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ENTHYMEMES AND THE PROBLEM OF LOGICAL FORM

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Abstract. In what follows, I distinguish between the problem of logical constants with respect to formal languages and the problem of logical form for a natural language, trying to offer a clear and intuitive statement of the second problem. I focus on a pragmatic approach to the problem of logical form, arguing that even if we had solid criteria to distinguish between logical and semantic truths, we would still have to devise additional criteria to distinguish between complete and enthymematic arguments for such an approach to be successful.

Keywords: logical form, natural language, pragmatic approach, logical and semantic truths.

I take it that the problem of logical constants might be roughly expressed by the following question: ‚What are the criteria for putting some of the symbols used in a formal language in the class of logical constants?' The use of inference rules to characterize logical constants and the appeal to a permutation invariance criterion are still debated in the recent literature on this subject[1]. I believe, however, that we should distinguish the previous question from another one: ‚How can we choose what particular words and phrases should we be looking at to make the logical form of all sentences in a natural language explicit?' The relation between the problem of logical constants and the philosophical problem raised by this second question, which I would call „the problem of logical form", does not seem clear[2]. However, even if

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[1] The inferentialist characterization of logical constants was suggested by Gentzen 1969, criticized by Prior 1960 and further developed by Hacking 1979 and Došen 1994. The permutation invariance criterion is due to Mostowski 1957 and Tarski 1986. Improvements were proposed by van Benthem 1989 and Sher 1989, 1991, critiques were issued by McGee 1996 and Gómez-Torrente 2002, being answered by Feferman 1999 and Sher 2003.

[2] If we assume that ordinary reasoning is expressed (at least in part) in our linguistic behaviour, then the debate between Harman 1984, 1986, 2009 and Field 2009 on the connection between logic and ordinary reasoning seems to be pertinent to the point I am making here.

the two problems are related, a separate treatment of the problem of logical form does not seem impossible.

Since the distinction between the problem of logical constants for a formal language and the problem of logical form does not seem to be sufficiently taken into account in the existing literature[3], I will try, in the first part of my paper, to offer a clear and intuitive statement of the problem as I see it. The end of my exposition will point to a known difficulty faced by a generic pragmatic approach to this problem[4]. The difficulty in case stems from our lack of a distinction between logical and semantic truths which does not already suppose the notion of logical form.

In the second part of my paper I offer my contribution to the problem of logical form. This is not, however, a positive contribution, but a negative one. I try to show that in order to solve the problem of logical form not only that we have to find a way to distinguish between logical and semantic truths, but we also have to overcome another difficulty. The additional difficulty, I try to argue, comes from our inability to distinguish between complete and enthymematic arguments.

1. In order to better understand the problem of logical form with respect to a natural language, let us consider the two following arguments:

(1) Andrew and Barry are brothers. Therefore, they are relatives.
(2) There is thunder and there is lightning. Therefore, if there is thunder, then there is lightning.

Now, (1) can be represented in formal standard notation[5] as follows:

(3) Bab |- Rab

Using the Polish notation, we could also represent (2) as:

(4) Kpq |- Cpq

[3] The only indication of such a distinction is in Sher 2003, p. 197. Sher seems to distinguish the problem of logical constants for a formal language from what I call the problem of logical form. She claims, however, that „a characterization of logical constants for natural languages [...] is largely an empirical enterprise, the enterprise of determining what terms speakers actually use as logical constants, either commonly or in certain contexts or circumstances." In my opinion, ‚The speaker S uses x as a logical constant.' requires further conceptual analysis.

[4] Such an approach, I believe, is exemplified by Brandom 1994 and Brandom 2008 (especially chapters 2 and 5). I do not assume that the pragmatic approach is the only possible, but I consider it the best suited, from the existent literature, for the problem of logical form.

[5] My use of formal notation has, of course, only an analogical role here.

Since ‚B', ‚R', ‚K' and ‚C' are all functional expressions (according to Frege[6]), the problem is to say why some of them are logical and some are extralogical.

It is, of course, irrelevant that ‚B' and ‚R' range over a domain of objects, while ‚K' and ‚C' take sentences as their arguments. A different argument could help us understand this:

(5) There is thunder only because there is lightning. Therefore, there is thunder only if there is lightning.

It might be acceptable to infer from the statement that an event *c* is the sole cause of another event *e* that *c*'s occurrence is a necessary condition for *e*'s occurrence. Nevertheless, we do not want to say that „because", or even „only because" are logical constants.

Suppose we pursue a pragmatic approach to the problem of logical form. Leaving aside for now the minimalism requirements which are sometimes associated with it[7], I take it that the main strategy of such an approach is to start by asking what use do we have for logic and identify logical words as those expressions which fulfill that use. Since we are concerned with the natural language here, the use of logic, in this respect, seems to be to distinguish valid from invalid arguments as they are expressed in a natural language[8]. According to this approach, then, our attempt to make such a distinction explicit will show us which of the words used in an argument display its logical form.

For instance, we would like to say, perhaps, that the following argument is not valid:

(6) This object is entirely green. Therefore, this object is not entirely red.

Indeed, it can be argued that (6) is an enthymeme, missing the premise that if an object is entirely green, then it is not red. If you want, you could express this premise in disjunctive form: „Either an object is green, or it is red.".

We would normally contrast this to the following argument:

(7) This object is entirely green. Therefore, it is not the case that this object is not green.

[6] See, for instance, Dummet 1973, ch. 2.

[7] See, for instance, Harman 1972. The minimalism requirement seems to be related to a different question from the one I am interested in here, namely: ‚What are our basic logical concepts?'.

[8] It can be reasonably argued that we should restrict our interest to deductive arguments only, but the concept of validity used here is not identical to that of formal validity. This distinction is made clear, for instance, in Sainsbury 1991, pp. 5-43.

The second argument, we would like to say, is valid, since if we regard it as an enthymeme, then its missing premise is a logical truth: „Either an object is green, or it is not green."

Such an answer might enable us to say that ‚not' and ‚it is not the case that' express the logical form of our sentences, while ‚green' and ‚red' are not in the same position.

One more example might clarify this point. Let us consider another pair of arguments[9]:

(8) Andrew is Bob's ancestor. Bob is the ancestor of Carol. Therefore, Andrew is Carol's ancestor.
(9) Ovidius is identical with Publius. Publius is identical with Naso. Therefore, Ovidius is identical with Naso.

In order to be valid, (8) needs the premise that the ancestral relation is transitive, while (9) needs the premise that the identity relation is transitive. Since we consider the latter to be a logical truth, while we believe the former is not a logical truth, we conclude that „identical with" shows the logical form of the sentences appearing in (9), while „ancestor (of)" does not show us anything about the logical form of the sentences appearing in (8)[10]

We want to say, in other words, that

(10) $(\forall x)(\forall y)(\forall z)[(Axy \,\&\, Ayz) \rightarrow Axz]$

is a semantic truth (an analytic statement of the second type, according to Quine 1951), while

(11) $(\forall x)(\forall y)(\forall z)[(Ixy \,\&\, Iyz) \rightarrow Ixz]$

is a logical truth (an analytic statement of the first type, according to Quine 1951).

Now, this conclusion seems to be based on a distinction between two kinds of analytic truths and if we take Quine and Wittgenstein seriously[11], we seem to face a serious problem, since there is no way in which we could distinguish between the two kinds of analyticity involved here (and between analytic and synthetic statements, for what is worth).

[9] The following example is a modified version of an example given in Smook 1998, p. 196.
[10] Given the role of the abstract ancestral relation in Frege's thought (see, for instance, Frege 1879, §26 and Frege 1884, §83), one could still wonder why this is so.
[11] See, for instance, Quine 1951 and Wittgenstein 1929.

2. Nothing is surprising up to this point. However, I would like to add one more observation. The sketched approach does not assume only that a distinction between semantic and logical truths is possible, but also that we can distinguish between complete arguments and their enthymematic form. This latter distinction, I believe, is also disputable.

Another pair of arguments might be useful to make this point:

(12) If it rains, then I take my umbrella. It rains. Therefore, I take my umbrella.
(13) If it rains, then I take my umbrella. If it does not rain, then I take my umbrella. Therefore, I take my umbrella.

We would ordinarily want to say of (12) that it is not an enthymeme. The argument from (13), however, seems to lack the premise that:

(14) Either it rains, or it does not rain.

This missing premise we regard to be a logical truth. However, a similar logical truth could be thought as missing from (12):

(15) If it rains and I take my umbrella when it rains, then I take my umbrella.

Now, we can say that (14) and (15) are both logical truths. The problem here is not to distinguish a valid argument from an argument which assumes a semantic truth. What we want is to distinguish between valid arguments which are complete (as they are) and incomplete arguments which assume only logical truths.

One last example might help us see that this is a different problem from that of distinguishing between logical and semantic truths. Suppose that we encounter the following argument:

(16) This object is here. Therefore it is not the case that this object is not here.

If we consider it an enthymeme, we could supplement its missing premise in at least two different ways:

(17) This object is here or this object is not here.
(18) Either this object is here, or this object is not here.

While (17), which is logically equivalent to the conditional „If this object is here, then it is not the case that this object is not here", contains an inclusive disjunction, (18) contains an exclusive disjunction. Both (17) and (18) are usually considered logical truths, but even so, they are different logical truths. Indeed, (17) could be seen as an instance of the principle of excluded

middle, while (18) could be regarded as an instance of the principle of bivalence[12]. On the first account, (16) shows that words and phrases expressing an inclusive disjunction are logical constants, while on the second, (16) shows that words and phrases expressing an exclusive disjunction are logical constants. At this stage, the minimalism requirements could either indicate that we should consider the inclusive disjunction as primitive, or they could point out that we should take the exclusive disjunction as primitive[13].

This dilemma could be of course avoided, at least for this case, by saying that (16) is not an enthymeme. However, we seem, one more time, to lack solid criteria to distinguish between (16) and (13)[14].

I confess I do not have a solution to this problem. I have only tried to present it and argue that it represents a genuine difficulty. The distinction between complete and enthymematic arguments needed here must not involve, of course, any notion of logical form. I believe this makes the problem difficult, but not necessarily insoluble. What I wanted to argue was only that the success of a pragmatic approach to the problem of logical form does not depend only on drawing a distinction between logical and semantic truths, but also on solving the above mentioned problem.

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[12] See Béziau 2003, for example.

[13] The everyday use of the „and/or" grammatical conjunction seems to suggest the following definition of the inclusive conjunction in terms of the exclusive disjunction: $p \vee q =^{def} (p \& q) \oplus (p \oplus q)$.

[14] In some cases, the answer to the question whether an argument is complete or not is not even intuitive. Consider, for instance, the argument having (18) as its premise and (17) as its conclusion. Should we say that the conditional „If (18) than (17)." is its missing premise, or not? The answer does not seem obvious. In addition, Carroll 1895 seems to suggest that any argument can be considered an enthymeme.

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