

## Truth in Context

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William G. Lycan stands out among functionalists for his defense of a truth-theoretic semantics as part of a psychological theory of verbal behavior. His aim, as he picturesquely puts it, is to "reconcile the crystalline abstract character of formal semantics with the rough, gritty, smelly realities of human linguistic activity" (Lycan, 1984, p. 43)<sup>1</sup>. I propose here to test Lycan's Metatheory against some cases that raise profound issues for any theorist who, like Lycan, takes the syntax of individual sentences to be represented in the brain.

### The Metatheory

Let me begin with a quick comment on three features of Lycan's Metatheory—truth conditions, context, and causality. (See Lycan's *Precis* for a fuller sketch of his Metatheory.)

#### *Truth-Conditions*

The notion of a sentence's truth condition lies at the core of the idea of linguistic meaning. The primary bearers of truth are semantic representations (SRs), which yield the truth conditions for the surface sentences that they generate via syntactic transformations.

Despite its importance, the notion of a truth-condition is more complicated than it might at first appear. This is so, because the grammatical structure of an SR "will *not* mirror that of the target sentence." (p. 30, emphasis his) To accommodate this fact, Lycan distinguishes between 'pure' and 'impure' T-sentences. Pure T-sentences are instances of "'p' is true iff [if and only if] p;" for example, "'Snow is white' is true iff snow is white" is a pure T-sentence. Contrasted with pure T-sentences are impure T-sentences, whose right-hand sides are philosophical analyses. For example, on a Davidson's analysis of action sentences, the following is an

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<sup>1</sup> Further references to this work will be indicated only by page numbers.

impure T-sentence: “‘Jane walks’ is true iff there is an event  $e$  and  $e$  is a walking, and Jane is  $e$ ’s protagonist”<sup>2</sup>.

To the extent that T-sentences are impure—and Lycan takes all theories to yield impure T-sentences (p. 282)—the truth condition of a surface sentence may not be obvious to competent speakers of the language. (It thus seems that, to the extent that T-sentences are impure, understanding a language can not be a matter of knowing the truth-conditions of sentences in any ordinary sense.)

### Context

In order to reconcile the pervasive context-dependence of the meaning of sentences in natural languages with the view that the truth conditions of such sentences are given by formulas in a formal language, Lycan relativizes the truth predicate to a context and invokes an assignment function  $\alpha$ , which takes “a sentence and a context as input and yields a sequence of denotata for the sentence’s deictic elements in that context” (p. 54). For example,  $\alpha$  assigns the speaker in context  $C$  as the value of “I” in  $C$ . Actually, the assignment function  $\alpha$  takes as argument elements of SRs rather than elements of surface sentences. Then, the fully explicit truth condition is given by an SR-on-an-assignment.

Lycan handles all contextual elements that affect the truth condition of an utterance by generalizing from his treatment of indexicals. When adequately refined, he claims, the methods used to handle deictic elements will “apply just as readily to context-dependence that arises from our orientation in the *Lebenswelt* as they will to the less glamorous cases of deixis that they were originally designed to accommodate” (p. 201). The assignment function (together with fuzzy logic, about which I have nothing to say<sup>3</sup>) is there to accommodate everything from indicators, demonstratives, and proper names to vagueness (‘Ted is getting bald’), restrictions on quantifiers (‘All students must pass the swimming test’), hidden parameters (‘the woman on the left’—left of what?), even context-dependence arising from “conversational purposes” (pp. 195–196; 55).

I shall call features of the context that can affect the truth condition of a sentence ‘semantically relevant features,’ and I shall say that a semantically relevant feature is ‘provided for’ in an SR iff there is a variable or parameter explicit in the SR, to which the assignment function can assign the appropriate value. In the example, ‘I am tired now’, the speaker and the time are semantically relevant

<sup>2</sup> Gilbert Harman notes that pure T-sentences can be derived from impure T-sentences together with logical truths of the metalanguage, e.g. supposing Davidson’s analysis to give the correct logical form, (M) “John walked iff there is an event  $e$  and  $e$  is a walking and John is  $e$ ’s protagonist” is such a logical truth. (Tomberlin, (1988), makes a similar point.) In response to Harman, Lycan points out that we need some independently reliable way to derive pure T-sentences; we could not know that (M) is a logical truth without already knowing that the theory we are testing is true or at least we must have done some “Davidsonian truth-theorizing on our metalanguage” (p. 299, n. 4).

<sup>3</sup> Bernard Kobes (1987) argued against the interpreting E. Rosch’s data as showing that there are degrees of membership in classes.

features, and they have been provided for in the SR by '(“I”, C)' and '(“now”, C)', which supply arguments for  $\alpha$ . Since all semantically relevant features must be explicitly provided for in the appropriate SRs, there is a fact of the matter as to how many parameters a given SR has. Also, note that hidden parameters are hidden only at the surface; they are fully explicit in the SR.

### *Causality*

We think in SRs in that SRs have physical realizations in the brain, which serve as inputs to mechanisms that in part cause utterances: “Any psychological realist (i.e. any semanticist who intends his theory as a functional description of a real mechanism hypothetically operating with speakers),” Lycan says, “presumably holds that in some sense we think in SRs—that some or all of our mental operations are defined over formulas of the canonical idiom that underlies the public languages we speak” (p. 62). Since we utter English sentences, not logical formulas, there occur within speakers actual, psychologically real operations that transform SRs into the surface sentences that we utter (p. 62).

Physically realized SRs are causally efficacious (p. 290). If the psychologically real connection that Lycan requires between surface structure and logical form (p. 61) is causal, then, on the assumption that causes precede effects, every contextual factor that can affect the truth value of a surface sentence is represented in the brain before the production of the utterance. As Lycan says, “In each case the semantic interpretation or truth-conditions of the SR will be completely determined by  $\alpha$  before it begins its trip to the surface” (p. 58).

Assignment functions again are the key. What is realized in the brain are at least the syntactic structures of SRs, along with those aspects of the semantics (if any) that are independent of context<sup>4</sup>. Then all the semantically relevant features are provided for in the following sense: For each semantically relevant feature of a possible context, there is a (physically realized) parameter that can serve as an argument for  $\alpha$ .

In sum, the linguistic and psychological sides of Lycan's theory are linked by the idea of an SR, a notion which has a dual purpose: Linguistically speaking, SRs are logical antecedents of utterances; it is by virtue of an SR's truth-conditional structure that the utterance has the truth condition that it has. Psychologically speaking, SRs are causal antecedents of utterances; it is by virtue of an SR's being realized in the brain in a certain way that the utterance with that truth condition is produced.

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<sup>4</sup> I have argued in Baker (1987) that, independent of context, semantically interpreted items can not be coherently attributed to the brain (as long as brain states are construed 'narrowly').

### Two Constraints on SRs

Implicitly this view seems to impose two constraints on what can count as a semantic representation:

- (C1) An SR with  $n$  parameters is syntactically distinct from an SR with  $n+1$  parameters.
- (C2) Syntactically distinct SRs have physically distinct realizations in the brain.

I take these constraints to be entirely uncontroversial. (C1) just says that tokens of the same syntactic type have the same number of parameters. (C2) is just another way of saying that syntax is represented in the brain, that syntax is psychologically real. Taken together, (C1) and (C2) entail that SRs with different numbers of parameters have physically distinct realizations in the brain (if they are realized in a brain at all)<sup>5</sup>. Let us test Lycan's view in two cases, both mentioned by Lycan himself.

#### Test Case I

Lycan notes: "hidden parameters are rife in English. Sometimes they are uncovered by substantive theories of the world: Harman argues for a 'society' parameter underlying moral predicates; . . . relativity theory betrays a frame-of-reference parameter in even the most solid-seeming spatial and temporal terms such as 'simultaneous'" (p. 302; n. 5).

So, consider various sincerely and assertively uttered tokens of the English sentence,

- (1) An event on the sun is not simultaneous with one's seeing it.

The first utterance is by a nineteenth century Newtonian physicist; the second utterance is by a twentieth century Einsteinian physicist. Do both the sentence tokens have the same truth conditions?

(A) Suppose not. Then, presumably, the Einsteinian's sentence has a hidden frame-of-reference parameter that the Newtonian's sentence lacks. I can think of two approaches to explaining such a difference: one would be to relativize truth conditions to theory; the other would be to take (1) as ambiguous and to construe the two utterances to be different 'readings' of (1). If truth conditions were relativized to theory, then (1) would not be true or false simpliciter. Such a move would seem to knock all the realism, psychological as well as linguistic, out of Lycan's view.

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<sup>5</sup> Notice that I am not supposing that Lycan takes truth conditions to be solipsistic (he explicitly takes them to be nonsolipsistic, p. 320), only that he takes syntax to be solipsistic to the extent that there are differences in brains representing SRs with different numbers of parameters, hidden or not. If there are no such differences in brains of people whose utterances are derived from SRs with different numbers of parameters, then I see no warrant for supposing that the SRs 'occur' in brains.)

The other approach to explaining a difference in truth condition in the two tokens of (1) is to treat them as having different 'readings', that is, to treat them as having different syntactic derivations or transformational histories. Although Lycan provides an example of such ambiguity, his example of lexical ambiguity (of 'bank') is not helpful in the present case. For Lycan treats 'bank<sub>1</sub>' and 'bank<sub>2</sub>' as lexical primitives; but it is implausible that 'simultaneous<sub>1</sub>' and 'simultaneous<sub>2</sub>' are lexical primitives when the differences between them are a matter of physical theory.

In any case, I think that there is a decisive objection to supposing that sincerely and assertively uttered tokens of (1) have different truth conditions. For if tokens of (1) have different truth conditions and hence have different SRs, then I do not believe that SRs can play their assigned psychological role in an account of utterances that posits "SRs occurring somehow in the brain, along with the encapsulating functionalist psychology" (p. 219).

Suppose that the Newtonian physicist teaches her child that the sun is far away and that it takes some time for light to reach earth from the sun. From that information, and in total ignorance of any physical theory, the child says, "So, an event on the sun is not simultaneous with one's seeing it." Suppose that the same episode occurs between the Einsteinian physicist and her child. Both children produce utterances of (1). Suppose that the children are molecular duplicates. In that case, if we suppose that the tokens of the Newtonian and Einsteinian children have different truth conditions, at least one of the constraints is violated.

Here is why. It follows from the constraints on SRs that SRs with different numbers of parameters must have different physical realizations. If the children's utterances of (1) have different truth conditions—if the Einsteinian child's utterance, but not the Newtonian child's utterance, has a hidden frame-of-reference parameter—then the SRs that produced the utterances have different numbers of parameters. But since the children are molecular duplicates, the realizations of the SRs in their brains are physically identical. In this example, SRs with different numbers of parameters would fail to have different physical realizations.

I see only two possible avenues of response for a proponent of the view that the Einsteinian's and Newtonian's tokens of (1) have different truth conditions.

(i) Deny that the children could be molecular duplicates; this move is easily blocked by altering the story to a twin-earth case and by filling in tedious detail—the child and her twin are both raised in a carefully controlled environment, etc.

(ii) Deny that the children's sentences inherit the truth conditions of the parents' sentences; in that case, some other account of the truth conditions of children's tokens is urgently needed; for this move would seem to make it miraculous that anyone ever learned a language. So, the supposition that the tokens of (1) produced by the children differ in truth condition seems untenable.

(B) So, consider the other alternative. Suppose that the utterances of (1) by the Einsteinian and Newtonian physicists have the same truth conditions. Do the SR tokens have a frame of reference parameter? Presumably so, since (we think) the Einsteinian theory is correct. Again, we have difficulty with the psychological side

of the theory: we need an account of the representation of a frame of reference parameter in the Newtonian's head. How did it get there?

Furthermore, how is the Newtonian's SR, on the alternative according to which it has a frame of reference parameter, related to epistemic states—for example, must we say (absurdly) that the Newtonian fails to understand her own theory, that not even Newton knew what he was talking about<sup>6</sup>?

In addition to raising such imponderable questions, the current alternative has another bizarre consequence. Since, on the current alternative, the correct theories are already represented in our brains before they are 'discovered', psychology would become the fundamental science. This suggests that to find out about the physical world, we should consult psychologists and linguists, not physicists.

Thus, it remains unclear to me how Lycan's view can handle utterances of (1) by the Newtonian, the Einsteinian and the two children; we seem to come to grief whether we assume that the utterances are produced by SRs of the same type or not.

It is important to see that the problems in the case of 'simultaneous' are not just confined to scientific terms or to cases of theory change. The problem generalizes to all impure T-sentences, the truth conditions of which need not be recognizable by competent speakers. Suppose that Davidson's account of action sentences is correct. Then everybody (even one who eschews an ontology of events) who says 'Jane walks' must have an SR of the form 'There is an event *e* and *e* is a walking...'. How does a child acquire this SR rather than what the parent takes to be the logical form of 'Jane walks,' say, *Fa*? How does the right SR get transferred to the brain of the child? These difficulties, along with the ones raised by the molecularly identical children, arise for a wide variety of cases, nonscientific as well as scientific<sup>7</sup>.

## Test Case II

The second kind of case what I want to consider is also suggested by Lycan. Concerning the singular term 'the woman on the left', Lycan asks, Left of what? and says "The woman on the left stole it' will be decoded into an SR containing a hidden parameter.  $\alpha$  will take this parameter as argument and assign it a contextually appropriate value, such as another woman" (p. 58). Let us consider sincerely and assertively utterances tokens of the English sentence.

(2) The woman on the left stole my purse.

First, suppose that Jane Jones is at a police line-up to identify the thief who snatched her purse. She says, "The woman on the left stole my purse." The sergeant asks, "On the left of what?" Jones answers, "On the left of the tallest woman." I

<sup>6</sup> And heaven help Aristotle: "Those things are called *simultaneous* without qualification and most strictly which come into being at the same time" (Categories, 14b25). Did he have a frame-of-reference parameter in his brain?

<sup>7</sup> Consider how Lycan might describe a relativist and an absolutist who both teach their molecularly identical children that slurping soup is impolite.

think (although I can not be sure) that this is at least good evidence that the hidden parameter in Jane's utterance of (2) is a 'tallest woman' parameter.

Now consider another context. Jane Jones is at the Super Bowl when her purse is lifted. She hails a passing police officer, spots the thief in the crowd, and then informs the officer, "The woman on the left stole my purse." The officer responds, "On the left of what?" Jones says, "On the left of the boy and girl locked in an ardent embrace." Is there a single SR associated with both tokens of (2)?

(A) Suppose not. Perhaps, whereas in the first case, there was only one hidden parameter (a 'tallest woman' parameter), in the second case, there were several hidden parameters—one that picks out a particular boy, one that picks out a particular girl, where the pair satisfy the relation ' $x$  is locked in an ardent embrace with  $y$ '. If so, it is simply not the case that a sentence like (2) has a fixed truth condition and that context is used solely to plug in the values. For, on this option, context determines both the number and kinds of parameters that there are in the SR.

This alternative is implausible, I think Lycan would agree, for it treats (2) as multiply ambiguous. In the case of genuinely ambiguous terms, the multiple meanings must be learned separately; one may understand one meaning and not the other(s). But 'left of' in the relevant contexts does not behave the way ambiguous terms do: No one learns separate meanings for 'left of' in the case of 'left of the tallest woman' and 'left of' in the case of 'left of the boy and girl locked in an ardent embrace;' anyone who understands 'left of' in the one case understands it in the other<sup>8</sup>.

'Left of' in the two contexts is not like 'bank', which has two dictionary definitions. (We do not consider dictionaries inadequate on the grounds that they fail to enumerate all the things which an object can be left of.) And if different spatial contexts required different 'readings' of (2), (2) would have indefinitely many 'readings'. How could we learn to use such a sentence? Spatial uses of 'left of' are more like indexicals, which have different values in different contexts without being lexically ambiguous.

Of course, there are cases of ambiguity involving *non*-spatial uses of 'left of', e.g. consider 'Jesse Jackson is to the left of Ronald Reagan'. In certain perceptual contexts, this sentence may be ambiguous: 'left of' may be a spatial or an ideological relation. But a glance at such cases just points up the contrast between them and the cases in which 'left of' is unambiguously a spatial relation. It thus seems to me to be implausible to regard these uses of 'left of' in spatial contexts as ambiguous.

Finally, treatment of spatial cases of 'left of' as ambiguous would seem to insulate the Metatheory from empirical disconfirmation. For any apparently disconfirming instance can be rendered innocuous by interpreting it to be the 'discovery' of a theretofore unrecognized ambiguity.

<sup>8</sup> It does not follow from this that anyone who understands 'left of the tallest woman' also understands 'left of the boy and girl locked in an ardent embrace'; for one may understand the former but, not understanding 'locked in an ardent embrace', fail to understand the latter.

(B) So, suppose that tokens of (2) have the same associated SR in every context. In that case, every token of (2)—at least every token of (2) that has a truth value—is a token of a sentence with the same hidden parameter(s). Perhaps we can treat the differences among tokens of (2) as pragmatic rather than semantic. For example, one may attempt to take ‘the woman on the left of the boy and the girl locked in an ardent embrace’ to be of the form ‘the woman on the left of  $x$ ’, and then take ‘the boy and the girl locked in an ardent embrace’ as simply a pragmatic way to compute the value of  $x$  in this context.

But what function is  $\alpha$ ? Suppose that  $\alpha$  takes as argument the element of the SR., ‘ $x$ ’, and returns as value a region of space. How is  $\alpha$  computed? Does it ‘look for’ a boy and a girl related in a certain way in order to determine the appropriate spatial location? Well, now suppose that Jones was mistaken: What she took to be a pair of young people was actually an incredibly lifelike sculpture of a family of four (the two sculptured children were obscured from Jones’ view.) In that case, the value of  $\alpha$  would have to be computed in the absence of a relevant boy and girl. Maybe in that case,  $\alpha$  would look for the sculpture, or perhaps for each of the sculptured family members. Each of these possibilities yields a different function. What determines which function is  $\alpha$ ? (Notice how far we have come from the relatively clear-cut case of indexicals.) And how could the brain of a person unaware that there is a sculpture in the vicinity compute either of the latter two functions? How does the brain ‘know’ which function to compute?

Finally, we would need a principled way to distinguish those elements that are to be regarded as pragmatic from those that are to be regarded as semantic. Compare two cases. In the first case, Jones says, “The woman on the left of the tallest woman stole my purse.” In the second case, Jones says, “The woman on the left stole my purse”; then when queried, immediately responds, “On the left of the tallest woman.” On the alternative under consideration, in the second case, ‘the tallest woman’ has a merely pragmatic role, but in the first ‘the tallest woman’ has a semantic role. It is really so clear that the sentences uttered should have different truth conditions?

The discussion of (2) leads to a dilemma. Either different SRs are represented in the brains of utterers of (2) or not. If so, then ‘context’ (and not context-independent facts about the brain) determines not just the values of the various parameters, but the numbers and kinds of parameters in SRs—and hence their syntactic identity—and (2) is ambiguous. On the other hand, if the various tokens of (2) have the same associated SR, and the differences between tokens are to be accounted for pragmatically, then it would seem that the assignment function can work only by a wave of the hand.

I conclude that neither alternative—that of treating the English sentence ‘The woman on the left stole my purse’ to be multiply ambiguous nor that of treating



differences between tokens in different contexts as pragmatic differences—sits easily with the view that utterances are produced by instantiated SRs<sup>9</sup>.

### Concluding Remark Regarding Context

The plausibility of treating semantically relevant features of context by appeal to an assignment function diminishes, as we move further from the paradigmatic case of indexicals. The use of assignment functions may seem attractive, because it seems to allow one to represent semantic features of a context in a context-free way, without having to find fully individuating descriptions. But what gives the approach its power in the cases of indexicals—namely, a well-developed theory of indexicals—is simply missing in the general case of ‘context’.

I am not raising empirical questions about how the brain computes  $\alpha$ , but rather asking what determines what function  $\alpha$  is. Specifying the domain and range of  $\alpha$  as context and denotata, respectively, is like saying that  $\alpha$  takes as arguments anything that is relevant and returns the right values. To say that the functions that capture the objective meanings of sentences are defined over contexts is fairly empty if one is unable to say what constitutes a context.

Indeed, we seem to run up against something like a ‘frame problem’. If the frame problem is how to represent everyday knowledge in an abstract descriptive scheme, then it has a variant that applies to semantics: how to represent in an abstract, context-free way all the contextual factors that could have any effect on the truth value of a sentence. To some extent, Lycan is aware of this. He discusses the frame problem in relation to the problem of disambiguation in parsing. He considers disambiguation by exploiting background knowledge to be “*just* a special case of the frame problem and not an especially aggravated instance of it. Somehow Mother Nature has solved the frame problem for human beings . . . [T]here must be some correct theory, for we do succeed in disambiguating . . . and we do not do this by magic, nor is it done by individual specialist neurons that might be described purely neuroanatomically” (pp. 202–203).

Lycan takes the fact that we do negotiate context nimbly to indicate that there are a definite number of relevant (and presumably, discoverable) factors that determine a context: “[T]here must be some correct theory.” But this is a *non sequitur*. From the fact that we understand sentences in contexts, all that follows is that there is some way we do it. But it does not follow that there is some correct theory of how we do it, nor that there is some way compatible with the computational paradigm that we do it.

But even if there were a definite number of factors that determine a context in which speech is interpreted, the fact that we have no idea of how to go about discovering them, or that we would not know when we had discovered them all,

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<sup>9</sup> Since the concern throughout is sentence meaning, I have tried not to open up any gaps between speaker meaning and sentence meaning. Jones makes no mistakes that would lead to a divergence of speaker meaning from sentence meaning.

does not bode well for actual theorizing. It rather dampens the hope for a theory that can "be taken cleanly over into a natural-language-understanding computer program" (p. 22).

The issues that I have raised here are not addressed only to Lycan, who has done an admirable job of trying to unite truth-theoretic semantics with functionalist psychology. Nobody working within the computational paradigm, as far as I know, has really begun to bring to light the subtle and complex ways in which 'context'—our social and physical environment—is implicated in the identity of our thoughts and utterances. The fate of the computational paradigm seems to me to rest on successful completion of that task.

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