Does the Quine/Duhem Thesis Prevent us from Defining Analyticity?

On a Fallacy in Quine

Prof. Dr. Olaf L. Müller (Humboldt-Universität zu Berlin)

ABSTRACT. Quine claims that holism (i.e., the Quine-Duhem thesis) prevents us from defining synonymy and analyticity (section II). In *Word and Object*, he dismisses a notion of synonymy which works well even if holism is true. The notion goes back to a proposal from Grice and Strawson and runs thus: R and S are synonymous iff for all sentences T we have that the logical conjunction of R and T is stimulus-synonymous to that of S and T. Whereas Grice and Strawson did not attempt to defend this definition, I try to show that it indeed gives us a satisfactory account of synonymy. Contrary to Quine, the notion is tighter than stimulus-synonymy – particularly when applied to sentences with less than critical semantic mass (section III). Now according to Quine, analyticity could be defined in terms of synonymy, if synonymy were to make sense: A sentence is analytic iff synonymous to self-conditionals. This leads us to the following notion of analyticity: S is analytic iff, for all sentences T, the logical conjunction of S and T is stimulus-synonymous to T; an analytic sentence does not change the semantic mass of any theory to which it may be conjoined (section IV). This notion is tighter than Quine's stimulus-analyticity; unlike stimulus-analyticity, it does not apply to those sentences from the very center of our theories which can be assented to, come what may, even though they are not synthetic in the intuitive sense (section V). Conclusion: We can have well-defined notions of synonymy and analyticity even if we embrace Quine's holism, naturalism, behaviorism, and radical translation. Quine's meaning skepticism is to be repudiated on Quinean grounds.

WARNING. This electronic version of the paper is published here with kind permission of the publishing house *Kluwer,* Dordrecht. It is not entirely identical with the most official version (see below): The electronic version differs from its official doppelganger typographically and with respect to layout. (The arguments, however, are the same in both versions). Here is how the paper has been published originally:

> Olaf Mueller "Does the Quine/Duhem thesis prevent us from defining analyticity? On fallacy in Quine". *Erkenntnis* 48 No. 1 (January 1998), pp. 81-99.

Does the Quine/Duhem Thesis Prevent us from Defining Analyticity?

On a Fallacy in Quine*

Prof. Dr. Olaf L. Müller (Humboldt-Universität zu Berlin)

I.

There is no way to make good sense of synonymy and analyticity! Such was the slogan against the 'first dogma of empiricism', a slogan that shook and shocked the philosophical community more than four decades ago. Quine was the leader in this historic battle that nowadays is studied in the classroom.[1] Quine's semantic skepticism sounds familiar to today's philosophy students. But having read the first *locus classicus*, 'Two Dogmas of Empiricism,'[2] they are still wondering: *Good and well, Quine has shown that some attempts to define synonymy or analyticity don't work; but how does it follow that there* cannot *be any satisfactory definitions for these notions at all?*

Pointing to this *nonsequitur* alone, however, doesn't suffice to rebuff Quine's challenge; as long as nobody successfully produces a positive account of synonymy and analyticity, it can hardly be claimed that Quine's skepticism has been proven to be wrong. So today's students summarize the war's first battle and write in their note-books: *So far, it's one to one.*

Then they turn to the second *locus classicus*, chapter II of *Word and Object*[3] [henceforth WO], in order to gain initiation into the mysteries of inscrutability, underdetermination, and indeterminacy. But the de-mystification is ready to hand: Blame all of it on Quine's behaviorism. The trick is to simply reverse Quine's arguments: He has shown, it is argued, that (i) on a behavioristic basis there is indeed no hope of reaching an understanding of our semantic notions; but (ii) we do

understand the semantic notions; therefore, (iii) behaviorism has been repudiated as a sufficient basis for semantics.[4]

This move is premature for two reasons. First, it ignores the serious arguments Quine has to offer for his behaviorism in semantics. If we wish to explain semantic notions without question-begging we have to make these notions work for languages which we don't yet understand. Unless the famous linguist in the jungle is a mind-reader, she has access to no evidence other than the speakers' overt dispositions to verbal behavior. But I don't wish to pursue this issue further, since it has been discussed at length in the literature.

What will concern us is the second reason why it is premature to reverse Quine in the way I've depicted above: Using Quine's own argument as a *reductio ad absurdum* of behaviorism depends obviously upon the assumption that Quine's main thesis (i) ('Behaviorism implies semantic skepticism') is correct. *But it is not,* as I'm going to show. My claim is as follows: Even if we grant Quine his behavioristic purism we can still define analyticity and synonymy; the first 'dogma of empiricism' is no dogma, it is true. And, what is worse for Quine, his mistake lies not in a failure to anticipate some new sort of definitions; rather it lies in his repudiation of a definition that shows up in the legendary *chapter II* itself. His repudiation, I claim, contains a serious fallacy.

In order to pinpoint the fallacy we'll have to revive good old Quinean stimulus semantics (section II).[5] But before doing so I should indicate which Quinean doctrines will not be under attack here. First of all, I won't challenge the *Quine/Duhem thesis of scientific holism* because I believe that holism is true. Unlike Quine I hold that holism goes nicely with a clear notion of synonymy; ironically it is Quine who fails to appreciate how holism indeed supports the notion (section III). I also want to show that holism is compatible with a notion of the analytic (sections IV/V).

Secondly, I am not going to discuss Quine's objections against the epistemic role some positivists wished to assign to analyticity. Rather, I shall be concerned with the

intelligibility of analyticity and synonymy, which is the more basic issue.[6] The semantic notions might have a clear sense without being epistemically important for, say, physics. They could still be very useful for linguistics, viz., for *describing* languages, and even for describing the language of physics.

The third Quinean doctrine which will not be attacked here is his *inscrutability of reference*. So I won't provide any argument to the effect that the jungle *word* 'gavagai' has to be translated as 'rabbit', as opposed to 'undetached rabbit part' or 'rabbit stage'. Quine is right, I think, that the linguist has lots of options to choose from when it comes to the translation of *single words* (as opposed to whole sentences). But since these subtle variations never affect what's happening on the level of *complete sentences*, I don't take the inscrutability of reference too seriously. After all, it is sentences we are interested in: I want to investigate under which conditions we may call a *sentence* analytic and under which conditions we may call two *sentences* synonymous.

Finally, Quine's *indeterminacy of translation* will not be at issue. If this indeterminacy is to be taken as an indeterminacy of translation manuals, it follows directly from the inscrutability of reference, since translation manuals proceed word by word. But in this paper I also don't want to deal with Quine's indeterminacy of translation in its stronger version, which asserts that one and the same jungle sentence could be equally well translated by incompatible English sentences. I won't touch this strong thesis because I don't wish to define an *inter*linguistic notion of synonymy but only an *intra*linguistic notion, working for sentences of one and the same language. This, I claim, will suffice to defend what Quine calls the 'first dogma of empiricism'.

It may be asked: Does this last restriction mean that I'm not willing to face Quine's challenge of radical translation at all? Yes and no. No, since the notion of synonymy I want to plead for applies to languages we don't yet understand: the linguist who is trying to find out which pairs of jungle sentences mean the same is indeed in a *radical* position. But, of course, she isn't *translating* yet. I hope that she will finally be able to exploit intralinguistic synonymies for her translation project, which is more global. How this has to be done will not be under discussion here. The only thing I

want to show in this paper is that we can make good sense of analyticity and (intralinguistic) synonymy even if these notions are to be applied to object languages that are not contained in the metalanguage.

II.

So let's find an unsuspecting subject from the remotest archipelago and investigate his speech dispositions by presenting stimuli to his sense organs. Given a sentence of the informant's language (say, 'Gavagai'), we can subdivide all possible stimuli into different classes. A first class, called the *affirmative stimulus meaning* of the sentence, contains all stimuli that would – if presented – *prompt*[7] the informant's assent to the sentence (WO, p. 32). As is well known, in the affirmative stimulus meaning of the sentence 'Gavagai' are collected all rabbit-like stimuli.

A second class of stimuli, the *negative stimulus meaning*, is defined analogously (replace 'assent' by 'dissent') and contains – in the case of 'Gavagai' – all stimuli differing evidently enough from those stimulations usually caused by rabbits (WO, p. 32).

When we know both affirmative and negative stimulus meaning of the native's sentences, we have accumulated all the information about his dispositions which Quine is willing to grant us – in the name of behaviorism. Does such knowledge suffice to distinguish every pair of non-synonymous sentences? Quine denies that it suffices; I want to show that he is wrong – provided that we really exploit the totality of that knowledge.

To be sure, a readily available definition first considered by Quine is unsatisfactory. That is, to define two sentences *stimulus-synonymous* when and only when they have the same affirmative and negative stimulus meaning (WO, p. 46), is merely an unsatisfactory *ersatz* (WO, p. 66). Why doesn't such defined stimulus synonymy work? – Sometimes, it works well. Let's take a look at this case first. According to the definition, the informant's sentence 'Gavagai' is stimulus-synonymous to our English sentence 'Lo, a rabbit' (WO, p. 33). A reasonable result, isn't it?

We run into trouble, however, as soon as we test sentences our informant can deny or accept without being *prompted* to react so by current stimulation. At tea time, for example, my verdict on the sentence 'The morning paper has come' need not depend on present stimuli because I might remember some matinal stimulations. Stimuli containing the morning paper may prompt my assent to the sentence at tea time, of course, but I might assent as well even if the *L.A. Times* is completely out of sight. In this case, all the nice tea time stimuli don't say anything about the sentence under investigation. They don't contribute causally to my verdict on it. Hence, they don't belong to its affirmative stimulus meaning. Nor do they belong to its negative stimulus meaning (for my reaction is still affirmative, whether it is prompted or not).

Such stimuli not contributing causally to a speaker's verdict on a given sentence (and hence belonging neither to its affirmative nor to its negative stimulus meaning) shall be labeled as *irrelevant* to that sentence from now on (WO, pp. 30, 36). These irrelevant stimuli are guilty of all calamities stimulus synonymy has to face. The more stimuli are irrelevant to a sentence, the sparser are its affirmative and negative stimulus meaning, and thus, the less information can be provided for tests of synonymy (WO, p. 63).

Let's now push matters to extremes. Imagine a sentence to which all stimuli are irrelevant. Such a sentence I shall call *stimulus-meaningless*, for the following reason. The sentence's affirmative and negative stimulus meanings are empty sets; they don't embrace any stimulus because stimulus meanings only contain stimuli that are *relevant* to the sentence concerned.

By definition, any two stimulus-meaningless sentences are stimulus-synonymous; their stimulus meanings are identical because they are empty. But the stimulus-meaningless sentences need not be meaningless in the intuitive sense; and, what's worse, they may, intuitively speaking, differ in meaning. Thus the notion of stimulus synonymy seems to fail when applied to stimulus-meaningless sentences.

Let us be more concrete. Which sentences are stimulus-meaningless? An important group of stimulus-meaningless sentences consists of the sentences which are,

traditionally, called analytic. There is no single stimulus *prompting* a speaker to assent to, say,

> 2 + 2 = 4,

or

> No bachelor is married,

because the speaker would assent *in any case*. Thus, the two sentences are stimulus-meaningless, and hence, stimulus-synonymous even though nobody – not even a philosopher – is willing to state that they mean the same, intuitively speaking. *Not even a philosopher?* Quine *is* willing, and among others, I am willing, too. This cries for elucidation. My point is that our well informed intuitions about semantics should be pleased with a synonymy definition implying that all (intuitively speaking) analytic sentences mean the same. To be sure, Quine accuses both intuitive notions, analyticity and synonymy, of being untenable. But he admits that *if* one of them *were* explicable without circularity, the other notion could be defined immediately because both are interdefinable:

> The interdefinitions run thus: sentences are synonymous if and only if their biconditional (formed by joining them with 'if and only if') is analytic, and a sentence is analytic if and only if synonymous with self-conditionals ('If p then p'). (WO, p. 65)

If Quine is right in describing our intuitions this way, it follows that all analytic sentences are synonymous because (i) each of them is synonymous with 'If p then p' and (ii) synonymy is a transitive relation.

But isn't it a little bit odd to maintain that '2 + 2 = 4' and 'No bachelor is married' mean the same? It is not, for they resemble each other in a crucial point: they say nothing at all about the state of the world. Quine wouldn't allow to put it this way, of course, but we are talking about semantic intuitions right now, looking for definitions

that fit together with these intuitions. (And it is not yet clear that we cannot find satisfactory definitions).

I think, in regard to our intuitions, Quine wouldn't disagree. Nay, he hastens to our aid against the suspicion raised by the question whether '2 + 2 = 4' and 'No bachelor is married' both mean the same. The answer: they are synonymous in a *broad* sense of synonymy, but not so in its *narrow* sense:

> For some purposes a narrower sort of synonymy of sentences is wanted, such as what Carnap calls intensional isomorphism, involving certain part-by-part correspondences of the sentences concerned. [...] But such variant versions can be defined on the basis of the broader one. Synonymy of parts is defined by appeal to analogy of roles in synonymous wholes; then synonymy in the narrower sense is defined for the wholes by appeal to synonymy of homologous parts. So let us concentrate on the broader and more basic notion of sentence synonymy. (WO, p. 62)

It would be complicated to spell out Carnap's notion of intensional isomorphism in greater detail; but this is not necessary here. I agree with Quine that the broad notion of synonymy is more basic. So let us concentrate on this notion of sentence synonymy and hence keep in mind that all analytic sentences have to be synonymous.[8] This consequence doesn't oppose an envisaged definition of synonymy. On the contrary, it is exactly what we wish.

Now let's go back to our discussion of stimulus synonymy. Looking for counterexamples, we have brought the analytic sentences into play because every stimulus is irrelevant to them (that means that they all are stimulus-synonymous). In the light of Quine's own remarks, however, we have seen a minute ago that all analytic sentences have to be synonymous (in the broad sense of synonymy, which is under discussion here). Hence, the analytic sentences cannot serve as counterexamples against the definition; they even support the notion of stimulus synonymy. Why, however, is stimulus synonymy nothing but an *ersatz*? In order to understand that it is still an ersatz we have to look for non-analytic sentences that turn

out to be stimulus-synonymous without corresponding in meaning, intuitively speaking.

Sentences with lots of irrelevant stimuli are the best candidates, because their (affirmative and negative) stimulus meaning is so emaciated that they are too weak to support interesting tests of stimulus synonymy (WO, p. 63). But when should we call a sentence's stimulus meaning sufficiently emaciated? It is not emaciated enough as long as it contains at least *some* stimuli (WO, p. 63). Let me demonstrate this by means of our old example. Uttered at tea time, the sentence 'The morning paper has come' has lots of irrelevant stimuli. But visual *L.A. Times* stimuli are covered by the sentence's affirmative stimulus meaning. This is enough in order to distinguish the sentence from, say, 'The crocuses are out' (WO, p. 36), a sentence with lots of irrelevant stimuli, too (because it can be assented in the absence of any crocus stimulus). But its affirmative stimulus meaning is not totally vacant since well arranged crocus stimuli do prompt the speaker's assent. Now, not all crocus stimuli enclose *L.A. Times* stimuli at one and the same time. Therefore, the affirmative stimulus meaning of both sentences differ from each other – which means that they are not stimulus-synonymous. Again a reasonable result of our definition.

III.

To recapitulate, stimulus synonymy works well in the case (i) of sentences without irrelevant stimuli (e.g. 'Lo! A rabbit'), (ii) of sentences with some irrelevant and some relevant stimuli (e.g. 'The morning paper has come'), and (iii) in the case of analytic sentences to which all stimuli are irrelevant. But where are Quine's striking counterexamples? To answer this question, Quine's holism enters the stage. The Quine/Duhem-thesis of holism was meant to repudiate the second dogma of empiricism (i.e., the reductionist thesis that each significant scientific sentence can be tested in isolation). Quine calls the second dogma 'intimately connected' with the first one: 'The two dogmas are, indeed, at root identical' (1961, p. 41). Therefore, if the second dogma is wrong (that is, if holism is true), the first dogma must be wrong, too. This guilt by association is Quine's main charge against synonymy (and analyticity), and it is exactly this association which I want to dispute. On what grounds does

Quine extend his charges against the second dogma to also include the first dogma? In WO he says:

> The significant trait of other sentences is that experience is relevant to them largely in indirect ways, through the mediation of associated sentences. Alternatives emerge: experiences call for changing a theory, but do not indicate just where and how. Any of various systematic changes can accommodate the recalcitrant datum, and all the sentences affected by any of those possible alternative readjustments would evidently have to count as disconfirmed by that datum indiscriminately or not at all. Yet the sentences can be quite unlike with respect to content, intuitively speaking, or role in the containing theory (WO, p. 64).

Quine talks in terms of confirmatory and disconfirmatory *experiences* here. In our and Quine's own manner of speech, scientific 'experiences' are stimuli in the lab, caused by measuring instruments, pointer deflections and so on. Now let us assume we discover recalcitrant lab stimuli against, for example, the ether drift theory. Obviously, the stimuli belong to the negative stimulus meaning of ('are disconfirmatory experiences for') *some* sentence. *Of which sentence, however?* An intuitive answer would be: Simply they belong to the negative stimulus meaning of the sentence 'There is ether drift'. According to Quine's holism, however, this answer is wrong because our recalcitrant lab stimuli don't say anything about 'There is ether drift' in isolation. An ether drift fan, for example, wouldn't abandon his trust in ether drift because of one experiment only. Rather he would protest against the arrangement of the instruments; he would be induced to deny sentences that connect ether drift with those special measuring instruments.

Quine's conclusion seems to be that the recalcitrant stimuli belong to the negative stimulus meaning, *either* of no sentence at all, *or* of every single sentence which has something to do with ether drift and thereby could be doubted in the light of the experiment. (In both alternatives, all these sentences would have the same negative stimulus meaning and therefore turn out to be stimulus-synonymous).

But Quine has overlooked a third alternative, which will eventually lead him into the fallacy I have announced. The alternative Quine fails to consider is as follows: The recalcitrant stimuli don't count as disconfirming any single sentence *in isolation* but do count as disconfirming their *conjunction* (which represents the complete theory). It is this third view I would like to plead for. We can verify it even when we consider two sentences only (thus simplifying ether drift physics irresponsibly, of course). The sentences in question are:

(S) There is ether drift.

(T) If and only if there is no ether drift, our such-and-such arranged interferometer has to flash as soon as turned on.

Now, how would we classify flashing interferometer stimuli? They are irrelevant for both S and T in isolation because they don't indicate which one sentence has to be removed. But, definitely, flashing interferometer stimuli oppose both sentences in combination:

(S & T) There is ether drift; and if and only if there is no ether drift, our such-and-such arranged interferometer has to flash as soon as turned on.

Flashing stimuli are not irrelevant for S & T. They belong to the negative stimulus meaning of the conjunction.[9]

Can we make capital out of this fact? Let's face the losses first. Quine is right that the old definition of stimulus synonymy doesn't work. Now we have found the counterexamples we were looking for. Theoretical sentences like 'There is ether drift' and 'There are electrons' cannot be proved or disproved by lab stimuli in isolation. Their stimulus meaning is not emaciated; it is empty. Therefore, they are stimulus-synonymous. So the notion of stimulus synonymy doesn't capture our intuitions about synonymy.

Fortunately, our considerations open the way for a more sophisticated definition of synonymy. To get at this definition, we must ask more than whether two sentences

are stimulus-synonymous in isolation; we must ask whether they are stimulus-synonymous in *every* possible theoretical context:

(D1) Two sentences R and S are *synonymous* when and only when, for every sentence T (which might be a very complicated theoretical sentence), the logical conjunction of R and T is stimulus-synonymous to that of S and T.[10]

Quine dismisses this fine definition saying no more than: 'this is yet more readily seen not to provide a tighter relation [than stimulus synonymy]' (WO, p. 65). This is a fallacy, as he could see if he were aware of the third alternative we developed above in order to handle recalcitrant stimuli. Though the sentences 'There is ether drift' and 'There are electrons' are stimulus-synonymous in isolation, they are not if embedded in an appropriate theoretical context. Flashing interferometer stimuli are members of the negative stimulus meaning of

(S & T) There is ether drift; and if and only if there is no ether drift, our such-and-such arranged interferometer has to flash as soon as turned on.

But they are irrelevant to this conjunction:

(R & T) There are electrons; and if and only if there is no ether drift, our such-and-such arranged interferometer has to flash as soon as turned on.

Hence both conjunctions differ in stimulus meaning; thus, they are not stimulus-synonymous. So we can deduce from our sophisticated definition D1 that the two existence statements R and S are not synonymous. Which shows, contrary to Quine, that synonymy as defined by D1 *is* a tighter relation than stimulus synonymy.

IV.

It is surprising that, though it was mentioned in Quine's own book, no one has until now cast this life-belt in order to save synonymy.[11] Why has it been ignored so

completely? I am unable to speculate on the causes that may have confused Quine and many of his readers, but I can report the reasons for my own former confusion. When I first read Quine some years ago, I tested the definition D1 by using two analytic sentences (with different content, intuitively speaking). They turned out to be synonymous because whatever I'd chosen as a would-be embedding theory T, the conjunction formed by T and one of the analytic sentences had the same stimulus meaning as T alone. For instance, the two conjunctions

2 + 2 = 4 and it is raining,

and

All bachelors are unmarried and it is raining,

don't say more than their common metereological subclause alone. So both conjunctions are stimulus-synonymous. And of course, the same would happen if we chose any non-metereological conjunct whatever as an embedding 'theory'. According to D1, therefore, the sentences

2 + 2 = 4,

and

All bachelors are unmarried,

are synonymous. So in *this* case, Quine is right that our definition of synonymy fails to provide a tighter relation than the primitive notion of stimulus synonymy.

But this result doesn't defeat our new definition at all. As we've seen in section II, it is again exactly what we want since we are interested in the broad sense of synonymy here. In this broad sense, all analytic sentences have to be synonymous with each other. Therefore, we can use one of them – say, a self-conditional – in order to grasp them all:

(D2) A sentence is analytic if and only if synonymous with self-conditionals ('If p then p').

As we remember, this is the second interdefinition that was mentioned by Quine in order to illustrate the interrelations between synonymy and analyticity. Quine couldn't make use of it because he failed to see an independent way of defining an interesting notion of synonymy. Since we, on the contrary, have supplied the missing definition (as given by D1), we have also got the key for the distinction between analytic and synthetic sentences.

You may ask: Does D2 get us really the notion of analyticity for which we were so avidly searching? Obviously the answer must be positive, if one grants both, (i) that we have succeeded in defining synonymy, and (ii) that all and only the analytic sentences are synonymous to a logical truth like 'If p then p'. So at least Quine should be pleased with D2, since he himself has been proposing the latter and should have been convinced of the former by our reasoning in the preceding section[12]: There it has been established that holism need not block us from defining synonymy. Given the definability of analyticity in terms of synonymy, we may conclude that holism is also compatible with a notion of analyticity.

If you still want to doubt the synthetic/analytic dichotomy, however, you may simply question that we *can* define analyticity in terms of synonymy as done in D2. – What semantic intuitions can we appeal to in order to make it plausible that indeed all and only the analytic sentences are synonymous to 'If p then p'? It wouldn't be enough merely to rely on the conspicuous fact that even so strong a critic of semantic intuitions as Quine does not dispute the conceptual connection between synonymy and analyticity. Here is the very general reason why I believe that Quine is right: synonymous sentences bear the same factual content; analytic sentences have zero factual content; so analytic sentences have to be synonymous with each other, which means that they must be synonymous to any obvious case of analyticity, e.g., to a self-conditional.

Instead of arguing for these semantic intuitions, however, I want to investigate more concretely whether our notion of analyticity as defined in D2 is extensionally equivalent to the intuitive notion of analyticity which we were out to explicate. Now an *explicans* need of course not match the *explicandum* perfectly: a matching in the essential cases will suffice. Quine's behavioristic imitation of analyticity, viz., stimulus analyticity, fails to provide a matching even in some essential cases. In these cases, I shall argue, our new notion of analyticity does better than Quine's stimulus analyticity.

Quine defines a sentence to be stimulus-analytic if and only if the speaker is disposed to assent to the sentence come what may, i.e., if the speaker is disposed to assent under any stimulation whatever. Should we set aside one complication (see footnote below), this notion is also characterizable in terms of stimulus synonymy, as follows:

(D3) A sentence is *stimulus-analytic* if and only if it is stimulus-synonymous to 'If p then p'.[13]

Quine's argument against stimulus analyticity consists in the claim that it is too loose a notion to approximate analyticity in the intuitive sense. This claim parallels his claim against stimulus synonymy, and D3 shows us why the parallel isn't merely a coincidence: If stimulus synonymy needs tightening in order to approximate synonymy in the intuitive sense, then the same must be true of stimulus analyticity. Now D1 provides a narrower notion of synonymy than stimulus synonymy (cf. section III). If, therefore, we turn D3 into D2 by replacing stimulus synonymy with synonymy in our sense, we may expect to arrive at a narrower notion of analyticity as well.[14] Before I demonstrate, by means of two examples, that this expectation isn't illusory (section V), I want to propose an alternative characterization of analyticity which makes it easier to deal with examples and avoids an awkward drawback of D2.

The drawback I have in mind is our appeal in D2 to self-conditionals as obvious cases of analyticity. Wouldn't it be nicer to circumscribe the analytic sentences without presupposing that self-conditionals are analytic? Let us try. Combining our two definitions, D1 and D2, we obtain:

(D4) A sentence S is *analytic* if and only if for all T, the conjunction of S and T is stimulus-synonymous to that of a self-conditional and T.

Our present aim is to get rid of the self-conditional in D4 where it is conjoined to the sentence T. Now does it change a sentence's stimulus meaning if we combine it, by conjunction, with a self-conditional? Not at all – each sentence is, I claim, stimulus-synonymous to its conjunction with 'If p then p'.[15] If this is granted[16], our characterization of analyticity runs thus:

(D5) A sentence S is *analytic* if and only if for all T, the conjunction of S and T is stimulus-synonymous to T.[17]

Such is the promised definition, cleansed of any assumption about self-conditionals.

V.

For the remaining part of the paper I wish to demonstrate how D5 can be viewed as giving substance to the intuitive assumption that analytic sentences don't carry any factual (or, if you want, empirical) content. In a weak sense, this is already true of stimulus-analytic sentences, since they are assented to come what may. This way of lacking factual content, however, isn't strong enough (as will be seen in two examples). By contrast, D5 provides a stronger version of this trait of analyticity: An analytic sentence is empty not only in isolation, but also when embedded in any possible context. That is to say, an analytic sentence never alters the factual content of a sentence to which it is conjoined. Let us examine this difference between analytic and stimulus-analytic sentences in the light of the aforementioned examples.

The first example is a bit confusing – at least to me. But because it is the only example Quine has to offer in WO against stimulus analyticity, it is worthwhile to scrutinize it. Here is the example:

(D) There have been black dogs (WO, p. 66).

Obviously, D won't qualify for analyticity in any intuitive sense. Is it stimulus-analytic? Quine thinks so, because he holds that each speaker is disposed to assent to D come what may. Whether this is so, I am not sure.[18] But I am quite sure that D fails to be analytic in the sense of D5.

To see this, we need to find a sentence C that isn't stimulus-synonymous to the conjunction of C and D. The following sentence will do:

> (C) The class of animals, which appear to humans under normal conditions to be black, contains no black animals, but only pink ones. This optical illusion results from their constantly producing a gas which absorbs all visible light. This gas is difficult to detect, because it dissolves close to the surface of pink animals. Furthermore, animals which seem to humans not to be black are, indeed, not black.

C implies, I think, that there haven't been any black dogs. So, embedding the dog sentence D in the context C yields a conjunction which will elicit each speaker's dissent under whatever stimulation. Therefore, there exists no stimulation that is relevant to the conjunction C & D; its stimulus meaning is empty.

But the stimulus meaning of C alone isn't empty. Because C is a very strong general statement, it is easy to name 'experiences' (stimuli) which would suffice to disprove C. Consider a sophisticated vacuum cleaner, which removes all gas particles from the surface of any given object. Let's suppose the linguist applies this *Super Hoover* to a dog which seems black to the native. If the procedure doesn't change the dog's colour, C must be rejected. And it must be rejected *on the ground of* the very stimulation the linguist has presented to the speaker. This stimulation is relevant to C, because unlike C & D, C alone need not be rejected come what may. If indeed the dog's colour turns pink, the corresponding stimulation does not *prompt* the speaker's dissenting from C. (The speaker may then withhold his judgement concerning C; and even if he still dissents from it, it is not *because of* the stimulation in question). Having found a

stimulus which is relevant to C alone, we must conclude that C isn't stimulus-synonymous to C & D, q.e.d.

So much about Quine's only example against stimulus analyticity. Admittedly the example does not reflect much of the substance in Quine's opposition towards the analytic. We need a more serious example.

Quine rejects the notion of analyticity because of holism: There are, he claims, sentences so remote from possible experience that, whatever recalcitrant datum we may face, we may still maintain our assent to those sentences – if only we readjust the rest of our theory. Such sentences are, then, stimulus-analytic (they are assented to come what may), but they need not be analytic in the intuitive sense.[19] I want to show that they also fail to be analytic in the sense of D5.

The best example for Quine's case I can imagine stems from the early days of quantum physics. It is Einstein's famous standing sentence:

(G) God does not play dice,

which was Einstein's metaphoric way of expressing his firm trust in determinism. (He didn't like the aleatoric elements in quantum physics). Simplifying Einstein's verbal dispositions, we want to assume that he was disposed to assent to G come what may; in his idiolect, the sentence was stimulus-analytic. Now G is not analytic in the intuitive sense. Let me show that D5 yields the same result.

Einstein's assent to G was incompatible with the quantum theory Q of his opponents. Therefore, Einstein and his opponents didn't need to experiment in order to disprove the conjunction of G (or an appropriate paraphrase of it in more scientific jargon) with Q; they all had to dissent from G & Q under whatever experimental stimulation. Thus, the conjunction's stimulus meaning is empty. But the stimulus meaning of Q alone is not empty. Q is a respectable scientific theory, open to an empirical investigation. There are possible stimulations which would disprove Q empirically. And those stimulations are, then, relevant to Q, even in Einstein's idiolect. (Einstein

would have welcomed them, happy, indeed, to dissent from Q *because of* an experiment). Even for Einstein, we conclude, Q alone is not stimulus-synonymous to the conjunction of G and Q. *Ergo*, G isn't analytic in the sense of D5, q.e.d.

I conclude from the discussion of the two examples that the notion of analyticity I have been proposing works well in cases where Quine's stimulus analyticity fails. My second example, it seems to me, may be viewed representative for the way D5 relieves the analytic from Quine's holistic shock. There may be arguments against the synthetic/analytic distinction which are not grounded in holism. What I wished to show is that we can accept the Quine/Duhem thesis without forgoing the notion of analyticity. The two 'dogmas' of empiricism are not in the same boat.[20]

NOTES

* I am grateful to Wolfgang Carl, Kit Fine, Gerhard Hauser, Christine Holten, David Hyder, Lorenz Krüger, Sven Rosenkranz, Layli Shirani, and two anonymous referees for helpful comments on earlier versions of this paper.

1 Quine's comrades were Goodman (1952), Mates (1952), and White (1952).

2 Quine (1961).

3 Quine (1960).

4 Harman mentions such an argument in order to convince Quine that he'd better cleanse the *entire chapter II* from behavioristic formulations (1969, pp. 22/3). Quine's reply is loaded with clear reservations: 'I am not sure [...] whether I want to be cleared [of the suspicion of philosophical behaviorism]' (1969, p. 296).

5 For sake of simplicity, I shall pursuit our discussion exclusively in terms of Quine's stimulus semantics as presented in WO, thereby neglecting important changes Quine's system has undergone in later publications. These changes are not important for our discussion; my arguments can be rephrased so as to fit into Quine's more recent framework. It is not necessary to take the effort of repudiating Quine's reservations towards synonymy and analyticicty in more recent terms because the essence of Quine's reservations remains unchanged. They are already most forcefully argued for in WO and in Quine (1961). Compare, however, footnotes 9, 12, 17 below.

6 Quine separates the two questions as well: 'The distinction [between the analytic and the synthetic – O.M.] itself, and not merely an epistemological question concerning it, is what is then in question' (1976, p.130). Here is more textual evidence for an interpretation according to which Quine, among other things, really wished to deny that analyticicty is an intelligible notion:

> 'Now here the difficulty is simply [...] the word 'analytic', which we do not understand!' (1961, p. 33).
>
> '[...] a boundary between analytic and synthetic statements simply has not been drawn. That there is such a distinction to be drawn at all is an unempirical dogma of empiricists, a metaphysical article of faith' (1961, p. 37).
>
> 'But I hope we are now impressed with how stubbornly the distinction between analytic and synthetic has resisted any straightforward drawing' (1961, p. 41).

7 Stimuli *prompting* assent have to contribute causally to the informant's reaction (WO, p. 30). In order to verify causal claims of this sort, unlike Quine I want to allow more than mere black box tests. In this respect, Quine's behaviorism is antiquated. Why not hope for powerful methods of neurophysiology?

8 Admittedly, Quine doesn't explicitly say that the analytic sentences are synonymous in the broad sense; he only implies that they are: Continuing his

discussion of broad synonymy, three pages later he arrives at the interdefinitions quoted above. And as we've already seen, from these interdefinitions it follows that analytic sentences are synonymous (in the sense of synonymy under discussion, i.e., in the broad sense of synonymy).

9 In many publications other than WO, it is Quine himself who maintains that sentences not testable in isolation can indeed be tested when joined into a sufficiently large conjunction. To quote a more recent Quinean metaphor, we have to put sentences together until 'critical semantical mass' is reached (1992, p. 17). That 'critical semantical mass' *can* be reached is the positive side of the holistic doctrine. It is Quine's failure in chapter II of WO not to be aware of this positive side at a very crucial point in his argumentation. There he seems only to see the negative side of holism, which consists of the claim that most sentences don't have critical semantical mass in isolation. In publications later than WO, on the other hand, Quine clearly saw the positive side of his holism; there he failed to realize how it can be invoked for defining analyticity, see footnote 12.

10 For Quine's formulation, see WO, p. 65. As noted by Quine, the roots of this idea can be traced to Grice / Strawson (1989). But Grice and Strawson stated only that such a definition was possible, without intending to defend it, see p. 210.

Admittedly, D1 can be applied to a foreign object language only if we manage to spot its logical conjunction. But Quine himself generously allows us to assume the translatability of the logical constants (cf. WO, §13).

11 As far as I can see, Gilbert Harman (1969) is the only commentator on chapter II who mentions the fallacy. According to Harman, Quine allows 'his argument to *appear* weaker than it is' (1969, p. 24 – my italics). Harman seems to view the fallacy as an unhappy accident. But Harman considers the Quinean argument as an argument against the determinacy of *translation*, not as an argument against the possibility of defining (intralinguistic) synonymy. Obviously this cannot be so, because the proposal 'too quickly' dismissed by Quine cannot be understood to work interlinguistically at all. This has been seen by Quine, see WO, p. 65.

12 There are indications in Quine's more recent publications that he is not opposed to an *intra*linguistic notion of synonymy in the fashion of D2 anymore:

> 'One is tempted to suppose that we might define meanings for sentences of less than critical mass, and even for terms, by substitutivity. If we can interchange two expressions without disturbing the empirical content of any testable context, are they not alike in meaning?' (1992, p. 53).

But he isn't interested much in that (intralinguistic) notion, as he continues:

> 'Well, the plan collapses between languages. Interchanging expressions would turn the context into nonsense if the expressions belong to different languages. So the plan offers no relief from the indeterminacy of translation' (1992, p. 53).

Even if we grant Quine that we cannot reach at an acceptable *inter*linguistic notion of synonymy, we need not despair of analyticity, because analyticity is already definable in terms of *intra*linguistic synonymy. But Quine is aware of this as well. Most recently, he has pointed to the other side of this very same coin, stating that intralinguistic but not interlinguistic synonymy is definable in terms of analyticity (1991, p. 271).

To put the scattered pieces of Quine's more recent views together: (i) intralinguistic (but not interlinguistic) synonymy is definable; (ii) analyticity is definable in terms of intralinguistic synonymy. It would seem that Quine has to conclude that (iii) there is a reasonable criterion for analyticity, too. But persistently Quine refuses to accept this (1991, p. 271).

13 To tell the truth, this formulation yields wildly paradoxical results, since it renders, say, contradictions stimulus-analytic. (This is because each contradiction has as empty a stimulus meaning as has a self-conditional. For no stimulation whatsoever can suffice to *prompt* the native's reaction to a contradiction. So all

stimuli are irrelevant to a contradiction as well as to a self-conditional.) But it is easy to fix this defect of D3:

(D3') A sentence is stimulus-analytic if and only if it is synonymous to 'If p then p', *and if the speaker is disposed to assent to the sentence.*

For clarity, I am going to omit the italized extra clause in the text. Don't worry about that; it won't harm my main argument, as I spell out in the next footnote.

14 Since D3 does not really define stimulus analyticity, but a still weaker notion (cf. previous footnote), it may seem that in fact D2 is *not* stronger than the correct version of D3, that is, D3'. Let us see what happens to the argument from the text when we apply it to D3'. Replacing stimulus synonymy with synonymy in our sense we obtain from D3':

(D2') A sentence is analytic if and only if synonymous with self-conditionals ('If p then p') *and if the speaker is disposed to assent to the sentence.*

But here we *can* omit the italized extra clause because a speaker *must* assent to a sentence which is analytic in the sense of D2. (For the proof, see footnote 17).

15 This is much less of an empirical claim than may seem. It is better understood as a methodological restriction on the translation of the native's logical constants, a restriction which has been called 'principle of charity': Evidence that speaks against the stimulus-synonymy of a given sentence and a conjunction of the latter with a self-conditional is better regarded as calling our translation of the native's logical arsenal into question.

16 If the stimulus synonymy of the two sentences were not granted, we could still use D5 for establishing the synthetic/analytic distinction. The only thing I would have to withdraw in this case is my claim that D2 und D5 are equivalent. Faced, then, with the alternative of choosing between D2 and D5, I would of course opt for D5, because it presupposes less than D2. But let us assume for the rest of our

discussion that the stimulus synonymy of T and 'T, and if p then p' is granted (so that D2 and D5 are equivalent).

Let us assume even more. Let us assume that the native's logical constants have been translated in such a way that makes *each* pair of logically equivalent sentences stimulus-synonymous (principle of charity). From this we can conclude that each truth of logic is also analytic in the sense of D2 and D5. But in order to obtain this nice result, we had of course to appeal to a notion of logical equivalence, or alternatively (what boils down to the same), to a notion of logical truth. According to Quine, fortunately, this notion is unproblematic (1961, pp. 22/23 and 1976, pp. 109/110).

You may ask: Are there more examples for analyticity, outside logic? The answer is positive, but it is beyond the reach of this paper to establish further examples. In Mueller (1998) I show that mathematical statements are analytic in the sense defined (see §10.16); I also argue for the analyticity of certain Carnap sentences (see §§11.6-11.13). So my notion of analyticity is much stronger than the notion for everyday life purposes which Quine is prepared to grant us in his more generous moments, cf. Quine (1974, pp. 78-80) and (1991, pp. 270/1).

17 Is D5 outdated in the light of Quine's more recent publicatons? As an anonymous referee has pointed out to me, one might think so: Quine does not believe any longer that the linguist can compare stimulations occuring at the surfaces of *different* speakers (1992, p. 42). As a consequence, the notion of stimulus synonymy cannot be applied to sentences from different speakers. The notion thus looses much of its interest; e.g. it won't be essential for the project of radical translation. However uninteresting the notion may be for some philosophical purposes, it is still well defined for the intrapersonal case, which is enough for our definition D5: the definition merely appeals to stimulus-synonymous sentences from *one and the same* speaker's idiolect. – A similar remark applies to the parallel objection against D1.

Given D5, it is easy to prove what I had promised in footnote 14:

(*) Each analytic sentence S is stimulus-analytic.

Proof: Let s be any stimulation. We have to show that a speaker has to assent to S under the stimulation s. There exists a sentence T(s) to which the speaker is prompted to assent by s. (Take for T(s) e.g. a partial description of what the speaker sees or hears or smells). According to D5, s must be contained in the affirmative stimulus meaning of S & T(s). But the speaker's assent to this conjunction is only possible if he is also disposed to assent to the first conjunct S alone, q.e.d. – The converse of (*) doesn't hold as will be seen in section V.

18 For I can imagine a speaker who had never seen any black dog. Such a speaker may withhold his judgement of D up to his first black dog stimulation, which, in fact and at this time, *prompts* him to assent to D. So at least D seems not to be stimulus-analytic for everybody.

19 Quine (1961, pp. 41, 43) and (1981, pp. 71/72).

20 I shall give a more detailed defense of synonymy and analyticity against Quine's meaning skepticism in Mueller (1998).

REFERENCES

Goodman, N. (1952), 'On Likeness of Meaning', in L. Linsky (ed.) *Semantics and the Philosophy of Language*. Urbana: University of Illinois Press.

Grice, P. and Strawson, P. (1989), 'In Defense of a Dogma', in P. Grice, *Studies in the Way of Words*. Cambridge / Mass.: Harvard Uiversity Press.

Harman, G. (1969), "An Introduction to 'Translation and Meaning', Chapter Two of *Word and Object*", in D. Davidson and J. Hintikka (eds.) *Words and Objections: Essays on the Work of W. V. Quine*. Dordrecht: Reidel.

Mates, B. (1952) 'Synonymity', in L. Linsky (ed.) *Semantics and the Philosophy of Language*. Urbana: University of Illinois Press.

Mueller, O. (1998), *Synonymie und Analytizitaet: Zwei sinnvolle Begriffe. Eine Auseinandersetzung mit W.V.O. Quines Bedeutungsskepsis.* Paderborn: Schoeningh.

Quine, W. V. O. (1960), *Word and Object.* Cambridge / Mass.: MIT Press.

Quine, W. V. O. (1961), 'Two Dogmas of Empiricism', in *From a Logical Point of View*, revised edition. Cambridge / Mass.: Harvard University Press.

Quine, W. V. O. (1969), 'Replies', in D. Davidson and J. Hintikka (eds.) *Words and Objections: Essays on the Work of W. V. Quine*. Dordrecht: Reidel.

Quine, W. V. O (1974), *The Roots of Reference. The Paul Carus lectures.* La Salle: Open Court.

Quine, W. V. O. (1976), 'Carnap and Logical Truth', in *The Ways of Paradox and Other Essays*, revised and enlarged edition. Cambridge / Mass.: Harvard University Press.

Quine, W. V. O. (1981), 'Five Milestones of Empiricism', in *Theories and things.* Cambridge / Mass.: Harvard University Press.

Quine, W. V. O. (1991) 'Two Dogmas in Retrospect', *Canadian Journal of Philosophy*, vol. 21, pp. 265-274.

Quine, W. V. O. (1992), *Pursuit of Truth*, revised edition. Cambridge / Mass.: Harvard University Press.

White, M. G. (1952), 'The Analytic and the Synthetic: An Untenable Dualism', in L. Linsky (ed.) *Semantics and the Philosophy of Language*. Urbana: University of Illinois Press.

Manuscript submitted August 12, 1996
Final version received September 29, 1997