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Metaphor thoughtfully

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Some Cognitive Linguistic theorizing and related psychological experimentation points to the active use of metaphorical, source/target relationships (mappings) in the mind even when external metaphorical communications are absent.

However, some ramifications of this need attention. This article explores how people might mentally *add metaphor* while understanding discourse, i.e., mentally couch their understanding in metaphorical terms not used by the discourse itself. This could even involve giving a literal sentence a metaphorical understanding. Metaphor addition is suggested by psychological evidence of bidirectionality in metaphor, where there is not only the normal, “forwards” transfer of information from source to target but also “reverse” transfer. In a different vein, the article deepens the author’s previous *Anti-Analogy-Extension Thesis* whereby source-domain items that are not mapped into the target can nevertheless be crucial in indirectly illuminating the target, and therefore arguably crucial in representing it. This results in an unusually holistic and fictionalist view of mental representation.

Keywords: metaphorical mappings, metaphor in thought, bidirectionality, mental representation, fictionalism

1. Introduction

This article explores and amplifies some ramifications of the idea, arising especially from the work of Lakoff (1980/2003), that metaphor is fundamentally an aspect of thought, and only derivatively of external expression in linguistic, pictorial, gestural or other forms. More specifically, the article engages with an idea about metaphorical thought (MT) that can be expressed as:

(MT) *our occurrent thoughts can be, and maybe often are, metaphorical, irrespective of external expression.*

By means of the term “occurrent” I focus on thoughts (etc.) that are taking place at a particular time, as opposed to, for instance, beliefs that a person might hold

over some (perhaps long) period without necessarily actively entertaining them in thought, and as opposed to long-term mental constructs such as concepts. I use “thoughts” in a liberal way, not confining attention to propositional, statement-like thoughts but also allowing consideration of, for instance, mental constructs akin to questions or wonderings, and also perceptions and mental images (visual or otherwise). Neither of the terms “occurrent” and “thoughts” in (MT) implies any necessary involvement of consciousness. The “irrespective of external expression” stresses that the thoughts need not be entertained during the understanding or production of any act of external expression in language, gesture, pictures, diagrams, music, dance or whatever. Of course, one important role for the thoughts is in such understanding or production.

By a thought being “metaphorical” I mean that it is couched at least in part in terms of the concepts from the source subject matter of a metaphorical way of describing the target situation that the thought is about. For instance, the temporal relationships of some events might be couched as spatial relationships of physical objects standing for those events, under a metaphorical conception of TIME AS SPACE (see, for instance, Moore, 2006, on such conceptions). So a metaphorical thought is an *internal* matter of couching the situation in metaphorical terms to oneself (perhaps entirely unconsciously), much as one might externally use a metaphorical sentence such as “*Christmas is still far away.*”¹ Henceforth I will refer to (MT) as the idea of *metaphorical thought* for short, but the restrictions and liberalities I’ve just laid out about what this term means will remain important.

This idea of metaphorical thought is historically related to and compatible with, but neither implied by nor reliant upon, the notion that we somehow hold within ourselves largely static, long-term structures such as “conceptual metaphors” or “primary metaphors” (Grady, 1997; Lakoff & Johnson, 1980/2003). Such structures are made up of “mappings” or relationships between source-side concepts and target-side concepts. Henceforth, partly to emphasize that this article is not dependent on the specific details of Conceptual Metaphor Theory or the theory of primary metaphors, I will use the term *metaphor schema* to mean such an internally-maintained relationships between two subject matters, such as between TIME and SPACE or between ELECTRICITY and LIQUID. As is well known (see, e.g.,: Bergen, 2015; Hampe, 2017b; Murphy, 1996, 1997; Steen, 2017; Vervaeke & Kennedy, 2004), even if we do hold metaphor schemata in our minds, it does not logically follow that when thinking about, say, something involving TIME we always actively use mappings relating it to SPACE. This issue even arises when we understand a sentence about TIME that’s

1. I use the term “subject matter” rather than “domain” in order to be neutral between the various proposed notions of domain and because of my scepticism about these notions (Barnden, 2010). But readers who adhere to domains can take my subject matters to be domains.

couched using SPACE, let alone when we are privately thinking about a TIME situation. In understanding the sentence we might not make online use of the mappings linking to any metaphorical thought, couched in terms of SPACE, about the TIME situation. Rather, when the SPACE wording is sufficiently familiar, we might have an entrenched meaning in terms of TIME directly stored with the SPACE wording. So, in understanding the sentence “*The meeting fills the whole morning*” we might conceivably have a TIME meaning stored for the (arguably) spatial word “*fills*.” Similarly, the comprehension of “*Mary grasped the idea*” could in principle just directly retrieve an *understand* sense of “*grasp*” rather than retrieving a physical notion of grasping and then using a metaphorical mapping to get to the notion of understanding. This direct-access-to-target-meaning possibility plays an important role in, for instance, Steen’s discussion (2017) of his Deliberate Metaphor Theory, which is a refinement and extension of Conceptual Metaphor Theory.

Another, related possibility is provided by the Career of Metaphor theory (Bowdle & Gentner, 2005), under which familiar wording would directly trigger an abstraction covering the source and target concepts. Regarding “*Mary grasped the idea*,” the abstraction would cover both physical grasping and understanding. The categorization or class-inclusion approach (Glucksberg, 2001) could also work this way in suitable circumstances.

Nevertheless, some experimental evidence points to online use, under suitable conditions, of source concepts – and hence, arguably, of mappings linking them to target concepts – during metaphor understanding (see, e.g.: Desai, Binder, Conant, Mano & Seidenberg, 2011; Desai, Conant, Binder, Park & Seidenberg, 2013; Gibbs & Matlock, 2008; Gibbs & Santa Cruz, 2012; Glucksberg, 2001; Jones & Estes, 2005; Miles, Nind & Macrae, 2010; Rubio Fernandez, 2007). Partly because of this evidence, the present article adopts the working hypothesis that such online use can indeed happen.

Note the word “use” here: the mappings together with source elements they involve might or might not, themselves, remain as part of the final meaning representation of the sentence. In the latter case the source elements and mappings are only stepping stones helping the construction of a meaning representation that is entirely in terms of the target subject matter. This question of mere use as stepping stones *versus* remaining as part of the meaning representation is discussed further in Barnden (2016c) (see also Barnden, 2010), and is central to Steen’s Deliberate Metaphor Theory (Steen, 2008, 2017). In the latter theory, most metaphor is non-“deliberate” and accordingly, if there is any use of mappings at all, this occurs only in processing stages leading up to the construction of a “situation model” (complete sentence meaning) that is entirely couched in target terms.

Of course, the need to suppose some online use of mappings is the more pressing the more unfamiliar the wording is. For example, consider the sentence “*Sorrel [tried*

to] coax the ... memory out of a dark and cobwebby corner of her mind.”² For hearers who had never encountered a sentence involving mental cobwebs before, nor more general metaphorical uses of “cobweb[by]” that could be specialized to mental states, it is hard to see how they could deal with “cobwebby” in understanding the sentence without having a metaphorical thought couched in terms of physical cobwebs.

If we assume that we do use metaphor schemata such as conceptual metaphors online during metaphor understanding, it is plausible that we can also have metaphorical thoughts even when not dealing with external expression. It would be strange to propose that metaphor schemata are used in occurrent thought *only* when dealing with external expression.

And if one makes the strong claim that the only way we have of conceiving some subject matters, e.g. MIND or TIME, is through their metaphorical connection to other subject matters, for example SPACE, then, of course, occurrent thoughts about the target must be occurrent thoughts in terms of at least one such subject matter. However, the claim that metaphors are essential to conceiving some subject matters is contentious, and Vervaeke & Kennedy (2004) and Murphy (1996, 1997) provide some critical discussion.

There is a considerable literature claiming that the ways we think about and deal with many aspects of life (including our own selves) are affected or “framed” by metaphorical views we hold of them, or are even just temporarily entertaining about them (see, e.g.: Boroditsky, 2000; Boroditsky & Ramscar, 2002; Burgers, Konijn & Steen, 2016; Lakoff & Johnson, 1999; Landau, Meier & Keefer, 2010; Landau, Robinson & Meier, 2014). Even when we acquire or are prompted to entertain the views in question by understanding recent discourse or other external expression, the point is that metaphorical thoughts can occur other than *during* the actual understanding or production of communications involving the metaphorical views in question.³ It is worth re-emphasizing here that metaphorical thought might not rest on already-held, relatively static metaphor schemata. In principle, a metaphorical thought could be based on some idiosyncratic metaphorical mappings that, for instance, the person in question has only just thought of or has only recently picked up from a particular episode of discourse.

2. From a crime novel, Hannah (2015, p. 287).

3. Lee & Schwarz (2016) distinguish between framing and metaphorical transfer from source to target, because they take a narrow view of transfer as an action that imposes a new source-derived attribute on the target or strengthens an existing target attribute, thereby effectively making or strengthening a *claim* about the target. In the present article, I mean “transfer” in a way that is sufficiently broad to cover what Lee and Schwarz mean by framing. It can, for instance, mean the transfer of a question (see Section 8.3), some issue for consideration, or a topic focus.

A body of psychological evidence that is particularly interesting from the point of view of this article supports “bidirectional” transfer between metaphorical sources and targets. (For a selection of studies and discussions, see: Anaki & Henik, 2017; Chan, Tong, Tan & Koh, 2013; Denke, Rotte, Heinze & Schaefer, 2016; Dong, Huang & Zhong, 2015; He, Chen, Zhang & Li, 2015; Landau, Meier & Keefer, 2010; Lee & Schwarz, 2012; Schneider, Parzuchowski, Wojciszke, Schwarz & Koole, 2015; Zhong & Liljenquist, 2006. However, there are results contrary to bidirectionality, e.g. Huang & Tse, 2015.) As just one instance, it has been found that, not only do estimates about the physical weight of something such as a book affect estimates of its importance under suitable conditions (Hauser & Schwarz, 2015), but also the reverse is true: in one study, thinking that a USB stick or portable hard drive held important information made participants estimate it to be physically heavier than when they did not think it held important information (Schneider et al., 2015). This suggests that when we think about the importance of something we also (at least sometimes) have corresponding metaphorical thoughts in terms of physical weight of the thing.

Thus, supposing that one starts with a thought in terms of importance, there is (sometimes) some sort of *reverse transfer* that creates a corresponding weight-based thought about that same thing. The notion of reverse transfer will play a central role in this article. Some of the other specific types of reverse transfer suggested by the various works cited above are from importance and power to physical size, power to weight, moral rightness to physical cleanliness, affection to warmth, love and jealousy to certain tastes, suspicion to smell, and hope/despair to brightness/darkness. But I will assume by default that reverse transfer can, in suitable circumstances, happen whatever the sources and targets are.

Reverse transfer has been mooted without extensive detail in the context of Interaction theories of metaphor (Waggoner, 1990). It is encompassed within the blending-theory approach (Fauconnier & Turner, 2008) in that a blend space, formed by developing information from all the input spaces, can in turn cause new information to arise in the input spaces, thus getting the effect of interaction in any direction between the input spaces. The discussion below can be seen as an extension of considerations brought forward by blending theorists, though not itself couched in terms of blending. Reverse transfer is central in the ATT-Meta theory of metaphor understanding and the related AI system (Barnden, 2001a,b, 2006, 2009, 2015, 2016a; Barnden & Lee, 2002).

The particular ramifications of (MT), the idea of metaphorical thought, that this article explores are *Addition of Metaphor during Understanding*, *Discourse Coherence through Metaphorization* (introduced under another label in Barnden, Glasbey, Lee & Wallington, 2004), and an extension and deepening of something I have called the *Anti-Analogy-Extension* thesis (Barnden, 2009, 2015). Addition

of Metaphor during Understanding is a simple corollary of reverse transfer. Given the possibility of reverse transfer, there is in particular no reason to deny *a priori* that it can happen when, for instance, someone is understanding a *literal sentence about T*. An example would be that a sentence about finance, making no allusion to liquid, might be understood with the help of a metaphorical thought couched in terms of liquids, if the hearer knows a MONEY AS A LIQUID metaphorical view. So, understanding of even a literal sentence might involve metaphorical representations. It appears that this point needs to be properly and systematically recognized in accounts of the meaning of sentences, certainly in fields that are not centrally concerned with metaphor, but even within Cognitive Linguistics. For instance, Deliberate Metaphor Theory, one of the most detailed and carefully considered accounts of meaning in Cognitive Linguistics, does not provide for it.

Discourse Coherence through Metaphorization is a special case of the *Addition* point, but arises particularly in the special case of discourse that mixes literal and metaphorical statements about a subject matter.

The *Anti-Analogy-Extension* thesis is in a distinct though complementary vein. It is that when a metaphorical thought about a subject matter T uses elements of the source subject matter that do not have a mapping to T, it is typically the case that there should *not* be an attempt to create such a mapping: rather, what should happen is merely to find an inferential connection between the unmapped elements and elements that do already have a mapping.

The plan of the paper is as follows. Section 2 will make some cautionary remarks about metaphorical bidirectionality, reverse transfer, and related issues of “embodiment.” Section 3 will discuss the potential usefulness or otherwise of metaphorical thoughts in reasoning about the world. Section 4 will address the Addition of Metaphor in Understanding. Section 5 will address Discourse Coherence through Metaphorization, and Section 6 the extended Anti-Analogy-Extension thesis. Section 7 will discuss a type of representational holism raised by the Anti-Analogy-Extension thesis. Section 8 engages in some further discussion. It advocates the view of metaphorical understanding and thinking as exercises in fiction building, and uses this to return to the issue of holism. It then changes tack to consider the fact that demonstrations of reverse transfer have been posed as presenting a challenge to Conceptual Metaphor Theory. I argue that this challenge is incorrect, being based on a misunderstanding of what it is that conceptual metaphors provide. Section 9 concludes.

2. Some cautionary remarks

Three cautions about bidirectionality and reverse transfer are in order. First, researchers claiming bidirectionality point out that it does not contradict the fact that linguistic metaphors are often demonstrably asymmetric in the sense that talking of B as A can be infelicitous even though it is felicitous to talk of A as B (Gentner & Bowdle, 2001; Glucksberg, 2001; Way, 1991; Wolff & Gentner, 2011). The fact that a USB stick feels heavier when thought to contain more important information does not license the (non-joking) use of “*This USB stick is extremely important*” to mean that it is weighing down one’s rucksack.

Secondly, bidirectionality is often cast as transfer of information from an abstract domain to a concrete domain as well as in the standard direction of concrete to abstract. But this characterization misses the main point and captures just a typical side-effect of the fact that, in the sort of metaphors studied, the targets tend to be more abstract than the sources. This abstractness difference is particularly strong in the theory of Conceptual Metaphors and primary metaphors. There are good reasons for it, in that more concrete subject matters may be easier to think within. For example, as Lee & Schwarz (2012) note, they tend to have greater “inferential richness and capacity.” Indeed, I will appeal to such advantages for some sources based on their relative concreteness below. But the general notion of reverse transfer and hence bidirectionality does not intrinsically involve an abstractness difference at all, least of all for the target to be more abstract than the source.

Thirdly, one must be careful in assessing whether evidence supports reverse transfer of the sort that will be central to this article. For instance, one intriguing study suggested reverse transfer from suspicion to fishy smell, relating to the use of “*being fishy*” or “*smelling fishy*” in English to mean being suspicious (Lee & Schwarz, 2012). But what was demonstrated was merely participants’ heightened sensitivity to a fishy smell in, say, a test tube when they are led to think that the experimenter is acting suspiciously. It wasn’t the *experimenters or their activities* that smelled fishy to the participants. But surely a reverse-transferred version of the idea that an experimenter is being suspicious is that they or their activity should smell fishy! After all, the point of the metaphor is that if something “*is/smells fishy*” then *that same thing* is worthy of suspicion. More relevant therefore is the case of the USB stick, where it is the stick that both feels heavier and is thought to contain more important material.

Going back to metaphor understanding, there is a particularly strong, “embodiment”-based type of claim about online use of mappings during understanding a metaphorical sentence, especially one whose source wording refers to physical matters, as in “*Mary grasped the idea.*” The basic claim is that there is activation of

sensorimotor brain mechanisms that would be activated in engaging in activity, such as physical grasping, described by a literal use of the source subject matter. (For results, theory and review see, e.g.: Bergen, 2015; Desai et al., 2011, 2013; Gibbs, 2006; Gibbs & Matlock, 2008; Hampe, 2017b.) The present article is compatible with such embodiment claims, but is not reliant on them. In principle, one could have metaphorical thoughts that feature physical grasping without engaging any sensorimotor brain circuitry, by representing the physical grasping in a purely symbolic way, and such thoughts are enough for this article.

But also, there are issues about what one means by a sensorimotor brain region. For example, although Desai *et al.* (2011) found that there is some enhanced activation of primary motor cortex in the understanding of metaphorical sentences such as “*Mary grasped the idea*,” their stronger results are more on the activation of secondary regions that relate to action in a less physically detailed, less modally-specific sense; and Desai *et al.* (2013) report that similar but somewhat more complex metaphorical sentences did *not* lead to enhanced activation in primary motor or motor-related areas, but only in the secondary areas. So the results support the idea that metaphorical use of (e.g.) “*grasp*” results in relatively abstract action representations in the brain, and therefore is indeed activating the source subject matter, but provide at best weak support for activation of the more physically specific regions that physical grasping involves or that literal mention of physical grasping stimulates.

Indeed, Casasanto & Gijssels (2015) persuasively argue for comprehensive caution about the idea that the available behavioural and neurophysiological experiments (including those of Desai *et al.*, 2011, 2013, and Lee & Schwarz, 2012) support the stronger forms of embodiment thesis. Casasanto and Gijssels argue that, even though the evidence does support the idea that non-modality-specific brain areas associated with metaphor source concepts are activated by target concepts, it is an open question whether such areas are *multimodal* in a way that still supports embodiment, or instead *amodal* and therefore not indicating any meaty notion of embodiment. But none of this negates the reality of reverse transfer as a phenomenon that does not presume embodiment, and Casasanto and Gijssels stress that “We now know that people activate source-domain representations with a surprising degree of automaticity when they process a variety of target domains.”

3. The potential usefulness or otherwise of metaphorical thoughts

First, some preliminary remarks are in order about the nature of the common-sense understanding that someone, Joe, might have of some everyday subject matter, such as household electricity (electrical supply, circuits and appliances), or financial

transactions, or marriage, or events and temporal relationships, or the workings of the mind, or ...

For a given subject matter, such as [household] electricity, Joe may have some degree, possibly low or possibly very high, of understanding of that area in its own terms. Such an understanding exists to the extent that (a) he has some concepts that are directly about aspects of electricity, e.g., a concept of electricity as such, a concept of a light switch, or a concept of the voltage of a supply, and (b) he can perform some reasoning that is useful for his purposes and that relies on reasoning tools such as inference rules, simulation mechanisms, or situation exemplars that are directly about electrical matters – or are completely neutral as to subject matter, such as content-unspecific rules of logical deduction, abduction or induction.

Joe may, nevertheless, possess a metaphor schema addressing electricity, such as *ELECTRICITY AS A LIQUID* (cf. Gentner & Gentner, 1983). Via this schema, electricity is viewed as a liquid that flows through (e.g.) wires as if they were (e.g.) pipes. The schema as held by Joe or some other individual might or might not also include a mapping of voltage to liquid pressure and/or a mapping of size of electric current to amount of liquid flowing, and/or ... (So different people might use different sets of mappings to some considerable extent.) Joe's having such a metaphor schema would not detract in any way from his ability to have concepts and reasoning tools that are directly about electricity, or to have episodes of reasoning and communication-understanding that are directly about electricity and do not use the metaphor schema. Directness does not imply complete isolation from metaphor, but rather that the link from the electricity concepts, etc. to what they are about is not itself mediated by metaphorical mappings.

Given these preliminaries, we can consider whether, to what extent, and exactly how it would be useful to Joe to have *LIQUID*-based metaphorical thoughts when thinking about electricity. The issue depends partly on what particular electrical matters Joe is thinking about and on how adequately he understands electricity in its own terms. It may be that, even though Joe can or does have such metaphorical thoughts, actually his understanding of electricity in its own terms is good enough for his practical purposes. He knows that having the lights on uses energy that costs money; when one light goes out, he can surmise that one light bulb has failed; or when all the lights go out but the other houses in the street are still lit up he can surmise that a contact breaker has tripped. In short, he can deal with many household electrical issues just by using concepts and reasoning tools that are directly about electricity (or are completely generic).

But, even under such conditions, using *ELECTRICITY AS A LIQUID* to think of the electrical situation in terms of, say, water flow could make some inferencing easier or quicker. For instance, suppose Joe suspects that he is being charged for some electricity that he is not using. He may suspect the electricity is doing what

would normally be described in language as “*leaking*.” Joe, as well as bringing to bear whatever knowledge he might have directly about electrical leakage, may also engage in reverse transfer across ELECTRICITY AS A LIQUID to create a metaphorical thought about liquid leaking from a pipe. The latter might prompt him quickly to think that some pipe in the source scenario needs to be wrapped with something that stops water flow, thereby prompting him to think quickly, via metaphorical mappings, about some wire needing more insulation. Depending on his amount of knowledge and past experience with thinking about electricity versus thinking about liquids, the liquid-metaphor-based inferencing could be easier or quicker than inferencing that is directly electrical, even when he is able to effect the latter. Notice also that he might pursue both lines of inference and that they could happen in parallel.

While a point commonly made about metaphors is that they (often) cast a subject matter in terms of a more familiar subject matter, thereby making inferencing easier and quicker, a related point that needs additional emphasis is that the source-based reasoning may also, or instead, be more *confident*, and therefore lead more readily to action.

It is instructive to look also at the case of Joe using a TIME AS SPACE metaphor when thinking about time. (This metaphor is especially useful to consider given that it has played a big role in the embodiment literature, e.g.: Boroditsky, 2000; Boroditsky & Ramscar, 2002.) Suppose Joe sees a problem with a meeting happening at a certain time, and wishes to change the time, while avoiding a clash with various other events. Now, Joe might be able to work out, purely by arithmetical calculation, that one way of solving the problem would be to schedule the meeting for a time that is after the ending time of the last of the other events, but still before some deadline for the meeting. However, it is likely to be much easier, quicker, and more confidence-inducing for him to view the events as laid out spatially on a line and to appeal to common-sense experience with manipulating physical objects in physical space. He can immediately and confidently imagine putting the meeting spatially after all of the events. Indeed, we would probably be surprised if we found out that Joe did *not* do this (whether consciously or unconsciously) and instead proceeded by abstract mathematics.⁴

So, it is conceivable that people may prefer metaphorical inferencing routes when they are available and have proved in the past to provide useful results. But moreover, precisely because a metaphorical route might be easier, quicker and more confidence-inducing, it is even possible that people do not take an available

4. Relevant here is the work by Byrne & Johnson-Laird (1989) on the benefits of using spatial mental models in reasoning. Such models could be used not just for reasoning about the arrangement of spatial objects in their own right but also when they stand for other, e.g. temporal, objects.

non-metaphorical route, depending on how much time they have available, how cognitively loaded they are, how much confidence they have in conclusions so far reached, and so on.

We now consider the case where Joe does not have fully adequate understanding of events/times, electrical matters, or whatever in their own terms to do inferring that he may be prompted to do. In particular, he may have no direct concept about electrical leakage, and if he is quite ignorant about electricity he may think that when a wall socket is not being used and its switch is on⁵ then there is a danger that electricity will seep out in appreciable quantities, just as water would run from an open tap (faucet). So, in suspecting that he is being charged for more electricity than he should be, he may think, by mentally using the ELECTRICITY AS A LIQUID metaphorical view, that he can help the situation by turning all such switches off. If he finds out that this hasn't helped the leakage problem he has an opportunity to learn lessons about electricity!

4. The addition of metaphor in understanding

Let's assume that Joe can have LIQUID-based metaphorical thoughts when thinking about ELECTRICITY, even when he is not currently exposed to any metaphorical utterance or other external expression that uses the ELECTRICITY AS A LIQUID metaphorical view. As we've already discussed, one type of situation that fits this scenario is that Joe is having such thoughts because he encounters an electrical problem in his house.

But surely also, another type of situation that equally fits the scenario is that he is engaged in understanding an utterance like "*The electricity is on*," which is about electricity but does *not* use ELECTRICITY AS A LIQUID. The mere fact that such an *external* sentence or other expression does not involve that metaphorical view is, in principle, *no reason at all* to think that Joe does not *internally* deploy that view as part of understanding it – if metaphor is claimed to be a fundamental aspect of thought in general. The point here is not merely that some problem-solving phase a short time after hearing the sentence might be framed by the metaphorical view, but also that the very understanding of the sentence might itself be based in part on the view. That is, part of the act of understanding of "*The electricity is on*" might be to construct a metaphorical thought about a liquid flowing in some pipes. Now, it may be that Joe *also* builds a semantic representation that is couched directly in terms of electricity. In that case, plausibly, Joe constructs the direct representation

5. In some countries including the UK some or most wall sockets have nearby switches governing them.

first, and then does a reverse-transfer act to construct the metaphorical thought. But just because the metaphorical thought comes second does not mean it is any less a part of the very understanding of the sentence.

Similarly, part of the act of understanding “*The meeting time has been changed from 3pm to 5pm*” might be to create a metaphorical thought about physical movement of a physical object corresponding to the meeting from one point on a line to another. Again, this thought could be a second representation created by reverse-transfer from an abstract representation about numerical times.

Although we have raised the possibility that the metaphorical thought in the examples above is a “second” representation of the meeting, created from a first, non-metaphorical one, we should consider the alternative possibility that no such non-metaphorical representation is created, and that the *only* one is the metaphorical one. The reason for raising this is clearer with the meeting-time example than with the electrical one. It could well be that any wording about changing the scheduled time of an event bypasses normal non-metaphorical meaning construction and directly triggers a representation in terms of spatial movement and a handling of “3pm” and “5pm” as if they were physical objects. There is no need for the hearer to construct a non-metaphorical mental representation of the form *Previously the meeting was scheduled for 3pm and then later it was scheduled instead for 5pm*. Even if this representation were at some point constructed, it could well be less important than the metaphorical representation, assuming it is less convenient in ordinary problem-solving tasks about times.

In our examples, irrespective of whether Joe constructs a non-metaphorical meaning representation or not, Joe is *adding* a metaphorical view into the understanding of the sentence in the sense that that view is not used by the sentence itself. Hence the label *Addition of Metaphor in Understanding*. But the phenomenon is broader than indicated by the examples so far. The very same type of consideration also suggests that a metaphorical sentence that uses a particular metaphorical view or views might be understood with the help of an *additional* view or views. The fact that the sentence “*Mary let the time run through her hands*” uses a metaphor of time as a physical substance that can be wasted does not imply that Joe, in understanding it, does not *also* view Mary’s situation partly in terms of, say, a TIME AS SPACE metaphorical view. This addition could be useful in that Joe may know that Mary has several time-consuming duties coming up and realizes that she now needs to reschedule something. The additional view is not needed to get the bare, immediate meaning of wastage that “*Mary let the time run through her hands*” conveys, but it could be useful in achieving understanding in a fuller sense, and in particular to achieve coherence between the sentence and other knowledge about Mary that Joe already may have or other sentences in the current discourse about Mary’s activities.

Although the experiments on bidirectionality mentioned in the Introduction provide some support for the possibility of Addition of Metaphor during Understanding, I stress that I am not making a prediction that it does happen, or about the circumstances under which it happens, such as whether it tends to happen more when the situation being discussed are relatively complex, obscure or unusual. Instead, I am pointing out that their *possibility* must be encompassed in semantic theory, psycholinguistic experiments on meaning, etc. – if it is claimed that metaphorical thoughts (in the sense of this article) are possible. It could well turn out that there is some mechanism that precludes the theoretically possible Additions or or quickly suppresses them if they do happen, but the point is that one should not simply assume that they are so precluded or suppressed. And if experiments show that preclusion/suppressing happens, then there need to be a theory of why and how they are.

I am not aware of a semantic theory inside or (especially) outside Cognitive Linguistics that systematically takes account of the possibility of Addition, whether by including it or explaining its exclusion (its preclusion or suppression). One movement in this direction, however, is the Gibbs & Santa Cruz (2012) account where the conceptual metaphors used to understand a given metaphorical sentence can include not just those used in the sentence itself but also those left over (with attenuated activation) from use in previously understood sentences.

There are signs from the experimental literature that Additions can be either precluded or quickly suppressed, or that they happen but with relatively weak level of activation. For instance, we can look again at the experiments of Desai et al. (2011). These involved trios of sentences of the following sort: [Lit:] “*Mary grasped the flowers*” / [Met:] “*Mary grasped the idea*” / [Abs:] “*Mary understood the idea.*” The experiments used fMRI techniques to examine the brain regions they activated. The intent was to see to what extent sensorimotor brain regions related to (e.g.) physical grasping were activated. The results suggested that both the literal (Lit) cases and the metaphorical (Met) cases stimulated such regions (though recall from the Introduction the question of what this means) and that they did so more than the abstract (Abs) cases. So there may have been partial or complete precluding/suppression in Abstract cases. There were also results in this study and in Desai et al. (2013) suggesting that the more familiar the metaphorical wording is, the less that (even secondary) action-related brain regions are activated and the more the simulation looks like that in Abstract cases.

Finally, there is no assumption in this section about levels of consciousness that, for instance, Joe may have about thinking in terms of liquids as an accompaniment to thinking about electricity. In principle, he might sometimes or always be entirely unconscious of it, or he might sometimes or always be vividly conscious of it.

5. Discourse coherence through metaphorization

I have given a special argument elsewhere (originally in Barnden, Glasbey, Lee & Wallington, 2004; see also Barnden & Wallington, 2010) that the understanding of metaphorical discourse can be facilitated by reverse transfers effecting the Addition of Metaphor in Understanding. The argument is that it is sometimes easiest to find coherence between metaphorical stretches and surrounding or interspersed literal stretches by, first, developing a coherent overall scenario from that mix of stretches in terms of the *source* subject matter; it is only after this that forward transfer of information to the target happens. This approach involves reverse-transferring the content of the literal stretches into source terms. That is, the claim is that it can be useful to “metaphorize” literal stretches on the way toward combining their meaning with the metaphorical stretches in order to ultimately to get the full message about the target, rather than working out the target-side meanings of the metaphorical and literal stretches and then combining those meanings.

Consider a variant of an example used above:

- (1) *“When all the appliances are switched on, I seem to use up gallons of electricity.”*

This sentence consists of two clauses, one a literal one about the switching on and one a metaphorical one about the usage of electricity. If Joe hears the sentence then, assuming he is very familiar with ELECTRICITY AS A LIQUID, it is natural and convenient for him to apply reverse transfer to the meaning of the first clause to build in his mind a scenario where there is a turning-on of water taps (metaphorically corresponding to the switching on of the electrical devices), and the resulting copious water flow causes the using-up of a large quantity of water that is suggested by the second clause. Then, normal, forward transfer to the target side can be done, resulting in a confident conclusion that the turning on the appliances causes strong currents of electricity to arise in the house’s wiring. This process easily allows Joe’s commonsense knowledge of water to help him confidently to build a coherent overall scenario.

The traditional alternative would be for Joe to find the target-side meaning of the second clause before making it cohere with the first clause. That is, he would mentally translate the notion of using up large quantities of water into terms that are directly about electricity, and then achieve coherence with the electrical switching-on from the first clause.

Joe might be in a position to achieve coherent understanding this way. But, even if so, there may be advantages of speed, ease or confidence in achieving coherence on the source side through metaphorization of the literal stretches, if Joe has greater familiarity with water than with electricity. In particular, strong confidence in the

causal link between turning on the appliances and strong currents of electricity might be more easily obtained this way. Barnden et al. (2004) and Barnden & Wallington (2010) make similar points about other examples.

6. The Anti-Analogy-Extension Thesis

In this section I am concerned with utterances based on familiar metaphorical views but using open-ended forms of expression that transcend what is immediately supplied by the familiar views. This is best brought out by examples such as the following:

- (2) “*The managers were getting cricks in their necks from talking up [to some people in power over them] and down [to the managers’ subordinates].*”⁶
- (3) “*One part of Mary was insisting that Mick was adorable.*”⁷

As regards (2), it is common for abstract control relationships, especially in organizational settings, to be metaphorically viewed in terms of relative vertical position of the people concerned (see, e.g., Cian, 2017). However, someone having a crick in their neck is not a matter addressed by this view. Thus the sentence transcends the view.

Let us assume that (2) conveys to the understander that (a) the managers experience annoyance and other emotional stress, and (b) it is difficult for the managers to continue the conversations. Intuitively, the idea is that people can get cricks in their necks from continually turning their heads in markedly different directions (up and down in the example), and that such cricks lead to annoyance, emotional stress, and difficulty in continuing to turn one’s head and hence difficulty in continuing with the conversations.

But notice that there is no need at all, in coming up with (a) and (b) during understanding, to work out what it is in *target* terms to have a neck-crick. All that’s important is the emotions and difficulty arising on the source side from a real neck-crick, assuming that these emotions and difficulty can be transferred to the target side (see Barnden, 2015, 2016a, for the ATT-Meta proposal about how such

6. Cited in Goatly (1997, p. 162). The example is from the *Daily Telegraph* newspaper.

7. (3) is an invented example, but is based closely on many real ones. See for example the MIND PARTS AS PERSONS section of the Barnden (n.d.) mental-metaphor database, which contains in particular an example where there are several “*voices*” inside someone and one is “*insisting*” something and another example where “*part*” of someone is “*shouting*” something. Examples (2), (3) and many others have been analysed under the ATT-Meta approach.

transfer happens). In brief, there is no need to seek or create a target-side parallel for the neck-cricks, or in other words to extend the known analogies such as that between verticality and controllingness.

This sort of point extends to very many examples of metaphor, to the extent that I claim that metaphor understanding can fruitfully adhere to an *Anti-Analogy-Extension* Thesis. This says that view-transcending elements of the source subject matter such as the crick in (2) should *not*, normally, be given target-side parallels. In particular, existing analogies should not normally be extended to encompass those elements – these elements should be left unmapped or “unparalleled.” Others have proposed such a principle (notably Langlotz, 2006) but it is opposite to the spirit of prominent theories such as Structure-Mapping Theory (Gentner, 1983; Bowdle & Gentner, 2005), which assume that the task is to maximize the extent of analogy and in particular to extend analogies to cover as yet unparalleled items.

In essence, the Thesis views map-transcending items like the neck-cricks in (2) as usually being, merely, tools for achieving certain effects through inferential links to source-side ideas that *can* already be mapped to the target. Usually they should not be taken as signalling the presence of items that exist on the target side. This thesis merely expresses a default, and there can be exceptions; for instance, if someone said “*I want to cure the neck-crick I got in talking up to the managers and ...*,” the understander may be impelled to search for something on the target side that is being described as “*the neck crick*.”

Let’s turn now to Example (3). I take it to rest on two very general metaphorical views that are often used about the mind. First, there is the view of a person or a person’s mind as having parts, where furthermore these parts are persons with their own mental states. I call these the “subpersons” of the person, and I call the view *Mind as Having Parts that are Persons*. Note carefully that the division into parts is itself a metaphorical fiction – the view is *not* about objectively-existing parts of the person being metaphorically viewed as subpersons. The point of the view is that if a part (a subperson) of a person P believes (desires, intends, ...) X then, intuitively, the whole person P could be said to partly believe it. But what does it mean to partially believe something? The way I cast it is to say that the real person merely has some *tendency to believe X*.⁸

One main representational benefit of *Mind as Having Parts that are Persons* is that it allows different subpersons to have different beliefs or other types of mental state, and may even have beliefs that conflict with each other. This can rise explicitly in sentences that have a form such as “*One part of P believes X, but another part believes Y*” where X and Y conflict. In such a case the whole person P has tendencies

8. Elsewhere I have cast this as the person having a “motive” to believe X, in a very general sense of a reason or some other factor.

to believe various conflicting things, without really *believing* any one of them. But I also claim that the case of conflicting tendencies can arise implicitly, and does so in (3).

The second metaphorical view used by (3) comes into play because the subpersons are portrayed as communicating in natural language. Since what is communicated is some idea that the whole person is entertaining, the additional metaphorical view here is that of *Ideas as Internal Utterances*. This is a very widely used metaphorical view that also often arises independently of *Mind as Having Parts that are Persons* (again, see Barnden, n.d.).

The main connection of this analysis to the Anti-Analogy-Extension Thesis is as follows. There is no need at all to propose that the “*part*” (a subperson) mentioned by (3) corresponds to an identifiable aspect of the real person. Rather, the mention of a part is *merely* a tool for helping to convey in an economical, accessible and vivid manner the possession of a particular, complex sort of mental state by Mary. The tool works because, intuitively, the mentioned “*insistence*” implies by default that some other subperson has claimed that Mick is not adorable, or is the opposite of adorable, giving Mary two different belief tendencies. And, while the notion of insistence may convey that the Mike-is-adorable belief tendency is strong, there is no clear target-side parallel for the insistence action itself, since there is no parallel for the subpersons. And crucially, no such parallels need to be worked out in order to work out the existence of the competing tendencies.

The Anti-Analogy-Extension Thesis is not just about items mentioned overtly in the sentence, such as the mentioned part of Mary and the mentioned insistence, but also to implied items such as the additional, inferred subperson. Indefinitely many things might be implied in source-side terms that do not get, or need to get, or able to get, any parallel in target-side terms.

What is the relationship of the Thesis to previous themes in this article? The answer is that their interaction with the Thesis provides a broadening and deepening of the Thesis to cover metaphorical thoughts not arising from metaphorical sentence understanding. The Thesis as portrayed above is about view-transcending items mentioned in or inferred from metaphorical sentences. But we now observe that if someone, Joe, can spontaneously think using metaphor, then the resulting source-side scenarios that Joe mentally constructs can involve unparalleled source-side items. The earlier focus on reverse transfer may have made it sound as though all the source-side items arise through reverse transfer and are therefore paralleled.

Why might such unparalleled items arise in spontaneous metaphorical thoughts, or similarly in Addition of Metaphor during Understanding? First, one simple answer is that spontaneous metaphor use could be in a daydreaming episode, where Joe develops a source-side scenario in his mind in, possibly, very

creative directions. Not all elaborations of the scenario might have any indirect implications for the target situation, but some could. Secondly, experience with past uses of a metaphorical view might prompt Joe to construct view-transcending items. Suppose he happens to be thinking of a person Sally having conflicting belief tendencies, or is understanding a sentence that literally states that Sally has such tendencies. He may then construct a source-side scenario involving subpersons with contrasting beliefs. Moreover, if he finds that this way of thinking does not achieve some assumed level of mental conflict in Sally, he may adumbrate the source scenario in a way that one might imagine a real interaction being people becoming heated. He could add ways in which the subpersons are loudly arguing with each other, for instance. He can be arbitrarily creative in this sort of way.

Or again, Joe, in spontaneously thinking about managers, could develop a source-side scenario that contains neck-cricks with no correspondence to the target scenario. Further, Joe may mentally develop such a source-side scenario in more creative ways, such as imagining pains in many parts of the managers' bodies, not just their necks, imagining the managers massaging those parts, contorting themselves, etc. These could have consequences about the intensity of the emotional states, their longevity and difficulty of eradication, and the desires of the managers. These conclusions can be mapped to reality. But most of the source-side scenario is not mapped.

7. A type of holism

The Anti-Analogy-Extension Thesis implies that possibly very major portions of a metaphorical thinking or language-understanding episode may not individually have any translation into non-metaphorical thoughts about the target within the person's mind. This is because extensive areas within a source-side scenario – such as an argument between subpersons, or neck-cricks and physical contortions, in some examples above – may not have any mapping into target scenario, but instead merely just indirectly support conclusions about the target through source-side reasoning.

Thus, the source-side scenario is to be regarded not as something that must have a detailed, comprehensive analogy to a target scenario but rather as something that somewhat holistically conveys information about the target scenario. This conveying is, to be sure, done by the use of mappings that pick on specific aspects of the source-side scenario. For example, a mapping might translate the belief of a subperson into a belief tendency of the whole, real person. But any specific aspect of the source-side scenario that is grabbed by a mapping may be the result of inference over large amounts of information within the scenario. Hence, there may be no specific part of a discourse's metaphorical sentence or sentences that can be

said to correspond to a given aspect of the target-side scenario (although this can happen in simple cases of metaphor). For example, going back to (3), an aspect of its meaning not detailed above, but explained in Barnden (2016a), is the explicit conclusion that Mary lacks an ordinary sort of belief that Mike is adorable. This is because she has tendencies not only to believe this but also its negation. This lack does not correspond to any one aspect of (3) but rather arises from the whole of (3), taking into account the implied existence of another subperson who believes Mike not to be adorable.

Similar holism is manifested in the fact that a metaphorical sentence sometimes cannot readily be given its own meaning in terms of the target scenario (Barnden & Wallington, 2010). Rather, it is only as a part of a conspiracy with surrounding metaphorical (or literal) sentences that it helps to convey something about the target. An example used in Barnden & Wallington (2010) is

- (4) *“Everyone is a moon, and has a dark side which he never shows to anybody.”*
[attributed to Mark Twain by Brians (2003, p. 74)]

This example could just as well have been in the following multi-sentence form, which is just as comprehensible:

- (4a) *“Everyone is a moon. Everyone has a dark side which he never shows to anybody.”*

I suggest that it is misguided simply to assume, without argument, that a hearer must first derive target-side meanings (i.e., meanings directly in terms of people’s natures) for the clause/sentence *“Everyone is a moon”* and a metaphorical meaning for the clause/sentence *“[Everyone] has a dark side which he never shows to anybody”* and then combine these target-side meanings. Rather, the second clause (but *not* the first one) indicates what it is about being a *“moon”* that the hearer should attend to, while it is the first clause that brings moons into the picture (whereas moons are *not* mentioned by the second clause). In the face of this I claim the hearer’s best approach, much as in Section 5, is to form a *source-side* scenario on the basis of both clauses, and only then extract implications for the target scenario. In the *source-side* scenario, the moon from the first clause reinforces the hiddenness from the second clause.⁹

Now, it’s certainly true that the second clause could plausibly have been given a metaphorical meaning even if the first clause hadn’t been uttered. The understanding process would have just cast the person as *some* physical object that has a dark side not shown to anyone else. So, one can imagine a process whereby the

9. But I will shortly comment about a mistaken assumption about the moon in (4/4a) that may already be troubling the attentive reader!

hearer works out a target-side meaning for the second clause and only later refines or strengthens it in some way by means of the first clause.

But the main point is that it would be quite hard to give the first clause/sentence its own relevant metaphorical meaning, and therefore quite hard to form an integrated understanding by combining target-side meanings for the two clauses. Either it would involve using the second clause for guidance as to what the first one means, in which case there hardly seems any point considering the first clause at all by itself, or the operation would involve taking the clause in isolation of the second, in which case (unless surrounding discourse context could help) we have a severe case of the usual problem of the indeterminacy of metaphor (see, e.g., Stern, 2000). Without the second clause it is wide open what the first clause is getting at. For example, in other contexts it could be construed as saying that everyone is somehow subservient to something that can be metaphorically portrayed as the Earth, or as saying that everyone serves as a source of illumination for the world in times of darkness, or everyone is a symbol of love, or ...

Actually, the first clause has a deeper effect than just reinforcing the never-showing in the second clause. The moon also has a bright side, at least some of which we can normally see, and which is extremely salient in a clear night sky. Thus, a more elaborated interpretation of (4) or (4a) could include the notion that everyone also has a side that is (in part) usually very much apparent. This new message cannot come from just the second clause, because although the mention of a dark side weakly suggests a non-dark side, there is no warrant for taking that side to be bright and salient. But, the fact that the message cannot come just from the second clause alone is not a reason for saying that the first clause should be given its own metaphorical meaning, but is rather a reason to say that a unified source-side scenario should be constructed from both clauses, and then target-scenario meaning should be extracted from that scenario as appropriate. However, I do not have a specific theory about when hearers are pressured to adopt this more holistic approach across clauses/sentences and when they give them separate metaphorical meanings.

Example (4/4a) raises another interesting issue. The example appears to assume that Earth's moon, and a moon in general, has a fixed dark side that cannot be seen, whereas of course in reality the darkness moves round the moon as it orbits the Earth. Indeed, the passage may be mistakenly equating the dark side with the side facing away from the Earth, which *is* a fixed part of the moon. Thus the example provides an example of a fairly common phenomenon, pointed out by other researchers, of the source subject matter of a metaphor being distorted with respect to reality (see discussion and references in Barnden, 2016b).

Language researchers in many disciplines appear to assume virtually without argument that every sentence, including metaphorical ones, must be assigned its own meaning in terms of the situation actually being talked about. However, the

considerations in this article suggest a conjecture that it is merely *typical* that a sentence taken alone can usefully be assigned such a meaning. Rather, meaning can act much more holistically across sentence (or clause) boundaries, and there is no hard syntactic limit as to what sort of segment of discourse might in a particular case be treated most naturally as a unit bearing specific meaning.

8. Further discussion

8.1 Handling metaphor with fictions

In various disciplines, researchers have suggested forms of an approach to metaphor that rests on *fictions*. Basically, what we have often been calling a source-side scenario in this article is relabelled as a fiction. The hearer of a metaphorical sentence uses the literal meaning of the sentence in context to (begin to) construct a fictional scenario expressed partly in source subject-matter terms, such as the scenario of some managers getting neck-cricks by having to turn their heads to talk to different people, in the case of Example (2). The fictional scenario is similar to a partial world as depicted by an ordinary fictional narrative such as a novel. The hearer may then elaborate (fill out) the fictional scenario by means of inference, using knowledge of the source subject matter. Metaphorical meaning arises when the hearer takes aspects of the fictional scenario and transfers them (with suitable modification) to become (alleged) aspects of the target scenario. The fictional-scenario aspects that are so transferred may either have been put there directly by the literal meaning of the metaphorical sentence, or may have arisen through elaboration of the scenario. The created information about the target scenario forms part of the meaning of the sentence for the hearer.

This general characterization fits fiction-based and pretence-based approaches to metaphor in philosophy (see notably Walton, 2004; Egan, 2008; also Yablo, 2001), a suggested enrichment of Relevance Theory accounts of metaphor developed in the field of linguistic pragmatics (Carston & Wearing, 2011), aspects of the “blending” or “conceptual integration” developed within cognitive science (Fauconnier & Turner, 2008), and my own ATT-Meta approach to metaphor (cited above). It is similar to the use of imaginary worlds for poetry understanding (Levin, 1988). But note that there are contrary arguments – for example, Camp (2009; forthcoming) argues that metaphor should not be cast as using fiction or pretence.¹⁰

10. In presenting ATT-Meta, elsewhere, I have usually used a weak notion of pretence rather than fiction, and have called the fictional scenario the pretence scenario, but I have not intended a fundamental difference between the two terms.

How can an explicitly fiction-based view of metaphor illuminate this article's themes? An initial observation is about reverse transfer. Reverse transfer brings fiction-based theory of metaphor closer to the theory of fiction in general. Ordinary stories standardly import information about the real world. For instance, if we know that a certain fictional character is intended to correspond to a real person, we would tend to import our knowledge of that person into the fiction (if not contradicted there) suitably amending it to fit the circumstances of the fiction.

And of course forward transfer is often important in ordinary fiction such as novels, short stories and theatrical plays. While such a fiction might be understood purely in its own right, often part of the author's purpose or reader's use of a fiction is to provide illumination of the real world, by a process akin to forward transfer by metaphorical mapping. This is of course especially the case of fictions dubbed as allegories, but it applies much more broadly.

8.2 Holism and indirectness of representation again

Given that the representations in a metaphorical fiction lead by forward transfer to representations that are directly about some situation, for instance one in the real world, then surely they can be regarded as indirect representations of aspects of that situation as well as being direct representations of the fictional scenario. And yet, as we have seen, some/many of the individual, operationally crucial elements of a metaphorical fiction – such as a “*part*” of Mary or an insistence by such a part – may themselves have no mapping to the target side. They only have an indirect functional role with respect to the target via other thoughts constituting the fiction, namely those that do have a mapping into the target. They nevertheless play an important role in representing the target. Thus, mental representation of, for instance, the outside world can be a much more indirect, holistic matter than it is often made out to be.

And even when metaphorical thoughts are accompanied by analogous thoughts directly in terms of the target, the fact that the metaphorical thoughts may allow easier, quicker or more confident thinking than the direct thoughts may confer on the metaphorical thought even more of a right to be dubbed as a mental representation of the target situation – albeit only indirectly of it.

In short, theories of mental representation in all relevant disciplines (linguistics, AI, philosophy, ...) need to cater for the point that what a mental representation directly describes is items and situations in fantasy worlds that only have a holistic, metaphorical connection to the real world, and that this phenomenon is not just an outlier but is central to how the mind represents the world – if metaphor is indeed important in thought.

The main strand of theorizing in philosophy that resembles these points is fictionalism (see, e.g., Yablo, 2001). A notable case is fictionalism about numbers

(Leng, 2010; Yablo, 2001). The main intuitive idea here is that numbers – as opposed to numerals, which are marks on paper, patterns of bits in computer memory, etc. – are not objectively existent entities, whether concrete or abstract. Rather, they are just items in a fiction, broadly analogous to entities in a science fiction or fantasy story, where even the categories of things are invented, not just particular items within categories. There are mappings/connections of some sort between numerical language as a whole and the real world, for example via counting and measurement practices, that allows that fictioning to be useful in our thinking about the world, our interactions with the world, and communication with other people. Some types of statement referring to numbers, such as that “*There are two ducks in my fridge*” or “*The number of ducks in my fridge is smaller than the number of major planets in our solar system*” can be mapped in principle to truths about the world and can lead to useful actions upon the world.

Similarly, according to a fiction-based view of metaphor, mental use of metaphor is an exercise in, perhaps highly temporary and idiosyncratic, fictionalism. The fictionalism is especially marked in the case of any elements of the source-side scenario that are not also within the target-side scenario.

Thus, the thrust of this section could be phrased as a claim that our mental representations of the world are fictionalist in a much more sweeping way than provided by fictionalist accounts of specific areas such as mathematics.

8.3 The source of action

Continuing this link to fictionalism, there is also a more extreme version of the holism and indirectness points we have made. In this article so far, even if some thoughts about the fiction are not themselves mapped to the target, their function in the mind is, nevertheless, to link via inference to items that do have a mapping. And we have suggested that actions upon the world would be related to the target-side representations.

However, it is also possible to conceive of a metaphorical fiction in which *nothing* is mapped to target-side representations of (e.g.) the outside world. As for actions, these could be linked directly to the *source*-side representations. For instance, perhaps Joe’s *only* resource for thinking about electricity is that it is a liquid flowing within wires, etc. Joe knows nothing about electricity other than what can be approximately captured by this resource, and he has no translation of *any* non-trivial liquid-based thoughts about electricity into any other terms.¹¹ As long

11. A trivial thought that would be translatable could be of the form *this instance of liquid is this instance of liquid*, which could be translated into *this instance of electricity is this instance of electricity*. I am seeking to confine the discussion to useful thoughts.

as his liquidish thoughts are adequately linked to relevant target-side actions, such as operating a switch, that he needs to take in the world (as well as to source-side ones such as operating a tap), he may be able to act upon the world perfectly well for everyday purposes.

8.4 Back to bidirectionality

The reverse-transfer aspect of bidirectionality has been posed as a challenging puzzle for Conceptual Metaphor Theory (CMT): see, e.g., the discussions in Anaki & Henik (2017), Lee & Schwarz (2012) and Shen & Porat (2017). Conceptual metaphors and primary metaphors are held to be unidirectional in that they project structure “forwards” from source to target but not the other way round, and reverse transfer might seem to violate this. But is a deep challenge really posed, and do the considerations of the present article, if valid, intensify the challenge?

No. First, Lee & Schwarz (2012) rightly point out that the alleged challenge rests on misunderstandings and a simplistic view of CMT. Lee and Schwarz say that the fact that there is a unidirectional projection mechanism does not preclude the existence of other mechanisms that allow bidirectional effects, and they talk about the co-activation of neural subsystems (Lakoff & Johnson, 1999, pp. 55–57) involved in processing the source and target subject matters. Shen & Porat (2017) take Lee and Schwarz somewhat to task for incompleteness in their account. Shen and Porat instead make the more radical claim that contrary to CMT, “unidirectional mappings are no longer regarded as an inherent component of metaphorical relationships at the conceptual level. Instead, ... bidirectionality ... derives largely from the structure of prelinguistic metaphorical relations, which ... are based on a bare association between concepts/domains, with no clear assignment of source and target. The unidirectionality of verbal metaphors ... is largely determined by being instantiated in a linguistic form.”

Whatever the merits of these authors’ responses to the challenge, there is a more fundamental way the challenge is misguided that they do not fully bring out. It is misguided because the reverse flow of information does not intrinsically violate any projective unidirectionality of conceptual metaphors or other sorts of metaphor schema in the first place. The projection of source structure onto the target results in (or strengthens, reaffirms or highlights) a partial parallelism of structure between target and source. For instance, under a TIME AS SPACE metaphor schema, a later-than temporal relationship might be made parallel with a further-along-the-line relationship in space. But, once such parallelism of structure has been created in the mind, there’s no reason at all why *specific instances* of structure on either side should not flow to the other side as licensed by that parallelism. For instance, there’s no reason at all why the proposition that a particular event is

later than another particular event should not be reverse-transferred to become a proposition about corresponding physical objects being in a further-along-the-line relationship. Such a reverse transfer is not an act imposing some new relationship on the source subject matter or of establishing parallelism between the further-along relationship and the later-than relationship: it is merely an act of *using* that already-established parallelism.

These observations may serve to sharpen a point made by Lee and Schwarz to the effect that the impression of a challenge arises partly from not adequately distinguishing between matters of representation and matters of online processing.

And reverse transfer does not violate the intuitive notion that source items stand for target items and not vice versa. The reverse transfer can just be construed as constructing the source item *that stands for the given target item*. For example, the reverse transfer of a specific instance of later-than merely constructs the specific instance of further-along that stands for that later-than instance. The reverse transfer does not have to be construed as making the later-than instance stand for the further-along instance.

In this vein, common-or-garden appeals to conceptual metaphor frequently seem to rest on some reverse transfer of information. Consider an utterance such as “*The foundations of the theory are crumbling*”, and suppose that this is analysed as a use of the THEORIES ARE BUILDINGS conceptual metaphor (or alternatively, using primary metaphors, in terms of PERSISTENCE IS REMAINING ERECT, where the types of erectness in question is of course that of a standing physical structure.) Unless there are lexicalized metaphorical senses of both “*foundations*” and “*crumbling*” that allow a target-side meaning to be immediately constructed, the hearer presumably must *view the theory as a building (or other standing physical structure)*. Thus, a (possibly unconscious) act of imagining a physical structure corresponding to the theory must first occur in order for the “*foundations*” and “*crumbling*” to make sense. But that imagining is an act of reverse transfer that merely exploits the parallelism that THEORIES ARE BUILDINGS (OR PERSISTENCE IS REMAINING ERECT) has previously established.

There is a further consideration. Barnden et al. (2004) point out that there is a type of reverse transfer different from those already alluded to in this article. The additional type is reverse transfer of *questions* about the target scenario. Suppose someone, Joe, is metaphorically thinking about certain time relationships amongst events as spatial relationships. This could be because of hearing a sentence like “*The meeting is very distant*” or “*The meeting was moved forward*” (cf. the experiments in Boroditsky, 2000; Boroditsky & Ramscar, 2002). Now suppose someone asks whether one of the events, E, is later than another one, F. It is perfectly natural then to suppose that Joe mentally reverse-transfers this question to become a question about whether (the physical object corresponding to) E is further along the spatial

line than (the physical object corresponding to) F. This is merely a question about the structure of the specific source-side scenario that Joe is currently entertaining, and in no way conflicts with the sort of projection of structure that conceptual metaphors are said to provide. The point here is not confined to questions posed in language, but could apply to mental questions that come up privately in Joe's mind. Also, questions (or related items such as issues for consideration) could be forward-transferred from source to target.

Of course, excusing one particular theory, CMT, from the alleged challenge does not affect the point that one must still account for the asymmetry of linguistic metaphor (see Section 2). The basic problem is actually not one of some data conflicting with some theory, but rather of two bodies of data – the linguistic data on asymmetry and the psychological data on bidirectionality (reverse transfer) – having a *prima facie* conflict with each other.

9. Concluding remarks

This article has argued that if we take the possibility of metaphorical thoughts, in the sense explained, seriously, and especially the experimentally supported idea that information can be transferred in reverse from target to source, we should also be careful to address the following possibilities in theorizing and in psychological experimentation: (i) that people may use reverse transfer in order mentally to *add metaphor* when understanding discourse, i.e., mentally couch their understanding of what the discourse says in metaphorical terms that are not used in the discourse itself, where this could even involve giving a literal sentence a metaphorical understanding; (ii) that, in particular, cognitive addition is a powerful tool for achieving coherent understanding of discourse through metaphorization of literal parts; and, (iii) from considerations other than reverse transfer, that a radical form of the Anti-Analogy-Extension Thesis holds, recognizing the phenomenon of source-domain items that are crucial to what is inferred about the target but that are not mapped into target terms. The arguments also lead to a more holistic, fictionalist view of discourse meaning and mental representation than is usually entertained.

The article has also briefly argued that bidirectionality of metaphor is not a special threat to Conceptual Metaphor Theory, but rather that together with the asymmetry of much linguistic metaphor is something that any theory needs to explain.

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