Chapter 11
Open-Ended Elaborations in Creative Metaphor

John Barnden

Abstract  This chapter looks at how a hearer or reader can understand metaphorical discourse, particularly when it is creative. The abilities of the ATT-Meta approach to creative metaphor understanding, implemented in an AI reasoning system, are discussed. A natural extension to metaphor generation is also briefly mentioned. As regards types of creativity, the chapter focusses on how ATT-Meta deals with open-ended elaborations (extensions) of familiar metaphorical views, although novel pairings of concepts in metaphor are also briefly discussed. A central feature of the approach is that it takes a (non-conventional) metaphorical utterance to imply a fictional or pretence scenario within which the elaboration takes place. The approach takes metaphorical mappings to act between fictions and reality (or other spaces outside the fiction), rather than between differentiated source and target domains as is usual in mapping-based metaphor theory. Another central feature is the adherence to an anti-analogy-extension thesis, which seeks to inhibit the extension of existing analogies to deal with elaborations. The approach lends itself naturally to the idea popular in Cognitive Linguistics that metaphor arises in thought as opposed to communication particularly. But the approach goes further in supporting a dramatic and disruptive version of this suggestion: namely that our thoughts can be intrinsically and creatively metaphorical in a way that cannot wholly be translated into non-metaphorical thoughts. This suggestion arises out of the anti-analogy-extension thesis: while analogy is involved in metaphor, and novel analogies are important in creativity, there is also a strong non-analogical side to creative metaphor.
11.1 Introduction

In metaphor in linguistic discourse, one subject matter is talked about in a way that can be analysed as using the resources of another subject matter. Metaphor often involves talking about aspects of the former subject matter as if they were aspects of the latter. For instance, the statement “The idea is buried deep in his mind” can be analysed as talking about the person’s mind as if it were some sort of physical terrain in which things can be buried, and talking about the idea as if it were a physical object that can be buried. The person’s mind (and its states, ideas, etc.) is the target subject matter and the physical objects and region constitute the source subject matter. We can also say the discourse is using a metaphorical view of the person’s mind as a physical terrain and a metaphorical view of the person’s ideas as physical objects. In such a view, target and source subject matters are paired with each other.

In the type of metaphor just discussed, an implicit similarity is assumed or created. But I also include simile, as in “The thought [acted] like a dark angry cloud”, 1 as a case of metaphor. Here a likeness is explicitly stated.

What I call a metaphorical view is broadly similar to the much-researched notion of a conceptual metaphor [30], but I use a different, more intuitive term to avoid any particular alignment with particular theories of what conceptual metaphors are or how they work. Metaphorical views can in principle have any degree of familiarity for a particular understander. Competent speakers of English will have great familiarity with views of mental states as physical states (involving terrain, containers, etc), because of the prevalent use of such views in English discourse—see, e.g., Jäkel [28], and the metaphor databank developed in the ATT-Meta project. 2 On the other hand, the sentences “The writing desk is a penguin” or (relatedly) “The writing desk flapped its wings and attacked the bookcase” introduce or rest upon a metaphorical view that is likely to be novel to most hearers. 3

To most people outside the academic discipline of metaphor, creative metaphor metaphor is probably a matter of an interesting, novel pairing of two subject matters. A good example, in Semino [40], is the metaphorical view of a migraine attack as being a matter of an animal moving about in the person’s head (taken from Ian McEwan’s novel Atonement). Another example, in Shakespeare’s Hamlet (Act I Scene v), is a metaphor of Hamlet’s father’s ghost as a “mole” moving about beneath the earth. Those two examples are from literary sources, and that is no accident, as it has been claimed that in non-literary language such novel pairings are rare (see, e.g., Cameron [13], Nacey [38]). But metaphor is important and widespread

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2 http://www.cs.bham.ac.uk/~jab/ATT-Meta/Databank/.
3 These sentences are invented variants of the famous literary example “Why is a raven like a writing desk?” from Alice’s Adventures in Wonderland. They are novel. A search of the Corpus of Global Web-Based English (GloWbE) at http://corpus.byu.edu/glowbe/ (on 21 July 2014) found no relevant occurrences of “desk” or “desks” with “penguin” or “penguins” within seven words on either side of them.
not just in literary language but also in mundane fiction, news chapters, classroom discourse, advertisements, doctor/patient dialogue, blogs, device manuals, internet chat, and so on; and creative metaphor can be found in such everyday discourse as well. But, in such discourse, what appears to be much more common than novel pairings are phenomena such as the extension of familiar metaphorical views of things and the novel compounding of familiar metaphorical views. Indeed, Lakoff and Turner [31] claim that even in poetry, creative metaphor makes heavy use of extension and compounding. Extension will be clarified shortly. Compounding is illustrated by the example given by Deignan et al. [16, Chap. 9] of a chronic-pain sufferer describing himself both as being in a concrete straitjacket and as being in a black isolated space.

This chapter outlines and extends an approach to metaphor understanding called ATT-Meta [1, 3, 5, 6, 8] that has been strongly directed at accounting for how creative metaphor extensions and compounds can be handled. Because of space constraints, I do not address compounding here except for a brief mention late in the chapter, but ATT-Meta’s approach to it is discussed in Barnden [8], extending Lee and Barnden [33].

There is an ambiguity in the word “extension” when applied to metaphor. One phenomenon it can describe is when a metaphorical view of something is used on multiple occasions over some possibly extensive swathe of discourse rather than just locally within a short sentence. But the sense of extension important in this chapter is a form of conceptual extension. It is a matter of exploiting some unusual aspect of the source subject matter of some familiar metaphorical view—unusual in the sense that that aspect is not normally exploited in uses of the view. For example, Semino [40] discusses a case of a pain being described as “viciously twisting” in the person’s head. It is common to describe pain as “sharp” or “stabbing”, using a familiar view of pain as the presence of an intrusive physical object that can cause pain, even when the pain is not in fact caused by any such object. But Semino shows that it is unusual to talk about vicious twisting when metaphorically describing pain. Such extensions are open-ended: there is no boundary to what a speaker might in principle say about the sharp object that is being twisted or otherwise manipulated, in the service of conveying useful information about the intensity and quality of the pain, and Semino and Deignan et al. (loc. cit.) give further creative examples.

To avoid the ambiguity of “extension” I will use the phrase “scenario elaboration” instead (or just “elaboration” for short). This is because some details of a scenario based on the source subject matter are being laid out, going beyond the basic source concepts used in the metaphorical views at hand. If a pain is metaphorically described as vicious twisting of a knife in the head, the source scenario is more elaborated than in just describing the pain as the presence of a knife, or yet more vaguely as stabbing. It is important to realize that what is being elaborated is a source scenario, not necessarily the source matter introduced by any one, specific metaphorical view. The elaboration might involve the source matter of more than one view, but might also introduce subject matter not belonging to any familiar metaphorical view. These points are missed by the term “extension”, which is naturally taken to imply that a
single, familiar metaphorical view is being elaborated. It is similarly missed by the notion of “entailments” (see, e.g., [29, pp. 384–389] of a metaphorical view.

I will be much concerned with the open-endedness of scenario elaboration. The following illustration is a rich but mundane example of creative metaphor using open-ended elaboration, from a story in a romance magazine found on a supermarket shelf:

(1) Sharon pulled herself out of her jeans, the words “How could he? How could he?” jumping about her wearied brain. Senseless, leaving her empty, cold, helpless. Another voice, angry and vindictive, shouted in her ear, ‘Serves you right, you silly fool: play with fire and watch your life go up in flames. It was all so predictable’.4

This contains many metaphorical aspects, some of which take the form of conventional metaphorical wording (play with fire, watch, life go up in flames, empty, cold). “Conventional” metaphorical wording is frequently used, relatively fixed wording with an entrenched metaphorical meaning. Also, portraying thoughts as if they were spoken utterances is common, especially in written fiction, as evidenced for instance by the ATT-Meta databank’s section on the metaphorical view called Ideas As Internal Utterances However, it is very unusual to talk about someone’s thought as an utterance “jumping about” their brain. It is certainly very common for thoughts to be portrayed as animate beings.5 But a search of GloWbE (see footnote 3) found no instances of anything jumping about a brain (or head, mind or skull) or jumping about in/inside a brain, etc. A search of the web delivered some instances of thoughts jumping about a brain.6 But only two of those instances featured words jumping about the brain, one with a “book” doing the jumping, another with “stories” doing the jumping. No instances were found of a particular string of words jumping about a brain.

Another example is:

(2) The weather is settling into a drier frame of mind.7

It is conventional to talk of “settled” weather, and the “settling” in (2) is a minor elaboration conveying the process of the weather becoming settled. But talk of the weather being in a “drier frame of mind” is creative. It is unusual phraseology, and at the same time a highly effective and economical way to convey a subtle state of the weather. Note that (2) conveys not that the weather is necessarily going to be in a (settled) state that is consistently drier, but rather a state in which it has some tendency to be drier. This is just as when we say someone is in a “generous frame of mind” to mean that they are currently inclined to be generous, not that they are actually being consistently generous.

In (2) a (frame of) mind is being attributed to the weather, which is therefore being personified. Weather has historically often been personified (or deified), so that

5 Again see ATT-Meta databank, section on Ideas As Persons or Other Animate Beings.
6 Eight instances on screen pages shown by Google searches conducted on 24th March 2014, using the search pattern “jump about * brain” and variants with “jumps”, “jumping” and “jumped”.
7 From a weather report on BBC Radio 4, U.K., 7 a.m., 30 July 2003.
there is a source scenario in which a person (standing for the weather) is engaged in activity of some sort. But personification where a “frame of mind” is used to convey a particular state of the weather appears to be an unusual elaboration. A GloWbE search found no instances of “weather” within six words to the left of “frame of mind”. A web search for “weather” being in a “frame of mind” reported four instances,\(^8\) casting the weather as being in a “fickle”, “friendly”, “bi-polar”, or “benevolent” frame of mind. These four examples are creative in the way they qualify the nature of the weather, by enriching the source scenario in an individual way. They also provide an important hint about the open-endedness of elaboration. In the case of “bi-polar”, alternative wording that conveyed a mental state akin to bipolarity would lead to similar conclusions about the weather. For example, the weather being in an “up and down frame of mind” would work similarly to mean that the weather is tending to regularly move between two states. Equally, the “benevolent” case would be replaced by the weather being in a “frame of mind where it was inclined to dispense largesse over wide sections of the populace”. There is no boundary round the way in which the frame of mind could be qualified. This gives great scope for metaphorical creativity.

Some other examples of open-ended and creative metaphor in mundane language will arise below.

The chapter looks mainly at how an understander (hearer or reader) understands metaphorical discourse according to the ATT-Meta approach, particularly when it is creative, rather than at creative metaphor generation, although a feature of ATT-Meta that helps with generation will be mentioned. Also, the approach leads to a new suggestion about the form metaphor may take within the mind (as opposed to within language, pictures, etc.) The suggestion is that, while analogy is involved in metaphor, and analogical thinking is extremely important in creativity, metaphorical thinking also has non-analogical aspects that are important in creativity.

A few words about ATT-Meta in general. The name ATT-Meta applies both to a theoretical account and the implemented AI reasoning system based on it. ATT-Meta is first and foremost a theoretical processing account of aspects of metaphor understanding. It can potentially inform psychological modelling of human metaphor understanding or intelligent computer programs for metaphor understanding, and has certain philosophical implications, some spelled out in Barnden and Wallington [10], for the nature of metaphor and metaphor understanding. Thus, in essence, the approach was developed in order to investigate the fundamental nature of metaphor. But the approach has been partially implemented in a computer program, a rule-based uncertain-reasoning system written in Prolog. The working system does not currently actually accept natural language sentences. Rather, it is a system for handling just the reasoning and source/target mapping actions that the ATT-Meta approach holds to be needed for handling a certain broad type of metaphor.\(^9\) The system is not intended to be definitive as to how the approach should be implemented in computer

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\(^8\) In Google search result pages.

\(^9\) However, in an ongoing EU project ATT-Meta is being combined with a natural language front-end for interpretation and generation of linguistic strings.
software—many other implementations of the broad principles of the ATT-Meta theoretical account could be envisaged.

The plan of the chapter is as follows. Section 11.2 explains the ATT-Meta approach and how it treats open-ended scenario elaborations. Section 11.3 explicates a crucial element of that treatment, namely an “anti-analogy-extension” thesis. Section 11.4 goes into further ways in which ATT-Meta handles creativity during metaphor understanding, and briefly discusses novel source/target pairings. It also touches on metaphor generation. Section 11.5 discusses the suggestion advertised above about the roles of analogy and metaphor in creative thinking. Section 11.6 concludes.

### 11.2 Open-Ended Elaboration and the ATT-Meta Approach

The ATT-Meta approach is mainly geared towards cases involving familiar metaphorical views, such as the view of the mind as a physical region. However, the approach is not much concerned with conventional metaphorical phraseology based on such views, as in “The idea was at the back of his mind”. Rather, ATT-Meta it is geared towards open-ended elaborations that rest on familiar metaphorical views. This is best brought out by examples such as (1,2) and the following:

(3) The managers were getting cricks in their necks from talking up [to some people in power over them] and down [to the managers’ subordinates].

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. However, someone having a crick in their neck is not a matter addressed by this view, and no conventional metaphorical sense for “crick” appears in, for instance, the Chambers dictionary. Only one example was found in GloWbE, only one in the British National Corpus (BNC), and only eight on the web, of metaphorical cricks in necks being used metaphorically to describe mental/emotional states in situations with no actual or potential turning of real heads. The BNC example was

The draught from Microsoft’s increasingly popular Windows is giving rival software firms a crick in the neck,

creatively exploiting the fact that a draught of air can cause a neck-crick, and that movement of an object can cause a draught. The GloWbE example was

More likely, Romney as president would be a man with a strange crick in the neck, constantly looking over his right shoulder to see which pickup truck full of movement conservatives was about to run him over.

Annoying things and circumstances are often conventionally described as being a “pain in the neck” or just “a pain”, and it might be possible to analyse (3) as resting

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10 Goatly ([24]: p. 162). The example is from the Daily Telegraph newspaper.
11 Accessed via http://corpus.byu.edu/bnc/.
on a metaphorical view underlying these idioms, for example a view of Annoying Item as a Pain. However, (3) shows some elaboration in that the specific notion of a crick is introduced, and linked to the specific context-specific circumstance of the constant turning of the managers’ heads in two opposite, physical directions. These cricks cause pain, emotional stress, difficulty in continuing such head-turning, and dislike of continuing it. Such feelings and so forth are in the source scenario, but I will show below how some are transferred into the target scenario (the situation actually described) as well. This generates conclusions such as that (a) the managers, in the target scenario, experience annoyance and other emotional stress, and (b) it is difficult for the managers to continue the conversations.

Point (b) is an illustration of how the (moderate) creativity of an example such as (3) rests not just in a degree of novelty but also in the way it economically conveys a range of useful information. (3) does not just convey (a), so the sentence is richer than if it had merely said that the managers were “getting annoyed” at their conversations. Annoyance does not in general imply difficulty of continuing (though it may imply reluctance to continue). However, having a crick in your neck not only causes pain but also makes it difficult to continue turning your head, and therefore difficult to continue the conversations.

The neck cricks begin to suggest the beneficial open-endedness of scenario elaborations in metaphor. The example could be further elaborated, creatively, by talking of the managers “massaging their necks”, for instance. This can easily be understood as indicating that the managers are experiencing pains in their necks. Another elaboration would be to add a mention of pains in other parts of the managers’ bodies, e.g. saying “getting cricks in their necks and cramps throughout their bodies”, emphasizing the degree of overall discomfort. There is no limit to what could be said about what the managers are experiencing in the source scenario, with the intent of emphasizing their discomfort, difficulties and resulting mental states and feelings.

Now consider:

(4) I don’t think strings are attached. If there are any they’re made of nylon. I don’t see them. 12

The speaker was an African politician being interviewed about a new investment by China in mineral mining. He used the common metaphorical view of requirements or constraints as attached strings. However, the being-made-of-nylon is an elaboration in the sense that normal use of the metaphorical view does not concern itself with what the strings are made of. The elaboration appears to be creative in being both unusual and effective. No instance of “nylon” being used metaphorically was found in the BNC, whether or not in conjunction with “string[s]”, and no metaphorical instance was found in GloWbE within seven words of “string[s]”. 13 In the context of

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13 A web search using Google uncovered a case of the “Ramon y Gabriela” guitar duo having a “nylon strings attached” relationship. However, the nylon here is just a pun exploiting the nylon composition of the guitar strings the duo used, and does not make a comment about the abstract nature of the relationship.
the sentences, the nylon constitution of the putative strings helps to convey that the requirements, if present at all, are not readily noticeable, because of the translucency of nylon. Notice a subtle point here. The mention of the nylon constitution is not redundant, even though (4) also explicitly says that the speaker cannot see the strings. Without the mention of the nylon constitution of the strings, it could have been that the speaker could not see them because of, say, inattention on his part. But the nylon constitution suggests the nature of the strings themselves should be blamed instead.

These examples and others have been analysed under the ATT-Meta approach (see for example Barnden [2, 4, 6, 8]). Amongst them are two closely-related examples, (5) and (6), that I will analyse in detail in the following, to convey the nature of the approach. (6) preserves the essential quality, for the purposes of this chapter, of real-discourse example (7).

(5) One part of Mary was insisting that Mick was adorable.

(6) Suddenly I was having second thoughts. About us, I mean. Did I really want to get married and spend the rest of my life with Mick? Of course you do one small voice insisted. Are you quite sure about that? another nudged.14

I take (5) 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 containing persons with their own mental states. I call these the “subpersons” of the person. The subpersons are often portrayed as parts of the person as in (5). I call this view Mind as Having Parts that are Persons (elsewhere I have less accurately called it Mind Parts as Persons). Secondly, the subpersons may be portrayed as communicating in natural language. In such a case, the utterance also rests on a metaphorical view of Ideas as Internal Utterances.

(6) does not mention any person-like part of Mary. But the existence of the voice can be used to infer such a subperson by default, within the source scenario. It will therefore turn out, in the account below, that (6) conveys the same thing about Mary’s mental state as (5) does. But an additional feature of (7) is the “small” qualification on the voice. I will discuss below what effect this has and how.

Now, I regard the uses of the notions of insisting and a voice as elaborations. The point of the Mind as Having Parts that are Persons is to relate the mental states of the real, whole person to the mental states of the subpersons, in particular to allow different subpersons to have different or even conflicting mental states. That relationship does not in itself make any use of the notion of a subperson “insisting” something, or indeed engaging in communication in any way, as I will make clearer below.

Furthermore, there is no bound on what sorts of elaborations make sense here. We can have any elaboration that, in the terms of the source subject matter, can have implications for the target. So, for example, suppose (5) had said “shouting” instead of “insisting” (cf. the shouting voice in (1)). The shouting has implications about the mental state of the subperson in question, for example that the subperson may be

angry, as well as suggesting (as in the insisting case) that another subperson has said something contrary. The anger could then be transferred, as we will see, to become an implication that the real person has a motive to be angry. Again, if a sentence creatively mentioned a subperson as knocking another subperson unconscious, this would make sense because the latter subperson would no longer have conscious mental states and feelings, and therefore certain implications about the real, whole person would disappear.

A distinctive feature of ATT-Meta, compared to other approaches in cognitive linguistics, psychology and AI, is to handle metaphor through a *pretence* or *fiction* mechanism. I use a very broad notion of pretence here. It is akin and even perhaps identical to that involved in thinking counterfactually. In thinking through what would have happened had Obama lost the 2012 US presidential election, one mentally pretends that Obama did lose the election and then explores that pretend scenario. This broad notion of pretence in no way involves deceiving oneself or others of anything, or of physically acting a role. Under this weak notion of pretence, the metaphor understander pretends that what the metaphorical sentence literally says is true, and draws consequences from it using knowledge of the source subject matter. Those consequences are still a part of the pretence.

What I referred to above as a source scenario is more precisely the *pretended scenario*. It may then be that a consequence derived within the pretence—for example, that a string cannot easily be seen, in the case of (4)—can somehow be mapped in some modified form to become a proposition about the target scenario—e.g., that one cannot easily be aware of the constraint. Such a target-scenario proposition forms part of the meaning of the discourse for the understander.

Another way of putting it is that understanders use the literal meaning of the utterance to begin to construct a fictional scenario which they then fill out by means of inference and out of which they selectively extract information about the target. A pretended scenario is similar to a world as depicted by a fictional narrative. The ATT-Meta approach is therefore akin to fictionalist approaches to metaphor in Philosophy (e.g., Walton [44]), and to the use of imaginary worlds for poetry understanding (Levin [34]). See also Carston and Wearing [14] for a recent preliminary extension of Relevance Theory in a similar vein.

### 11.2.1 Metaphorical Views and Mappings in ATT-Meta

One major question is how information is transferred out of the pretended scenario into the target scenario (the reality scenario), possibly in modified form. Here ATT-Meta borrows in part from conceptual metaphor theory, while going beyond it. A conceptual metaphor consists of a set of mappings—or as I will say, *correspondences*—between aspects of the source subject matter and aspects of the target matter. These mappings constitute an analogy. The ATT-Meta approach broadly adopts this idea, though the correspondences are considerably different in form and function from those in conceptual metaphor theory and in analogy theory. One difference is
that in the ATT-Meta approach there are two broad sorts of correspondence: (i) view-specific correspondences that are associated with particular metaphorical views, and (ii) view-neutral mapping adjuncts that apply by default in any case of metaphorical understanding and that build upon the effects of, and indefinitely extend the reach of, the correspondences in (i).

A metaphorical view in ATT-Meta involves a small number of very general, high level view-specific correspondences. In case of Mind as Having Parts that are Persons, only two correspondences appear to be needed for a large array of examples. They can intuitively be expressed as follows.

(C1) A person having some motive to believe/desire/intend/fear/like/… something metaphorically corresponds to at least one subperson of that person having a motive to believe/desire/intend/fear/like/… it.

(C2) A person believing/desiring/… something metaphorically corresponds to every metaphorical subperson of that person believing/desiring/… it.

If we know from an utterance such as (5) that some subperson believes something, then a fortiori that subperson presumably has a motive to believe it. Hence, via (C1), the overall, real person has a motive to believe it as well.

One main point of the Mind as Having Parts that are Persons view is that it allows different subpersons to have different beliefs (etc.) that conflict with each other. In such a case the real person has motives to believe various conflicting things, without actually believing any one of them. This sort of conflict is explicitly illustrated in (7), but as we will see, (5) and (6) implicitly convey conflict.

View-specific correspondences such as (C1) and (C2) are couched in ATT-Meta as correspondence rules that relate aspects of some source subject matter being used in a pretence to aspects of some target subject matter in the reasoning space surrounding the pretence. This surrounding space is usually the space concerning reality (the reality space), but pretences can be nested within other pretences and other sorts of space. Hence, correspondences in ATT-Meta serve to bridge, in general, between a pretence space and a surrounding space.

(C1) and (C2) are more precisely glossed as follows. X is a variable standing for some proposition. The “surround” is the space surrounding the pretence space. For simplicity here I restrict the rules to dealing with just the mental state of belief.

(8) IF (in the surround) P is a person AND (within the pretence) P has one or more subpersons THEN (in the surround) P’s having some motive to believe X CORRESPONDS TO (in the pretence) at least one subperson having a motive to believe X.

(9) IF (in the surround) P is a person AND (within the pretence) P has one or more subpersons THEN (in the surround) P’s believing that X CORRESPONDS TO (in the pretence) all the subpersons believing that X.

The IF part of such rules acts as an appropriateness condition or guard. During processing of a metaphorical utterance, it can become apparent that a person P is
being viewed as having subpersons. This can happen, for instance, if a “part” of P is described as having thoughts. Then, the rules above can fire for P and any proposition X that may be salient. What the rule does is create the *individual correspondence* specified in the THEN part, for the *particular* person P and proposition X at hand.

### 11.2.2 The Process of Understanding (6)

The present subsection outlines how the ATT-Meta system processes (6). The system is a complex one based on a rule-based reasoning engine, implemented in Prolog, that performs a type of qualitatively-uncertain reasoning whose main feature is reasoning with defaults. It is also has a treatment of degrees with which situations can hold.

Taking sentence (6) literally, the mentioned voice insists that Mick is adorable. This fact about Mary is a premise used within the pretence, and is used to infer that (by default) there is a subperson inside Mary. Given the general default that when people claim things they believe them, the system can then infer that

(A) that subperson believes that Mick is adorable.

It follows by default that

(B) that subperson has a motive to believe that Mick is adorable.

Since Mary does have a subperson in the pretence, the above correspondence rule (8) applies, creating an individual correspondence between *Mary’s* having a motive to believe that Mick is adorable and the *subperson* having such a motive. Notice that this in itself is just a correspondence between two possible states of affairs. It doesn’t say that these states of affairs obtain (in the reality space and pretence space respectively). But (B) does say that the state of affairs on the pretence side holds, so ATT-Meta creates the following proposition about reality:

(C) Mary has some motive for believing that Mick is adorable.

Thus, overall, a few simple inference steps lead from a within-pretence premise derived directly from (6) taken literally to a within-pretence proposition (B) that is mapped to become a within-reality proposition (C). See Fig. 11.1 (where the example is put into the present tense for simplicity).

But also the “insisting” in (6) can be used to infer that actually there is a subperson of Mary that believes that Mick is *not* adorable. This arises because of the real-world nature of “insisting”. Typically, someone insists something because there is a conversation with a person who denies it. Thus, the presence of a subperson who claims that Mick is not adorable can be inferred by default. This is also shown in Fig. 11.1. Then, given again the general default that when someone claims something they believe it, this subperson presumably believes that Mick is not adorable. Hence, via a different application of correspondence rule (8), we get the result that Mary has a motive to believe that Mick is not adorable. Thus we get the effect that Mary has motives both to believe that Mick is adorable and to believe that he isn’t. In addition, by means of correspondence rule (9) it can be inferred that Mary lacks the belief that Mick is adorable, since there is a subperson who lacks this belief.
"A voice [v] inside Mary insisted that Mick was adorable."

**Fig. 11.1** Showing the processing for (a present tense version of) example (6). The heavily outlined box shows the pretence space. The *thick, circled arrows* crossing the box boundary from inside shows a mapping action, specifically one that arises from a view-specific correspondence rule (8) in the text, associated with the *Mind as Having Parts that are Persons* view. The *thin lines* joining the *thick arrow* show the dependence of the correspondence on the guard conditions in (8). Other *arrows* show ordinary inference steps.

In summary so far, ATT-Meta is able to deal with open-ended elaborations through open-ended inference within the pretence, deriving conclusions (indirectly from the literal meanings of sentences) that can be transferred with the help of correspondence rules such as (8,9) to become statements about the target scenario. To emphasize this point further, I mentioned above a potential variant of (6) that uses “shouting” instead
of “insisting”. A possible line of reasoning would deliver all the consequences above plus an extra one that says that the shouting subperson is angry or alarmed. By (C1), we then get the implication that Mary has a motive to be angry or alarmed.

11.2.3 View-Neutral Mapping Adjuncts

Consider again the neck-crick example, (3). How can conclusions such as that the managers, in reality, are experiencing negative emotions, caused by the conversations, and find it difficult to continue their conversations, be created? Such conclusions arise within the pretence, but we need to transfer them to the surrounding space (reality space).

This is where view-neutral mapping adjuncts (VNMs) come in. There are general qualities about source scenarios that are very often transferred in metaphor to the target scenarios no matter what the specific metaphorical view is. Amongst such qualities are the following:

- Emotional/attitudinal states, value-judgments, etc.
- Mental states, such as believing, intending, wanting.
- Time-Course, incl. starting, continuing, ending, immediacy, smoothness/intermittency, rates at which episodes occur, temporal relationships between episodes, etc.
- Causation, prevention, enablement, ability, attempting and tendency relationships, and related qualities such as effectiveness. 15
- Ease/difficulty properties.
- Normal functioning (of a machine, organism, protective measure, structure, etc.)
- Modal qualities: possibility, necessity, obligation, …
- Qualitative number/amount (little, much, few, many, more, …)
- Uncertainty with which situations hold.
- Degrees to which situations hold.
- Complementation (the logical operation of switching between a situation holding and not holding).

As an illustration, to reflect the first two items in the above list, the ATT-Meta system contains the following rule:

\[(10) \text{IF something P in a pretence CORRESPONDS TO something S in the surround AND cognitive agent A in the pretence CORRESPONDS TO agent B in the surround THEN (in the pretence) agent A’s bearing a particular mental/affective attitude towards P CORRESPONDS TO (in the surround) agent B’s bearing the same attitude towards S.}\]

In the neck-crick example, we can take P to be the conversations in the pretence and S to be the conversations in reality. They are actually the same conversations.

15 Effectiveness has only recently been added, and is reported for the first time here.
Intuitively, something can exist in both spaces, but formally they are treated as separate but “corresponding” entities. We can take A to be the (set of) managers in the pretence and B the same managers in reality. Again, A “corresponds” to B. Thus, the rule delivers a correspondence between emotional distress of the managers about the conversations, in the pretence, and emotional distress of the managers about the conversations, in reality. The managers are indeed inferred to experience distress in the pretence, so the correspondence is used to infer that they experience it in reality as well.

The VNMA that handles causal relationships etc. takes the form of a rule like (10) that says that P causing Q in the pretence corresponds to R causing S in reality, if P corresponds to R and Q corresponds to S. As a result, the conversations causing the emotional distress in the pretence is inferred to correspond to their doing also in reality. Since the former casual link can be inferred to exist in the pretence, it is also assumed to exist in reality.

Note that there is nothing assumed in the causal chain in reality space to correspond to the neck-crick itself or the physical pain it causes. This is simply because the neck-crick itself does not correspond to anything in reality, nor does the physical pain. A causal link in the pretence between P and Q is only inferred to correspond to one in reality if P corresponds to something R in reality and Q corresponds to something S in reality. Similarly, (10) is parasitic on the existence of a correspondence between P and S and a correspondence between A and B.

Equally, the within-pretence difficulty for the managers of continuing with the conversations transfers to reality, because of VNMA rules handling time-course (a case of which is the continuation of a situation) and difficulty. For example, here is the rule for some aspects of the Time-Course VNMA.

\[(11) \quad \text{IF some situation } P \text{ in a pretence CORRESPONDS TO some situation } S \text{ in the surround} \]
\[\quad \text{THEN} \]
\[\quad \text{in the pretence } P \text{’s having a specific qualitative temporal attribute} \]
\[\quad \text{CORRESPONDS TO} \]
\[\quad \text{in the surround } S \text{’s having the same attribute.} \]

The continuation of a situation is one case of a qualitative temporal attribute. So, because the conversations in the pretence correspond to the conversations in reality, the continuation of the conversations in the pretence corresponds to their continuation in reality, because of the Time-Course VNMA.

Then, given that these continuations correspond, and the managers correspond between pretence and reality, the difficulty the managers have in engaging in the continuations also corresponds, by the Ease/Difficulty VNMA.

Notice here how VNMA can recursively build on each other: for example, continuations are made correspond by one VNMA, allowing another VNMA to make the difficulty of the continuations to correspond. If, further, an agent in the pretence were to have a mental/emotional state about this difficulty, then a corresponding agent in reality would be inferred to have it as well. Thus, the emotional/mental-state VNMA would have built on the Ease/Difficulty VNMA, which would have built on the Time-Course VNMA.
Note also that in all this, the only view-specific correspondences used are the very basic one of relative vertical position relationships in pretence corresponding to control relationships in reality, and the identity-like correspondences for the conversations and managers. Thus, the meaning arising from (3) is generated mainly by VNMAs, not by view-specific correspondences. Work on the ATT-Meta approach indicates that metaphorical utterances often get much, and in some cases all or almost all, of their effect via VNMAs rather than directly from view-specific mappings. The latter often merely provide a scaffold to allow VNMAs to handle the most important information. The treatment of a wide variety of examples in [2, 4, 6, 8] provides evidence for this claim.

However, VNMAs are merely default rules, so their implications can be defeated in specific circumstances by other evidence. This defeasibility applies also to the effect of view-specific rules.

As another example of the use of VNMAs, there was no treatment above of the effect of the “small” qualifier of the voice in example (7). Suppose this qualification is added to (6), to get

(12) One small voice inside Mary was insisting that Mick was adorable.

The effect of the smallness is quite subtle, but at least some of it can be captured by the notion that a small voice in a conversation is a relatively ineffective one (by default). So, the voice, and therefore also the mental states of the subperson whose voice it is, are relatively ineffective in the overall pretended scenario. Now, the subperson’s motivational state corresponds under the Mind as Having Parts that are Persons view to Mary’s having a motive to believe that Mick is adorable. So, the effectiveness of the subperson’s motivational state in the pretended scenario corresponds by the Causation/etc. VNMA to the effectiveness of that motivational state of Mary’s in the reality scenario. Moreover, as qualitative degrees to which situations hold carry across by the Degree VNMA, a relatively small degree of effectiveness in the pretended scenario maps to a relatively small degree of effectiveness in the reality scenario.

Notice that the pretend subpersons themselves do not correspond to anything in reality. It is merely that certain things about their mental states correspond to certain things about the real person’s mental states. This point leads into the next section.

11.3 The Anti-Analogy-Extension Thesis

In the ATT-Meta approach, as in conceptual metaphor theory, metaphor is based on familiar analogies. An ATT-Meta metaphorical view is largely realized as a set of entrenched correspondence rules, and VNMAs are additional correspondence rules. Nevertheless, a key point about the ATT-Meta approach can be called the

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16 The realization of a view can also involve ancillary assumptions [8]. These are default assumptions about the nature of the pretended scenarios involved in a metaphorical view. Figure 11.1 shows one
Anti-Analogy-Extension Thesis. This says that open-ended elaboration in metaphor should not, normally, be handled by extending already known analogies. ATT-Meta seeks to get away with the least amount of analogy possible, contra other theories such as Structure-Mapping Theory [11, 18, 22] which assume that the task is to maximize the extent of (structurally well-founded) analogy.

I call both the view-specific correspondence rules and the view-neutral mapping adjuncts standard analogical mapping rules. They are part of an understander’s long-term knowledge. However, suppose an understander is faced with a metaphorical sentence where there are as yet unparalleled within-pretence items, such as the nylon in (4), and the sub persons, voices, smallness, insisting and nudging in (5, 6, 7, 12). Such items are ones that are not mappable into the surrounding space by any standard mappings. Then, the Anti-Analogy-Extension Thesis says that, unless there are special pressures to act otherwise, understanding does not seek to provide parallels in the surrounding space for the as-yet-unparalleled items. Rather, the understander tries to connect these items to within-pretence content that can be converted via standard mappings. This is on the theoretical principle that, typically, the unparalleled items are proposed by a speaker not as individually standing for aspects of the target scenario being addressed, but rather to build a pretended scenario that holistically illuminates the target side using knowledge of metaphor that the understander is expected already to have.

In particular, there is no need at all to propose that for examples like (5) and (6) the mentioned parts and voices correspond to identifiable aspects of the real person, or to propose that there is some internal, real mental action that can be clearly held to correspond to the action of insisting in the sentence. Rather, the mentions of parts, a voice and insisting in (5, 6) are merely tools towards constructing a rich pretended scenario, which in turn conveys in an economical, accessible and vivid manner the possession of a particular sort of mental state by Mary.

Similarly, in the neck-crick example (3), the cricks and resultant physical pain have no parallel in reality. The cricks are only there to convey emotional distress, difficulty in continuing the conversations, etc. In the nylon constraints example (4), the speaker is not trying to refer to possible real features of the putative abstract constraints that correspond to nylon, to being made of nylon, or the general being-made-of relationship. The being-made-of-nylon is only there to convey information such as that the speaker cannot see the constraints and to suggest it is not his fault.

Although the nylon itself has no parallel, the nature (whatever it is) of an item in a pretence is taken to correspond to the (possibly different) nature of a corresponding item in the surrounding space. Since the nature of the strings in the pretence causes the politician not to see them, their nature in reality causes him not to be aware of them in reality (by the Causation-etc. VNMA). But there is no need at all to analyse the nature of the constraints in order to find items analogous to being-made-of and

(Footnote 16 continued)
application of such assumptions. In brief, it is assumed that if an agent has a subperson that is involved in a conversation, then there is an interlocutor who is another subperson involved in the conversation.
to nylon. Those within-pretence aspects are not paralleled in reality, even though the overall nature of the strings is, as an unanalysed unit.

Consider also the following example:

And do you remember that one of the Vault’s SPECIAL FEATURES was A DARK, DUSTY, COBWEBBY CORNER WHERE UNWANTED THOUGHTS AND FEELINGS COULD BE DUMPED? Well, that’s where you can push the no-longer wanted, unrealistic and overly negative thoughts too!17

There is no need for an understander to find a parallel for the mentioned corner or the qualities of being cobwebby, dusty and dark. Instead, these aspects of the pretended scenario lead to within-pretence inferences about such matters as the relative inaccessibility and hiddenness of the negative thoughts (metaphorically viewed as physical objects) once the thoughts have been “pushed” into the “corner”.

The example is moderately novel not only in the notion of a “Vault” in the mind but also in the use of “cobwebby” (whereas mention of pushing ideas, or of parts of the mind such as corners and recesses, is common). This word may be unusual in any mode of use, judging by the mere 29 occurrences in GloWbE. None of the uses are similar to that in the example above, but a few uses of cobwebby corners, cellars, etc. of the mind can be found in other sources.18

The Anti-Analogy-Extension Thesis goes hand in hand with a form of holism about the pretended scenarios and the metaphorical sentences leading to them. The pretended scenario is to be regarded not as having a detailed analogy to a reality scenario (or a scenario in some other sort of surrounding space) but rather something that holistically conveys information about a reality scenario. This conveying is, to be sure, done by the action of correspondences that pick on specific aspects of the pretended scenario. But the ultimate intent here is to transfer information, not specify an analogy. And any specific aspect of the pretended scenario that is grabbed by a correspondence may be the result of inference over large amounts of information within the scenario. In particular what this means is that there may be no specific part of the metaphorical sentences that can be said to correspond to a given aspect of the reality scenario (although this can happen in simple cases of metaphor). For example, going back to (6), the fact that Mary lacks the belief that Mike is adorable does not correspond to any one aspect of (6) but rather to the whole of (6).

Another work that emphasizes both frequent holism of metaphor and the lack of need for (or indeed the frequent undesirability of) analogy-extension is Langlotz’s [32] treatment of idioms, including metaphor-based ones.


18 For instance, three such uses in http://cardkiwi.com/words/cobwebby/cobwebby-sentence-examples.
11.4 How ATT-Meta Helps with Creativity

There is no limit to the amount or type of inference that can take place in a pretence, so that indefinitely rich elaborations can be handled with the aid of suitable reasoning mechanisms and enough general knowledge of the source subject matter(s). The Anti-Analogy-Extension Thesis gives both speaker and hearer the freedom to process elaborations without a general imperative to establish new analogical linkages: the thesis seeks instead to rely on standard mappings, whether view-specific or view-neutral. But there are some further features of the ATT-Meta approach that help with open-ended elaborations.

First, the ATT-Meta approach gives a major role to goal-directed reasoning. Although the descriptions of reasoning above are couched as moving forward from premises towards conclusions, the process is actually typically assumed to proceed in a goal-directed way. That is, there is some goal or issue that the system is trying to address, and reasoning steps are attempted towards that end. For example, in the case of (7), the context raises the question of whether to get married to Mick. Given the presence of view-specific correspondence rules (8,9), this can be converted into the goal of investigating, in the pretence, which subpersons want, or have a motive to want, the marriage. By a process of backwards chaining through inference rules, it is discovered that there is a subperson who does have this motive and one that has a motive not to want it. This then rolls forward via the relevant view-specific correspondence to become the conclusion that Mary herself both has a motive to want the marriage and a motive not to. Goal-directed reasoning is an extremely powerful tool for combatting the notorious indeterminacy and context-sensitivity of metaphorical meaning (see, e.g., [41]). Suitably deployed it can guide metaphor understanding towards uncovering meaning that is relevant to the context, thereby helping creative metaphor to have a useful meaning—cf. the Sternberg and Lubart’s [42] definition of creativity as “the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints”). See Barnden [6] for more on this.

The ATT-Meta system currently has no facility for analogy discovery. That is, new correspondence rules cannot at present be created in the system. However, there is already a way in which ATT-Meta can cope to some extent with novel pairings of target and source in metaphor. This is because, just as with open-ended elaborations, novel pairings can work partly or even wholly by means of standard correspondence rules (view-specific and view-neutral), rather than new ones. For instance, suppose someone says in a fit of metaphorical creativity, “My TV set is a pile of rotting mongoose tails that’ve been lying round in the sun for a few days”. It may be clear from context that the speaker is merely trying to convey her feeling of disgust towards the TV set in question. This feeling gets transferred from pretence to reality because of a VNMA. There is no need for the hearer to find a more detailed analogy between the TV set and the mentioned tail-pile, and indeed it would be waste of effort to try

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19 The overall ATT-Meta approach allows non-goal-directed as well as goal-directed reasoning to be used. However, the implemented ATT-Meta system can at present only do goal-directed reasoning.
to find one. Similarly, recall the real example in the Introduction of a migraine being described as a moving animal in the head. Much of the point is about the time-course of the migraine developing and about the fact that the progress cannot be resisted. Such content can be carried over from pretence to reality by VNMAs. For example, difficulty of resistance amounts to difficulty of preventing continuation, and here the difficulty, prevention and continuation are handled by three VNMAs.

But the ATT-Meta approach could be expanded to include the creation of new correspondence rules using methods discussed in the analogy literature (e.g., Falkenhainer et al. [18], Indurkhya [27]). If this were done then the approach would actually allow two different ways in which an explicit metaphorical pairing could be processed, such as in “Yesterday was Christmas Day for newspaper editors”20 or similarly “Yesterday was a feast day”—when yesterday was not a special day. One of these ways, the one already available, and suitable in some circumstances, would be for such a sentence to be understood as a pretended equation (the day is Christmas Day) or pretended categorization (the day is a feast day). Then, within the pretence, an inference might be made that the day was very pleasurable, and this could be carried over into reality, with the help of VNMAs, to create the conclusion that the real day was very pleasurable. The other understanding approach, suitable in other circumstances, would not be to put an equation or categorization into the pretence, but rather to try to discover an analogy between the target item (the real day) and the source item (Christmas Day, or a feast day, as an aspect of the pretence). The analogy would be couched initially in newly-constructed correspondence rules about the specific day, but might later be generalized to cover any day.

This potential double approach to explicit novel pairings resonates with and is closely analogous to a prevalent concern in the psychological literature on metaphor. Here there is dispute between the categorization theory (or class-inclusion or property-attribution theory) and the so-called comparison theory (see, e.g., [11, 23]). Considerations in that dispute about when categorization or comparison are appropriate could illuminate the question of when ATT-Meta should seek a new analogy across the pretence/surround boundary and when it should use a within-pretence categorization or equation.

ATT-Meta’s handling of creativity benefits from the fact that metaphorical views are not reified in ATT-Meta: they are not themselves explicitly represented. This allows great freedom in the nature of the correspondence rules. Metaphorical views are merely a theoretical abstraction from the guards in the individual correspondence rules possessed by an understander using the approach. Consider again correspondence rule (8). Because the guard requires there to be a person (in the surrounding space) that (within the pretence) has subpersons, the rules can be thought of as belonging to the Mind as Having Parts that are Persons view. So can rule (9). But there is no explicit connection between these rules, other than the fact that they have the same guard, or any labelling of the rules as belonging to any view. Thus, the use of correspondence rules does not require a prior, explicit decision that some particular metaphorical view is in play. Rather, what needs to be inferred is certain

aspects of the pretended scenario and surrounding scenario (e.g. that the person has subpersons). Thus, correspondence rules come into play opportunistically during the understanding process, as a seamless part of the overall reasoning activities involved in understanding.

Furthermore, it may be that guards of different correspondence rules might merely overlap rather than being identical, or might merely be similar in some other way. There may only a rough way to theoretically categorize rules as regards what metaphorical views they are in, and it may difficult to say that a given metaphorical view is reflected in any clearly delineated set of correspondence rules.

The flexibility of the contents of pretences in ATT-Meta is boosted by an avoidance of any restriction on correspondence rules as regards how different the subject matters they link are. In conceptual metaphor theory, it is often claimed or tacitly assumed that metaphorical mappings cross between delineated, qualitatively very different “domains”. This certainly respects the intuition that in much metaphor the source and target subject matters are often completely different types of things, as when an idea or mind is viewed as being a physical creature (see ATT-Meta databank cited above). But in Barnden [7] I argue for scepticism, shared with other authors such as Haser [25, p. 32ff], about the scientific utility of the notion of “domain” in describing what metaphor fundamentally is or how it works. There is at most a general tendency for the target and source to be completely different sorts of thing, and much metaphor does not obey this tendency.

Indeed, **Mind as Having Parts that are Persons** radically fails to obey it. There, both the target and the source subject matter involve people, thoughts, utterances, etc. Also, there are simpler metaphors like “Japan—The Britain of Asia?”21 and “Tuesday is honorary Monday this week” (heard in conversation) where target and source cannot be said to be completely different sorts of thing. Of course the target and the source are always different (a person does not contain a conversation amongst subpersons, Japan is not Britain) but things can be different while being the same sort of thing, intuitively. Ironically, even some famous, much-discussed examples of conceptual metaphors as *Life as Journey* and *Argument as War* [30] fail to exhibit the domain difference that is usually claimed. Literal journeys are an important part of life itself; and wars importantly contain, and may even sometimes be based on, literal arguments. In sum, it is quite common for there to be a strong overlap between target and source subject matters.

Accordingly, in ATT-Meta, correspondences (mappings) are not by definition between subject matters or domains that have a radical qualitative difference. Rather, by definition they are between the contents of a pretence and contents outside the pretence. ATT-Meta makes no assumptions whatever as to how close or distinct, or how disjoint or overlapping, the two subject matters are, and there is no use of subject matter distinctions anywhere in the approach. Thus, there are no artificial limits on what can go in the pretence, or on what source subject matter can be used to illuminate a given target.

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In ATT-Meta, a transfer of information from pretence into surrounding space is just a reasoning step like any other, and an individual correspondence created by a correspondence rule is just a proposition like any other. (Recall that a correspondence rule such as (8) creates an individual correspondence when it fires, such as: Mary’s having a motive to believe that Mike is adorable corresponds to at least one subperson having a motive to believe this.) Further, correspondence rules just sit with other rules in the system, firing when able to. The overall reasoning engine that handles the firing of rules makes no distinction between correspondence rules and other rules. In addition, while reasoning actions occur in different spaces, there is no regimentation of when reasoning steps happen in different spaces, except as is dictated by the natural linkages between the outputs of some rules and inputs of others. The actions in different spaces are interleaved in whatever way is convenient for the goals for reasoning. Thus, as already hinted, the peculiarly metaphorical aspects of ATT-Meta’s reasoning (reasoning within pretences; and the action of correspondences to transfer information) are seamlessly woven into the overall reasoning endeavour. This gives tremendous flexibility especially when dealing with more elaborate cases of metaphor, and especially when a metaphorical scenario is developed over a multi-sentence or larger region of discourse. It is typical in such cases for reasoning to be needed in the ordinary terms of the target subject matter, not just metaphor-based reasoning, partly because metaphorical stretches can be separated by literal language.

In the ATT-Meta approach (and implemented system) metaphorical correspondences cause information to be transferred in both directions between a pretence and the surrounding space. I call the surround-into-pretence direction the “reverse” direction. The motives for this are detailed in Barnden et al. [9]. In brief, one reason is to try to maximize the degree of consistency between what is being inferred within the pretended scenario and what is being inferred within the surrounding space’s scenario, and another is to allow useful enrichment of the pretended scenario based on information independently known about the surround. For example, in a Mind as Having Parts that are Persons example, if we know that the real person believes X then it may be useful to infer that each subperson believes X too, by virtue of correspondence rule (9). This could allow important inference about different subpersons’ thoughts to take place. This case of reverse transfer is a simple instance of the “metaphorization” of information in the surrounding space. A more elaborate case, concerning a creative metaphor of doubts and grievances moving in and out of a conversation as though they were independent-minded cats, is discussed in Barnden et al. [6, 9].

At the time of writing, ATT-Meta is being developed towards metaphor generation as well as understanding. The reverse transfer capability puts ATT-Meta in an advantageous position in this respect.
11.5 Metaphor in Thought

Within the Cognitive Linguistics field, it is typical to think of metaphor as something that is somehow fundamental in the mind, not just in communication and external expression, and in particular to think of many concepts, particularly abstract ones, as in some way structured by metaphor (i.e., by being the target of metaphorical mappings with source concepts). See Vervaeke and Kennedy [43] and Murphy [36] for a discussion of some of the main points here. One reason for the hypothesis is that metaphor occurs in media other than language, such as in graphical media (notably advertisements, comic strips, etc.), gesture, and music [15, 20, 21]. One might try to account for this in a number of ways, but one parsimonious option is that metaphor is inherently a mental as opposed to purely communicative or externally-expressive phenomenon. I will take the point to basically be that, when thinking but not externally communicating about some subject matters, we are at least sometimes mentally using metaphorical mappings between those subject matters and suitably-related source subject matters. This mental activity may be unconscious.

Various features of ATT-Meta, notably the Anti-Analogy-Extension Thesis, suggest interesting possibilities about metaphor within the mind. That thesis leads to an especially strong claim: namely, that portions of a metaphorical thinking episode may not individually have any translation into non-metaphorical thoughts within the person’s mind. This is because extensive areas within a metaphorical pretence may not have any analogical correspondence to the target subject matter, but rather just serve indirectly to support those limited aspects of the pretence that are in analogical correspondence to the target. Open-ended elaboration of metaphor could exist in mind just as much (or more than) in language and other external expression, and it could creatively lead to new thoughts about the target that are relatively unconstrained by analogy between source and target.

For example, someone thinking (but not communicating) about the managers in (3) may mentally develop the pretended scenario in creative ways as above, such as imagining pains in many parts of the managers’ bodies, not just their necks, imagining the managers massaging themselves, 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 pretended scenario is not mapped. Similarly, when Bill is thinking about an idea as physical object in, say, John’s mind, metaphorically conceived as a physical terrain, Bill could think of an idea being buried under the floor of an ocean and eaten away by creatures there, as a way of considering the lengthy inaccessibility, hiddenness and deterioration of the idea, without thinking that the ocean and the creatures correspond to anything about John’s mind. There is no more reason to think that anything like a comprehensive analogy for a pretended scenario is found in the case of metaphor that is purely in the mind than that such an analogy can be found in the case of metaphor in discourse.

The approach thus suggests a creative use of metaphor within the mind that goes beyond the typical idea that the way that metaphor helps creativity is through novel
analogies being created between subject matters. That type of metaphorical creativity is important, but so is the open-ended elaboration of an existing analogy without extending it.

### 11.6 Conclusions and Final Remarks

This chapter has indicated how the ATT-Meta approach can handle, from an understander’s viewpoint, certain broad and important types of creativity in metaphor. The chapter has concentrated on the case of open-ended pretended-scenario elaborations. Even very creative elaborations and novel pairings work in important part by engaging standard analogical parallels (view-specific or view-neutral), rather than by extension of an existing analogy through the addition of new correspondence rules. Elsewhere (Barnden [8], extending Lee and Barnden [33]) I have shown that the ATT-Meta approach can handle a variety of ways in which metaphorical views can be compounded (mixed). One, parallel, type of compounding involves mixing of different subject matters within one pretence, or use of multiple pretences side by side. Another, serial, type (i.e., chained metaphor) is handled by having pretences nested within other pretences. This is all implemented in the ATT-Meta system.

The chapter has also mentioned a natural extension to metaphor generation, by virtue of the reverse-transfer capability of ATT-Meta, which is a significant measure for suitably enriching pretended scenarios even during understanding. Given the open-endedness of the way in which pretended scenarios can be developed, the stage is set for creative generation as well as understanding.

ATT-Meta’s emphasis on the Anti-Analogy-Extension thesis is distinctive compared to most other work on metaphor. Also, ATT-Meta’s emphasis on the following topics from the previous section is distinctive compared to conceptual-metaphor theory: use of view-neutral correspondences as well as view-specific ones; opportunistic use of correspondences through guard satisfaction; intertwining of mapping with other reasoning; non-reification of metaphorical views; rejection of a domain-difference assumption; and reverse transfer. However, the emphasis on view-neutral mapping resonates with the transfer of higher-order structure in Structure-Mapping Theory (Gentner [22]) and owes a considerable debt to the AI work on metaphor by Carbonell [12].

At a suitably high level the ATT-Meta approach bears some strong similarities to those of Hobbs and Narayanan [26, 39], and somewhat less so to the MIDAS system of Martin [35]. The differences are explained in Barnden [5]. But the closest point of contact with other work, and one very relevant to the topic of creativity, is with Conceptual Integration theory, or Blending [19]. Reasoning within the pretence is broadly like the elaboration of a blend space. The relationship to blending is especially close because of something not yet mentioned: namely that a pretence can opportunistically use information from the surrounding space, much as a fictional story about, say, Sherlock Holmes can use real information about London. A pretence can also blend different source subject matters together, as needed for
example for some types of metaphor compounding. However, as well as some technical differences, there is perhaps a significant difference in underlying philosophy between the ATT-Meta approach and blending. The core notion in ATT-Meta is that of a pretence or fiction. Blending of knowledge from different aspects of life is an important opportunity that fiction provides, but it is merely a subordinate one. It is a special case of the fact that fiction can depart arbitrarily from reality. Indeed, much open-ended metaphor does not rely in any important way on blending as such, as opposed to the development of a fictional scenario in the quite straightforward terms of some familiar source subject matter.

Various types of creativity in metaphor have not been mentioned at all so far. One is the way that source subject matters can be unrealistically distorted. A simple, practical example of this is provided by Musolff’s example [37] of the EU as a “marriage” between countries. It is a strange marriage, in that there are far more partners than usual even in cultures that allow polygamy or polyandry, and there is no involvement of sex, whether intragender or intergender! Yet, we somehow understand the metaphor without any difficulty or (usually) any sense of shock, irony or amusement. ATT-Meta can cope with such distortion, which can be seen as another type of pretended scenario elaboration, partly through downplaying analogy.

A fiction-based approach to metaphor facilitates creativity in many ways, including through facilitating free elaborations and distortions, liberated moreover by policies such as the downplaying of analogy. Also, there has been extensive work on various forms of fictionalism in philosophy [17]. This suggests that fictionalist approaches to many phenomena, not just metaphor, could usefully be studied in A(G)I.

The free intertwining of metaphorical processing and general reasoning is essential in the ATT-Meta approach, and signals a way in which metaphor and creativity need to be worked more closely into theories in an AGI vein as well as into psychological and philosophical theories. Also, the chapter has advocated serious consideration of the idea that metaphor is fundamental in some thinking, in a way that goes far beyond the popular idea that some concepts are structured though mappings to others, and the popular idea in creativity theory that much creativity rests on analogy. The fundamentality of metaphor in (some) thinking is amplified by a type of holism: a frequent lack of analogy between specific metaphorical thoughts and any specific aspects of reality.

Acknowledgments This work was supported in part by an EU grant, FP7-PEOPLE-2012-IIF project 330569 (“GenMeta”). I am grateful to Andrew Gargett for help with data collection, and to an anonymous reviewer for helpful comments.
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