

# *Ordinary Expressions Have No Exact and Systematic Logic*

*Some Remarks on Strawson's Contributions to Logical Theory*

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**Abstract:** The general slogan in the title of this paper (which is taken from Strawson 1952, 57) gives a general, but nevertheless accurate, expression of Strawson's view concerning the nature of formal logic per se in relation to natural language. What is at stake here is the extent to which the formal methods and the formal semantics of contemporary symbolic logic can render the meanings of natural language expressions. Strawson sets up an agenda for logical theory which, although rather dated for a logic text, is what one naturally expects from an introduction to elementary formal logic and a systematic analysis of certain crucial metalogical concepts, most notably entailment. However, my own reading is that Strawson's approach to logic makes a lasting contribution to understanding the inner workings of natural language through his critical discussion of the limits of the formal renderings of the semantics of natural language expressions via canonical first-order notations. One can recognize in this critical attitude towards the limits of formal methods a consistent generalization of Strawson's own strategy from his critical response to Russell's theory of descriptions.

In my paper I shall focus on certain examples which illustrate the general slogan that characterizes Strawson's views on the nature of logic in connection with ordinary language and talk.

**Keywords:** logical analysis, natural language, limits of formalization, semantics.

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Let me begin with the big picture. Strawson's original contribution to the development of logical theory consists, roughly, in his anti-formalist stance and critical attitude toward the adequacy of the application of formal methods of logical analysis to ordinary language. In

the golden age of mathematical logic, Strawson develops a dissenting view towards the kind of logic which is appropriate for understanding the workings of the natural language, and his views are motivated against a background which is constituted by the contrast between formal logic and the logic of ordinary discourse. The best starting point to present and understand his views on the matter is the chapter "Two Kinds of Logic" from *Introduction to Logical Theory* (ILT) (Strawson 1952). There, Strawson describes and evaluates the limits of formal methods in logic – in what concerns their applications to natural language – as compared to the systematic, albeit non-formal, analysis, of ordinary discourse.

Strawson's second kind of logic differs from the formal, deductive logic which originates with Aristotle and has come to our time through the work of Frege, Russell, Whitehead, Hilbert, Gödel, Tarski, Kripke and many other mathematically minded philosophers and logicians. However, what Strawson means by this is not a disparaging attitude towards formal logic. Strawson's new kind of logic is not either the inductive logic of the empirically minded philosopher-scientists, or the abductive kind advocated by early pragmatists. Strawson aims at a logic of ordinary language usage. So in fact, he has a broader view of the scope of logic:

Side by side with the study of formal logic, and overlapping it, we have another study: the study of the logical features of ordinary speech. The second study can illuminate the first, and can by it be illuminated or obscured.

(1952, 231)

*ILT* seeks to offer a more profound view of the relationships between the two kinds of logic. The most general and important moral to draw from this study is that "simple deductive relationships are not the only kind we have to consider if we wish to understand the logical workings of the language" (ibid., 231).

But what should be the profound reason of the old and the new deductive logic not being adequate for doing the job that one reasonably expects from a logic to do? What is missing from deductive logic which is packed with "entailment rules"? The new kind of logic for ordinary language usage should "supplement", according to Strawson, the old logic with characteristic "referring rules". For the philosopher, a logic which consists only in entailment rules cannot be complete with respect to the expressive power of natural language usage.

What is inadequate, then, in the formal procedures when applied to the workings of a natural language? Strawson's argument is this: the subject matter of formal logic is essentially connected with natural language, and therefore the formal development of various systems of mathematical and mathematically oriented philosophical logics should not lose contact with the workings of natural language. Since logic is concerned with the mechanics of the necessary transmission of truth from the premises of a given argument to its conclusion, and since there is an intimate connection between truth and meaning, the meanings of the premises and the conclusion of the arguments should also be taken care of by logic (by the referring rule). Thus, an adequate system of logic for ordinary language should come up with rules for constituting the meanings of those utterances. Roughly, the passage from the old kind to the new kind of logic looks like this: the subject matter of logic is essentially connected with the workings of a natural language; logic's concern should be the manner in which truth flows from the premises of an argument to its conclusion; but what is true or false is a particular use of a declarative sentence; so logic should cope with declarative sentences as used on particular occasions; this motivates the requirement that entailment rules of the old logic be supplemented by the referring rules governing the ordinary-language.

Consequently, this new kind of logical analysis has to acknowledge many more dimensions of the natural language than the formal apparatus of the old deductive logic is ready to accept, to deal with, and to absorb, and it also has to enrich the tool-kit of formal analysis with devices that one does not use in formal logic. "The complete logical picture" that will do full justice to ordinary language will emerge from this addition of the new referring rules to the entailment rules of the mathematically oriented formal logic.

*ILT* is a subtle and complex challenge that a philosopher of ordinary language poses to the limits of logical formalization. And Strawson sees the relative merits and limits in both logical enterprises:

What we shall not find in our results [of logical analysis of the ordinary discourse, M. D.] is that character of elegance and system which belongs to the constructions of formal logic. It is none the less true that the logic of ordinary speech provides a field of intellectual study unsurpassed in richness, complexity, and the power to absorb. (ibid., 232)

Now, it's time to narrow the angle and take a closer view of the subject. Let me first say a few words about the aims and the contents of

Strawson's book. *ILT* has three main purposes: (i) to introduce the reader into formal logic; (ii) to give a proper analysis of the main concepts of the philosophy of logic, notably the concept of entailment; and (iii) to evaluate to what extent the tools and methods of formal logic are fit for the task of rendering the meanings of natural language expressions. The parts of the book which pursue the first and the second aim are pretty much dated; there are nowadays many logic texts which give full coverage of both semantics and proof theory for first-order logic and at least some of the main metalogical results. However, the last aim is the one which gives to the *ILT* the specific flavor that makes it worth reading and studying today. And incidentally, the third goal of this text is the one which generalizes Strawson's main point in his celebrated response to Russell's theory of singular definite descriptions.

The slogan from the title of my paper, viz. "ordinary expressions have no exact and systematic logic" (*ibid.*, 57), encompasses Strawson's general attitude and orientation. To understand what Strawson means by this, one needs to cover a bit of background. Strawson envisions the main task of the formal logician as that of coming up with sets of general rules of inference or types of entailment. But this move already brings in a divergence between the formal logic rules of certain expressions, which are taken as logical constants in the language under consideration, and the logic of their natural language counterparts. The counterparts may have natural uses which conflict with the logician's rules. What is the proper diagnosis here? Strawson makes the following comment:

This does not mean that the logician's rules are incorrect, nor does it mean that ordinary language is inconsistent. It means simply that a word which has different logical uses in ordinary speech may be assigned a single standard logical use in logician's rules. (*ibid.*, 56)

So, in general, what the slogan might mean is that one cannot exhaust what natural language expressions convey across different contexts within ordinary discourse by an abstract meaning assignment which is governed by the norms of the formal logician. The richness of the vernacular cannot be totally absorbed into the frugal paraphrases of logical canonical notations.

But things get even worse: the gap between the meanings of the logical constants as they are taken care of by the logicians' rules and their would-be natural language renderings widens more and more due to the legitimate strive of the formal logician for system and generality. The

motivating force behind formal logic from its very beginning at least as a modern, mathematical subject, has been to seek a few formal principles which, when applied to a small number of initially chosen forms of valid inference would yield the other valid forms of inference, ideally all and only those forms of valid inference.

But in this ideal also looms large the danger of formal logical language no longer being adequately connected with its natural language interpretation. And the original connection between the idiomatic expressions and their formal counterparts, whose primary motivation should be that the latter codify the logical relationships between the former, is thereby severely broken. And Strawson comments:

and it is this ideal of systematization which has most profoundly influenced the modern development of logic; so profoundly that the original conception of simply codifying the most general principles we appeal to in making our logical appraisals has pretty well been lost sight of. For the expressions of ordinary speech, such as 'if', 'and', 'not', 'all', 'some', 'or', which figured so prominently as logical constants in the inference-patterns of early logicians, lack, as they are ordinarily used, not only the stability, but also the simplicity, of meaning which would make them the ideal candidates for the roles of constants in logical systems of the now desired kind. (ibid., 57)

The formal logical constants have a life of their own, as it were. They are assigned the sort of meanings that are required by the needs of the formal system. And they lose contact with the richness and the variety of the meanings of their would-be natural counterparts. The formal logician looks for an exact and systematic logic of those constants. However, his method is severely limited from the outside, because

he cannot give the exact and systematic logic of expressions of everyday speech; for these expressions have no exact and systematic logic. What he can, and does, do is to devise a set of rules which satisfies his requirements, and, at the same time, while not doing full justice to the complexities of ordinary usage, and diverging from it in many ways, does touch ordinary usage at some vital points. (ibid., 57)

So, coming back again to the main slogan, viz. "*Ordinary expressions have no exact and systematic logic*", we can see that the slogan itself has no unique and exact meaning. For it may mean any of the following: (i) the expressions are ambiguous, or (ii) the expressions are vague, or (iii) the expressions are so rich in meaning and so fluent in their interconnectedness that they cannot in principle be absorbed by the formal rules of

logic. Reading carefully through Strawson's own examples and commentaries, we might say that he is rather referring to the richness of the ordinary language option; however the examples also leave room for considering the ambiguity case as well.

At this point, it is desirable to have an inventory of the different ways in which, according to Strawson, ordinary language as used diverges from the depicted language through the canonical notations (logical forms) of the interpreted first-order language. Quine's critical review, 'Mr. Strawson on Logical Theory', is very useful in this regard. In his paper, Quine emphasizes in a clear and convincing way the strengths and also the weaknesses of Strawson's critical approach to the formal methods of logic as applied to natural language. This inventory of Strawson's most interesting and important contribution can be conveniently summarized thus.

(i) The many-few relation thesis. There are many uses of ordinary language expressions that are put into correspondence with very few forms of the formal language.

(ii) The thesis - the lack of parallelism between ordinary language connectives and their formal counterparts. The logical vocabulary has ordinary uses which do not correspond to any classical logical laws governing the corresponding logical items. Thus, one can easily see that there isn't any easy and straightforward correspondence between truth-functional constants and the ordinary words that the constants purport to codify. To take only a few examples, think of the cases of identifying "and" with "&", and "if... then..." with " $\rightarrow$ ", respectively. Strawson points out that some of them are only misleading whereas others are plainly wrong. Here is Strawson's more general diagnosis which is formulated with regard to the conjunction "and":

We shall be entitled to say that such an identification is definitely wrong, wherever we find that the ordinary conjunction, in its standard or primary use, does not conform to a logical rule which holds for the truth-functional constant with which it is identified, and whenever we find, conversely, that the truth-functional constant does not conform to a logical rule which holds for the ordinary conjunction in its standard or primary use. But we shall also find that even the most mistaken of these identifications has a point: we shall find not only some degree of formal parallelism... but some degree of interpretation of meanings of the interpreted expressions of the system and of ordinary speech respectively. We could not, of course, find the latter without the former.

(ibid., 78)

So, what's wrong with the identification of "and" with "&" is that in natural language "and" can perform tasks that "&" cannot in the corresponding interpreted formal language. For instance, it can be used in a collective way to couple nouns, or adjectives, or adverbs, whereas "&" can only be used to couple separate sentences. Then again, "and" could convey information about temporal order, whereas "&" does not usually have this temporal value.

(iii) The truth-value gaps thesis. The lack of parallelism between "if... then..." and " $\rightarrow$ " is even more striking. This divergence also illustrates what has been called "truth-value gaps". The usual formal definition of " $\rightarrow$ " as a truth-functional connective (which makes a sentence true provided either its antecedent is false or its consequent is true or both) does not work for the "if... then..." sentences in ordinary discourse. One usually does not raise the issue of the truth-value of a material conditional in natural language as a whole; the consequent is thought of as conditionally true or false given the antecedent. One naturally uses an "if... then..." statement in circumstances in which one does not know whether the sentence corresponding to the antecedent is true or false, or even if one believes it to be false one still considers that a logical passage from that sentence to the consequent is still sound or reasonable. So, whereas the " $\rightarrow$ "-sentence is trivially true in cases in which the antecedent is false, the "if... then..." sentence is not trivially true in those circumstances.

(iv) The existential import thesis. The idea of the truth-value gaps occurs again in the context in which Strawson defends the traditional syllogistic apropos the question of existential import. His view is that when a categorical statement contains a term, with an empty extension, the question of the truth-value of the sentence, containing that term, does not arise.

(v) The thesis – the referential vs. the predicative role of a singular term. The distinction between the referential and the predicative role of a singular term, which is very important for ordinary language, connects well with the doctrine of truth-value gaps. If a singular term, which is used referentially, purports to designate an object, which does not exist, the issue of what is truth-value of the sentence in which the term occurs does not arise. Here again the ordinary discourse diverges from modern standard formal logic, for in the latter there is nothing to correspond to the referential role of terms, in Strawson's sense, and there is no room for such truth-value gaps either.

(vi) The instability of truth-value thesis. The variation of the truth-values of sentences which contain indexicals or tensed verbs is another major aspect in which ordinary language sentences differ from the canonical notation of standard formal logic.

At the end of the day, what are we going to make of Strawson's views and critical arguments about the inadequacy of formal logic to the uses of ordinary language? Can the formal logician defend his trade? Must she/he do so?

First on a very general note: Strawson's criticism of formal methods as they apply to ordinary language is of considerable importance. He opens wide a realm of problems, questions and ideas that put into a limpid correlation the formal languages of logic with ordinary language. Strawson does a genuine service and justice to the logical analysis of ordinary language. He is rightly celebrated for being a forerunner of pragmatics.

But, then again, one may legitimately ask whether his criticism targets logical theory *per se*? Do his examples and comments show some inherent flaws in the body of contemporary logical theory? Here, I imagine that many will try to figure out an answer depending on which side of the relation between natural language and formal languages of logic they are on. Mathematically minded people will say, after pondering the difficulties of putting words into canonical logical notations "so much for natural language". However, people persuaded that natural language is fine as it is, will condemn the logical formalisms for not being flexible and fluid enough to be able to absorb the riches of the natural language, and they will say "so much for the limited expressive power of formal languages".

At any rate, let's notice that Strawson's main pieces of criticism do not count against the formal character of logic *per se*, for what he targets through his critical examples and comments are the manoeuvres and the paraphrasing techniques through which the sentences of ordinary language are forced to fit into the Procrustean bed of the canonical first-order logical notations. Formal logic proper does not include the operations, which belong in the applied logic, whereby the natural discourse turns into logical forms via interpretation and paraphrase.

And finally, as to the two kinds of logic issue, my comment is this: Strawson only apparently advocates two different logics. It does not seem to me that he would buy into a genuine pluralist position concerning the problem which logical system/systems is/are correct. At the end of the day, Strawson wants a logical system which does full justice to

ordinary discourse, and this is the old entailment – rule-based system supplemented with reference rules. But why not follow the suggestion conveyed by the question that he raises, namely “why two kinds of logic”? Why not more than two?

Some recent authors (e.g. J. C. Beall and Greg Restall in 2006) defend the view in the philosophy of logics called logical pluralism, arguing that the notion of logical consequence (either model-theoretic or proof-theoretic) is systematically ambiguous. There is no single deductive logical consequence relation which corresponds to this notion of logical consequence. There is a plurality of consequence relations which are equally legitimate as the one which is defined in the semantics of the classical first-order logic. Thus the notions of modal, or intuitionistic or relevance logical consequence are as legitimate as the notion of classical logical consequence. There’s no such thing as a unique correct logic. Rather, each logic defines its proper concept of semantic or syntactic logical consequence. The plurality exists not only because there are different classic and non-classic logical languages. The phenomenon occurs even within the same logical language and it is triggered by the kind of interpretation or the class of models which set the semantic parameters of the logical language. And now, if pluralism be the philosophical position about the right kind of logic, then there is no problem accepting what Strawson says about different systems of logic and to carry on his suggestions. Pluralists will accept the lesson, happily endorsing the ensuing teachings, provided there is a way in which a logic of ordinary language use can be properly constructed.

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