

simplification of contracts. Berkeley uses it also in testing the consistency of a set of clauses; in determining the implications of a contract for one or another random set of circumstances; in distilling out the net differences between two closely related contracts; in all places, in short, where he detects value in being able to manipulate the terms of a contract with mathematical facility.

The usefulness of mathematical logic for Shannon and for Berkeley has resided in the application of prefabricated techniques to preformulated problems. The practical usefulness of a theory is not, however, to be appraised alone on the basis of such cases. We must allow the applicational needs themselves, rather, to play their part in motivating future elaborations of theory—just as the elaboration of tensor analysis and even of the differential calculus was motivated by the needs of physics. The history of mathematics has consisted to an important degree in such give-and-take between theory and application. Much of the value of mathematical logic for technology lies not merely in the direct applications of its already perfected techniques but in its potentialities as a basis from which to construct subsidiary techniques of unforeseen kinds in response to special needs.

— 14 —

On the Reasons for Indeterminacy of Translation¹

1970

My *gavagai* example has figured too centrally in discussions of the indeterminacy of translation. Readers see the example as the ground of the doctrine, and hope by resolving the example to cast doubt on the doctrine. The real ground of the doctrine is very different, broader and deeper.

Let us put translation aside for a while and think about physical theory. Naturally it is underdetermined by past evidence; a future observation can conflict with it. Naturally it is underdetermined by past and future evidence combined, since some observable event that conflicts with it can happen to go unobserved. Moreover many people will agree, far beyond all this, that physical theory is underdetermined even by all *possible* observations. Not to make a mystery of this mode of possibility, what I mean is the following. Consider all the observation sentences of the language: all the occasion sentences that are suited for use in reporting observable events in the external world.² Apply dates and positions to them in all combinations, without regard to whether observers were at the place and time. Some of these place-timed sentences will be true and the others false, by virtue simply of the observable though unobserved past and future events in the world. Now my point about physical theory is that physical theory is underdetermined even by all these truths. Theory can still vary though all possible observations be fixed. Physical theories can be at odds with each other and yet compatible with all possible data even in the broadest sense. In a word, they can be logically incompatible and empirically equivalent.

1. I am indebted to Burton Dreben for helpful criticism of an earlier draft of this paper.

2. The concept of observation sentence that I developed in §10 of *Word and Object* gains perhaps some further clarification in 85–89 of *Ontological Relativity and Other Essays* (New York: Columbia University Press, 1969).

This is a point on which I expect wide agreement, if only because the observational criteria of theoretical terms are commonly so flexible and fragmentary. People who agree on this general point need not agree as to how much of physical theory is empirically unfixed in this strong sense; some will acknowledge such slack only in the highest and most speculative reaches of physical theory, while others see it as extending even to common-sense traits of macroscopic bodies.

Now let us turn to the radical translation of a radically foreign physicist's theory. As always in radical translation, the starting point is the equating of observation sentences of the two languages by an inductive equating of stimulus meanings. In order afterward to construe the foreigner's theoretical sentences we have to project analytical hypotheses, whose ultimate justification is substantially just that the implied observation sentences match up. But now the same old empirical slack, the old indeterminacy between physical theories, recurs in second intension. Insofar as the truth of a physical theory is underdetermined by observables, the translation of the foreigner's physical theory is underdetermined by translation of his observation sentences. If our physical theory can vary though all possible observations be fixed, then our translation of his physical theory can vary though our translations of all possible observation reports on his part be fixed. Our translation of his observation sentences no more fixes our translation of his physical theory than our own possible observations fix our own physical theory.

The indeterminacy of translation is not just an instance of the empirically underdetermined character of physics. The point is not just that linguistics, being a part of behavioral science and hence ultimately of physics, shares the empirically underdetermined character of physics. On the contrary, the indeterminacy of translation is additional. Where physical theories *A* and *B* are both compatible with all possible data, we might adopt *A* for ourselves and still remain free to translate the foreigner either as believing *A* or as believing *B*.

Such choice between *A* and *B* in translation could be guided by simplicity. By imputing *B* to the foreigner we might come out with shorter and more direct translations, and with less in the way of elaborate contextual paraphrases, than by imputing *A* to him. That is one possibility. A second possibility is that both choices, *A* and *B*, require forbiddingly circuitous and cumbersome translation rules. In this case we might regard the foreigner as holding neither *A* nor *B*; we might attribute to him rather some

false physical theory which we can refute, or some obscure one which we despair of penetrating, or we might even regard him as holding no coherent physical theory at all. But we can imagine also, third, the possibility that *A* and *B* are both reasonably attributable. It might turn out that with just moderate circuitousness of translation at certain points—different points—*A* and *B* could be imputed about equally well. In this event no basis for a choice can be gained by exposing the foreigner to new physical data and noting his verbal response, since the theories *A* and *B* fit all possible observations equally well. No basis can be gained by interrogation in a theoretical vein, since the interrogation would take place in the foreigner's language and so could itself be interpreted according to either plan. In this event our choice would be determined simply by the accident of hitting upon one of the two systems of translation first.

The metaphor of the black box, often so useful, can be misleading here. The problem is not one of hidden facts, such as might be uncovered by learning more about the brain physiology of thought processes. To expect a distinctive physical mechanism behind every genuinely distinct mental state is one thing; to expect a distinctive mechanism for every purported distinction that can be phrased in traditional mentalistic language is another. The question whether, in the situation last described, the foreigner really believes *A* or believes rather *B*, is a question whose very significance I would put in doubt. This is what I am getting at in arguing the indeterminacy of translation.

My argument in these pages has been and will remain directed to you who already agree that there can be logically incompatible and empirically equivalent physical theories *A* and *B*. What degree of indeterminacy of translation you must then recognize, granted the force of my argument, will depend on the amount of empirical slack that you are willing to acknowledge in physics. If you were one of those who saw physics as empirically underdetermined only in its highest theoretical reaches, then by the argument at hand I can claim your concurrence in the indeterminacy of translation only of highly theoretical physics. For my own part, I think the empirical slack in physics extends to ordinary traits of ordinary bodies and hence that the indeterminacy of translation likewise affects that level of discourse. But it is important, for those who would not go so far, to note the graduation of liabilities.

Gavagai, whose troubles I shall now review, lay at an extreme of the scale. It was an observation sentence. Its stimulus meaning was inductively

well established, we supposed, coinciding with that of 'Rabbit'.³ Where indeterminacy threatened was in trying to settle upon the divided reference of *gavagai* as a term: whether rabbits or rabbit stages or undetached rabbit parts. Readers have responded with suggestions of how, with help of screens or other devices, we might hope to give the native informant an inkling of the desired distinctions and so settle the reference.

Ingenuity in this vein proves unrewarding because of vagueness of purpose. The purpose cannot be to drive a wedge between stimulus meanings of observation sentences, thereby linking *Gavagai* rather to 'Rabbit' than to 'Rabbit stage' or 'Undetached rabbit part'; for the stimulus meanings of all these sentences are incontestably identical. They comprise the stimulations that would make people think a rabbit was present. The purpose can only be to settle what *gavagai* denotes for the native as a term. But the whole notion of terms and their denotation is bound up with our own grammatical analysis of the sentences of our own language. It can be projected on the native language only as we settle what to count in the native language as analogues of our pronouns, identity, plurals, and related apparatus; and I urged in *Word and Object* that there would be some freedom of choice on this score. Once such choices are settled, on the other hand, however arbitrarily, the question whether the *gavagai* are rabbits or stages or parts can be settled too, by interrogation.

The most to hope for from the screens and kindred aids, then, is an indirect hint as to which of various analytical hypotheses regarding pronouns, identity, plurals, etc., might in the end work out most naturally. When this kind of hint is available, should we say that the supposed multiplicity of choices was not in fact open after all? Or should we say that the choice is open but that we have found a practical consideration that will help us in choosing? The issue is palpably unreal, and the doctrine of the indeterminacy of translation depends in no way upon it.

The *gavagai* example was at best an example only of the inscrutability of terms, not of the indeterminacy of translation of sentences. As sentence, *Gavagai* had a translation that was unique to within stimulus synonymy; for the occasion sentences 'Rabbit', 'Rabbit stage', and 'Undetached rabbit part' are stimulus-synonymous and holophrastically interchangeable. The

3. Strictly speaking, even this induction presupposes something like an analytical hypothesis in a small way: the decision as to what to take as signs of assent and dissent. See *Word and Object*, 80; also D. Davidson and J. Hintikka, ed. *Words and Objections* (Dordrecht: Reidel, 1968), 312, 317 or *Synthese*, xix. 1/2 (December 1968): 284, 289.

gavagai example had only this indirect bearing on indeterminacy of translation of sentences: one could imagine with some plausibility that some lengthy nonobservational sentences containing *gavagai* could be found which would go into English in materially different ways according as *gavagai* was equated with one or another of the terms 'rabbit', 'rabbit stage', etc. This whole effort was aimed not at proof but at helping the reader to reconcile the indeterminacy of translation imaginatively with the concrete reality of radical translation. The argument for the indeterminacy is another thing, as seen earlier in this paper.

Over the inscrutability of terms itself there is little room for debate. A clear example from real life was seen in connection with the Japanese classifiers.⁴ This example makes it pretty clear, moreover, that the inscrutability of terms need not always bring indeterminacy of sentence translation in its train, however the case may be in particular with *gavagai*. Again the questions raised by deferred ostension (*op. cit.*), e.g., as between expressions and their Gödel numbers, are strictly a matter of inscrutability of terms. This, not the indeterminacy of translation, is the substance of ontological relativity.

There are two ways of pressing the doctrine of indeterminacy of translation to maximize its scope. I can press from above and press from below, playing both ends against the middle. At the upper end there is the argument, early in the present paper, which is meant to persuade anyone to recognize the indeterminacy of translation of such portions of natural science as he is willing to regard as underdetermined by all possible observations. If I can get people to see this empirical slack as affecting not just highly theoretical physics but fairly common-sense talk of bodies, then I can get them to concede indeterminacy of translation of fairly common-sense talk of bodies. This I call pressing from above.

By pressing from below I mean pressing whatever arguments for indeterminacy of translation can be based on the inscrutability of terms. I suppose Harman's example⁵ regarding natural numbers comes under this head, theoretical though it is. It is that the sentence ' $3 \in 5$ ' goes into a true sentence of set theory under von Neumann's way of construing natural numbers, but goes into a false one under Zermelo's way. But a limitation of

4. *Ontological Relativity and Other Essays*, pp. 35f. Also in *The Journal of Philosophy*, LXV, 7 (April 4, 1968): 191ff.

5. Gilbert Harman, "An Introduction to Translation and Meaning," in *Words and Objections*, 14. Also in *Synthese*, *ibid.*, 14.

this example, as Harman recognizes, is that ' $3 \in 5$ ' rates as nonsense apart from set-theoretic explications of natural number.

In these pages I prefer not to speculate on how much better one might do from below, or from above either. My purpose here is to separate the issues and identify the arguments; and this may be managed most effectively by leaving the reader to consider what more might be proved.

— 15 —

Methodological Reflections on Current Linguistic Theory

1970

I want to make some broadly methodological remarks on a variety of issues. To begin with I'll talk of *rules*, and dwell a while on the distinction between *fitting* and *guiding*.

Imagine two systems of English grammar: one an old-fashioned system that draws heavily on the Latin grammarians, and the other a streamlined formulation due to Jespersen. Imagine that the two systems are *extensionally equivalent*, in this sense: they determine, recursively, the same infinite set of well-formed English sentences. In Denmark the boys in one school learn English by the one system, and those in another school learn it by the other. In the end the boys all sound alike. Both systems of rules *fit* the behavior of all the boys, but each system *guides* the behavior of only half the boys. Both systems *fit* the behavior also of all us native speakers of English; this is what makes both systems correct. But neither system guides us native speakers of English; no rules do, except for some intrusions of inessential schoolwork.

My distinction between fitting and guiding is, you see, the obvious and flat-footed one. Fitting is a matter of true description; guiding is a matter of cause and effect. Behavior *fits* a rule whenever it conforms to it; whenever the rule truly describes the behavior. But the behavior is not *guided* by the rule unless the behavior knows the rule and can state it. This behavior *observes* the rule.

But now it seems that Chomsky and his followers recognize an intermediate condition, between mere fitting and full guidance in my flat-footed sense of the word. They regard English speech as in some sense rule-*guided* not only in the case of the Danish schoolboys, but also in our own case, however unprepared we be to state the rules. According to this doctrine,

Confessions of a Confirmed
Extensionalist

and Other Essays

W. V. Quine

Edited by

Dagfinn Føllesdal

Douglas B. Quine

Harvard University Press
Cambridge, Massachusetts
London, England

2008