under consideration.) On this view, *strictly equivalent* propositions, which are true in the same possible circumstances are identified. However it is clear that most strictly equivalent

propositions are not substitutable *salva felicitate* within the scope of illocutionary forces. For example, the assertion that Paris is a city is different from the assertion that it is a city and not an irrational number even if their contents are strictly equivalent propositions. One can make the first assertion without making the second. Illocutionary logic requires then a finer propositional logic.

For this purpose I have formulated in *Meaning and Speech Acts* and later papers a natural logic of propositions in terms of predication so as to take into account the fact that propositions are always in principle expressible in the performance of illocutionary acts. My propositional logic is *predicative* in the very general sense that it mainly takes into consideration the acts of predication that we make in expressing and understanding propositions. My main objective was to construct a theory of truth that would be appropriate for enriching the theory of success and satisfaction of illocutionary acts. I have analyzed the logical form of propositions on the basis of the following principles:

**A) Propositions have a structure of constituents.**

As Frege, Russell, Strawson and others pointed out, understanding a proposition consists mainly of understanding which attributes (properties or relations) certain objects of reference must possess in the world in order that this proposition be true. In expressing propositions speakers refer to objects under concepts and we predicate of them attributes. They have in mind atomic propositions whose truth in a circumstance depends on whether these objects have in that circumstance the predicated attribute. Each proposition is then composed out of atomic propositions corresponding to predications. For example, the proposition that the pope is in Rome or Venice is composed of two atomic propositions: the first predicates of him the property of being in Rome, the second the property of being in Venice. It is true if and only if at least one is true.

**B) Propositional constituents are senses and not objects.**

As Frege pointed out, we cannot refer to objects without subsuming them under senses and without predicating of them attributes. Thus the formal ontology of propositional logic is realist and not nominalist. Referential and predicative expressions have a sense in addition to a possible denotation. Frege's argument against direct reference remains conclusive

if one accepts that propositions are contents of thought. As Kaplan nowadays admits quite frankly, Kripke's puzzle for belief is much more a puzzle for the theory of direct reference than for propositional attitudes. From the true premise that Babylonians did not believe that Hesperus is Phosphorus that theory concludes that they did not believe that Hesperus is Hesperus. Such an absurd conclusion is incompatible with the minimal rationality of competent speakers.

**C) Propositions are complex senses whose structure is finite.**

As is well known, human beings have restricted cognitive abilities. We can only use finitely long sentences in a context of utterance. Similarly, we only can refer to a finite number of different objects or predicate of them a finite number of attributes. Consequently, propositions which are the senses of sentences have a finite number of propositional constituents. Upon reflexion, this requirement of finiteness has important consequences both for illocutionary and intensional logics. A human being can only express a finite number of propositions in an act of thought. So a speaker can only perform a finite number of illocutionary acts in a possible context of use of a natural language. Furthermore, one must reject the standard objectual or substitutional analyses of quantification in propositional logic. For we do not refer to all the values that can be assigned to bound variables when we make generalizations.

**D) Carnap's explication of truth conditions is not adequate. It does not take into account the effective way in which we understand such conditions.**

To understand the truth conditions of a proposition is not to know its truth value in each possible circumstance, as most logicians tend to believe. It is rather to understand that it is true according to some possible truth conditions of its atomic propositions and false according to all others. We understand the proposition that whales are fishes without knowing *eo ipso* that it is necessarily false. It is a historical discovery that whales are mammals. In my view, to understand an elementary proposition is just to understand that it is true in a circumstance *i* if and only if the denotations of its attribute and concepts are such that its unique atomic proposition is true in that very circumstance. It is not to know whether or not that is true in that circumstance. We often express senses without knowing their denotation in the context of

utterance. We can speak of Jane's children without knowing who they are. From a cognitive point of view, atomic propositions have a lot of *possible truth conditions*: they can be true in all circumstances, they can be false in all circumstances, they can be false in one circumstance and true in all others, they can be false in two circumstances and true in all others, and so on. The type of possible truth conditions is that of functions from the set of all possible circumstances into the set of truth values. Among all possible truth conditions of each atomic proposition, there are of course its *actual Carnapian truth conditions* which gives as value the true in a circumstance if and only if the objects which fall under its concepts satisfy its attribute in that circumstance.

I propose to analyze inductively truth conditions by associating with each proposition with respect to any circumstance the unique set of possible truth conditions of its atomic propositions which are compatible with its truth in that very circumstance. As we will see, this explicates better the mechanism of truth understanding. Thus the truth of an elementary proposition in a circumstance is compatible by definition with all and only the possible truth conditions of its unique atomic proposition under which it is true in that very circumstance. As one can expect, the truth of propositional negation  $\neg P$  is compatible with all and only the possible truth conditions of its atomic propositions which are incompatible with the truth of  $P$ . And the truth of the modal proposition that it is universally necessary that  $P$  in any circumstance is compatible with all and only the possible truth conditions of its atomic propositions which are compatible with the truth of  $P$  in all circumstances. As Wittgenstein pointed out in the *Tractatus*, there are two limit cases of truth conditions. Sometimes the truth of a proposition is compatible with all possible ways in which objects could be. It is a tautology. Sometimes it is incompatible with all of them. It is a contradiction. In my approach, *tautologies* are propositions whose truth is compatible with all the possible truth conditions of their atomic propositions. And *contradictions* are propositions whose truth is compatible with none.

#### **E. The set of propositions is recursive.**

*Elementary propositions* are the simplest propositions. All other propositions are *more complex*: they are obtained by applying to simpler propositions operations which change

atomic propositions or truth conditions. Truth functions are the simplest propositional operations: they only rearrange truth conditions. Thus the conjunction  $P \wedge Q$  and the disjunction  $P \vee Q$  of two propositions  $P$  and  $Q$  have all and only the atomic propositions of  $P$  and  $Q$ . Such propositions only differ by their truth conditions. The truth of the disjunction is compatible with all the possible truth conditions of their atomic propositions which are compatible with the truth of at least one of the two arguments  $P$  and  $Q$ . But the truth of the conjunction is only compatible with all these possible truth conditions which are compatible with the truth of both  $P$  and  $Q$ . Unlike truth functions, quantification and modal, temporal and agentive operations on propositions change constituent atomic propositions as well as truth conditions. Thus by way of saying that it is necessary that God does not make mistakes we do not only predicate of God the property of not making mistakes. We also predicate of Him the modal property of infallibility, namely that He does not make mistakes in all possible circumstances.

**F. In order to be identical two propositions must be composed of the same atomic propositions and their truth in each circumstance must be compatible with the same possible truth conditions of their atomic propositions.**

This criterion of propositional identity is stronger than that of classical logics such as modal, temporal and intensional logics and the logic of relevance. Strictly equivalent propositions composed out of different atomic propositions are no longer identified. We do not make the same predications in expressing them. Unlike Parry [1933] I do not identify all strictly equivalent propositions whose atomic propositions are the same. Such propositions whose truth is not compatible with the same possible truth conditions of these atomic propositions do indeed not have the same cognitive value. For we understand in a different way their truth conditions. For example, we can believe the necessarily false proposition that whales are fishes. But we never believe the contradiction that whales are and are not fishes. We know *a priori* that it is false. Notice that my criterion of propositional identity is less rigid than that of intensional isomorphism of Cresswell [1975]'s hyperintensional logic. For all Boolean laws of idempotence, commutativity, distributivity and associativity of truth functions remain valid laws of propositional identity.

### **G. A new concise definition of truth**

In the philosophical tradition from Aristotle to Tarski true propositions correspond to reality. Objects of reference stand in certain relations in possible circumstances. Atomic propositions have then a unique truth value in each circumstance depending on the denotation of their attributes and concepts and the order of their predication. Their actual truth conditions are then well determined. However things could stand in many other relations in each circumstance. In addition to the ways in which things are, there are the possible ways in which they could be. We are not omniscient. In interpreting propositional contents of utterances we consider then a lot of possible truth conditions other than the actual truth conditions of their atomic propositions. We know *a priori* the actual truth conditions of few propositions. The truth of most propositions in most circumstances is compatible with many possible ways in which objects could be in them and incompatible with many others. Think about disjunctions, material implications, historic possibilities, future propositions, etc. However in order that a proposition P be true in a given circumstance, things must be in that circumstance as P represents them. Otherwise there would be no correspondence. Along these lines, I define truth as follows: a proposition *is true in a circumstance i* according to an interpretation if and only if its truth in that circumstance is compatible with the actual truth conditions of all its atomic propositions in that very interpretation. One can derive from that simple definition classical laws of truth theory.

### **H. A new relation of strong implication between propositions**

Human beings are not perfectionaly rational. We are often inconsistent. For example, we sometimes assert propositions whose truth is impossible. Furthermore, our illocutionary commitments are not as strong as they should be from the logical point of view. Thus, we assert propositions without asserting all their logical consequences. We are not omniscient and we even do not know all necessary truths. We therefore need in propositional logic a finer logical implication than C.I. Lewis' strict implication. A proposition *strictly implies* all others which are true in all possible circumstances where it is true. As we do not know which propositions are strictly implied by the propositional contents of our thoughts, illocutionary and psychological commitments which are based on truth conditions are not explainable in

terms of strict implication. Hintikka's epistemic logic according to which the set of propositional contents of our beliefs is closed under strict implication predicts far too many commitments.

Given my predicative analysis of the logical form of propositions, one can define a new relation of *strong implication* between propositions which is finer than Lewis' strict implication. A proposition P *strongly implies* another proposition Q when firstly, all the atomic propositions of Q are in P and secondly, the proposition P *tautologically implies* proposition Q, that is to say: all possible truth conditions assignments to atomic propositions which are compatible with the truth of proposition P in a circumstance are also compatible with the truth of proposition Q in that very circumstance. Unlike strict implication, **strong implication is cognitive**. Whenever a proposition P strongly implies another proposition Q we cannot express that proposition P without knowing *a priori* that it implies that other proposition Q. For in expressing P, we have in mind by hypothesis all atomic propositions of Q. We make all the corresponding acts of reference and predication. Furthermore, in understanding the truth conditions of proposition P we have in mind all possible truth conditions of its atomic propositions which are compatible with its truth in any circumstance. The same possible truth conditions of atomic propositions of P which are in Q are by hypothesis compatible with the truth of proposition Q in the same circumstance. Thus we know in expressing P that if P then Q.

### **Section 3. A new formulation of illocutionary logic**

Thanks to the new predicative propositional logic I have enriched the theory of success and satisfaction of elementary illocutionary acts. I have first formulated [1991] [1995] an illocutionary logic incorporating the minimal predicative logic of elementary propositions and of their truth functions. Next [2001,forthcoming] I have incorporated predicative logics of quantification, historic modalities, action and time in illocutionary logic. So we can now better explicate commissive, directive and declaratory illocutionary forces whose propositional content, preparatory and sincerity conditions are relative to time, action and abilities. And prove new valid

laws governing the success conditions of elementary illocutionary acts having such forces. We can also develop the theory of satisfaction thanks to the new theory of truth and derive illocutionary commitments based on truth conditions thanks to strong implication. Because illocutionary acts are by nature actions, the new logic of action of illocutionary logic applies to illocutionary acts as well as to the actions represented by their propositional content. I [1991] [1995] have adopted new principles in the formulation of illocutionary logic:

**A) Competent speakers are minimally rational.**

**As Greek and classic philosophers had anticipated, language is the work of reason. First, competent speakers are *minimally consistent*.** They never attempt to achieve an illocutionary point with a non empty direction of fit on a contradictory propositional content. They know *a priori* that such attempts would fail. Declarative, imperative, performative sentences whose clause express a contradiction (e.g. “Come and do not come!”) are both illocutionarily and truth conditionally inconsistent. They express illocutionary acts which are both unperformable and unsatisfiable. Similarly, competent speakers never attempt to achieve an illocutionary point with the things-to-words direction of fit on a tautology. They know *a priori* that tautologies are true, no matter what they do. And consequently that such attempts are pointless. So imperative and performative sentences like “Come or do not come!”, “I promise or do not promise to come” are illocutionarily inconsistent.

**Second,** whoever attempts to achieve an illocutionary point with a non empty direction of fit on a proposition P also attempts to achieve that point on all other propositions Q strongly implied by P which satisfy the propositional content conditions of that point. For he knows *a priori* that there would not be satisfaction otherwise. Thus, by way of promising to serve red or white wine a speaker *eo ipso* commits himself to serve wine. Such a promise, he knows, could not be kept otherwise.

**B) Illocutionary commitment is well founded.**

Human agents have restricted abilities. They can only make a finite number of attempts in each circumstance. So they only attempt to achieve illocutionary points on a finite number of propositional contents in each context. And they can only succeed in carrying out a finite number of intentional (verbal and non verbal) actions at each moment. Furthermore, they carry out all

their successful actions at a moment by way of making at that moment a basic attempt which generates (causally, conventionally or by extension) all these actions.<sup>6</sup> Thus speakers succeed in performing all their illocutionary acts in each context of utterance by way of attempting to perform a single primary illocutionary act in that context. In the use of language they make that basic attempt by way of uttering a sentence. Their basic speech act is then an utterance act which generates all their successful illocutionary acts given the meaning of their words and the facts that exist in the proper circumstance of their context of utterance. In the case of a literal utterance, where speaker meaning is identical with sentence meaning, the primary illocutionary act that the speaker attempts to perform is by hypothesis the literal illocutionary act expressed by the uttered sentence.

Whenever an utterance is successful, it is in performing the primary act that he performs all others in the context of utterance. In such a case, the speaker then performs all illocutionary acts to which the primary illocutionary act strongly commit him. So if he primarily makes a testimony then he also makes an assertion. But he can also perform other illocutionary acts. For example a speaker who makes an assertion about the future also makes a prediction. A successful literal utterance today of the declarative sentence “It will rain tomorrow” is both an assertion and a prediction. However the primary literal assertion does not strongly commit the speaker to the prediction. For tomorrow one can still make the same assertion by saying “It is raining today”. But one cannot any more make the prediction. For tomorrow that assertion will be about the present and not the future.

### **C. The law of identity for illocutionary acts**

Two types of elementary illocutionary acts are identical when they have the same propositional content and the same conditions of success. Two illocutionary denegations are identical when they are denegations of the same speech act. And two conditional speech acts are identical when their aim is to perform the same illocutionary act on the same condition.

Illocutionary acts are *natural kinds of use of language*. They serve linguistic purposes in relating propositions to the world with a direction of fit. Now different illocutionary acts should

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<sup>6</sup> See Goldman [1970] for the terminology of generation of actions and my paper [1999] on the basic logic of action.

have different linguistic purposes, and different linguistic purposes should be either achievable under different conditions or directed at facts represented or obtainable under different conditions. Thus an elementary illocutionary act can be identified formally with the pair containing its propositional content and the set of possible contexts in which it is performed. And the logical type of a force  $F$  is that of a function which associates with each proposition  $P$  the pair corresponding to illocutionary act  $F(P)$ . Given these remarks, there are three essential features in every illocutionary act: firstly, the (possibly empty) set of its antecedent propositions, secondly the non empty set of its constituent elementary illocutionary acts and thirdly the set of all contexts where it is successfully performed. So, for example, each conditional speech act of the form  $(P \vee Q) \Rightarrow A$  is identical with the conjunction  $(P \Rightarrow A) \& (Q \Rightarrow A)$ .

In order to formulate illocutionary logic I [1991] [1995] have used an artificial ideographical object language where the logical form of illocutionary acts is shown clearly on the surface by the grammatical form of formulas which express them. So one can see on the surface whether one illocutionary force marker expresses a stronger force than another. And one can also determine effectively on the basis of their syntactic forms which clauses express propositions related by strong implication. **The number of proper primitive notions of first order illocutionary logic is small. Its theoretical vocabulary contains a few new logical constants and syncategorematic expressions expressing universals of language use.**<sup>7</sup> Some of these universals are illocutionary: the five illocutionary points, the basic degree of strength, and, for each other type of force component, the neutral and absorbent components of that type and the various operations on components of illocutionary force. Other primitive notions of illocutionary logic are relative to propositions: identity, presupposition, expression of attitudes, functional application, truth functions, necessity, quantification, etc.

Many important notions of illocutionary and propositional logics like force, illocutionary acts, success and satisfaction conditions, performability, satisfiability, strong and weak illocutionary commitment etc. are derived from the few primitive notions by a series of rules of abbreviation. As one might expect, the syntactic form of a force marker is complex: it contains six constituents expressing the six different components of that force. Markers whose syntactic forms

are the simplest express primitive forces: they only contain logical constants expressing an illocutionary point, the neutral mode of achievement of illocutionary point, the neutral degree of strength and the neutral propositional content, preparatory and sincerity conditions. Other force markers contain longer constituent expressions expressing complex propositional content, preparatory or sincerity conditions or a greater or weaker degree of strength. Each formula expressing an elementary illocutionary act is a force marker followed by a clause.

**The new illocutionary logic that I have formulated on the basis of these principles contains a unified theory of success, satisfaction and truth.** It explains why speakers are *not perfectly rational* and in which way they are always *minimally rational*. It also explains why some unsatisfiable illocutionary acts are performable and why others are unperformable but satisfiable. There are four important logical *relations of implication* between speech acts. **First, some illocutionary acts have more conditions of success than others. They strongly commit the speaker to these other illocutionary acts.** For example, one cannot implore help and protection without making a request for help. **Second, some illocutionary acts have more conditions of satisfaction than others:** they cannot be satisfied unless the others are also satisfied. For example, whenever an elementary illocutionary act is satisfied, any assertion of its propositional content is *eo ipso* true. **Third, some illocutionary acts have conditions of success which are stronger than the conditions of satisfaction of others:** they cannot be successfully performed unless the others are satisfied. For example, by virtue of its double direction of fit, a successful declaration is *eo ipso* satisfied. **Finally, some speech acts have conditions of satisfaction which are stronger than the conditions of success of other speech acts:** they cannot be satisfied in a context unless the others are performed in that context. For example, given the self referential nature of the conditions of satisfaction of illocutionary acts with the things-to-words direction of fit, the satisfaction of directives and commissives requires their successful performance. Thus if a promise is kept, it has been made. Similarly, if an order is obeyed, it has been given. Illocutionary logic can prove all the fundamental laws governing these four kinds of relations of implication between speech acts.<sup>8</sup>

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<sup>7</sup> See D. Vanderveken [2001] « Universal Grammar & Speech Act Theory »

<sup>8</sup> See the Volume 2 of *Meaning and Speech Acts* and my paper [1995].

Contrary to what was commonly believed before, the set of illocutionary acts is much more logically structured by these logical relations of implication than the set of propositions is structured by material or even strict implication. For example, given the general definition of success and the recursive definition of the set of all illocutionary forces, there are a few valid laws of comparative strength for illocutionary forces which explain strong illocutionary commitments due to force. First, any force  $F_2$  which is obtained from another force  $F_1$  by the application of an operation is either stronger or weaker than that force. By definition, a force  $F_1$  is *stronger than* another force  $F_2$  when any illocutionary act of the form  $F_1(P)$  strongly commits the speaker to the corresponding illocutionary act of the form  $F_2(P)$ . For example, the forces of a prediction and of a testimony are stronger than the force of an assertion. Conversely, a force  $F$  is *weaker than* another force  $F'$  when  $F'$  is stronger than  $F$ . All the Boolean operations which consist in adding a new mode of achievement, a new propositional, preparatory or sincerity condition and the Abelian operation which consists in increasing the degree of strength generate stronger illocutionary forces. Second, the order of application of operations on forces is not important; it does not affect the success conditions. Finally, when an illocutionary force is stronger than another force, it can always be obtained from that force by a finite number of applications of such operations. The set of propositions is not structured so strongly by implication in standard logic. First, the applications of logical operations on propositions such as truth functions do not always generate implication. Second, the order of application of these operations is important; it often affects the truth conditions.

Furthermore, illocutionary logic has contributed to the theory of truth. It has discovered that the set of propositions is logically structured by a logical relation of strong implication much finer than all other relations of implication. Unlike strict implication, strong implication is anti-symmetrical. Two propositions which strongly imply each other are identical. Unlike Parry's analytic implication, strong implication is always tautological. Natural deduction rules of elimination and introduction generate strong implication when all atomic propositions of the conclusion belong to the premises. So a conjunction  $P \wedge Q$  strongly implies each conjunct  $P$  and  $Q$ . But a proposition  $P$  does not strongly imply any disjunction of the form  $P \vee Q$ . Strong implication is paraconsistent. A contradiction does not strongly imply all propositions.

Tautologies (and contradictions) are a special kind of necessarily true (and false) propositions. Unlike other necessarily true propositions, we know *a priori* that tautologies are true (and that contradictions are false). Finally, strong implication is finite and decidable.

#### **Section 4. THE GENERAL SEMANTICS OF SUCCESS AND SATISFACTION**

Contemporary logicians like Church [1951], Carnap [1956], Prior [1967], Belnap [1992,94], Kripke[1963], Kaplan [1979] and Marcus [1993] have used the resources of logical formalisms such as proof and model theory in order to formulate philosophical logics like modal, intensional and temporal logic and the logic of demonstratives and agency which are important for the analysis of propositional contents. Such logicians have contributed to the theory of truth and meaning. Some like Montague [1974], Cresswell [1973] contributed moreover to the foundations of the formal syntax and semantics of natural languages. Thus logical formalisms which were originally conceived by Frege, Russell and Tarski for the sole study of formal languages, were successfully used and improved to generate and interpret important fragments of ordinary language.

Like Montague, I think that there is no important theoretical difference between formal and natural languages. Mathematical formalisms are most useful to explicate meaning and understanding. However, unlike Montague, Davidson and many others, I do not believe that the single most important objective of semantics is to develop a recursive theory of truth. As I have explained, the primary units of meaning in the use and comprehension of language are not isolated propositions (or truth conditions) but complete illocutionary acts whose success and satisfaction conditions are not reducible to truth conditions. On my view, the primary objectives of semantics are then to formulate a theory of success and of satisfaction for illocutionary acts and not to just develop the theory of truth for propositions. For that purpose formal semantics must integrate a unified illocutionary and intensional logic.

Until now, traditional formal semantics has tended to construct the linguistic competence of speakers as their ability to understand the propositional contents of utterances. For that reason, most applications of formal semantics to actual natural languages have been restricted

until *Meaning and Speech Acts* solely to the interpretation of declarative sentences. Thanks to illocutionary logic formal semantics can now analyze other kinds of expressions like force markers and performative verbs whose meaning contributes to the determination of success and satisfaction conditions. For the first time in the history of logic, we now have formal means for interpreting without reduction all syntactic types of sentences (imperative, optative, conditional, exclamatory, subjunctive as well as declarative) expressing speech acts with any possible illocutionary force. In my approach, the semantic theory of truth advocated by Montague and Davidson for ordinary language is just the special sub-theory for assertive speech acts of the more general theory of satisfaction for speech acts with an arbitrary illocutionary force. On my account, linguistic competence is not separable from performance, as Chomsky thinks. On the contrary, it is essentially the speaker's ability to perform and understand illocutionary acts which are meanings of utterances.

Natural languages have a vast vocabulary for specifying illocutionary act types and propositions. But they are ambiguous and their grammatical conventions are so complicated that it is difficult to analyze directly the underlying logical form of attempted illocutionary acts. First, there is no one-to-one correspondence between illocutionary forces and performative verbs or force markers of natural languages. "Illocutionary forces are, so to speak, natural kinds of use of language, but we can no more expect the vernacular expressions to correspond exactly to the natural kinds than we can expect vernacular names of plants and animals to correspond exactly to the natural kinds"<sup>9</sup>. Thus, some possible illocutionary forces are *not actual* today in English. One can no longer repudiate one's wife and break off one's marriage by uttering words, as one could do in past civilisations in certain ways fixed by custom. Some possible illocutionary forces are actual in English but are not realized syntactically or lexicalized. For example, there is no marker in English for commissive illocutionary forces. One cannot directly commit oneself to doing something in English. One must speak non literally (by saying, for example, "I will do it") or performatively ("I promise to do it"). (In the first case, the speaker commits himself indirectly to an action by making a literal assertion. In the second, by making a literal declaration.) Moreover

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<sup>9</sup> Searle and Vanderveken, *Foundations of Illocutionary Logic*, Cambridge University Press, 1985, p.179

actual forces such as to boast are named by speech act verbs which have no performative use. Certain forces have an implicit mode of achievement of their point. Notice also that performative verbs like "tell" and "swear" are ambiguous between different illocutionary points. One can assertively tell that something is the case, just as one can make a directive in telling someone to do something. A second reason for distinguishing carefully between illocutionary forces, on the one hand, and performative verbs and illocutionary force markers, on the other hand, is that **natural languages are not perspicuous**. Many sentences of the same syntactic type (for example, declarative sentences like "They lost", "Frankly, they lost", "Of course, they lost", "Unfortunately, they lost" and "Alas, they lost") express illocutionary acts whose assertive forces are different. The same holds for illocutionary force markers. Sentential types like the declarative, imperative and exclamatory types express primitive forces. But others like the conditional and interrogative types express derived forces. To ask a question is to request the hearer to perform a future speech act that would give a correct answer to that question. Many performative verbs with a superficially similar syntactic behaviour (for example, "order", "forbid" and "permit") do not name illocutionary acts with the same logical form. The verb "order" names a derived directive illocutionary force. But there is no force of forbidding. For an act of forbidding something is just an order not to do it. Furthermore, an act of granting permission is the illocutionary denegation of an act of forbidding.

As Russell and the first Wittgenstein argued, one should not trust too much the surface structure of ordinary language in order to describe its logical structure. It is better to analyze indirectly the deep structure of ordinary sentences *via* their translations into a logically perfect perspicuous and disambiguous formal object language. **I have used for that purpose in the formal semantics of success and satisfaction<sup>10</sup> the ideographic language of a higher order unified illocutionary and intensional logic containing a revisited predicative propositional logic where strictly equivalent propositions are distinguished. All the logical constants and syncategorematic expressions of the ideographic object language of illocutionary logic express universal features of language** such as identity, success, truth, satisfaction, abstraction over contexts, functional application and  $\lambda$  abstraction. Because of this, the syntactic rules of formation and abbreviation of the ideal object language, the meaning postulates governing its

expressions in possible interpretations and the axioms and rules of inference of the corresponding axiomatic system make **universal claims about the deep structure of language**. Thanks to the new ideography, richer fragments of natural languages containing sentences of all syntactic types (declarative as well as non declarative sentences) can now be interpreted indirectly in logic. The first advantage of using an ideographic language is to have at one's disposal a theoretical vocabulary thanks to which any expressible illocutionary act can in principle be analyzed in a canonical way and be put into relationships with others. Another advantage is that, contrary to what is the case in ordinary language, the grammatical forms of its sentences reflect clearly on the surface the logical forms of the illocutionary acts that they express. As Montague [1970] pointed out, by way of translating clauses of ordinary sentences into the ideal object language of intensional logic, formal semantics clarifies the logical form of propositions and proceeds to a better explication of their truth conditions. Similarly, by way of translating force markers and performative verbs into the ideographic object language of illocutionary logic, formal semantics can exhibit the logical form of illocutions and proceed to a better explication of their success and satisfaction conditions.

I have developed the foundations of a formal semantics of success and satisfaction for elementary illocutionary acts in *Meaning & Speech Acts*. The first volume *Principles of Language Use* is introductory, the second *Formal Semantics of Success and Satisfaction* uses proof and model theories in order to formalize the theory. I am now writing a new book *The Logic of Discourse* where I formulate a richer illocutionary logic capable of expressing historic modalities, time and action and studying complex illocutionary acts like denegations and conditional speech acts and conversations with a discursive purpose such as consultations, interviews, deliberations and eulogies. I have adopted the following principles in my formal theory of meaning.

**I) There are two types of meaning.**

Most sentences contain expressions whose sense can vary in different contexts. They can serve to perform literally different illocutionary acts in different contexts. For example, each utterance of the sentence "Today it is raining" serves to assert the proposition that it is raining on the day of that utterance. So different assertions are made by uttering that sentence on different

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<sup>10</sup> See Volume 2 of *Meaning and Speech Acts*

days. In my conception of semantics, the *linguistic meaning* of a sentence in a semantic interpretation is then a function from the set of possible contexts of utterance into the set of illocutionary acts. On the other hand, the *meaning of a sentence in a context* is the particular illocutionary act that it expresses in that context. (It is the value that the linguistic meaning of that sentence associates with that context.) Thus, linguistic meanings apply to *sentence types*, whereas illocutionary acts apply to *sentences in contexts* or *sentence tokens*.

## II) Illocutionary act types (and not tokens) are the units of sentence meaning in contexts.

The illocutionary act type expressed by a sentence in a context of utterance can be defined counterfactually as the primary illocutionary act that the speaker would mean to perform in that context if he were using that single sentence and speaking literally. Such an illocutionary act type exists even if the speaker does not use that sentence or if he uses it unsuccessfully in that context. Just as syntax and semantics are primarily concerned with the formation and interpretation of sentence types, speech act theory is primarily concerned with the analysis of illocutionary act types. Linguistic competence is *creative*. We only use and understand finitely many sentence tokens during our life time. However, we are able to use and understand an *infinite* set of sentences including *new sentences* which have never been used before. Similarly, we are able to perform and understand infinitely many illocutionary acts including *new illocutionary acts* never performed before.

## III) Possible contexts of utterance consist of various features

For the purposes of general semantics, a *possible context of utterance* of a semantic interpretation consists of: one or several *speakers* and *hearers*, a *finite set of sentences* (uttered by the speaker(s) in that context), a *moment of time* and a *place* (which are the moment and place at which utterances are made in that context), a *history* containing moments of time before and after the moment of utterance<sup>11</sup> and a *background*<sup>12</sup> relative to the forms of life in which are engaged

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<sup>11</sup> Speech act theory requires a logic of branching time compatible with indeterminism and the liberty of human agents. In the logic of branching time, a *moment* is a possible state of the world at an instant and the temporal relation of anteriority/ posteriority is partial rather than linear. On the one hand, each moment is immediately preceded by at most one moment. On the other hand, several incompatible moments might immediately follow upon a given moment. A *history* is a maximal chain of moments of time. See Belnap & Green [1994] and Vanderveken [1999]. Unlike Belnap, I believe that contexts of utterance occur not only at a moment but also in a history. For the utterances and illocutionary acts which are made in a context are in general part of a discourse or

protagonists of the utterance. The force and propositional content of literal illocutionary acts are independent on background. Thus two utterances of the sentence like “Cut the grass!” express the same directive in contexts that differ at most by the fact that their speaker and hearer are engaged in a different background. However, as Searle [1980] pointed out, different denotations can correspond to the same senses in circumstances with different backgrounds. For example, in order to cut the grass, a hearer can use a lawnmower in an ordinary background where the purposes of contextual forms of life are esthetical (to make the lawn more beautiful). But he has to act differently when the purposes are to sell the lawn. (In that case he must transplant the grass.)

#### IV) **Speaker meaning is reduced to sentence meaning**

In semantics one assumes in so far as it is possible that speakers speak literally and mean what they say. Thus the primary illocutionary act that the speaker means to perform in a context according to a semantic interpretation is always the conjunction of all literal illocutionary acts expressed by the sentences that he utters in that context, when all such illocutionary acts are simultaneously performable. For example, if the speaker says “Can you pass the salt?” he refers to the salt and not the sugar and he means to ask a question about the hearer’s abilities and not to indirectly request him to pass the salt. Speakers who use an illocutionarily inconsistent sentence like “I am not myself today” know by virtue of competence that it is impossible to perform the literal illocutionary act. So they do not mean what they say. They mean something else. In the present formal semantics of literal meaning, I will consider that they do not mean anything.<sup>13</sup>

#### V) **There is a double semantic indexation in the understanding of meaning.**

Just as the same sentence can express different illocutionary act types in different contexts of utterance, the illocutionary act, which is the meaning of a sentence in a context, can have different success and satisfaction values in different contexts. For example, the present utterance "I am awake right now" is a successful and true assertion about Daniel Vanderveken in the present

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conversation which occur during an interval of time containing past and future moments of utterances. The discourse to which the speaker contributes by asking a question is not the same if the hearer answers one way or another. Furthermore, the interpretation of an utterance can depend on a future exchange between protagonists of the discourse. For considerations on the logical structure of discourse see D. Vanderveken [2001][forthcoming].

<sup>12</sup> The term and notions of background are from Searle [1979][1980].

<sup>13</sup> It is the purpose of formal pragmatics to study non literal meaning. See D. Vanderveken [1981] and [1997] for considerations on non literal illocutionary acts.

context. But that particular assertion about me is not true in other contexts where I am sleeping. Moreover, it is not often made in the use of English. **In my view, we interpret sentences and assign to them a meaning in two steps:**

-In the first step, we interpret a sentence as expressing certain *literal illocutionary acts* in various contexts of utterance. **In our interpretation, we determine the nature of literal speech acts from the linguistic meaning of that sentence and the relevant aspects of each context.** Sometimes, we understand the linguistic meaning of a sentence. But that sentence contains an expression such as "yesterday" or "he" whose sense is context-dependent. And we do not know the relevant feature of the context of utterance. In that case, we are not able to fully understand the illocutionary act that is the meaning of that sentence in that particular context. Expressions whose linguistic meaning is sensitive to contextual aspects of the same type (e.g. "tomorrow", "today" and "yesterday") can have the same sense in different contexts (taking place in following days). Thus non synonymous sentences of ordinary language can express literally the same illocutionary act in different contexts whose contextual aspects are related in certain ways. For example, the three sentences "It will rain tomorrow", "It is raining today" and "It has rained yesterday" serve to make the same assertion whenever they are used in three days running. By virtue of linguistic competence, we are aware of such meaning similarities.

- In the second step of our interpretation, each illocutionary act, that is the meaning of a sentence in a context, is then evaluated in its turn as having a *success* and a *satisfaction value* in various contexts of utterance. **From a philosophical point of view, the success and satisfaction values of an illocutionary act in a context are dependent on particular aspects** like the moment of time, history and background which constitute the **particular circumstance of that context.** Success and satisfaction values of an illocution can then vary from one circumstance to another in an interpretation. For example, the assertion that Paul will win is true in a circumstance if and only if Paul wins in another circumstance at a posterior moment in the same history and background. As Searle [1980] pointed out, the truth value of propositions and satisfaction values of illocutionary acts are relative to the background of contexts. The same holds for success values. However, as Kaplan anticipated, these values are always the same in contexts occurring in the same circumstance.

Just as we can understand an expressed proposition without knowing whether it is true in the context of utterance, we can understand the illocutionary act that a speaker attempts to perform in a context without knowing whether or not it is successful or satisfied. We often do not know whether the relevant facts exist in the circumstance of that context.

**VI There is a general ramification of the fundamental semantic notions of analyticity, consistency and entailment.**

As I said earlier, one must distinguish the two notions of illocutionary and truth conditional consistency in language. Similarly one must distinguish the notions of illocutionary and truth conditional analyticity. Some sentences e.g. Moore's paradoxical sentence "It is raining and I do not believe it" are *analytically unsuccessful*: they can never be used literally with success. Others like "I do not exist" are *analytically insatisfied*: they can never be used literally with satisfaction. Such notions do not have the same extension. Utterances of Moore's paradoxical sentence are not analytically insatisfied.

Just as illocutionary acts are related by four different kinds of implication, sentences are related by *four different kinds of entailment* in the deep structure of language:

*-Illocutionary entailment*: A sentence such as "I request your help" *illocutionarily entails* the sentence "Please, help me!" : it expresses in each context of use an illocution that the speaker could not perform in that context without also performing the illocution expressed by the second sentence.

*-Truth conditional entailment*: A sentence like "Please, eat!" *truth-conditionally entails* the sentence "You are able to eat" : it expresses in each context of use an illocution which could not be satisfied in that context unless the illocution expressed by the second sentence is also satisfied.

*-Illocutionary entailment of satisfaction*: A sentence *illocutionarily entails the satisfaction of* another sentence when it expresses in each context an illocution whose successful performance in that context implies the satisfaction of the illocution expressed by the other sentence. For example, performative sentences illocutionarily entail their own satisfaction.

*-Truth conditional entailment of success*: Finally, a sentence *truth conditionally entails the success of* another sentence when it expresses in each context an illocution whose satisfaction in that context implies the successful performance of the illocution expressed by the second sentence.

For example, imperative and performative sentences truth conditionally entail their own success.

The four preceding relations of entailment exist between sentences when the illocutionary acts that they express in a possible context of utterance always have *in that very context* related success or satisfaction values. However illocutionary acts which are the meanings of two sentences in a given context of utterance also have success and satisfaction values in all other possible contexts. And one can quantify over all these values. So there are four strong relations of entailment of each type in the logic of language, for example: *strong illocutionary and strong truth conditional entailment*. A sentence *strongly illocutionarily entails* (or *strongly truth conditionally entails*) another sentence when it expresses in any context an illocutionary act which has the same or more success (or satisfaction) conditions than the illocutionary act expressed by the other sentence in the same context. As one can expect from Kaplan's logic of demonstratives, not all cases of illocutionary or truth conditional entailment are strong. For example, the sentence "John asserts that he won yesterday" both illocutionarily and truth conditionally entails (but not strongly) the sentence "John reports that he won yesterday".

Notions of illocutionary consistency, analyticity and entailment had been completely ignored until now by formal semantics. However, as I pointed out in *Meaning and Speech Acts*, all the ramified notions that I have defined exist for all kinds of sentences (whether declarative or not) in ordinary language. And they do not coincide in extension. For example, performative sentences illocutionarily entail (but not truth conditionally) corresponding non performative sentences. By assigning entire illocutionary acts as semantic values to sentences in contexts, semantics can better describe the logic of language.

On the basis of the principles that I have just explained, I have pursued Montague's program and developed in Volume 2 of *Meaning and Speech Acts* a general formal semantics of success and satisfaction that is a generalization and extension of Montague's intensional logic. For my purposes, I have enriched the conceptual apparatus of intensional logic in various ways. I have used as ideal object language the ideographic object language of a higher order illocutionary logic that contains that of intensional logic. As I said earlier, all logical constants or syncategorematic expressions express primitive notions which are *material or formal linguistic universals* relative to force or propositions. I have define all other fundamental illocutionary and intensional notions by

rules of abbreviation. I have explained how to translate the different syntactic types of declarative, conditional, imperative, performative, exclamatory, optative, subjunctive and interrogative sentences into the ideal language. In order to stratify the universe of discourse, I have enriched formal ontology by admitting the new primitive type of success values in addition to those of truth values, individuals and attributes. I have changed the definition of the logical type of propositions in the predicative way. Furthermore, I have adopted the double semantic indexation advocated above. So illocutionary acts are the meanings of sentences in contexts of interpretations. I have defined recursively truth, success and satisfaction by induction on the length of clauses and sentences in canonical notation. And I have axiomatized all generally valid laws of my illocutionary logic. Incidentally, the axiomatic system is a conservative extension of that of Gallin for Montague's intensional logic.

Unlike Montague, who tended to consider formal semantics and universal grammar as parts of mathematics, I think like Searle, Chomsky and others that philosophy, linguistics and psychology have to play an important role in their development. Natural languages are human languages whose speakers have creative and restricted abilities. We are able to learn them and to understand rapidly the meanings of their sentences. We know by virtue of linguistic competence the logical forms of sentences whose utterances are analytically unsuccessful. We also know just by understanding them which sentences are related by illocutionary entailment. So we need a very constructive formal theory of meaning that accounts for such facts. I have formulated general semantics so as to make decidable innate notions. Here are a few important laws of the logic of language that I have stated.

There are sentences whose utterances are analytically successful and satisfied, for example, "I am speaking" and Descartes' *Cogito* "I am thinking now". They do not however express necessarily and *a priori* true propositions. Contrary to what was commonly believed in logical positivism, the notions of analytic, *a priori* and necessary truth do not coincide in extension. Kaplan [1979] has noticed that analytically true sentences like "I am here now" are not necessarily true and Kripke [1971] that necessarily true sentences like "Water is H<sub>2</sub>O" are not *a priori true*. All their distinctions hold and can be generalized at the illocutionary level and for all types of sentences. Kaplan also discovered the existence of analytically false sentences e.g. "I do not exist"

which are however truth conditionally consistent. Similarly, Moore's paradoxical sentence "It is raining today and I do not believe it" is analytically unsuccessful but it is illocutionarily consistent. Nothing prevents my making that assertion tomorrow by saying "It was raining yesterday and I did not believe it".

Because of the minimal rationality of competent speakers, semantic paradoxes like the liar paradox do not really occur in the use of language. Contrary to what Russell and Tarski believed, natural languages are not inconsistent because they contain paradoxical sentences like "This assertion is false" and, let me add, "I will not keep this promise", "Disobey this order", etc. It is not necessary to prevent the formation of such sentences in logic in order to avoid paradoxes. As I have shown, one can translate without inconsistency these paradoxical sentences in the object language of general semantics. For their self referential utterances are not both satisfied and unsatisfied, as logicians wrongly believe. When their logical form is well analyzed, it appears that in order to be satisfied such utterances would have to be successful. And this is impossible given the law of minimal consistency of speakers stated above. As Prior [1971] anticipated, the liar's paradox is of the form "There exists a proposition P such that I assert P and P is not true and P is that very proposition, namely that there is a proposition P such that I assert P and P is not true" Whenever the logical form of the liar's paradox is so analyzed, one discovers that it is a false assertion that no one can make. For its propositional content is a pure contradiction incompatible with all possible truth conditions. Sentences expressing that paradox are then both illocutionarily and truth conditionally inconsistent.

The general semantics of success and satisfaction studies inferences from a new point of view. An inference is *valid* whenever it is not possible for its premises to express illocutionary acts with certain success or satisfaction values unless its conclusion also expresses an illocutionary act with the same or other success or satisfaction values. So general semantics can formulate valid laws of inference for all types of sentences. It can study *practical inferences* whose conclusion has the things-to-words direction of fit as well as *theoretical inferences* whose conclusion has the words-to-things direction of fit. Until now, contemporary logic and formal semantics have been confined to the study of the sole *assertive use* of language and to the interpretation of *declarative sentences*. They have studied the *valid forms of theoretical inferences* whose premises cannot be

true unless their conclusion is also true. However, we are not able to make all such valid theoretical inferences by virtue of linguistic competence. For we understand propositions without knowing how they are related by strict implication. Moreover, there are many other kinds of inference relative to success and satisfaction conditions. From the point of view of universal grammar, the most interesting principles of valid inferences are those that speakers have necessarily internalized in learning their mother tongue. They reflect the very nature of *human reason* and constitute a decidable *natural logic* that is part of linguistic competence. The logical semantics of speech acts is able to study these principles. For example, we are all able by virtue of competence to make practical and theoretical inferences whose premises cannot be successful and satisfied unless their conclusion is also successful and satisfied. For example, when we understand the request expressed by a literal utterance of the imperative sentence "Please, come and see me tomorrow at home or in the office!" , we infer automatically that the speaker also means to request "Please, come and see me tomorrow!" For we know by virtue of our competence that it is not possible to make the request expressed by the premise without making that expressed by the conclusion. And we also know by competence that it is not possible to grant the first request without also granting the second.

Here are a few characteristic laws of the semantics for speech acts.

A sentence of the form [d]f(p) strongly entails both illocutionarily and truth conditionally the shorter sentence f(p) when its complex marker [d]f contains an additional expression d naming a force component or serves to increase the degree of strength. Thus, sentences like "Come, please!", "Frankly, come!", "Come urgently!" and "O.K. come!" strongly illocutionarily and truth conditionally entail "Come!"

The interrogative type of sentence contains the imperative type. So any interrogative sentence e.g. "Is it raining?" is synonymous with the corresponding imperative sentence "Please, tell whether or not it is raining".

Exclamatory sentences are the weakest type of sentences. For every successful performance of an illocutionary act is an expression of the attitudes determined by its sincerity conditions. So every elementary sentence e.g. "Alas, he is dead" strongly illocutionarily entails corresponding exclamatory sentences e.g. "How sad that he be dead!" But the converse is not

true. For there is more in the performance of an illocution with a non empty direction of fit than a simple expression of attitudes.

Performative sentences are the strongest type of sentence. For every successful declaration is felicitous. So performative sentences like “I ask you if it is raining” strongly illocutionarily entail corresponding non performative sentences “Is it raining?”. But the converse is not true. For we need not make a declaration in order to perform an illocutionary act. We can directly perform it. So the so-called performative hypothesis is false. Performative sentences are not synonymous with corresponding non performative sentence.

Every explicit performative sentence e.g. “I hereby condemn you to death” strongly entails both illocutionarily and truth conditionally the corresponding declarative sentence “You are condemned to death”. For any successful declaration is an assertion . But the converse is not true. So performative utterances are not assertions to the effect that the speaker performs an illocutionary act as G.J. Warnock [1973] and others claim.

Only the rules of introduction and elimination of natural deduction whose premises contain the clauses of their conclusion generate strong illocutionary entailment between sentences whose marker expresses a non expressive force. Thus “Do it today or tomorrow!” illocutionarily and truth conditionally entail “Do it!” But “Do it today!” does not illocutionarily entail “Do it today or tomorrow!” (Such laws had been formulated in an *ad hoc* way in *Foundations*.)

Unlike applied semantics of empirical linguistics, general semantics is above all a logico-philosophical theory of language. It deals mainly with the logical form of meanings of possible utterances of sentences of possible natural languages and only incidentally with particular actual realizations of these possibilities in living languages. Its primary objective is to articulate and exhibit the deep logical structure common to all possible natural language. As Cocchiarella [1997] pointed out, my program is also an attempt to articulate what classical philosophers called *a priori* forms of thought. “In any case, the notion of a *lingua philosophica* containig both an intensional and illocutionary logic is no longer merely a program but has already in many respects been realized.”

As Searle and I pointed out, illocutionary logic is transcendental in Kant’s sense. Any conceptual thought is in principle expressible by means of language in the performance of an

illocutionary act. Consequently, necessary and universal semantic laws determining the conditions of possibility of successful meaningful utterances reflect *a priori* forms of thought. It is impossible to have a thought whose expression would ever violate such laws. General semantics aims to do more than stating empirical laws governing meaning and understanding. In the tradition of transcendental philosophy, it also aims to fix limits to thought. According to Wittgenstein [1922] the logic of language fixes limits to thought indirectly by fixing limits to their expression in language. In general semantics, limits of thought show themselves in language in the fact that sentences of certain logical forms can never be used literally with success. We can of course refer to impossible thoughts, describe their forms and even attribute them to others. But we can never really entertain these impossible thoughts in the first person, just as we cannot speak and think literally when we make analytically unsuccessful utterances. Along the same lines, the fact that sentences of certain logical forms illocutionarily entail others shows that we cannot have certain thoughts without having others. So language reflects the *a priori* order of thought.

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