

Meaning Holism

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1. Background

The term ‘meaning holism’ (together with variants like ‘semantic holism’ and ‘linguistic holism’) has been used for a number of more or less closely interrelated ideas. According to one common view, meaning holism (MH) is the thesis that what a linguistic expression means depends on its relations to many or all other expressions within the same totality. Sometimes these relations are called ‘conceptual’ or ‘inferential’. A related idea is that what an expression means depends, mutually, on the meaning of the other expressions in the totality, or alternatively on some semantic property of this totality itself. The totality in question may be the language to which the expressions belong, or a theory formulation in that language. In this sense MH is contrasted e.g. with so-called atomistic theories, according to which each simple expression can have a meaning independently of all other expressions, or molecular theories according to which there are meaning dependencies but restricted to smaller parts and often unidirectional.

Meaning holistic ideas were introduced into analytic philosophy in the early 1950’s, in works by Carl Gustav Hempel (1950) and Willard Van Quine (1951), both concerned with the meaning of theoretical sentences in the formulation of a scientific theory.

Hempel articulated an idea of interdependence among expressions:

In order to understand “the meaning” of a hypothesis within an empiricist language, we have to know not merely what observation sentences it entails alone or in conjunction with subsidiary hypotheses, but also what other, non-observational, empirical sentences are entailed by it, and for what other hypotheses the given one would be confirmatory or disconfirmatory. In other words, the cognitive meaning of a statement in an empirical language is reflected in the totality of its logical relationships to all other statements in that language, and not to the observation sentences alone. (Hempel 1950:181)

Hempel’s idea was a way of accounting for the fact that in general, a theoretical sentence does not alone, but only together with other theoretical sentences, imply observation sentences. This, sometimes called *confirmation holism*, or *epistemological holism*, was even more emphasized by Quine. In setting out his views on sentence meaning, he employed the more austere notion of *empirical content*. Roughly, the empirical content of a sentence is the set of possible experiences that confirm it. Quine then characterized ‘total science’ metaphorically as a field of force with observation sentences at the periphery, confronting experience, and theoretical sentences in the interior:

If this view is right, it is misleading to speak of the empirical content

of an individual statement—especially if it is a statement at all remote from the experiential periphery of the field. (Quine 1951:43)

The unit of empirical significance is the whole of science. (Quine 1951:42).

This has often been taken as implying that it is the whole theory formulation that has meaning in the first place, and that theoretical sentences and sub-sentential expressions, have meaning (but not empirical content) in a derivative way. So understood, it is one example of the idea that the meaning of individual expressions depends on the totality to which they belong.

Hempel's view, though clearly anticipating later holistic ideas, did not have a great influence, but Quine's did. In particular, it has been correctly pointed out that if you combine confirmation holism with a form of *verificationism*, or some similar epistemic conception of sentence meaning, then a form of meaning holism results, provided the meaning of sentence is understood as something like its *total contribution* to the empirical content of the theory. Because of confirmation holism, the contribution of a theoretical sentence depends on the contributions of other sentences, and therefore the meaning of the sentence depends on the meaning of other sentences. This source of meaning holism has received much attention.

Other important meaning holistic ideas were proposed in Wilfrid Sellars's work on language games (1963). On Sellars's view, the meaning of an expression is determined by the set of rules governing the kinds of 'moves' that can be made with it in the game. There are three kinds of move: *language entry moves*, which lead from observation to the acceptance of a sentence, *intra-language moves*, which are inferential transitions from sentences to a sentence, and *language exit moves*, which lead from accepted sentences to action. Since, on Sellars's view, sameness of meaning consists in sameness of role in a language game, an intuitively holistic conception results.

Sellars's work inspired what has come to be called *conceptual role* or *inferential role semantics*, suggested e.g. in works by Harman (1974), Field (1977), Block (1986) and Brandom (1994). In a narrower sense, *inferential* role semantics is concerned with the meaning of sentences only, and identifies it with its role in a set of correct or accepted inferences or inference patterns, whereas *conceptual* role semantics is concerned also with sub-sentential expressions, and with the roles not only in inferences proper, but also roles in relation to perception and action. In Harman and Block the theories are concerned with *mental* language, i.e. a system of mental representations having its own syntax-like structure. Again, the holistic element consists in the idea that the *conceptual role* of a mental representation relates it directly or indirectly to all or at least many other mental representations in the same system, and since meaning is or is determined by conceptual role, representations are mutually dependent for meaning.

Yet other holistic ideas were suggested in Donald Davidson's theory of *radical interpretation* (1967, 1973). According to Davidson, a correct semantic theory for the language of a particular speaker is a theory that results from methodologically correct *interpretation* of the utterances of that speaker. Such interpretation is holistic in the sense that only *whole* theories can be tested by the interpretation method. Although the semantic theory will ascribe meaning to individual sentences of the language, the possible empirical evidence for any particular ascription is too weak to fully support it. The accumulated evidence can justify the whole theory, but parts of the evidence cannot fully justify parts of the theory. This connects with the idea of interdependence when the structure of the language and the theory is taken into account (see section 2) given that, as on Davidson's view, meaning is *determined* by methodologically correct interpretation. Related ideas were formulated by Dennett (1971) and Lewis (1974).

Holism of this kind is sometimes connected with a kind of *belief holism*, according to which a subject cannot have a particular belief without having many related beliefs. For instance, Davidson puts it like this:

There are good reasons for not insisting on any particular list of beliefs that are needed if a creature is to wonder whether a gun is loaded. Nevertheless, it is necessary that there be endless interlocked beliefs. The system of such beliefs identifies a thought by locating it in a logical and epistemic space. (Davidson 1975:157)

Belief holism has seemed plausible (see section 4), but the role of meaning or content has not always been clear (see next section).

MH has also had its critics. Davidson's holism in particular was criticized by Michael Dummett (1976, 1991), who concentrated on the issue of language learning. Other attacks on holism include Fodor 1987 and above all Fodor and Lepore 1992, who stressed questions of communication and psychological generalizations. Fodor and Lepore's attack on holism gave rise to an intense discussion of the topic during the 1990:s. Unfortunately, the definitions of MH in these discussions have varied quite a bit, and to some extent the discussions have suffered from it. Before looking at the arguments, the question of definition therefore needs some attention.

2. Defining meaning holism

Indirect definitions. In the case of belief holism, the stress is on the conditions for a person to have a belief with such and such a content. This is clearly a different question from that concerning how belief states depend on each other for having their content fixed. If there is a dependence, so that one belief state cannot have a particular content unless it is somehow connected to other belief states with appropriately related contents, then belief holistic claims follow. But the converse doesn't hold. There can be other reasons for belief holism than MH. For instance, it is reasonable to claim that to have a belief that a gun is loaded the believer must minimally be able to distinguish

guns from other things. This may then be combined with two further claims: first, that the only way of having that ability is having a grasp of functional features of guns (as distinct from perceptual features), and second, that grasp of functional features requires further beliefs. The need for having further beliefs is then *epistemological* rather than *semantic*: other beliefs are needed for some particular cognitive capacity. If the dependence of some beliefs on others isn't semantic in nature, we don't have an example of MH.

A analogous point can be made regarding the ascriptions of beliefs to speakers or of meaning to their words. It is reasonable to hold, with Davidson, that interpretation of a speaker is a holistic enterprise, precisely because the evidence at each point by itself is so weak. But unless it is also held that an expression has some particular meaning just *because* this is what it can correctly be interpreted as meaning, MH doesn't follow. You might hold that it is merely a matter of empirical fact that a certain method of interpretation is reliable for finding out what human speakers mean by their words. That these words have those meanings may however depend on quite different factors, and there need be no holism involved. You will then affirm interpretation holism for epistemological reasons and reject MH itself.

Similarly, Dummett's definition of meaning holism suffers from a failure of distinguishing purely semantic issues. According to Dummett, meaning holism is the view that you have to know an entire language in order to know the meaning of any single expres-

sion in that language (1991:221). (A similar formulation can be found in Wittgenstein's *Philosophical Investigations*, #199, but the exegetical issues are too difficult to be discussed here). Exactly what knowing an entire language amounts to in this context is not so clear (e.g. knowing the meanings of all the simple parts and all syntactic operations), but either way there can be several reasons why knowledge of an entire language is necessary for knowing the meaning of any single expression. It can be because of semantic dependencies between expressions, but it can also be because of cognitive peculiarities of the human mind, having to do with its capacity of grasping concepts (cf. Tennant 1987), and in that case the view does not have much to do with MH.

In general, if a definition of MH is given, not in terms of what meaning expressions have or how their meaning is determined, but *indirectly*, in terms of conditions on having meaning at all, or on being related in a certain way to things having meaning, then there is a possibility that those conditions are met for *non-semantic* reasons.

In fact, this holds of the official definition of meaning holism given in Fodor and Lepore (FL) 1992. According to FL (1992:1-2), a property is *atomic* just if it is possible for exactly one thing to have it. A property is *anatomic* just if it is necessary that if one thing has it, then at least two things have it. A property is *holistic* in the sense of FL just if it is necessary that if one thing has it, then *lots* of things have it. In this terminology, meaning holism is the view that the generic property of having meaning, or intentional content, is holistic. Let's call this *FL-holism*. FL-holism is indeed a consequence of other defini-

tions in terms of meaning determination, but in itself does not distinguish between semantic and non-semantic reasons why lots of things must be implicated. As FL seem to have acknowledged (Fodor and Lepore 1993:318), it may be that for any system to be *mental*, that system must have a lot of *states* that can be characterized as mental. Then add the views that mental states are individuated by their intentional content, and that nothing can have meaning or content unless there is a system with mental states. FL-holism results, because of metaphysical or nomological facts about the mental, not for semantic reasons.

Definitions in terms of inferential role. Although it is common to characterize holism as the view that the meaning of an expression is its role *in the language*, this is not in itself a holistic view in any interesting sense. The *role* of ‘and’ in English may be said to be exactly that of expressing the truth function of conjunction, which is not holistically characterized at all. Similarly, the role of the name ‘Ernest Hemingway’ may be to contribute to truth conditions of sentences exactly by referring to Ernest Hemingway. In general, describing the meaning of an expression in terms of its semantic contributions to more complex expressions is often part of holistic views, but as long as the role in question can be specified without reference to the meaning of any other expression, it is not itself holistic.

Another issue is whether MH shall be characterized in terms that are independent of any particular meaning theory, or whether some particular theory or kind of theory may

be presupposed. For instance, according to the definition given by Louise Antony (1993:140), meaning holism is the view that ‘conceptual connections constitute content’. This definition apparently presupposes some form of conceptual role semantics, since the general idea of semantic interdependence between expressions does *not* imply that if two expressions are interdependent for meaning, there is also a conceptual connection (in any ordinary sense of this phrase) between them. Given Antony’s definition, MH is false if conceptual role semantics is false.

This situation is even clearer in Michael Devitt’s definition. Devitt (1996:10) assumes a conceptual/inferential role semantics for sentences, and defines meaning holism as the view that *all* the inferential relations a sentence participates in together constitute its meaning. Devitt himself is opposed to holism in this sense, and prefers ‘localism’, the view that only a distinguished subset of this total inferential set constitute the meaning of the sentence. Devitt openly assumes an inferential role semantics for both definitions. But even with this assumption in place, it is worth while to consider the relation between Devitt’s definition and the idea of interdependence, not least since holism in this sense plays a central role in the arguments of Fodor and Lepore and in subsequent discussion.

Assume the view that there is an interdependence for meaning between *any* two expressions in a language. That is, for any two expressions, whatever meaning is given to the one constrains what meaning can be given to the other. Call this *total pair holism*. Assume further, that if two sentences stand in a relevant inferential relation, they are

interdependent for meaning in this sense, and also that interdependence is a transitive relation (if s and s' are interdependent, and also s' and s'' , then so are s and s''). Now it is clear that total pair holism does not imply Devitt holism, for it may well be enough that for each sentence only a small subset of its total inferential set is relevant for meaning interdependence, and that yet because of the transitivity of interdependence, total pair holism results. In fact, it is enough that each sentence is relevantly related to just two other sentences (number the sentences consecutively, and let each odd-numbered sentence s_n be relevantly inferrable from exactly s_{n-1} and s_{n+1} ; then because of the transitivity, all sentences are semantically interdependent).

Neither does Devitt holism imply total pair holism, for it is in principle possible that the language is partitioned into isolated 'inferential' sets of sentences, such that no two sentences of different inferential sets are inferentially related. Then total pair holism is false, even though Devitt holism may be true.

Thus, Devitt holism and total pair holism are logically independent. It is plausible that as a matter of general tendency (assuming inferential role semantics), the more other sentences a particular sentence is relevantly inferentially related to, the closer the language will be to instantiate total pair holism. Moreover, if the language in question contains logical vocabulary, it is not partitioned into isolated inferential sets, for any two sentences will be inferentially related to, among other things, their conjunction. Still, these two ideas of holism are clearly different.

Holism as a principle of meaning determination. Even when we turn to the idea of interdependence itself, there are a number of issues to be clarified. First, some formulations of holism, like Antony's, suggest that what gets determined, or constituted, are the meanings or contents themselves. But it is unclear whether anyone really thinks so, and it is an implausible view anyway. Meanings, if they are entities at all, are abstract, and it is not plausible that whenever some abstract entities are essentially related to each other, they are also 'constituted' by that relation. For instance, it does not make much sense to say that the number 5, or the concept of that number, is constituted by the fact $5+27=32$, or that the proposition that p is constituted by the fact that it is equivalent with the proposition that $(p\&q) \rightarrow p$, even though these relations may well be called 'conceptual'. That which is constituting must in some way or other be prior to that which it constitutes, and when it comes to abstract objects, the only ideas of priority that seem plausibly applicable are those of part-whole relations or inductive definitions. For instance, we might say that the number 5 is constituted by being the successor of the number 4, or that the proposition that $p\&q$ is constituted by being the conjunction of p and q . But such constitution is obviously not holistic.

What can plausibly be said to be determined or constituted according to MH is rather the expression–meaning *relation*. That is, *what* meaning an expression has may be determined or constituted in a holistic way. But it is then highly misleading, or outright false, to say that what meaning a sentence has is determined by its inferential relations to other

sentences. Only a sentence that *has* a meaning can be at all inferentially related to other sentences. It simply cannot be (even though suggested by many formulations in the literature) that inferential relations between sentences precede the meaningfulness of their relata.

Rather, the proper basis for presenting MH along the idea of interdependence, is to say that expressions in a language (public or mental) have certain *non*-semantic properties and stand in certain *non*-semantic relations to each other, such that the semantic properties of the sentences depend on, get determined or constituted by, or supervene on, these non-semantic properties and relations. Call this *the determination base*. In Davidson's case the determination base consists of sentences being *held true* by the speaker (or in later works, preferred true), or in general *held true under certain circumstances*, together with the syntactic relations of constituent structure. In the case of Brian Loar (1981) it is a matter of causal relations between physical (neural) states.

Properly stated, inferential role semantics is a theory of how the meanings of sentences get determined by what inferences the speaker, or thinker, *accepts*. The relation that holds between two sentences just in case a particular speaker accepts the inference from the truth of the first to the truth of the second, is itself *non*-semantic. It is a fact about speaker psychology, not about inferential properties of the sentences. Given such non-semantic facts, it is up to the theory to say how the inferential properties themselves, and further semantic properties, get determined. One such principle of determination is

precisely that if an inference is accepted as valid, then it is to *be* valid. That is, the sentences involved must be assigned meaning to the effect that the accepted inferences come out as valid. Call this the *Validating Principle*. This principle seems often tacitly taken for granted in the literature in cases where the difference between being valid and being accepted as valid isn't noted. It *is* noted, and emphasized, e.g. in Boghossian 1993, 1994.

In Davidson's framework the principle is in a sense approximated. The method of interpretation is summed up under the title 'the principle of charity'. In its simplest version this is the principle of *maximizing* truth among the sentences held true by the speaker. That is, assign meaning so that as much as possible of what the speaker says comes out as true. This is a *best approximation* principle. Since all speakers in fact have a number of false beliefs, it is not in general possible (given that interpretation is constrained by the need of respecting the constituent structure of sentences) to find an interpretation that makes true all the sentences held true. According to the principle of charity, an interpretation that gives the best approximation is correct.

The Validating principle induces a kind of generalized implicit definition. Normally, in an implicit definition you have a number of sentences containing mostly words that are already interpreted, but also one or more that are not. By stipulating that the sentences shall be true, the previously uninterpreted words must get some meaning (if there is one) such that the sentences in fact come out true. This was the case with Hilbert's

implicit definition of the terms ‘point’, ‘line’ and ‘plane’ by means of his axioms of geometry (Hilbert 1899). This is also the best way of understanding Hempel’s suggestion. Theoretical sentences of a scientific theory contain previously understood expressions, and also theoretical terms specific to the theory itself. These terms, such as ‘quark’ and ‘boson’ in particle physics, can be seen as implicitly defined by means of the theory formulation. Some of its sentences are to be true, and some are held to follow from others. This totality of accepted truths and inferences together implicitly define the terms specific to the theory. Since the terms are connected, both by co-occurring in the same sentences and by occurring in inferentially related sentences, the meaning assigned to one term must match the meanings assigned to others, so that the desired truths and validities result. That is, we have interdependence.

Usually, meaning determination principles are thought of synchronically: for instance, the meaning of a speaker’s sentences at a time t is taken to depend on his attitudes at time t , not on his *revisions* of those attitudes at later times. However, *dispositions* to make revisions can be taken into account. For instance, the *strength* with which a speaker holds a particular sentence true (his unwillingness to give it up), may be relevant to meaning determination.

This applies to the connection between MH and Quine’s claim in *Two Dogmas of unrestrained revisability*, i.e. that any statement held true can be given up in the face of recalcitrant experience (Quine 1951:43). The connection is not simple, but it is important

to note that MH, as a meaning determination principle, can accommodate both restricted and unrestricted revisability. On a restricted revisability alternative, a particular proposition p can not be assigned to any sentence s as held true by speaker S , if S is disposed to give up his attitude to s under particular circumstances. Typically, you would prefer this alternative if you believe in an unrevisability version of the analytic/synthetic distinction and think that some propositions, e.g. the proposition *that bachelors are unmarried*, can only be expressed by an analytic sentence.

The primacy of the whole. The semantic idea, exemplifying more general holistic ideas, that there is some whole with semantic significance that has priority of the semantics of parts—individual linguistic expressions—is not always easy to make sense of. There does not e.g. seem to be any relevant semantic property of a *language* by which a language can be the ‘whole’ in question.

The idea, often attributed to Quine (cf. Okasha 2000), that the meaning of theoretical sentences consist in their contribution to the empirical content of the theory does, on closer inspection, reduce to a kind of inferential role semantics: some sentences are taken as together entailing certain observation conditionals (i.e. conditionals with observation sentences as antecedent and consequent) or observation categoricals (universalized observation conditionals), whereas the various observation sentences are just accepted or rejected. Therefore, this idea does not really give rise to a different kind of meaning holism. The primacy of the whole boils down to the primacy and relative independence

of observation sentences (cf. Quine 1986b).

An alternative is the *nihilist* view, which does seem to have been Quine's (Quine 1986a), that sentences without empirical content, including many theoretical sentences, don't have any meaning at all. On this alternative, too, meaning is assigned to individual observation sentences, not just to the totality.

The network metaphor. As in the Davidson quotation above, and e.g. also in Block 1998, MH is sometimes characterized by saying that the meaning of a sentence, or a belief state, is given by its place in a 'network', 'web', 'pattern', 'space' or 'system' of sentences or beliefs. The network metaphor is not cashed in, however, but only used as an illustration. The illustration is somewhat misleading, since it suggests that—like the nodes in a network are pairwise connected with lines—the relevant interconnections between expressions consist in a large number of *binary* relations, and also that a metric of *distance* between the nodes can be defined on that basis, so that we have a well-defined notion of a *location* in the network (directly connected expressions are supposed to be 'closer' than indirectly connected ones). By contrast, the relations actually considered in theories of meaning determination are more complex.

The combinatorics of interdependence. The general idea of interdependence of meaning determination is only that the assignment of meaning to one or more expressions constrains the assignment of meaning to others. This again means that some combinations of expression-meaning pairs are ruled out. For example, with respect to a

miniature language of three singular terms and three one-place predicates, for which there are three possible objects of reference to the terms and three possible concepts expressible by the predicates, the set M of possible combinations of meaning assignments has exactly $3^6=729$ members, since each of the six expressions of the language has three possible meanings. If we say that expression t_1 cannot have meaning m_3 while expression F_2 has meaning m_6 , then this excludes all meaning distributions that include pair of assignments, which is exactly $3^4=81$ distributions (three possible meanings to each of the remaining four expressions). All proper subsets of M define restrictions that rule certain combinations out. For instance, the restriction that all expressions must have *different* meanings leaves only $(3!)^2=36$ admissible distributions (combining 3·2·1 possible distributions over the terms freely with as many possible distributions over the predicates).

By means of such combinatorial ideas we can give a *measure* of interdependence. Let's say that a *total distribution* gives a meaning to each of the expressions of the language (for sake of simplicity, ignore lexical ambiguity). For an expression e the assignment number $N(e)$ is the total number of meanings given to e by the different admissible total distributions. For instance, in the example $N(e)=3$ for all simple e if all possible total distributions are admissible, but also after imposing the *different meanings* restriction: in either case there are three possible meanings a particular simple expression can have. Let $N(L)$ be the number of admissible total distributions to the language L , and

$N(E)$ the number of admissible distributions to syntactically *simple* expressions. If we simplify matters by assuming that the language has a compositional semantics, and fix the semantic significance of syntactic operations, then the meanings of complex expressions will be uniquely determined by the meanings given to simple expressions and their mode of composition. Then $N(L)=N(E)$, for if there are, say, 36 admissible distributions over simple expressions, there cannot be 37 admissible total distributions. For if so, there are two distributions giving the same meanings to simple expressions but differing over the meaning of some complex expression, thus violating the assumption of compositionality (given that the significance of syntax is fixed).

Now we want to give a measure of interdependence by computing the degree to which possible distributions are excluded. Since it cannot be assumed that $N(e)$ is the same for all expressions e , we shall have to give an interdependence measure for each e , and then define the total measure as an average. First, then, we specify the maximum number of admissible total distributions. We get the maximum number if meaning assignments to individual expressions can be freely combined. Where k is the number of simple expressions of L we have

$$Max(L) = N(e_1) \cdot N(e_2) \cdot \dots \cdot N(e_k)$$

which in the example is 3^6 . Then we define $DI(L, e)$, the degree of interdependence of L with respect to e , as follows:

$$DI(L, e) = \frac{Max(L) - N(L)}{Max(L) - N(e)}$$

When meaning assignments can be combined freely we have no interdependence at all, which amounts to setting $N(L)=Max(L)$. In this case $DI(L, e)=0$ for any expression e .

When interdependence is maximal, any assignment of meaning to one expression uniquely determines the assignment of meaning to any other expression. Then $N(L)=N(e)$, for any simple expression e : there cannot be two total distributions d_1 and d_2 that assign the same meaning m to some expression e , for then there is at least one expression e' that gets different meanings by d_1 and d_2 . In that case, assigning m to e does not uniquely determine the meaning of e' , contrary to assumption. In case of maximal interdependence, when $N(L)=N(e)$, we have $DI(L, e)=1$ (note that $DI(L, e)$ is undefined in case $N(e)=1$ for all $e' \in e$, since then $Max(L)-N(e)=0$; this is intuitively right, since if there isn't more than one possible meaning for any single expression, there is no measurable degree of interdependence either). Values between 0 and 1 correspond to intermediate degrees of interdependence, the higher the more interdependent. In the example, with the *different meanings* restriction in force, giving 36 admissible total assignments, we have

$$DI(L, e) = \frac{729 - 36}{729 - 3} = 0,995$$

for each e .

Finally, we define $DI(L)$, the degree of interdependence of L , as the *average* of the expression-relative values:

$$DI(L) = \overline{DI(L, e_i)}, \quad 1 \leq i \leq k$$

(where the bar denotes average value). We have the highest degree of interdependence for L , $DI(L)=1$, in case $DI(L, e)=1$ for all e . Again, values between 0 and 1 correspond to intermediate degrees of interdependence, the higher the more holistic. Total pair holism is of not of highest degree, since it only says that the assignment of meaning to an expression *constrains* the assignment to any other. This is best understood as a *lowering* of N -values, as follows: let $N(e'|e)$ be a conditional value, the (highest) number of admissible assignments to e' given an admissible assignment to e . We can now interpret total pair holism as the view that for all e, e' in L , if $N(e')>1$, then $N(e'|e)<N(e')$.

We can now define MH in terms of degree of interdependence. Following some suggestions in the literature, we should define MH as the view that $DI(L)=1$ (for any L). However, it might be more reasonable to require only a value close to 1. One can also go for a definition in terms of conditional assignment numbers. Finally, one can disregard numbers altogether and focus on the mechanisms that bring interdependence about.

Meanings and the mechanisms of determination. The main idea in the literature of a determination mechanism has the following form: first, assign a basic property to some

sentences, like being accepted as true (or accepted as true under certain circumstances), or to some inferences, like accepted as valid (or as valid under certain circumstances). Second, require a certain semantic dependence of complex expressions on their proper parts, like that the semantics be compositional. Third, assume some syntactic analysis of the sentences. Optionally, one can also fix the semantic significance of syntactic operations, or just let that be determined together with the meanings of the expressions.

The meaning determining factors are then a combination of non-semantic facts and structural constraints. Now assume that available semantic values are ordinary objects as values for singular terms, ordinary familiar concepts as values for predicates, familiar concepts of concepts as values for quantifiers, and so on. That is, assume *standard meanings*.

Assume further that the general determination principle is the *Validating Principle*. (That is, we assume that the Validating Principle is a *true* principle of meaning determination, not that it is accepted by the speaker.) Because of the Validating Principle, the meanings assigned to constituents of a sentence that is held true must fit together so that—given the way the world is—the sentence comes out true. Because of this, the constituent parts cannot be assigned meaning independently of each other. And this is repeated for sentence after sentence, inference after inference, that is to come out true or valid. (This is like solving a system of mathematical equations, where numerical values are to be assigned to free variables so that the equations come out true.) Then the follow-

ing might happen:

- a) We have underdetermination: more than one total meaning assignment fulfils the requirements.
- b) We have unsatisfiable overdetermination: no total meaning assignment fulfils the requirement.

There are now basically two options available. The first option is to keep standard meanings and adjust the evidence. For instance, with respect to underdetermination we can require *more* non-semantic facts, sharpen the structural constraints, or simply accept the underdetermination. With respect to unsatisfiable overdetermination we can take Davidson's option and *discount* some sentences or inferences accepted by the person as mere mistakes. The hope is that such a process eventually yields a unique total meaning assignment, which is the *best approximation*. Clearly, with finding a best approximation for assigning familiar meanings there will be several sets of non-semantic facts that determine the *same* total meaning assignment as outcome. That is, we have a *many-one correlation* between determination bases and total meaning assignments.

The second option is to take the non-semantic facts to determine a unique meaning assignment *anyway*. That will then have the consequence that the meanings assigned to expressions are *other* than the familiar ones. That is, we reject standard meanings in favour of some *non-standard* semantics with differently individuated, perhaps more

fine-grained meanings. (In terms of the system of equations analogy, this corresponds to the need of introducing numbers of a new kind, like complex numbers in relation to the reals, in order that the equations come out true.) What meanings will this give us? That is unclear. Perhaps meanings defined in terms of *sense data*, or perhaps meanings defined in terms neural network activation patterns, as in Paul Churchland's (1991, 1993, 1998) *state space semantics*. According to Ned Block (1986, 1993, 1995), inferential role semantics is a semantics for *narrow mental content*. Narrow content is a *non-representational* kind of content, determined completely by *speaker-internal* factors, the main purpose of which is to serve for psychological explanations. However, if the relevant kind of meaning is non-representational, then the concepts of truth and falsity don't apply, and then something else than the Validating Principle is needed to effect the determination.

If we abstract from the Validating Principle and simply consider a total meaning assignment as a (non-constant) function of a base of accepted sentences or inferences, then it is clear that a subject cannot change his mind arbitrarily much without inducing meaning changes. The total meaning assignment cannot stay fixed through *all* changes in acceptance attitudes. But beyond this consequence, not much follows concerning the relation between meaning and acceptance (meaning and belief). For instance, it does *not* follow from the general idea that if some particular expression *e* is to have some particular meaning *m*, then some particular inference *i* must be accepted, so that acceptance of *i* is *constitutive* of *e* meaning *m*. The function from bases to meaning assignments might

simply be more complicated.

Further, it is often assumed in the literature that if you have a holistic inferential role semantics for mental content (i.e. Devitt holism), then *any* change of belief (any change of acceptance of sentences or inferences) will change the contents of *all* the beliefs of the subject. This is the *Instability* or *Total Change Thesis*. The Total Change Thesis is extremely strong. It is stronger than the assumption of a *one-one correlation* between determination bases and total assignments, for the obtaining of a one-one correlation allows different total assignments to overlap. The Total Change Thesis does imply a maximal degree of semantic interdependence. For if assigning a meaning to one expression e does not determine the meaning of another expression e' , but allows e' to be assigned both m_1 and m_2 , then e can retain its meaning while e' changes from m_1 to m_2 , and precisely this was ruled out.

It is unclear what determination mechanism would make the Total Change Thesis true. Probably it is assumed that a change of meaning of one word somehow infects its environment by inducing a change of meaning in all words co-occurring with it in sentences in the determination base. As the infected words spread the change via contact in other sentences, total change eventually results. But the mechanism of this induction is unspecified. It is indeed true that the Validating Principle *can* effect total semantic change in exceptional cases, but the Total Change Thesis requires this to happen every time.

One can try to simply identify the determination base with *Fregean sense*, since the determination base does something that Fregean sense does too, viz. determine reference. One can characterize the *determination base role* of an expression by constructing that it from the expression's occurrences in accepted inferences, so that any change somewhere in the determination base does induce changes in the roles of other expressions in accordance with the infection scenario (for suggestions, see Berg 1993 and Pagin 1997). Then a high degree of *sense*-interdependence between different expressions automatically results, because of the identity. However, selecting an expression's role in the determination base as its meaning is a rather extreme form of non-standard semantics. It is not a *content* or *meaning* in any intuitive sense of those terms. The truth of MH or the Total Change Thesis cannot simply be stipulated by decreeing that one or other holistic property be called 'meaning' or 'sense'.

Accepting the identity gives one a reason for the claim that because of holism, the meaning of an expression cannot be *specified* except by specifying the meaning of every expression in the language (see e.g. Davidson 1967:22). This claim does not follow from the premise that meaning determination is holistic in any of the senses given here. It must be distinguished from the claim that the conditions for a particular expression to *have* a particular meaning cannot be specified without specifying the corresponding meaning conditions for other (possibly all other) expressions. This claim, by contrast, does follow.

It seems that belief in the Total Change Thesis tacitly relies on the assumptions that a) there is a one-one correlation between determination bases and total meaning assignments, and b) meanings are so finely *individuated* that maximum interdependence can be upheld. But neither a) nor b) is true in all versions of MH.

3. Arguments against meaning holism

Two main arguments have been levelled against MH, Dummett's language learning argument, and Fodor and Lepore's instability or total change arguments. In addition, Fodor and Lepore have a related argument that MH is incompatible with semantic compositionality.

The language learning argument. Dummett (1976:42-45, 1991:221) has argued that if meaning holism is true, then a language cannot be learnt incrementally, i.e. by learning small parts of the language at a time. This is so, according to Dummett, since one cannot know the meaning of any expression without knowing the entire language. But, the argument concludes, if we cannot learn it incrementally, it is a mystery how we can learn it at all.

The thesis that we cannot learn a language incrementally does follow from Dummett's definition of holism (see section 2), but not, or at least not straightforwardly, from more standard definitions. The difference between them may be used for countering the argument. Although Dummett's learnability thesis is correct with respect to some defini-

tions of holism and some definitions of knowledge, it is incorrect with respect to others.

With respect to a version of MH that supports the Total Change Thesis, it is correct that one must know the entire language for understanding any expression it, at least if learning a new expression automatically changes the determination base. With respect to a definition of knowledge by which you cannot know what an expression means unless you know all the facts that determine its meaning and how that is done, Dummett's thesis is again correct even for weaker versions of MH.

But if a *reliabilist* conception of knowledge may be employed, and weaker versions of MH are acceptable, then Dummett's claim is incorrect. If associating the right meaning with an expression as the result of a reliable learning process is enough for knowledge, then it is possible for speakers to know what an individual expression means even from knowledge of a small fragment of the language containing it. This holds provided that, first, we have a version of MH that allows standard meanings, and second, we have a meaning determination principle that is normally *conservative*, i.e. by which the meaning assigned to an expression usually remains the same as the language is extended with new expressions (cf. Pagin 1997). This indeed does hold for Davidson's principle of charity, since speakers do not normally perform large scale beliefs revisions as part of learning new words.

A different response to Dummett is proposed in Bilgrami 1986 and in Dresner 2002 but prefigured already in Davidson 1965. All hold that learning can be gradual in the

sense that a subject can have *partial knowledge* of the meaning of an expression and gradually increase it. Dresner suggests an algebraic framework for representing partial knowledge of meaning, and a way of making the notion of partial knowledge precise, and also refers to empirical studies. The general idea is that a speaker can know some but not all of the restrictions on admissible interpretations of lexical items.

A variant of the language learning argument concerns the possibility of communication (Dummett 1973:599). The assumptions are that communication succeeds only if the hearer knows what the speaker says, and that in order to know this the hearer must know the speaker's language. On these assumptions we have the same difficulties, and the same possible countersuggestions, with communication as we have with original language learning. Cf. Tennant 1987, Shieh 1997.

The total change arguments. In Fodor 1987:55-60 and in Fodor and Lepore 1992:11-22 (see also Putnam 1986) three arguments against MH are extracted from the Total Change Thesis. First, two persons cannot disagree on anything, and they cannot agree on anything unless they agree on everything. This makes communication impossible except between persons that agree on every belief anyway, and therefore don't need it. Second, one person cannot change his mind about anything, for changing one's mind also changes the content of the belief. Third, because of these facts, we cannot make true intentional generalizations, and hence no good intentional explanations.

It is widely agreed both that these consequences do follow from the Total Change

Thesis (given that the determination base consists of accepted sentences and inferences), and that they are unacceptable. However, several authors, including McLaughlin (1993) and Pagin (1997), have pointed out that the Total Change Thesis does not follow from MH (even though true of some versions). In particular there may be a many-one correlation between determination bases and total meaning assignments, allowing for the desired meaning stability across determination base variations.

Another point discussed, especially between FL (1992, 1999) and Churchland (1993, 1998), is whether it can be enough, e.g. for successful communication, that the meanings assigned to an expression by speaker and hearer are *similar*, even if not identical. If it is enough, we could live with the truth of the Total Change Thesis. However, the discussion has been somewhat distorted by the conflation of two different issues. On the one hand we have the question whether communicative success is compatible with meaning difference, in some respect and to some extent, between speaker and hearer. On the other hand we have the question whether intersubjective identity *or* similarity is definable in the first place, given that the determinants of meaning are (like neural activation patterns) *wholly internal* to the speakers. The first question is the point of departure, but the discussion has come to concern the second. Several commentators, like Tiffany (1999), have regarded FL as victorious on the second point, but the original question remains.

The compositionality argument. In FL 1991:332-37, Fodor and Lepore argue that an inferential role theory must be combined with acceptance of the analytic/synthetic dis-

tion, and since this distinction cannot be upheld (in a principled way), inferential role semantics should be given up. The justification for the combination claim involves the principle of compositionality.

On FL's understanding, if the inference from 'x is a brown cow' to 'x is dangerous' is part of the meaning of 'x is a brown cow', and meaning is compositional, then it must follow from the meanings of the components of 'x is a brown cow' and the mode of composition, that the inference to 'x is dangerous' is part of its meaning. But intuitively it doesn't, since acceptance of the inference depends only on the speaker's beliefs, not the meanings of the components. In order to avoid this conclusion, FL argue, inferential role semantics must be restricted to identifying meaning with role in *analytic* inferences, like from 'x is a brown cow' to 'x is an animal'. Hence acceptance of the analytic/synthetic distinction.

There are two reasons why this might seem unpersuasive. The first concerns the relevance of the analytic/synthetic distinction. Assume that what FL mean, by saying that meaning *is* inferential role, at bottom is that the Validating Principle applies to accepted inferences. Any inference accepted as valid must come out as valid after meaning assignment. But here, coming out as valid does not mean coming out as logically valid, or as conceptually valid. The Validating Principle requires only that accepted inferences lead from true premises to true conclusions, *given* the facts of the world, not that they come out true or valid *independently* of facts. Hence it is not required that accepted, meaning

constitutive inferences are analytically valid. That the inference is only contingently correct is not a problem.

The second reason concerns contingent validity. The real problem with FL's 'brown cow' example is rather that the inference isn't even contingently valid. Given the Validating Principle, this would force an assignment of non-standard meaning to 'brown cow', and, given compositionality, also to 'brown' and 'cow'. They could not mean *brown* and *cow*, respectively, for a speaker accepting the inference. This problem with the Validating Principle was noted above, and it can be circumvented by replacing it with some weaker principle that can accommodate mistaken beliefs, in particular a principle that allows a many-one relation between determination bases and total meaning assignments.

4. Arguments for meaning holism

There have not been many arguments for MH, and those presented have usually relied on controversial assumptions. One kind consist of arguments for the truth of certain meaning theories, which are then assumed to be holistic. For instance, in Bilgrami 1998 it is argued that we need appeal to inferential role for solving Fregean coreference problems, and since inferential role semantics is holistic, MH is true.

Another kind consists of arguments that need to be combined with a meaning theory of a certain kind to yield MH. For instance, it is common to regard the combination of

Quine's confirmation holism with *verificationism* as an argument for MH. However, this argument is not endorsed by Quine himself (cf. Quine 1986a). Moreover, few post-positivist philosophers have been verificationists, and those that have been, like Dummett, Prawitz and Cozzo, have tended to be anti-holists, favouring the view that only what counts as a *direct* or *canonical* verification is meaning determining, not every possible verification. MH will follow only if everything accepted as a verification takes part in meaning determination.

A similar situation holds as regards appeal to belief holism. There is a strong intuitive support for belief holism, as has been brought out by Stephen Stich:

Shortly before her death, Mrs. T had lost all memory about what assassination is. She had even forgotten what death itself is. She could, however, regularly respond to the question, "What happened to McKinley?" by saying, "McKinley was assassinated." Did she, at that time, believe that McKinley was assassinated? For just about everyone to whom I have posed this question, the overwhelmingly clear intuitive answer is no. One simply cannot believe that McKinley was assassinated if one has no idea what an assassination is, nor any grasp of the difference between life and death. (Stich 1983:56)

Although these intuitions are widely shared, we get an argument for MH only if there is

further support for the view that belief holism results for reasons of semantic interdependence between belief states, rather than for epistemological or other reasons.

A related appeal to change over time is made in Block 1995, building on Putnam 1983. Block argues to the effect that changes in belief induce changes in narrow mental content. This is advertised as an argument for holism, even though the argument only considers the change of content of one particular term ('grug'). The underlying idea seems to be that since *small* changes of belief suffice for changes in narrow content, changes in belief will induce *many* changes in narrow content.

Two related arguments have been presented, but not endorsed, by Fodor and Lepore. The first (FL 1991:340) is an argument for the conclusion that inferential role semantics is holistic, and the second (1992:23-24) for belief holism, or FL-holism with respect to belief. The 1991 version runs as follows.

1. The meaning of an expression is at least partially constituted by the expression's inferential relations.
2. There is no principled distinction between those of its inferential relations that constitute the meaning of an expression and those that don't.
3. Hence, the meaning of an expression is constituted by *all* of its inferential relations, hence by all of its role in a language.

This argument and its later variant have received much attention, and a large part of

the discussion has been concerned with the second premise. FL think of the second premise as expressing a claim about the analytic/synthetic distinction, and the 1992 version has the rejection of a principled analytic/synthetic distinction explicitly as its second premise. Several authors (e.g. Boghossian 1993, Rey 1993) have tried defend the analytic/synthetic or constitutive/non-constitutive distinctions. FL themselves accept the second premise and have consequently argued against the first.

Three problems with this argument deserve mention. First, as several commentators have pointed out (concerning this or the later version; see especially Perry 1994), the structure of the argument is unclear. Some kind of slippery slope or sorites argument is suggested, but exactly how it is to come out as valid remains unspecified (this connects with the third problem). Second, the conclusion is what is here called Devitt holism, and there is a big step from there to interdependence versions of MH, and especially to the Total Change Thesis that FL employ for their *reductio* of MH. Third, it is not clear whether anyone endorses the argument (hence unclear whether anyone is committed to clarifying the structure). In addition, as was pointed out above, the analytic/synthetic distinction is irrelevant if meaning is assigned in accordance with the Validating Principle.

Finally, an argument due to Glüer (2001) trades on the difficulties with the Validating Principle. As mentioned above, it has the consequence that, *if* speakers make mistakes, strange non-standard meanings result. In Fodor's own information-theoretic setting this is known as the *disjunction problem*: occasionally mistaking a cow for a horse results in

'horse' meaning *horse or cow* (Fodor 1992 chapters 3 and 4), and in a normative setting it is an aspect of the *rule-following* problem. In order to avoid non-standard meanings the Validating Principle must be replaced by some principle that filters out mistakes.

In both the normative and the information-theoretic settings, it has proved difficult to find principles that work. Glüer's argument for holism then has the following form: there is a filtering principle that works in a holistic context, viz. the *best approximation* principle, and since no working non-holistic filtering principle exists, MH is true. Basically, therefore, the argument is that MH provides the only way of securing standard meanings.

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