Can Compositionality Solve the Thought-or-Language Problem?

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Abstract: Jerry Fodor has claimed to have a solution to the traditional problem of what comes first, thought or language. Compositionality, he says, will give us the answer, for at least one must be compositional, and if only one of them is, that is the one that has underived semantic content. He argues that natural languages are not compositional, and therefore that the content of language is derived from the content of thought. I will argue that the idea that language is not compositional conflicts with his productivity and systematicity arguments for the existence of a language of thought. I will also show that Fodor's solution to the problem fails, as his main argument is circular. Finally, I suggest that Fodor's argument against the compositionality of language is not decisive, and that we can still attribute at least some degree of compositionality to language.

Do sentences mean what they do because of the thoughts they express, or is it thought that derives its semantic content from the words and sentences of a natural language? Jerry Fodor (2001) has claimed to have a solution to the traditional problem of what comes first (in order of the explanation of semantic content), thought or language. Compositionality, Fodor says, will give us the answer, for whichever is compositional, if only one is, must be the one with semantic content in the first place. Compositionality, as Fodor and Lepore put it,

> is the property that a system of representation has when (i) it contains both primitive symbols and symbols that are syntactically and semantically complex; and (ii) the latter inherit their syntactic/semantic properties from the former. (Fodor & Lepore, 2002, p. 1)[1]

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1 For discussions on how to better phrase the principle of compositionality, see Szabó (2000, 2010, 2012). In its most general formulation, according to Szabó (2010, p. 255), the principle of compositionality says that 'the meaning of a complex expression is determined by its structure and the meanings of its constituents'. Another common formulation says that the meaning of a complex expression is a *function* of the meanings of its constituents and the way

But why should compositionality decide what has semantic content in the first place? Before assessing Fodor's solution to what we can call the thought-or-language problem, I am going to review his arguments for taking compositionality to be so central, or, as he says, non-negotiable. We will see that it is assumed that both natural languages and the system of mental representations are productive and systematic, and that only assuming that they are compositional can we explain these phenomena. In fact, the argument from productivity and the argument from systematicity are two of Fodor's most influential arguments for the assumption that there is a language of thought.[2] By language, Fodor basically means a representational system that has constituent syntactic structure and compositional semantics. The idea then is that thought, like a natural language, exhibits the phenomena of productivity and systematicity, and that a natural way of explaining these phenomena is by the assumption that thought has a syntactic structure and compositional semantics, just like natural languages. Being compositional is what makes thought like a language, hence the *language* of thought.

In the following two sections, I will briefly explore these arguments, in order to make it clear why compositionality is important, and to show how the assumption that there is a language of thought relates to it. In the third section of the paper, I will turn to Fodor's more recent view, that compositionality can decide the thought-or-language problem. We will see that he argues that natural languages are not compositional, and therefore that the content of language is derived from the content of thought. I will then argue that the

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they are combined. But, as Szabó (2010, p. 256) notes, the formulation in terms of function is too weak: 'functions are cheap and determination is not—there is probably a function from the GDP of each country to the number of its bald citizens but the former surely does not determine the latter.' I will assume that, in saying that a complex expression inherits its semantic and syntactic properties from primitive symbols, Fodor and Lepore simply mean that the semantic and syntactic properties of a complex expression are determined by the semantic and syntactic properties of its constituents. This is similar to the way Fodor (2008, p. 17) states what it is for thought to be compositional: 'the content of a thought is entirely determined by its structure together with the content of its constituent concepts.'

2 Fodor formulates these arguments in several places, for example *Psychosemantics* (1987), 'Connectionism and Cognitive Architecture' (1988) which is co-athoured by Pylyshyn, and *A Theory of Content* (1990).

idea that language is not compositional conflicts with the productivity and systematicity arguments that we will see in Sections 1 and 2. Most importantly, I will also show that Fodor's solution to the thought-or-language problem fails, for his main argument is circular. Finally, I suggest that Fodor's argument against the compositionality of language is not decisive, and that we can still attribute some degree of compositionality to language.

1. Productivity

The basic idea of productivity is that there does not seem to be a limit to the number of thoughts we can produce and understand. We constantly have thoughts that we never had before, and everything indicates that our ability to have new thoughts is unlimited. We are obviously finite beings, and therefore the number of thoughts we actually entertain during our lives is finite. But this seems to be a limitation of the finite resources at our disposal, not of our cognitive abilities. Natural languages exhibit the same phenomenon. We constantly produce and understand new sentences, which we had never encountered before, which suggests that there is no limit to the number of possible sentences in a natural language.

In the case of language productivity, part of the classic explanation for the unlimited number of possible sentences of a natural language involves assuming that sentences have a combinatorial structure, that is, they are formed from a finite number of constituents (words or morphemes), which are combined according to grammatical rules to form structurally complex expressions. What guarantees the lack of a limit to the number of sentences in a given language, as Chomsky would say, is the use of grammatical rules that can be recursively applied. To give just one example, the grammatical rules of English allow sentences to be inserted into sentences repeatedly, as in the sentence 'John believes that Mary said that Peter spoke with Sarah about John.' In principle, it is always possible to make that sentence longer by adding new constituents, which suggests that there is an infinite number of well-formed sentences in a language. Recursive rules, along with the assumption that sentences have a combinatorial

syntactic structure, explain the unlimited number of well-formed sentences that can be produced in a language.

Furthermore, we might ask: since we can in theory produce new sentences *ad infinitum*, what guarantees that those sentences can be understood? A common answer, endorsed by Fodor, is that the meaning of a sentence is derived from the meanings of its constituent parts, together with the way they are combined. I can understand the sentence 'Twenty blue monkeys dance tango in Japan', which I had never encountered before, because I derive its meaning *compositionally*, from the meanings of each of its constituents and the way in which they are combined. Sentences having a constituent syntactic structure and compositional semantics is what explains the productivity of natural languages.

According to Fodor,

> a natural suggestion is that the productivity of thoughts is like the productivity of natural languages, i.e., that there are indefinitely many thoughts to entertain for much the same reason that there are indefinitely many sentences to utter. (Fodor, 1990, p. 18)

That is, based on an analogy with natural language, Fodor assumes that the unbounded expressive power of thought 'must presumably be achieved by finite means' (Fodor & Pylyshyn, 1988, p. 33). It seems absurd to assume, for example, that we store an infinite number of mental representations in memory, since our ability to store information is limited.

According to Fodor (and Pylyshyn), the best way to explain the productivity of thought, while taking into account the finite resources of memory, is to suppose that cognition operates through the use of a system of representations which, just like sentences in a natural language, have a syntactic constituent structure and are compositional. So we explain the syntactic aspect of the productivity of thought by assuming that complex thoughts, just like sentences, are formed from simpler constituents (concepts), which are combined according to rules, many of which can be recursively applied. But new thoughts are also meaningful. The semantic aspect of productivity is explained by compositionality. Just as the compositionality of

language is what explains my ability to understand sentences I have never heard before, it seems reasonable to assume that I can grasp thoughts I have never had before, such as the thought that apple ice cream goes well with coffee, because its meaning is determined by the meanings of its constituent concepts (which are known to me), together with its structure.

The point, then, is that the best way to explain the productivity of thought, according to Fodor, is by the assumption that thought has a very similar structure to that of natural languages. The syntactic constituent structure and the combinatorial semantics (or, for all purposes, the compositionality, since compositionality entails a syntactic structure) of natural languages is what explains (along with recursion) their productivity. Likewise, the assumption that thought is compositional (i.e., that the meaning of a complex thought is determined by the meanings of its constituent concepts and the way they are combined) would explain the productivity of thought. This means that it is reasonable to suppose that there is a *language* of thought, to the extent that thought, like language, is compositional.[3]

2. Systematicity

The argument from systematicity is similar to the productivity argument, in that both are based on the comparison of thought with natural languages. The argument, as Fodor formulates it, is that:

(1) Linguistic abilities have the property of systematicity because natural languages are compositional.
(2) Thought is also systematic.
       Therefore, by an inference to the best explanation,

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3 Note that this argument alone does not show that the language in which thought occurs must be different from any natural language. The argument only shows that the system of mental representations must be compositional (and recursive). Since natural languages are compositional (and recursive), they could in principle be candidates for the language of thought. Fodor formulates several other arguments for the idea that thought does not occur in a natural language. In the third section, we will see one of his attempts to establish that the content of thought is prior to the content of language, which may be seen as an argument for the view that the language of thought cannot be a natural language.

(3) Thought must also be compositional.[4]

To say that the linguistic abilities to understand and produce sentences are systematic is the same as saying that 'the ability to produce/understand some sentences is *intrinsically* connected to the ability to produce/understand certain others' (Fodor & Pylyshyn, 1988, p. 37). A native speaker of English who can say/understand, for example, the sentence 'Mary loves John', will be able to say/understand the sentence 'John loves Mary'. Fodor and Pylyshyn argue that if we learned a language simply by memorizing the sentences we hear, just as when we read and memorize a phrase book teaching a foreign language, the systematicity of linguistic abilities would be a mystery. In other words, if we assumed that each sentence is an atomic unit, which has no structural connection with other sentences, we could not explain why our linguistic abilities are systematic. But supposing, on the contrary, that language is compositional, and therefore that sentences have a constituent structure, we can explain why certain sentences are systematically related to others. In the case of the sentences 'John loves Mary' and 'Mary loves John', both have the same syntactic structure and the same lexical constituents, 'John', 'loves' and 'Mary.' We can understand one sentence when we understand the other because we master the grammar of English and know the meanings of the lexical items, which are the same in both cases, and we derive the meaning of each sentence from its syntactic structure and the meanings of its constituents. Thus, Fodor believes that the best way to explain the systematicity of linguistic abilities is by the assumption that not all sentences of natural languages are atomic, but some have a constituent structure, and their meanings are derived in a compositional way from their constituents and the way they are combined.

We come then to step (2) in the argument. The idea is that thinking is also systematic. Fodor and Pylyshyn argue that thought must be at least as

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4 Cf. Fodor, 1987, p. 148. Here Fodor does not use the term 'compositional', but says instead that natural languages and thought have a 'combinatorial semantics'. I take these to be synonyms.

systematic as language if we accept (i) that language is systematic, (ii) that understanding a sentence involves entertaining the thought it expresses and (iii) that the function of language is to express thought. If understanding a sentence like 'John loves Mary' involves having the thought that John loves Mary, and if when I understand this sentence I can also understand the sentence 'Mary loves John' (because language is systematic), then if I can have the thought that John loves Mary, I can also have the thought that Mary loves John. If the linguistic ability of understanding sentences is systematic, the ability to have certain thoughts must also be, because the former only occurs because of the latter (since the function of language is to express thought). The systematicity of thought follows from the systematicity of language.

We come finally to point (3) of the argument. Just as the systematicity of language can be explained by its compositionality, so can the systematicity of thought be explained by assuming that we employ a system of mental representations that is compositional and has constituent syntactic structure. To be able to think that John loves Mary makes one capable of thinking that Mary loves John because both mental representations are formed from the same constituents and have the same structure, from which they derive their meanings; the constituents are just combined in different ways. If mental representations were always atomic and did not share constituents and structures, the phenomenon that being able to think that John loves Mary implies being able to think that Mary loves John would be a mystery. It is reasonable to suppose, therefore, that mental representations have a constituent structure and that the meaning of complex representations is derived compositionally from their syntactic and semantic constituents, just like sentences of a natural language, and therefore that there is a language of thought.

We have seen how the assumption that there is a language of thought is used to explain the productivity and the systematicity of cognitive capacities, and that the explanation of these phenomena in thought is based on an analogy with language. Just as supposing that language is compositional allows us to explain the productivity and systematicity of language, so too

supposing that thought is compositional allows us to explain the productivity and systematicity of thought. We do not have direct access to the vehicle of thought, but it is reasonable to suppose that there is a *language* of thought insofar as the assumption of a system of mental representations that is compositional like language would explain these phenomena.

This is not to say that the compositionality of thought depends in any way on the compositionality of language. But both the argument from systematicity and the argument from productivity in favor of a language of thought certainly derive their strength from the assumption that compositionality allows one to explain systematicity and productivity in language.[5] In the way Fodor formulates them, they are deeply grounded in the analogy with natural languages. Fodor and Pylyshyn (1988, pp. 43–44) even say that 'beyond any serious doubt, the sentences of English must be compositional to some serious extent', and they think there is no 'way out of the need to acknowledge the compositionality of natural languages and of mental representations' (Fodor & Pylyshyn, 1988, p. 45).

3. Language, Thought and Compositionality

In light of the arguments from the previous sections, it is somewhat surprising that in his article 'Language, Thought and Compositionality' (2001) Fodor goes on to say that natural language is not compositional. In this section, I will present the central ideas of this article, and then raise three worries about it.

3.1 Main Ideas

Fodor's goal in this article, as he puts it, is to investigate what comes first in order of explanation, the content of thought, or the content of language.

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5 More recently, other arguments have been developed to support the compositionality of language. Pagin (2012), argues that a compositional semantics would help to minimize computational complexity in linguistic communication. So if the semantics of natural languages were compositional, this would help to explain how we usually manage to communicate in an efficient and successful manner. Del Pinal (2015) formulates an argument for the compositionality of the faculty of language based on language acquisition.

Or, put another way, whether it is thought or language that has underived semantic content. He assumes that either sentences derive their content from thoughts, or vice versa, without a third option. His proposal, basically, is that the issue should be decided by compositionality. According to Fodor, any adequate theory of content must accept that content is compositional: 'one thing that we know about content *for sure*: It is compositional in whatever it is underived in' (Fodor, 2001, p. 6). Compositionality is, in Fodor's words, non-negotiable. Fodor thinks this for the reasons we saw in the previous sections: it is compositionality that explains productivity and systematicity. So whatever has content in the first place, thought or language, must be compositional. Fodor (2001, p. 6) characterizes compositionality here by saying that 'the semantic value of a thought (/sentence) is inherited from the semantic values of its constituents, together with their arrangement'. He also notes that a complex thought or sentence will only be compositional if it is explicit about its content and structure, that is, if its content contains *all and only* the semantic properties that it inherits from its constituents and structure. So in his view, compositionality requires a straightforward correspondence between the constituents of a thought/sentence and the constituents of its content. Given that compositionality is non-negotiable, if only one of thought and language is compositional, this will be the one that has semantic content in the first place.

Fodor then argues that language is not compositional. He starts from the premises that sentences express thoughts, and that the content of a sentence is the content of the thought it expresses. According to Fodor, if language were compositional, sentences would have exactly the same constituent structure as the constituent structure of the thoughts they express. That is, for language to be compositional, it is necessary, in Fodor's view, that sentences be explicit about the structures and contents of the thoughts they express; there must be a straightforward correspondence between the constituents of a sentence, and the constituents of its content, that is, of the thought it expresses. If language were compositional, the meaning of a sentence (i.e., the thought it expresses) would be derived only from the meanings of its constituents and the way they are combined. However, according

to Fodor, it is an empirical fact that sentences are often inexplicit and ellip-
tical about the structure and content of the thoughts they express.[6]

Fodor gives as an example the sentence 'it is three o'clock', when uttered
as an answer to the question of what time it is. Imagining that the sentence is
uttered at three o'clock in the afternoon, the thought that one intends to
communicate is that it is three o'clock in the afternoon here and now,
but the sentence is inexplicit about the time of day and the place. If we
were to derive the meaning of the sentence in a purely compositional
way, from its constituent parts, we would not arrive at exactly the same
thought that it is normally used to express, namely the thought that it is
three o'clock in the afternoon here and now. No constituent of the sentence
'it is three o'clock' corresponds to *afternoon*, for instance. This is why the
same sentence can be used to express both the thought that it is three
o'clock in the afternoon and the thought that it is three o'clock at night.
So the structure of the sentence leaves out something that appears in its
content. Since compositionality requires explicitness, the sentence is
taken to be non-compositional.

Fodor's point is that we often use sentences that are not entirely explicit
about their contents, that is, about the thoughts they are used to express. It
seems then that in many cases the content of a sentence is not determined
compositionally, by the meanings of its constituents and the way they are
combined, because sentences often do not have all the constituents as the
thoughts they express. If language were compositional, this would not be
the case. According to Fodor (2001, p. 12),

> either the content of the thought is different from the content of the sentence
> that expresses it, or the sentence isn't compositional. I take it that the first dis-
> junct is preposterous; so I take it that the second disjunct must be true.

This argument alone does not show that thought is compositional. But if we
accept that either language or thought must have content in the first place,

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6 Janssen (1997), unlike Fodor, takes compositionality in language to be a methodological prin-
ciple, rather than an empirical hypothesis about how the meaning of complex expressions is
determined. An examination of this debate would take me too far afield.

that compositionality is what decides which content comes first, and that language is not compositional, we are led to the idea that thought must be compositional. To support this idea, Fodor says that the problems raised against the compositionality of language do not apply to thought. According to him,

> whereas the content of a sentence may be inexplicit with respect to the content of the thought it expresses, a thought can't be inexplicit with respect to its own content; there can't be more—or less—to a thought than there is to its content because a thought just *is* its content. (Fodor, 2001, p. 14)

The idea seems to be that sentences can be inexplicit because they, strictly speaking, have no content of their own but derive their content from the thoughts they are used to express. This creates the possibility that there may not be a direct correspondence between the constituents of a sentence and the constituents of its content. The same inexplicitness cannot happen with thought, because, as Fodor puts it, a thought just is its content. Fodor is assuming that a thought does not derive its content from something external to it, and so it is not subject to being inexplicit about its content; it is not possible for a thought to have more or fewer parts than there are in its content. Fodor seems to conclude from the explicitness of thought that thought is compositional. According to him, 'a mental representation is *ipso facto* compositional with respect to the content that a correct semantics would assign to it' (Fodor, 2001, p. 14). Once it is accepted that thought, unlike language, is compositional, Fodor concludes that the content of thought, unlike the content of language, is not derived, or is the one that comes first in order of explanation.

3.2 Problems

The arguments and ideas presented in 'Language, Thought and Compositionality' can be questioned in several ways. I will formulate three problems here. The *first* is that the idea that language is not compositional affects the arguments formulated earlier by Fodor in favor of the existence of a language of thought. As we have seen, Fodor said that we can explain the productivity and systematicity of thought by the assumption that thought

is compositional, just as we explain the productivity and the systematicity of language by assuming that language is compositional. These arguments were entirely based on the analogy with language. But if the inference from the productivity and systematicity of language to its compositionality no longer works, since Fodor now says that language is not compositional, what guarantees that it works for thought? If natural languages are not compositional, their compositionality cannot be what explains their systematicity and productivity. Similarly, it seems that compositionality could not be what explains the systematicity and productivity of thought. It is certainly possible that thought is compositional and language is not. Fodor never intended to say that the compositionality of thought depends on the compositionality of language, for example, or that if language is not compositional, then thought cannot be either. But still, if language is not compositional, Fodor owes us a reformulation of the productivity and systematicity arguments for the language of thought, which does not rest on the analogy with natural language.[7] Also, what led to the conclusion that the system of mental representation was language-like was that it was compositional, like natural languages. If thought is no longer considered compositional by means of the analogy with language, since language is no longer compositional, why continue to say that there is a *language* of thought?

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7 As I will mention below, Fodor (2008) later goes in the direction of denying that natural languages are, strictly speaking, productive and systematic. That could be a way, even if not a very satisfying one, of preserving the inference from productivity and systematicity to compositionality for thought, while denying that the compositionality of language is what explains its productivity and systematicity (for, strictly speaking, language is neither productive, nor systematic). Even though Fodor's new view, that language is not compositional, conflicts with the productivity and systematicity arguments for the language of thought, I'm leaving it open that the arguments could be preserved after some reformulation such as the one just mentioned. For a stronger opposition against Fodor's arguments for the compositionality of thought, see Clapp, 2012. Clapp also notes the problem that denying language's compositionality raises to the systematicity and productivity arguments for thought, but he goes on to argue that neither language nor thought is (truth-conditionally) systematic nor (truth-conditionally) compositional. While Clapp may be right, as I read Fodor, he is committed only to meaning, and not to truth-conditional, systematicity and compositionality.

As we saw in the previous section, it is possible to read Fodor as sketching an argument for the compositionality of thought in that same article. The idea is that thought is compositional because it is always explicit about its content. So maybe this could be a way of arguing for the existence of a compositional system of mental representation that would not depend on the analogy with language. A first problem here is that Fodor assumes that thought is always explicit (that there is not anything extra or missing in a thought with respect to its content) because he is already assuming that thought does not derive its content from something else. The problem with this assumption is that the argumentation is circular regarding the thought-or-language problem, as I will argue later.

But in addition, at this point it seems that Fodor is assuming that, because it is explicit, thought must be compositional. This is a questionable step. Even accepting that thoughts are always explicit (that there is not more or less to a thought than there is to its content), and that thoughts do not derive their content from something external, it does not follow from this that thoughts are composed of parts (concepts), which combine to form complex formulas in a language of thought, which derive their content from their component concepts and the way they are combined. There is nothing that seems to exclude *a priori* the possibility that all thoughts are atomic, not compositional, units, which are always explicit about their contents. Explicitness only requires that there is no misalignment between the structure of a thought and the structure of its content, but it says nothing about complex thoughts being constructed out of simple units. That is an extra assumption which, though reasonable, cannot be inferred from thought's supposed explicitness. So even if the compositionality of thought requires explicitness,[8] compositionality does not follow from the assumption that thought is always explicit, unless it is already taken as a starting point that for a thought to be explicit is for it to have a constituent structure that determines a thought's content (in which case, the compositionality of thought would have been simply assumed together with its explicitness, and not argued for).

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8 For a criticism of the idea that compositionality requires explicitness, see Elugardo, 2005.

To be sure, unlike Clapp (2012), I'm not trying to argue that thought is not compositional. According to Clapp, by accepting that language is not compositional, Fodor must also accept that thought is not compositional. The problem is that Clapp's notion of compositionality rests on the assumption that the semantic content of declarative sentences and thoughts is their truth-conditions, or the propositions they express, to which Fodor is not explicitly committed. So in arguing against Fodor's explicitness argument for the compositionality of thought, for instance, Clapp assumes that a thought's content is a proposition, which is conceived of as a set of conditions under which a thought is true. He then goes on to argue that there are cases where it seems unlikely that a thought is explicit about all that appears in the proposition it expresses, which means that the proposition a thought expresses will not always be derived compositionally. But Fodor is assuming that there isn't a separation between a thought and its content. He is not assuming that thoughts or sentences derive their content from a third thing, namely a proposition, but rather that the semantic content of a sentence is the thought it expresses, and that a thought just is its semantic content (and not its truth-conditional content, as Clapp claims). However problematic Fodor's views might be, they are not, I think, subject to Clapp's criticism, for they do not share the same assumptions. In addition, there seems to be an intuitive appeal to the idea that a thought's meaning does not need to be identical to a proposition that specifies its truth-conditions. So even if one accepts Clapp's argument that thought's truth-conditional content is not compositional, there could still be another form of content that is, as Clapp (2012, p. 321) himself admits.

All I am claiming, then, is that in accepting that language is not compositional, we are left with no real argument for the compositionality of thought, and therefore for the idea that there is a language of thought. The explicitness argument can be questioned first because Fodor gives no argument for the explicitness of thought, and second because he seems to be simply assuming that compositionality follows from explicitness. The second assumption, as I have tried to show, is false. But that does not mean, as Clapp suggests, that we should reject the compositionality of

thought. We could either formulate new arguments for it, or we could try to preserve the systematicity and productivity arguments by reestablishing the compositionality of language. In the final section, I will indicate how the second alternative could be pursued.

It could be said, though, that Fodor is arguing for the compositionality of thought not solely on the basis of the explicitness of thought, but rather on the basis of thought being productive, systematic *and* explicit.[9] So compositionality can be inferred for thought, even if it can't for language, because thought, besides being productive and systematic is, unlike language, also explicit. But, assuming that productivity and systematicity are not enough to infer compositionality (since language is supposed to have both of these characteristics, while still not being compositional), it is unclear why adding explicitness to the picture would make the case for the compositionality of thought any stronger. It seems that the most the assumption of explicitness could do is to create no impediments for the idea that thought is compositional (since the fact that language is not explicit is supposed to be a problem for the assumption that language is compositional). But adding that thought is explicit seems to leave both the argument from productivity and the argument from systematicity unaffected. And, as I suggested earlier, there is no need to assume that thought being explicit makes a case for thought being compositional.

Besides, it is important to stress that we were not initially looking for an argument for the compositionality of thought or language for its own sake, but rather we were looking for an explanation of productivity and systematicity. Compositionality was supposed to be what explains productivity and systematicity, both in thought and in language. Even if we concede that the explicitness of thought makes a stronger case for the compositionality of thought, if compositionality is not what explains the productivity and systematicity of language, it is unclear how it could be what explains these features of thought. And assuming that we accept that thought is compositional and that compositionality is what explains the productivity and systematicity

9 I owe this observation to a reviewer.

of thought, we would still be left with the problem of explaining the productivity and systematicity of language. Assuming that language is not compositional would leave these characteristics unexplained.

This is the *second* problem with Fodor's new views. Fodor often argues, including in this very paper, that compositionality explains the systematicity and productivity of both thought and language.[10] Denying that language is compositional makes its productivity and systematicity a mystery. What Fodor could do is deny that natural languages are, strictly speaking, productive and systematic. In *LOT 2* Fodor (2008) seems to hold precisely that view: the productivity and the systematicity of language are only apparent; they are parasitic on the productivity and the systematicity of thought. According to him,

> one can imagine a view according to which *only* thought is compositional in the first instance and the apparent productivity, systematicity, etc. of languages is parasitic on that of the thoughts they are used to express. In fact, I'm inclined to think that's the right view. (Fodor, 2008, p. 55, n.8)

What Fodor seems to mean by this is that language is only productive and systematic because thought is productive and systematic.

In the case of the productivity of language, the idea would be that there is no limit to the number of grammatical sentences of a language because there is no limit to the number of thoughts one can have. That is, language is only productive because thought is productive. But even if this is true, that is, even if the productivity of language derives from, or is parasitic on, the productivity of thought, it still must be explained. And it is not clear how the productivity of language could be explained only by the compositionality of thought. It seems that the unlimited number of grammatical sentences of

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10 Strangely, perhaps by a relapse, in arguing for the non-negotiability of compositionality, Fodor (2001, p. 6) says in this same article that 'both human thought and human language are, invariably, productive and systematic; and the only way that they could be is by being compositional'. He also says that English being compositional is what explains the possibility of forming several different sentences about, for example, doves and weather in Manhattan, with the same words being used with the same meanings in different sentences. Apparently, Fodor changes his mind a few pages later, when he goes on to say that 'as a matter of empirical fact, language is pretty clearly not compositional' (2001, p. 11).

a language must be, at least in part, a consequence of the mechanisms of language itself. And the natural assumption is that language itself is, to some degree at least, compositional.

Likewise, even if the systematicity of language is derived from the systematicity of thought, it seems reasonable to suppose that the English sentences 'John loves Mary' and 'Mary loves John' are systematically related because their meanings are obtained in a compositional way, from words and structures that they both share. It is not clear how the relationship between these two sentences could be explained by appealing only to the compositionality of their corresponding thoughts, and not to the compositionality of the sentences themselves. That is, it seems strange to suppose that they are systematically related only because their mental correlates are, and that there is nothing in language itself that guarantees the systematic relationship between these two sentences. In short, if Fodor wishes to defend the idea that language is not compositional, he must offer some explanation for the productivity and the systematicity of language. Even accepting that these phenomena are parasitic on the same phenomena in thought, it seems reasonable that they are to be explained by the compositionality of language, even if this is also dependent on, or parasitic on, the compositionality of thought.[11]

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11 Szabó (2010) argues against the arguments that infer the compositionality of linguistic content from the productivity and systematicity of language. He adopts a Kaplanian distinction between character, which is linguistic meaning out of context, and content, which is linguistic meaning relative to context. According to him, productivity and systematicity only give us grounds to accept the compositionality of character, but not the compositionality of expression content. Even if he is right, some compositionality (namely, of meaning out of context) still needs to be attributed to language in order for its productivity and systematicity to be explained. But it is not clear that Szabó is right about productivity and systematicity not giving us grounds to infer the compositionality of expression content (assuming we accept that distinction). His point against the productivity argument, for instance, is that 'It is simply not true that competent speakers can in general understand—know the content of—complex expressions they never encountered before purely on the basis of their linguistic competence' (Szabó, 2010, p. 261). He highlights the fact that we typically understand new sentences in contexts of utterance, and that knowing the character of the constituents of a new complex expression is not sufficient to determine the expression's content relative to a context. But the proponent of the productivity argument could reply that what explains our ability to understand the content of a new complex expression in a context is the compositionality of expression content: the

The *third*, and most substantial problem with Fodor's views is that his central argument is circular.[12] As we have seen, Fodor's goal is to determine what comes first in order of explanation, the content of thought, or the content of language. According to him, this question must be decided by compositionality. Whichever is compositional will be the one that has underived content. However, in arguing that language is not compositional, Fodor assumes that the function of language is to express thought, and that the content of a sentence is the content of the thought it expresses. As we have seen, he says that sentences often have more or fewer constituents than the thoughts they express. Because sentences are often inexplicit about their contents, they will not be compositional. But in this argument, Fodor is already assuming that sentences have no content of their own, and that the content of a sentence is not independent of the content of thought. That is, in arguing against the compositionality of language, he already supposes that the content of a sentence is to be explained in terms of the content of the thought it expresses. And if this is so, we already know that language cannot come first in the explanatory order, even before we know whether language is compositional or not.

The same circularity occurs when Fodor argues that thought, unlike language, is compositional. The idea is that thought cannot be inexplicit about its content, because the content of a thought is the thought itself. Given that all that is in a thought is in its content, since they are the same thing, thought is always explicit and, presumably, compositional. But this argument presupposes that the content of thought does not derive from something external to it, for example the content of the sentences of a

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content of a complex expression is determined by its structure and the *contents* of its constituents, which in turn can be sensitive to the context. The view is not, as Szabó characterizes it, that the *character* of the constituents of a complex expression is sufficient to determine the expression's content, but rather that the *content* of the constituents (which can depend on the context) is.

12 Other discussions of Fodor's argument have focused on whether language is in fact compositional (Elugardo, 2005, Szabó, 2010), and whether thought itself is compositional (Clapp, 2012), but they have failed to notice what I take to be the central flaw in Fodor's argument, namely, its circular solution to the thought-or-language problem.

language. And if this is so, we already know in advance that it is thought that has underived content, and not language, even before we know whether or not thought is compositional.

In the way that Fodor argues, the explicitness and the compositionality of thought are in fact consequences of the *assumption* that thought has underived content. Fodor comes to the idea that thought is compositional because he has already stipulated that the content of thought is explanatorily prior to the content of sentences in a natural language. If we withdraw this stipulation, neither his idea that thought is explicit nor that it is compositional holds. But Fodor could only use the compositionality of thought to determine in a neutral way that thought has content in the first place if his argument in favor of the compositionality of thought were independent of this presupposition, and therefore not circular. Perhaps explicitness and compositionality do follow from the assumption that the content of thought is underived. But we would then need an argument in favor of the underived content of thought other than the argument from compositionality, one that does not presuppose underived content, and Fodor does not offer us one. I'm not saying there aren't any good reasons to think that language derives its content from thought. There may be, but compositionality is not one of them. Fodor cannot legitimately use compositionality to decide whether it is thought or language that has underived content because he is using the idea that language has derived content to argue against its compositionality, and the idea that thought has underived content to argue in favor of its compositionality.

4. Possible Replies

One possible way out of the first two problems presented above (namely, that we are left with no arguments for the compositionality of thought and with no explanation for the productivity and systematicity of language) is to try to reestablish the compositionality of language. That way, we could preserve the productivity and systematicity arguments for the language of thought, as well as explain the productivity and systematicity of language. There are several ways to do this.

We have seen that Fodor's main point against the compositionality of language is that sentences are often inexplicit about their contents. But one could deny that elliptical sentences such as 'it is three o'clock' are really inexplicit about their contents. That is a common strategy adopted, for instance, by Elugardo (2005). As he notes, most theories about syntactic ellipses adopt the distinction between the surface form and the logical or deep syntactic form of sentences, and hold that only the first is inexplicit. According to one view, the sentence 'it is three o'clock' would also have 'here' and 'now' as hidden syntactic constituents, even though its surface form does not make these constituents explicit. If we accept that this sentence has a hidden syntactic form that is explicit about its content, Fodor cannot use the inexplicit character of its superficial form to argue against the sentence's compositionality.

But against that, I suspect Fodor would say that assuming that the sentence 'it is three o'clock' has hidden constituents that are not, as it were, there for everyone to see, is a somewhat ad hoc stipulation, whose only motivation is to preserve the sentence's compositionality.[13] Instead, if there really are hidden constituents somewhere, in Fodor's view they are constituents of the thought that is being expressed. As he says in *LOT 2*, 'I think that LF [logical form] is a level of description not of English, but of Mentalese' (2008, p. 78, n.50). Assuming that sentences are used to express thoughts, there is no reason to suppose that there will always be a correspondence between the constituents of a sentence and the constituents of the thought that it is expressing. In order for communication to occur efficiently, we may say less than what we think, because, e.g., information that is of mutual knowledge between speaker and hearer doesn't need to be made explicit in a sentence, when it is not relevant (Sperber

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13 Fodor (2001, p. 13) says that 'the more or less patent uncompositionality of English isn't something that formal semanticists like to admit. Rather, as far as I can tell, it's the house rule in formal semantics that you hold onto the compositionality of natural language, whatever the cost in face implausibility may be.' Szabó (2012, p. 73) seems to share this concern, when he points out that 'the fixes semanticists come up with when faced with putative counterexamples to compositionality are often complicated and lack independent motivation'.

and Wilson, 1986). In some of these cases at least, Fodor could insist that the deep structure of the sentence is better understood not on the level of the sentence, but rather as a specification of the constituents and structure of the thought being expressed, which the sentence does not encode completely due to conversational maxims that speakers and hearers implicitly follow. So, in the case of 'it is three o'clock', claiming that its deep structure is compositional would be the same as claiming that the thought expressed by it is compositional. The sentence proper, to the extent that it lacks constituents which are present in the thought that it expresses, would not be compositional according to Fodor.[14]

　　Whether or not Fodor is right about this,[15] there are still other ways of challenging his claim that language is not compositional. Another possible way out, while accepting the idea that the meaning of a sentence is solely the thought it expresses, would be to admit that there are degrees of compositionality in language. While sometimes there may be more in the meaning of a sentence than what can strictly be extracted from its

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14 Another way of trying to preserve the compositionality of language, also adopted by Elugardo (2005), is to say that Fodor's notion of compositionality is too strong. He denies that compositionality requires that the syntactic structure of sentences should be explicit about the structure of their contents. That is, he denies that there must be a one-to-one correspondence between the syntactic constituents of the sentence and the constituents of its semantic content, for the sentence to be compositional. But if one accepts that the content of the sentence 'it is three o'clock' is that *it is three o'clock in the afternoon here and now,* and that the sentence does not have 'here', 'now' and 'afternoon' as constituents, then the sentence's content is simply not being determined compositionally. Another way out is to say that the meaning of a sentence is the proposition, not the thought, that it expresses. In this case, however, one might also ask whether the proposition that a sentence expresses can always be derived compositionally from the parts of the sentence and their mode of combination. As Clapp notes, that would also be problematic. But I do not intend to explore these alternatives here.

15　For a defense of the common strategy of postulating syntactic features at a deeper level than the level of surface syntax, but that still qualifies as linguistic, see Stanley, 2007. Recanati (2010), on the other hand, argues that pragmatic processes, which are not linguistically controlled, can enrich what a sentence says. For instance, the operation of modulation can alter the senses of the constituents of a sentence, depending on the context. But he then argues that compositionality can still be preserved, even if not all the constituents of the interpretation are made explicit in a sentence, provided that what determines the meaning of a sentence are the *modulated* senses of its constituents, together with the way they are combined.

constituent parts, as in the case of the sentence 'it is three o'clock' (assuming we reject the postulation of hidden constituents in this case), Fodor hasn't shown that this is usually the case. Other sentences could be explicit and compositional. And even if it is true that sentences are not, for the most part, entirely explicit about their contents, it seems at least sometimes possible to transform inexplicit sentences into sentences that are explicit about their contents. One can say, for example, that 'it is right now three o'clock in the afternoon here in Paris'. Of course, one does not usually say this because in communication we typically follow certain maxims, such as the conversational maxim of quantity stated by Grice (1975), that we avoid saying more than what is needed. But it could be argued that it is at least sometimes possible to state a sentence that is fully compositional. It seems then that Fodor should accept that there are at least some sentences whose meanings can be obtained in a compositional way, and that language is potentially compositional, in the sense that sentences that are fully compositional could be stated, even if they generally aren't because they are not required for making ourselves understood.

Moreover, even in the case of sentences such as 'it is three o'clock', it seems reasonable to suppose that their constituents and the way they are combined are not entirely irrelevant, but that they place some constraints on the possible meanings of the sentence. Fodor's argument does not seem to be enough to discard the idea that non-explicit sentences have their meanings, at least in part, determined by their constituents and the way they are combined. So if we are committed to Fodor's ideas that the meaning of a sentence is the thought it expresses, that compositionality requires explicitness of constituents, and that hidden constituents should not be multiplied with the only motivation being to preserve the compositionality of a sentence, then we might have to conclude that there is occasionally more in a thought than there is in a sentence that expresses it, and that not all sentences are strictly compositional. But we can still accept that some sentences are explicit and entirely compositional, that some sentences could be made explicit, and that even non-explicit, not fully compositional sentences, can have constituents that play some role in

determining their meanings. That is, if we accept that there are degrees of compositionality, we can say that the meaning of a sentence is *at least in part* determined by the meanings of its constituents and the way they are combined, even in cases where the content of a sentence does not contain *all and only* what can be extracted from its constituents. A partial compositionality could explain the productivity and systematicity of language,[16] and allow us to preserve the productivity and systematicity arguments for the compositionality of thought (even if thought's compositionality, unlike the compositionality of language, is assumed to be complete because of thought's explicit character).

So far I have been dealing with Fodor's objection to the compositionality of language by granting him that the content of a sentence is the thought it expresses. I tried to show that, even if we accept this, one can still attribute at least some degree of compositionality to language. But another reasonable way of blocking Fodor's argument against the compositionality of language, is simply to deny that the content of a sentence is solely the thought that it expresses.[17] So one standard view assumes that there can be a separation of the *semantic content* of a sentence from its *assertion content,* which is the thought that a speaker intends to express in uttering a sentence on a particular occasion. The semantic content of a sentence could be compositional, determined by the conventional linguistic meanings of its constituents, even in a case where the assertion content of an utterance of the same sentence cannot be obtained in a strictly compositional way from the syntactic constituents of the sentence, perhaps because the sentence lacks constituents that the assertion content has. It could then be said that there is something any competent speaker of English understands from the sentence 'it's

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16 Prinz (2012) uses a somewhat similar strategy, but with the purpose of supporting the view that some concepts are prototypes against the charge that prototypes don't compose. He argues that we are capable of combining concepts (and prototypes) compositionally, even if we don't always do so. According to him, potential compositionality is all we need to account for the productivity and systematicity of thought.
17 This strategy is also adopted by Elugardo (2005) when challenging Fodor's argument against the compositionality of language.

three o'clock' in the absence of any particular context, which is determined compositionality from the sentence's structure and constituents. But the same sentence can have different assertion contents, depending on whether it is used to express the thought that it is three o'clock in the afternoon in Paris, or three o'clock at night in Chicago. Assuming the distinction between semantic content and assertion content is correct, Fodor's inexplicitness objection could at most be directed against the compositionality of assertion content.[18] For he could insist that the assertion content has constituents that are not present in the sentence. But nothing he has said speaks against the compositionality of semantic content. And perhaps all we need to explain the productivity and systematicity of language is the compositionality of semantic content.

As I tried to show, in denying that language is compositional, Fodor compromises the arguments for the language of thought presented in the first two sections of this paper. Also, denying that language is compositional makes its systematicity and productivity a mystery. These consequences could perhaps be tolerated if the non-compositionality of language could be used to solve the thought-or-language problem, that is, if it could be used to determine that it is thought, not language, that has meaning in the first place. But, as we have seen, Fodor does not reach this conclusion in a neutral way, for his argument is circular. Again, Fodor cannot claim that the non-compositionality of language is what is deciding that language does not have content in the first place, because in order to argue against the compositionality of language, he is already assuming that natural language sentences derive their meanings from the thoughts they express.

Since compositionality cannot really decide the thought-or-language problem, it is better to hold either to a mitigated compositionality of language or to a compositionality of the semantic content of sentences, as I suggested above. That way, we can explain the phenomena of systematicity and productivity in language, which seem quite difficult to deny, and

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18 For a defense of the compositionality of assertion content against underdetermination arguments such as the one Fodor formulates, see Szabó, 2010.

preserve the arguments for the language of thought which take as their basis the analogy with language. The admission of some degree of compositionality in language would possibly prevent Fodor from following his plan to use compositionality as a criterion for deciding whether it is thought or language that comes first in the order of explanation.[19] But, as we have seen, this is a plan that cannot really be followed in a non question-begging way.

This is not to say that there is no reason to assume that the content of language is, at least sometimes, derived from the content of thought. On the contrary, that is an intuitive assumption, and it is behind the very idea suggested above, that the same sentence can, when used in different situations, have different assertion contents. More generally, unlike language, thought is often assumed both to be unambiguous and also what disambiguates sentences and words in a natural language (Pinker, 1994; Pylyshyn, 2003; Fodor, 1998). Also, non-literal meanings of words and sentences are often explained in terms of the intentions of the speakers in uttering those words and sentences. So some phenomena can be explained by the assumption that sentences and words mean what they do because they express the thoughts that they express. But the compositionality of thought and the non-compositionality of language, as I have tried to show, are consequences of the assumption that thought, unlike language, has underived content. They do not, then, give us any extra reasons to assume the priority of thought over language. This is why compositionality doesn't really solve the thought-or-language problem.

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19 In this new scenario, in which we accept that there may be degrees of compositionality in language, Fodor could still say that only what is *strictly* compositional has content in the first place. But he would then have to argue against the strict compositionality of language, and in favor of the strict compositionality of thought, without presupposing the priority of one with respect to the other, that is, without presupposing that the content of a sentence is the thought it expresses, and that a thought just is its content.

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