

# Consequences for Language Learning of an AI Approach to Metaphor

**John A. Barnden**

School of Computer Science; University of Birmingham  
Birmingham, B15 2TT, United Kingdom

J.A.Barnden@cs.bham.ac.uk

Tel: (+44)(0)121-414-3816 Fax: (+44)(0)121-414-4281

## **Abstract**

Some recent work in Applied Linguistics has addressed the difficulties language learners have with metaphor. The present paper presents some reasons for optimism about the task of helping learners overcome some of these difficulties, at least when learning English. This (restricted) optimism is one lesson the author has distilled from his work on developing an approach to metaphor understanding within the context of Artificial Intelligence. An implication of the approach is that, rather than learning lots of language- and metaphor-specific mappings, the learner need only learn a relatively small number of such mappings per conceptual metaphor, together with certain types of mapping that act as adjuncts to any conceptual metaphor. According to the approach learners also need a rich understanding of source domains, but this is needed anyway for non-metaphorical understanding purposes,

## **Keywords**

metaphor, artificial intelligence, language learning, reasoning

# 1 Introduction

Some recent work in Applied Linguistics has addressed the difficulties language learners have with metaphor and the question of how to help them overcome these difficulties (Boers & Demecheleer 2001; Charteris-Black 2002; Deignan, Gabrys & Solska 1997; Holme 2004; Littlemore & Low 2006; Philip 2005). The present paper presents reasons for some optimism—albeit tentative, partial and relative—about the task of helping learners with metaphor, at least when learning English. This (restricted) optimism is one lesson that can be distilled from an approach to metaphor understanding that has been developed by the present author and colleagues within the context of Artificial Intelligence. The theoretical principles of this approach have been developed in part from the realism enforced by the task of implementing metaphorical understanding in a working computer program (ATT-Meta). However, our concern in this paper is with the general approach, which we call the ATT-Meta approach, rather than with the specific computer system we have derived from it, especially as the system does not yet embody all elements of the approach.

In the following, we use the term “metaphorical view” to mean essentially the same as “conceptual metaphor” (see, e.g., Lakoff 1993), and thus to take it to consist of a mapping of various aspects of some source domain to aspects of some target domain. We use the term “metaphorical view” instead of “conceptual metaphor” so as to avoid presumptions that our approach necessarily carries over all elements from conceptual metaphor theory, and also because we allow a metaphorical view to contain additional elements called ancillary assumptions (explained below).

We consider the mapping between two domains that is inherent in a metaphorical view to be a collection of *[individual] mapping relationships*, each of which maps some aspect of the source domain to some aspect of the target domain. So, in a metaphorical view of LOVE RELATIONSHIP AS JOURNEY there is, amongst others, an individual mapping relationship between the notion of a journey and the notion of a love relationship, and another individual mapping relationship between the notion of a participant in journey and the notion of a participant in the love relationship.

The main principles in the ATT-Meta approach that are relevant for this paper are as follows.

- As well as specific metaphorical views, with their particular sets of mapping relationships, understanders use a set of *view-neutral mapping adjuncts* (VNMAAs). These are principles that sanction the transfer (by default) of particular sorts of information from the source-domain scenario into the target-domain scenario, but are independent of any particular metaphorical view.

Many mapping relationships that have been proposed by other authors as components of metaphorical views can now be recast as the effect of VNMAAs. Thus, we factor out the view-neutral aspects, markedly reducing the number of mapping relationships specific to a metaphorical view.

- When an utterance rests on one or more metaphorical views that are familiar (to the understander), but is *map-transcending* in involving source-domain elements not mapped in a relevant way by any familiar views, understanding does *not* in general involve creating new mapping relationships to handle them.

Instead, in those circumstances, understanding generally involves connecting the map-transcending elements to elements that can indeed be mapped to the target, whether by existing metaphor-specific mapping relationships or by view-neutral mapping adjuncts. The connection between the map-transcending elements and the mappable elements is done by reasoning within (mainly) the terms of the source domain.

- Creation of new mapping relationships to handle map-transcending elements does sometimes need to be done, but is an exceptional action undertaken only when special needs of discourse understanding force it to take place.

The lesson for language teaching that we draw from these principles is the relatively hopeful one that, rather than learning lots of language- and metaphor-specific mappings, the learner need only learn a relatively small number of such mappings together with certain mapping principles that act as adjuncts to any conceptual metaphor. According to the approach learners also need a rich understanding of source domains, but this is needed anyway for non-metaphorical understanding purposes.

In the remainder of the paper we will proceed as follows. We will first outline the ATT-Meta approach. Then we will further illustrate the power of the principles above, at least in the case of English, by going

through fifteen examples that are collectively diverse and individually reasonably complex. These examples are borrowed from Goatly's (1997) book, and are taken from real discourse. Barnden (2001b) originally used them as a way of evaluating the ATT-Meta approach relatively objectively, and we mainly copy the analyses in that report into the present paper while making some improvements. Finally, we will return to the issue of language learning and make a further few observations.

Before proceeding we must stress that the ATT-Meta approach is not as it stands a specific, complete model of metaphor understanding. It is parametrized by whatever views are familiar to a particular understander, whatever particular mapping relationships the understander includes in views, and whatever lexicon senses the understander has for words. Thus, it is important to understand that this paper does not seek to establish that any particular metaphorical views are familiar to typical understanders, that any particular mapping relationships appear in particular views, and so on.

Also, we stress that this paper only addresses a particular aspect of the difficulty that metaphor presents in language learning, and is not claimed to help with other aspects, such as the phraseological problems studied in Philip (2005).

## **2 ATT-Meta, Map-Transcendence and Pretence**

The ATT-Meta theoretical approach and related computer system is for performing a type of reasoning that is useful for metaphor interpretation. The approach is described in, for instance, Barnden (1998, 2001a) and Barnden, Glasbey, Lee and Wallington (2003, 2004a). The metaphorical utterances of main interest in the ATT-Meta approach are those that rest on metaphorical views that are familiar to the understander, but that are nevertheless "map-transcending" in involving source-domain elements not directly mapped by any view familiar to the understander (or at least not mapped in a way that leads to an understanding of the sentence that is relevant to the discourse). For instance, to take a modified version of an example from Hobbs (1990), consider the sentence "[the computer program variable] N leaps from 1 to 100." This sentence rests on a metaphorical view whereby variables are regarded as moving physical objects and their values as physical locations. We assume that the understander is familiar with this view. But suppose that the only lexical

sense the understander knows for the verb “leap” is *physically-leap*, and that the understander does not have a metaphorical mapping for that sense into the target domain of variables and values. So the sentence is map-transcending in using the *physically-leap* concept.

Similarly, to take an example from Martin (1990), consider the sentence “How do I enter [the computer program] Emacs?” This rests on a metaphorical view of a program as a physical region and the user as an occupant of that region. The understander may be familiar with this, but may only have a physical-entering sense for the verb “enter” and may not have any mapping (within any metaphorical view) of this sense to something to do with programs. The utterance would therefore be map-transcending for the understander. Equally, consider the sentence “McEnroe starved Connors to death” when used as a description of a tennis match. A metaphorical view of SPORT AS COMBAT may be familiar to the understander, and that view may map combat-domain concepts such as killing to target-domain concepts such as defeating. However, it may be that neither those mappings nor any others available to the understander map the source-domain concept of starving someone, which would therefore be map-transcending.

Clearly, map-transcendence is a fuzzy concept that is relative to particular understanders and what metaphorical views and individual mapping relationships they are familiar with. Map-transcendence is strongly related to the phenomenon of “unused” parts of the source domain as discussed in Lakoff and Johnson (1980). However, we prefer to avoid that term because it may wrongly suggest that the parts in question have *never* been used. Far from it: it is in principle possible even that a given understander has *often* met sentences of the form “*variable* leaps from *value1* to *value2*” without bothering to develop a mapping from *physically-leap* to something in the target domain.

One crux of the ATT-Meta approach is to allow arbitrarily rich source-domain reasoning to connect map-transcending sentence components to source-domain concepts that can be mapped by known mappings. In this respect, ATT-Meta’s approach is similar to one strand of Hobbs’s approach to metaphor (Hobbs 1990, 1992). Both approaches can infer that a variable N *has value* 100 from any sentence couched in spatial terms that even indirectly *implies* that N is *physically-at* 100, as long as the systems have the necessary knowledge about physical space to infer that N is physically-at 100 from the sentence. The inference can be arbitrarily indirect and complex in principle. To make the point, a vivid example would be a sentence such as “N

meandered along a circuitous route towards 100 but didn't complete the journey until after M fell to 0." This implies, among several other things, that N had value 100 at some point.

ATT-Meta avoids placing internal propositions such as *N is physically-at 100*, which are not statements about reality, on a par with statements such as *N has value 100*, which are. (By contrast, there is nothing in Hobbs's internal representation to say that the former proposition is merely a metaphorical pretence or fiction.) In the ATT-Meta approach there is special computational "mental space" in which such propositions and inferences arising from them are kept separate from propositions and reasoning about reality. We call this space a *metaphorical pretence cocoon*. Thus, the internal proposition *N physically-leaps from 1 to 100* arising directly from the sentence "N leaps from 1 to 100" is placed in the cocoon, and an inference result that (say) *N is spatially-at 100 afterwards*, together with the inference chain itself, also lies within the cocoon. A metaphorical mapping relationship that takes *spatially-at* to *has-as-value* can then give the result that, in reality, N has value 100 afterwards as one aspect of the meaning of the utterance.

By clearly marking some propositions as being pretences, the use of a cocoon ensures that the system is not misled by the propositions directly derived from metaphorical utterances, that is, propositions like *N physically-leaps from 1 to 100*. This isn't perhaps a practical problem in this particular example, but notice that in the case of a metaphorical utterance of "McEnroe killed Connors," which could in principle be taken literally, the understander needs to be clear that the directly-derived proposition *McEnroe biologically-killed Connors* is not a statement about reality.

But, in addition, we do not want to let the knowledge that McEnroe did not biologically-kill Connors in reality to defeat the pretend information that McEnroe did biologically-kill Connors. Thus, pretence cocoons prevent pretences from infecting reality but, equally, protect the integrity of pretences when reality conflicts with the pretence. However, information about reality that does not conflict with the pretence can be used in the pretence.

Although we are dubbing as "reality" what goes on outside the pretence, this is an oversimplification. In actuality, the pretence could be embedded within some sort of unreal context, and we will see an example of this in an example below (the Stolen Love example in section 5.11). Other cases are embedding of a pretence

within another pretence to get the effect of chained metaphor (Lee & Barnden 2001) and embedding of a pretence within the belief space of another agent (addressed briefly in Barnden 1998). One could also have metaphorical pretence within a fictional world. However, for simplicity, in this paper we will mostly pretend that the pretence is embedded in reality.

We have indicated that what is initially inserted in the pretence cocoon in the case of “N leaps from 1 to 100” is the proposition *N physically-leaps from 1 to 100*. Similarly, what might be inserted in the case of “McEnroe killed Connors” is *McEnroe biologically-killed Connors*. This reflects a general assumption in the ATT-Meta approach that what is inserted in the cocoon is a “direct” meaning of the metaphorical sentence (or of some metaphorical sentence-component such as a clause). A direct meaning of a sentence is a logical form derived compositionally from the “direct” senses of lexical units in the sentence. A direct sense for a lexical unit is just any sense listed for the lexical unit in the understander’s lexicon, so that it is directly accessible from the lexical unit. In particular, we have been assuming that the verbs “leap” and “kill” have as direct senses the concepts of *physically-leap* and *biologically-kill* respectively.

Clearly, a given lexical unit could actually have more than one direct sense, and indeed some of the direct senses could be metaphorical or special in some other way. We simply embrace such possibilities, saying that if, for instance, “leap” happened to have something like *change-value* as a direct sense, then “N leaps from 1 to 100” could be understood without use of the inferential pretence mechanism outlined above.

## 2.1 An Example

We will now look in somewhat more detail at how the ATT-Meta approach can deal with a case of map-transcending metaphor. Consider:

“The idea that Kyle was having an affair was in the far reaches of Anne’s mind.” [Anne and Kyle are married.]

This is adapted from a real-discourse example (Gross 1994). We assume the understander is familiar with

metaphorical views of MIND AS PHYSICAL SPACE and IDEAS AS PHYSICAL OBJECTS. We also assume, for the sake of example, that the phrase “far reaches” only has a spatial direct sense for the system, and that this spatial notion is not mapped to the mental domain by any metaphorical view known to the system. So the notion of physical far-reaches in the sentence is map-transcending. But we suppose the understander possesses the following mapping relationship, as part of the metaphorical view of IDEAS AS PHYSICAL OBJECTS. The relationship is cast as a correspondence between a situation pertaining in the metaphorical pretence cocoon and a situation in reality.

an agent’s conscious self operating physically (within the pretence) on an idea that is being viewed as a physical object corresponds to the agent operating (in reality) in a conscious mental way on the idea.

The pretence situation is about physical operation on the idea and the reality situation is about conscious mental processing on the idea.

As well as mapping relationships, metaphorical views can involve what we call *ancillary assumptions* about the source-domain scenarios involved in applications of the view. In the case of MIND AS PHYSICAL SPACE, we include the following ancillary assumption:

When an agent’s mind is being viewed as a physical region in a metaphorical pretence, then it is also assumed in the pretence that the agent’s conscious self is a person physically located in a central subregion of that region.

We believe this casting of the conscious self as a homunculus placed centrally within the agent’s own mind-space is needed to make sense of many examples.

The understander can reason, within the pretence, that because Anne’s mind has far reaches it is some sort of large physical region. Then, by the above ancillary assumption for MIND AS PHYSICAL SPACE,

Anne's conscious self is located in a central subregion. By contrast, given suitable common-sense knowledge about physical objects and regions, the understander can infer that probably the mentioned idea (of Kyle having an affair) is physically accessible to Anne's conscious self *only to a very low degree*, because of the distance between far reaches of a region and a central subregion. The understander can then go on to infer that Anne's conscious self probably only has a very low degree of ability to physically operate on the idea. The above mapping relationship for IDEAS AS PHYSICAL OBJECTS then converts this to the reality proposition that Anne only has a very low degree of ability to consciously mentally operate on the idea. We take this conclusion to be a reasonable rendering of the main point of the utterance.

Crucially, however, the conversion just mentioned via the mapping relationship needs further justification. Notice that the mapping relationship itself does not mention *abilities* to physically or mentally operate on ideas, or *degrees* of such abilities. It just relates physical operation to mental operation as such. So, by itself, it would only be capable of converting some proposition that Anne's conscious self does actually operate physically on the idea of Kyle having an affair, to become a proposition that Anne does consciously mentally operate on the idea. But *that* sort of conversion is not quite what we need.

We deal with this problem by means of a further fundamental aspect of the ATT-Meta approach, namely "view-neutral mapping adjuncts" (VNMA) (Barnden & Lee 2001; Barnden *et al.* 2003). With partial inspiration from Carbonell's AI work on metaphor (Carbonell 1982), we view certain aspects of information arising in the pretence cocoon to carry over to the reality context independently of any specific metaphorical views that are in play. In particular, we postulate that, if an action type X in the pretence maps to an action type Y in reality, then agents' *ability* to do X in the pretence maps to any corresponding reality-agents' *ability* to do Y, whatever metaphorical views may be in play. This is an example of the application of a VNMA that sanctions the mapping of properties/relationships concerning causation, prevention, helping, enablement, abilities and ease/difficulty. Another VNMA says that if some situation type S in the pretence maps to a situation type T in the cocoon, then the (*qualitative*) *degree* to which S pertains is transferred to become the qualitative degree to which T pertains, irrespective of the specific metaphorical views in play. We will give a fuller list of VNMA's below.

## 2.2 Mapping Relationships based on Identity

Entities existing in reality are taken by default to exist also in the pretence (but not the other way round). For instance, in the Anne/Kyle example, Anne’s mind exists in both pretence and reality. In the McEnroe/Connors example, the tennis players exist both in the pretence and in reality. An entity can have arbitrarily different properties in the pretence from what it has in reality.

For any entity that exists both in reality and in the pretence, we can consider there to be an identity link between the entity in the pretence and that same entity in reality. This identity relationship can further be thought of as a special sort of mapping relationship.

We have now seen the most important features of the ATT-Meta approach as far as the present paper is concerned. The general picture of reasoning according to the ATT-Meta approach is shown in Figure 1.

## 3 Introduction to Goatly Examples

We will now proceed to show how the ATT-Meta approach could extract important target-domain information from (simplified variants of) examples we found in Goatly (1997)—a well-known work on metaphor. Goatly presents a thorough study of the different forms in which metaphor can appear in discourse, and contains numerous real-discourse examples he found either by himself in newspapers, magazines and books and or by a search over a corpus that was a precursor to the current Collins COBUILD Bank of English.

We concentrate on examples that plausibly are based on familiar views but are nevertheless map-transcending. Our purpose is to support, by illustration, the principles listed in the Introduction, most crucially the principles concerning the economization on view-specific mappings that is achievable by means of view-neutral mapping adjuncts and within-pretence reasoning.

Goatly’s examples come from a wide variety of sources, both mundane and literary. Another constraint on our selection of examples was that we wanted them to come from mundane discourse. By mundane

discourse we mean discourse in conversations, popular magazine articles, popular novels, news articles, popular science texts and other factual texts for wide consumption by the public. When it was not clear from Goatly's annotations whether the examples were from such discourse, we still included them if we judged that could plausibly be used in mundane discourse without looking out of place.

There is a great deal of understander-relativity in our approach to metaphor understanding. For one thing, the question of whether a metaphorical view is familiar or not is an understander-relative issue. Thus, in choosing examples, we have tried to assess whether the view would be familiar to a typical ordinary English speaker. We did this partly by intuition, partly by considering claims of other metaphor theorists such as Lakoff as to what views are conventional (and as illustrated in compendia such as the Master Metaphor List—Lakoff, 1994), partly on the basis of views we have discovered to be common in building our own databank of metaphor examples (Barnden, n.d.), and partly by looking in dictionaries for the phraseology used in the utterances.

There is further understander-relativity in the question of what particular mapping relationships between source and target are included in viewing something A as something B. For example, different understanders may differ in detail on what a metaphorical view of IDEAS AS PLANTS amounts to. We have tried to include in the view only those mapping relationships that seem to be needed in many examples we have encountered.

Additionally, we only consider Goatly examples in which the metaphoricity is plausibly not *sidelined* for an ordinary English speaker. An understander might have a sports-domain lexicon sense for “kill,” so that he/she/it could use that sense in understanding the sentence “McEnroe killed Connors” in the tennis context, thus sidelining any need to proceed via a sense of kill in the biological combat domain and a mapping from that domain to the domain of sport. Clearly, whether the metaphoricity of an utterance is sidelined or not is again an understander-relative matter.

As a result of applying our various constraints, we ultimately settled on fifteen examples from Goatly, out of roughly 170 examples that we considered to be of mundane metaphor.

We believe our discussion of the individual examples covers the main informational contributions that the examples make concerning the target domains of the utterances. We use the term “informational contributions” to avoid discussions about whether they are parts of the “meanings” of utterances, or merely connotations or pragmatic conclusions.

Our analysis of the examples rests heavily on view-neutral mapping adjuncts (VNMA), briefly introduced above. Therefore, we first summarize the VNMA that are relevant to the examples before proceeding to analyse the examples.

## 4 View-Neutral Mapping Adjuncts Used

Earlier, we met the *Qualitative Degree* VNMA that maps identically the qualitative degree to which situations hold. That is, if a situation S holds to some degree D in the metaphorical pretence and S maps to a situation T outside the pretence, then by default T holds to degree D. For example, if in the pretence an idea is physically visible to high degree, and if the ideas being physically visible corresponds in reality to its being available to thought processes, then in reality this availability is also to a high degree. (In the ATT-Meta approach we only consider qualitative degrees.)

The other VNMA we encountered above was one we loosely call The *Causation/Ability* VNMA. It identically maps properties/relationships of ability, ease, difficulty, enablement, disablement, helping, prevention and causation that hold of/between suitable entities (events, actions, processes, people, ...). For example, if event E causes event F in the pretence, and E and F both map to events in reality—let’s say events EE and FF—then the reality proposition that EE causes FF is also created (if needed by understanding processes).

The *Change* VNMA maps change events. If in the pretence it is stated that there is a change from one within-pretence state to another, and both states map to reality states, then the reality proposition that there is a change from one of those states to the other is created (if needed).

The *Event-Shape* VNMA identically maps aspectual features of events/situations/processes in the pretence, such as whether they have a start or end, or are intermittent, to corresponding events/situations/processes, if any, in reality. The *Time-Order* VNMA identically maps the time order of events in the pretence, if they are mapped to reality events. The *Duration* and *Rate* VNMA's identically map qualitative durations and rates of mapped events.

The *Mental/Emotional States* VNMA maps mental/emotional states of within-pretence agents or of the understander. If an agent A in the pretence has an attitude X (mental or emotional) to a proposition P, and A and P correspond, respectively, to an agent B and a proposition Q in reality, then the proposition that B has attitude X to Q is created (if needed). Similarly, the understander's own attitudes about pretence situations carry over to become attitudes about corresponding reality items, if any.

Similarly, the *Value-Judgment* VNMA identically maps value-judgments about within-pretence situations by within-pretence agents or by the understander, as long as the situations and agents map to some situations and agents in reality. Value judgments include judgments of goodness (in several senses), importance, and interestingness. We see no rigid distinction between emotional attitudes and value judgments, so this VNMA and the preceding one can be considered to overlap, and should perhaps be merged.

The *Function* VNMA identically maps functions and functioning. If a within-pretence entity X has function F, and X and F map into entity Y and function G in reality, then the proposition that Y has function G in reality is created (if needed). Also, the fact that a mapped within-pretence entity is functioning (i.e., actually serving its function) is mapped.

The *Physical Size* VNMA identically maps qualitative physical size properties and relationships of mapped physical objects in the pretence.

The *Negation* VNMA states that if a within-pretence proposition P is mapped to reality proposition R, then the negation of P is also mapped, and is mapped to the negation of R. For example, if the proposition that McEnroe killed Connors is mapped to the proposition that he defeated Connors, then, by virtue of the VNMA, the view also maps the proposition that McEnroe did *not* kill Connors to the proposition that he

did *not* defeat Connors. The Negation VNMA is actually just one aspect of a VNMA that deals with logical structure in general.

Finally, the *Modality* VNMA carries over modal qualities of situations, such as (logical or contingent) possibility, (logical or contingent) necessity, and obligation. One or two further VNMAs are given in Barnden & Lee (2001) and Barnden *et al.* (2003).

Note that VNMAs are parasitic on other things that are mapped, in the sense that they are all conceptually of the form: *if* such-and-such things are mapped from the pretence into reality space, and [possibly also] the reality-space items are of the right kind, *then* also such-and-such things are mapped. So, if something in the *if*-part fails to map across, or does not map to the right kind of entity, then the VNMA has no effect on the case at hand. A good example of this is if a non-thinking entity X in reality is portrayed as a person in the pretence. In the pretence, X may have mental states. However, because X in the pretence maps to X in reality, but X in reality is not a thinking agent, the VNMA does not map the possession of those mental states to any claim about reality. The parasitic nature of VNMAs explains why we use the term “adjuncts.” However, note that VNMAs can build upon the effects of other VNMAs: the existing mapping links that VNMAs add to can themselves have arisen by the application of VNMAs.

VNMAs are default principles, and their conclusions about reality can be defeated by other evidence. Also, in the above descriptions of VNMAs we sometimes emphasize that the result of applying the VNMA is created if needed, rather than just blindly created. All VNMAs have this on-demand quality. In fact, the approach rests heavily on reasoning that is generated in order to support specific reasoning goals, rather than on reasoning that proceeds forwards undirectedly from already established information (Barnden & Lee 2001; Barnden *et al.* 2004a). This paper does not go into this matter, and for simplicity presents reasoning as if it all went forwards.

VNMAs are still the subject of empirical and theoretical investigation, and have largely not been implemented in the ATT-Meta program itself. We have produced an experimental implementation that handles a small number of VNMAs, but much work remains to be done on other VNMAs.

## 5 Analysis of Goatly Examples

We are now ready to look at the selected Goatly examples. For each example, we give a page reference to where it appears in Goatly (1997). The exact citations for the examples are in Goatly's book. For many examples in this section there is a Figure depicting the computational processing sketched in the text.

We will mention a few cases in which it is possible that understanding involves some construction of structural analogy between pretence and reality, over and above the mere fact that some entities in reality are also in the pretence, giving rise to identity-based mapping relationships as explained in section 2.2. Such relationships can be viewed as forming a basic analogy between aspects of the pretence and aspects of reality. But, one might ask whether additional entities in the pretence should be mapped into reality, such as the far reaches mentioned in the Anne/Kyle sentence.

We will also at times address the question of whether understanding involves map-creation in the sense of creating new mapping relationships to handle map-transcending *concepts*, rather than specific entities, appealed to by the metaphorical utterance. For example, if the far reaches *were* mapped to reality entities, then there is the further question of whether the concept of physical far reaches should be mapped to some concept concerning the mind.

In fact, in the Anne/Kyle example, we claim that not only is there no need to map the notion of the far-reaches of a region to some concept to do with the mind, but also there is no need to find an analogical correspondent of the particular far-reaches mentioned in the utterance. This sceptical stance on mapping of entities and concepts used by the pretence is multiply echoed in the analysis of Goatly examples below.

### 5.1 The Fast Hairdresser

“Britain’s fastest hairdresser ... is hoping to snip five minutes off his world record today.”

[Goatly p.161; from *Daily Mirror* newspaper]

The metaphorically-used word “snip” is of course a pun, in that hairdressers snip hair. We ignore this aspect here—our focus is not on any humour as such, but on the informational contributions to be drawn about the hairdresser. We simplify the example slightly to get the sentence shown in Figure 2.

We take the sentence to rest on a familiar metaphorical view of A MEASUREMENT AS A LONG PHYSICAL OBJECT. In the example the measurement is a competitive record. We take the view to include a mapping relationship whereby the length of the physical object corresponds to the size of the measurement. However, we assume that the view has no mapping relationship for the notion of snipping, which is therefore a map-transcending element.

Within the source domain of physical objects, snipping off implies cutting off, which causes reduction of length. By the length-to-measure-value mapping in the metaphorical view, the original length before the snipping and the resulting smaller length map respectively to the original record time and the later improved record time. The *event* of shortening maps to become an *event* of improving, because of the Change VNMA. The causation of the shortening by the hairdresser maps by the Causation/Ability VNMA to the causation of the record-improvement by the hairdresser.

The reasoning shown in the Figure assumes that a snipping act is one of *easy* cutting. Therefore, the above record-shortening event in the pretence cocoon is easy. The ease of this event is mapped over by the Causation/Ability VNMA.

Finally, the Mental/Emotional States VNMA allows the hoping to be mapped over.

As far as the present article is concerned, the main consequences of this analysis are as follows:-

- There is no need to create mapping relationships to handle the notions of snipping (or cutting more generally).
- The only view-specific mapping needed is between the size of the measurement (the competitive record in this case) and the length of the corresponding long physical object.

## 5.2 Broken Railway

“The railway’s recovery from recession and last summer’s strikes was ‘fragile’ and would be damaged by another dispute.” [Goatly p.320; from *International Express* newspaper]

The example is from a newspaper report, and immediately follows the sentence “Mr Watkinson said he was confident the vast majority would reject industrial action.” Thus it is likely that the quotation marks round “fragile” are to indicate that the word is one Watkinson himself used, rather than to mark a special or unusual usage. This common journalistic use of quotation occurs throughout the excerpt in Goatly.

We take the example to use a familiar metaphorical view of ABSTRACT STATE AS PHYSICAL OBJECT. This view is evidenced also by the word “damaged” in the example. One could felicitously talk, say, about a state of “calm” activity in a company as being “smashed” by a takeover bid. States of health or of the mind/emotions are often talked about in these terms – indeed, “fragile state of health” or “fragile state of mind” strike us as stock phrases. It may therefore be that “fragile” has an abstract direct sense as well as a physical one, thus sidelining the metaphoricity potentially arising from the physical sense. However, as we are unsure on this point we will assume that there is an understander for whom the fragility, and the damage, are map-transcending, as a way of illustrating the nature of our approach.

Since a fragile physical object is one that can be easily damaged, it is an immediate inference in the pretence (see Figure 3) that the railway’s recovered state (metonymically referred to by “recovery”) is one that can be easily damaged physically. As for damage itself, the understander can infer an undesirable modification in the pretence, and carry over the modification and the undesirability by the Change and Value-Judgment VNMA. Ease of possible damage then implies ease of possibly reaching the undesirably-modified state, because of the Causation/Ability VNMA.

The main observations for our purposes are:

- There is no need to create mapping relationships to handle the notions of fragility and damage.

- The only view-specific mapping used is that inherent in viewing the abstract state of the railway as a physical object. Moreover, this mapping is not actually itself used directly to create any information about the railway. Rather, merely by providing a reality-correspondent for the physical object in the pretence it allows the mentioned VNMA's to operate.

### 5.3 People on the Line

“And if you have to draw a line through the whole company it would be a pretty thick line, you know, it would have two edges, and there would be a fair number of people in it, contained in it.” [Goatly p.156; part of an interview reported in an academic journal article]

We analyze this as manifesting the familiar metaphorical view of ORGANIZATION AS PHYSICAL STRUCTURE. The organization is the company, and we assume that the physical structure is a configuration of components of the drawing or picture that is implicitly referred to by the sentence. We take the mention of the company in the utterance to refer metonymically to the component of the drawing that depicts the whole company.

Note here that we are taking the physical structure to be part of the drawing itself, not some imaginary physical structure that is *depicted* by the drawing. The latter possibility provides a viable variant of our account, but would introduce more complexity as we would have to take into account the structural analogy between drawing and imagined physical structure. However, the broad strokes of the account would be unaffected.

We assume that, under the metaphorical view mentioned, there are two mapping relationships: parts of the organization correspond to parts of the physical structure, and the role of a person within the organization corresponds to the physical location of a depiction of the person within the physical structure.

What Goatly says about the example amount in part to saying that it conveys that a fair number of people do not have a role in the two aspects of the company corresponding to the picture-regions separated

by the line. Let's call these aspects A and B. Rather, those people have a role in some other the company aspect C corresponding to the line itself. We can arrive at this interpretation by the ATT-Meta method as follows.

From the containment of the people in the line, as expressed in the pretence cocoon, it can be inferred by source-domain reasoning in the cocoon that they are not on either side of the line, even though they are within the overall physical structure. The above mapping relationships ORGANIZATION AS PHYSICAL STRUCTURE together with the view-neutral Negation VNMA can then allow the assembly of the informational contribution that the people who are metaphorically within the line have a role within the company aspect C but do not have a role in aspects A and B. See Figure 4.

The main consequences of the analysis are:-

- There is no need to create mapping relationships to handle the notion of a line, the notion of thickness, or the notion of an edge of a line.
- The only view-specific mapping relationships needed are the two listed above (i.e., physical parts to organizational parts, and physical location to role within the organization).

## 5.4 Infection Entering

“The lymphatic tissues help to defend the areas of the body where infection can easily enter.”

[Goatly p.321; from *New Scientist* magazine]

A physical state of infection is often portrayed as a physical substance that can move—e.g. infection is often described as “spreading.” We assume that this familiar metaphorical view maps the proposition that an infection is physically-in/at a body area to the proposition that the infection affects that area. However, we suppose that the understander does not have a mapping relationship for the physical-movement concept of “entering” into the infection domain, so that the sentence is map-transcending in this respect for the understander.

Figure 5 shows how the approach could handle the entering. For ease of illustration we have modified and curtailed the example to get the metaphorical utterance “Infection can easily enter A” where A is some body area. Simple physical reasoning within the pretence cocoon from an infection entering an area can establish that at some point the infection comes to be within the area. We assume that ease and ability is carried along by such an inference, so that in the pretence we get the conclusion that it can easily come to be that the infection is physically in A. The coming-to-be in the source-domain maps to coming-to-be in the target-domain, by virtue of the Change VNMA. The ease is carried over by the Causation/Ability VNMA. The overall effect is that the understander can construct the target-domain informational contribution that the infection can easily come to be affecting the tissue areas in question.

The “defending” in the example can also be dealt with. We assume that one sense for “defend” in the domain of physical entities is “preventing physical damage.” Assume for the moment that the metaphorical view of INFECTION AS PHYSICAL SUBSTANCE maps physical damage of an area of tissue to biological damage (which is itself of course a specialized form of physical damage). Then prevention of physical damage maps to prevention of biological damage, because of the Causation/Ability VNMA. The same VNMA then specifies that *helping* to prevent physical damage maps to *helping* to prevent biological damage.

The assumption we made a moment ago that INFECTION AS PHYSICAL SUBSTANCE maps physical damage to biological damage is not actually necessary. As explained in section 5.2, the VNMAs allow damage to be mapped over automatically to a target-domain state of the entity in question being undesirably modified.

Another possible inference from biological damage in the pretence is that the body area in question is partially defunct, i.e. at most partially serving its function. This condition can be carried over to reality by the Qualitative Degree and Function VNMAs.

The main consequences are:

- There is no need to create mapping relationships to handle the notions of entering or defending.

- The only view-specific mapping needed is between an infection being physically-in/at a body region and the infection affecting that body region.

## 5.5 The Battered Trilby

“And towards the end of the century men began to wear, so to speak, the very symbol of their bashed-in authority: the trilby.” [Goatly p.127, from corpus; hyphen inserted by us]

The focus of Goatly’s discussion is the metaphorical view (as he claims) of AUTHORITY AS TRILBY HAT. The notion that authority can be bashed in exploits the common occurrence of real hats getting bashed in. However, for brevity we will ignore the hat and discuss merely the simplified sentence “Men’s authority is bashed in” without relying on any mention of a hat at all.

We can take this simplified sentence to manifest a familiar, very general metaphorical view of ABSTRACT ENTITY AS PHYSICAL OBJECT. Prototypically, bashed-in things are rigid walls, doors, etc, and perhaps exterior physical surfaces in general. As a result of being bashed in, such a physical object is damaged—i.e., it is undesirably modified and is probably defunct to some extent. Thus the Change, Value-Judgment, Function and Qualitative Degree VNMAs allow the production of the target informational contribution that the authority is undesirably modified and is probably somewhat defunct. See Figure 6.

Main consequences:-

- There is no need to create a mapping relationship to handle the notion of physically bashing something in.
- The only view-specific mapping needed is that inherent in viewing an abstract entity (the authority) as a physical object. Moreover, this mapping is not actually itself used directly to create any information about the authority in question. Rather, merely by providing a reality-correspondent for the physical object in the pretence it allows the mentioned VNMAs to operate.

## 5.6 Going with the Flow

“a kind of psychic eddy current, some sort of spiritual diabetic flow” [Goatly p.171; from corpus]

The phrase before the comma rests on the familiar metaphorical views of MENTAL ENTITIES AS LIQUID (a special case of MENTAL ENTITIES AS PHYSICAL OBJECTS) and MENTAL PROCESSING AS LIQUID FLOW. An eddy current is a current off to the side of the main flow of a river (etc.). So the mental process is somewhat separated from the main subregion of the mind. This leads, much as in the Anne/Kyle example in section 2.1, to an informational contribution that the mental process is to some extent not part of conscious awareness. The activeness inherent in the notion of a current maps to the mental domain by the Event-Shape VNMA, to get an informational contribution that a process is being talked about, not a fixed state. See Figure 7.

Main consequences:-

- There is no need to create a mapping relationship to handle the notion of an eddy current.
- Assuming an analysis parallel to that of Anne/Kyle example, the only view-specific mapping needed is between, on the pretence side, physical manipulation of an idea-as-physical object by the agent’s conscious self and, on the reality side, conscious mental manipulation of the idea.

The phrase after the comma is puzzling. We suspect that the word “diabetic” is either a typo or an illiterate substitution for “diabatic” (meaning to do with the flow of heat), and that no metaphor in terms of diabetes is intended. On this assumption, the mental activity under discussion is also being metaphorically viewed as flow of heat or of something hot. Since it is common for certain emotions to be metaphorically viewed in terms of heat (e.g.: some positive emotions as warmth; anger as [intense] heat), the intention could be to connote an emotional activity. This might fit with the word “spiritual” as well.

## 5.7 The Nanny State

“Planetary control would require the existence of some kind of giant panglossian nanny who had looked after the earth since life began; or committees of organisms with foresight who could plan the future.” [Goatly p.308; from a *New Scientist* article]

This is from an article by J. Lovelock putting forward the theory of “Gaia,” whereby the planet forms an integrated organism in which biological organisms keep the planet fit for life. But the quoted excerpt is part of a summary of a criticism of the theory by another scientist, F. Doolittle, who is reported as rejecting Gaia on the grounds that planetary self-regulation would need foresight and planning by living organisms. Thus Doolittle is claiming (according to the clause before the semicolon) that there would need *literally* to be a thinking agent caring for and controlling the planet. (NB: Lovelock himself makes no such claim in the article.) This agent is, according to Lovelock, described metaphorically by Doolittle as a panglossian nanny.

This metaphorical step can be regarded as a use of a familiar metaphorical view of CARETAKING ENTITY AS NANNY (witness phrases such as “nanny state” and the verb “to nanny”). We assume this involves the mapping relationship inherent in viewing the caretaking entity X as a nanny, a mapping relationship inherent in viewing the taken-care-of entity Y as an infant, and a mapping relationship between the proposition that X-as-nanny takes care of Y in the pretence and the (identical) proposition in reality that X takes care of Y. Note that we do not assume a mapping for any particular type of caretaking action that a nanny might take—we are just concerned with the general notion of caretaking.

Now the passage is presumably map-transcending at least in its use of the word “panglossian.” This word means believing that all is for the best in this best of all possible worlds (*Webster’s Third New International Dictionary*, 1961). How do we deal with this element?

See Figure 8. In the pretence cocoon, the nanny believes that what goes on in the world is the best possible, including, presumably, her own caretaking actions. By means of the Mental/Emotional-States VNMA the understander can transfer the optimistic beliefs of the nanny to become optimistic beliefs of the planet-agent. The Figure just shows two optimistic beliefs the nanny presumably has.

To handle the word “giant” we either need to assume that gigantic size is attributed by the utterance directly to the planet-agent, or that it is applied to the nanny in the pretence and then mapped to the target by the Physical Size VNMA, as assumed in the Figure.

The main consequences are:-

- There is no need to create a mapping relationship to handle the notion of being panglossian.
- The only view-specific mapping relationships needed are the three mentioned above (nanny to caretaker, infant to caretaker, caretaking to caretaking), with only the one that maps caretaking actions actually generating a reality proposition.

A further observation is that one could interpret the metaphorical view as implying that the cared-for entity *Y* *needs* to be taken care of, just as *Y* as an infant in the pretence needs the caretaking of the nanny. This is the reason for the pejorative connotation of descriptions such as “nanny state.” In our approach, modal qualities such as needs and obligations are carried over by the Modality VNMA. (We take necessity to include contingent, situation-specific necessity as well as the classical, analytic notion of necessity.)

## **5.8 The Neck-Cricked Managers**

“This all means that general managers have cricks in their necks from talking down to the Community Health Councils and District Health Authorities, and up to Regions and the Department.”  
[Goatly p.162; from *Daily Telegraph* newspaper]

This manifests a familiar metaphorical view of ORGANIZATIONAL CONTROL AS VERTICAL POSITION. The managers control the Councils and Authorities, and are controlled by the Regions and the Department. (It does not seem that “talking down to” is being used in its stock metaphorical meaning of “being condescending to.”) See Figure 9 for the processing. In the pretence cocoon, the managers get cricks in their necks because of their contortions. The managers therefore experience physical suffering, and hence

emotional suffering. The causation and emotional suffering map to the target by Causation/Ability and Mental/Emotional States VNMA.

It could further be inferred from the utterance that the managers have some inability to continue talking easily to their controllers and controllees. This would follow from inferring within the pretence cocoon that the cricks cause some inability to turn heads, so that there is difficulty in talking, and then applying VNMA. The Causation/Ability VNMA maps the causation and the inability to the target domain. Also, the degree of inability is mapped by the Qualitative Degree VNMA.

Main consequences:-

- There is no need to create mapping relationships to handle necks, cricks, physical suffering or head-turning.
- The only view-specific mapping relationships needed are one that maps vertical-position relationships to control relationships and one that identically maps communication relationships (e.g., talking).

## 5.9 Political Flotsam

“... until James Callaghan is washed up onto the pebbles of the Upper House” [Goatly p.109; from *Daily Telegraph* newspaper]

This passage is about James Callaghan (a former Prime Minister of the U.K.) moving from the House of Commons (also known as the “Lower” House) to the House of Lords (the “Upper” House) in the U.K. Parliament. We take the passage to manifest a familiar metaphorical view of INSTITUTIONS AS SPATIAL REGIONS, with membership of an institution corresponding to presence in a region. The map-transcending aspects of the example are the pebbles and the washing-up process. Together these imply in the pretence that the Upper House is actually a special sort of spatial region, namely a land-mass with a shore.

The informational contribution to the effect that Callaghan joined the Upper House follows simply from viewing the Lower House (House of Commons) and Upper House as regions, reasoning within the source domain of physical space that Callaghan moved to the latter region, using the known mapping relationship between presence in a region and membership of an institution, and using the Change VNMA to infer an event of membership change from the physical movement event. See Figure 10.

Although, therefore, the particular mentioned event of physically being washed up from the sea maps to the event of joining an institution, the being-physically-washed-up *property* itself need not map to anything.

When a person is washed up by the sea, it is reasonable to infer that the person arrives on the shore non-deliberately, and may well be physically weakened or even dead and therefore at least partially defunct (not fully serving its function). The non-deliberateness can be mapped over by the Negation and Mental/Emotional States VNMA. The partial defunctness is handled by the Qualitative Degree and Function VNMA.

Main consequences:-

- There is no need to create mapping relationships to handle pebbles or being washed up.
- The only view-specific mapping relationships needed are the one inherent in taking an institution to be a region, and the one that maps being physically-in the region to being a member of the institution. Of these it is only the latter that actually transfers propositions between pretence and reality.

## 5.10 The Staid Strippers

“When the contestants strip off their designer suits to reveal rippling muscularity, they metaphorically shed their shackling cloaks of staid mundaneness.” [Goatly p.170; from a news or magazine article]

This rather colourful passage is complex. It provides informational contributions concerning the temporary

abstract appearance of the contestants (temporary staid mundaneness) and concerning temporary constraint on the contestants. We first consider the appearance of staid mundaneness and then the constraint.

We take “cloaks of staid mundaneness” to specify that the staid mundaneness is, metaphorically, the fabric out of which the imaginary shackling cloaks are made (cf. “cloaks of velvet”). A cloak of a particular fabric causes the external physical appearance of the wearer to be (that of) that fabric. Accordingly, we take the sentence to be using a familiar metaphorical view of ABSTRACT APPEARANCE AS PHYSICAL APPEARANCE, with the staid mundaneness being the abstract appearance in this case and being viewed as a visible physical quality in the pretence. The metaphorical view is often manifested in expressions such as “wear an appearance of [conciliation, say]”, “put on a [conciliatory, say] face” and “wear / put on a mask” when this is used metaphorically. It would appear to be related to the primary metaphor called THE NATURE OF AN ENTITY IS ITS [physical] SHAPE in Grady (1997a).

In the metaphorical pretence, before the shedding of the cloaks the contestants have the appearance of the staid-mundaneness fabric. In fact, this is so to a high degree because a cloak is a relatively all-encompassing covering. Thus, in reality the contestants initially have to a high degree the appearance of staid mundaneness. But the shedding of the cloaks in the pretence implies that the physical appearance of the contestants ceases to be the staid-mundaneness fabric. Therefore, by the Event Shape VNMA, in reality the abstract appearance of the contestants ceases to be staid mundaneness.

In fact, we can go further than this and infer that initially the *designer suits caused* the contestants to have the appearance of staid mundaneness, but then after the stripping this was no longer the case. This can be inferred as follows. The sentence strongly suggests a metaphorical correspondence between the real suits and the pretend cloaks, because of the parallelism suggested by the word “When,” the prior similarity between suits and cloaks, and the near-synonymy between stripping-off and shedding. Thus, in the pretence the suits and cloaks are identified, so that the suits/cloaks initially cause the contestants to have the appearance of staid-mundaneness fabric. After being shed they no longer cause this. By the Causation/Ability VNMA, we find that the real suits initially caused but then ceased to cause the abstract appearance of staid mundaneness. See Figure 11.

The previous paragraph describes a small amount of analogy-construction (though we could almost say the analogy is stated by the sentence). Further than this it is possible to envisage the creation of a mapping relationship between the general notion of a suit and the notion of a cloak. However, doing so would not add anything to the above analysis, so we claim it is not necessary to understanding the sentence.

We turn now to the question of constraint. The example uses a further familiar metaphorical view. The mundaneness-cloak is shackling, so that we have a use of ABSTRACT CONSTRAINT AS PHYSICAL CONSTRAINT. This view is familiarly manifested in utterances like “Bill is chained/shackled to his job” and “Pension increases should be tied to inflation.” In the present example the physical constraint is of a strong sort, so that by the Qualitative Degree VNMA the abstract constraint is too. The shedding of the cloaks implies that the physical constraint ceases, so that in reality the abstract constraint ceases. (The later cessation is not included in the Figure.)

The map-transcending elements in the sentence are the cloaks, the shedding and shackling. The main consequences of our analysis are:-

- There is no need to create mapping relationships to handle the notion of a cloak, the shackling nature of the cloaks, or the notion of shedding a cloak (even though it is likely that by a minor amount of analogy-construction the mentioned suits are identified with the cloaks and the stripping-off of suits is identified with the shedding of cloaks).
- The only other view-specific mapping relationships needed are the one mapping physical appearance to abstract appearance and the one mapping physical constraint to abstract constraint.

Finally, the word “metaphorically” in the example is, of course, used as a hint of metaphoricity to the understander, a hint that is perhaps needed. The similarity of cloaks to suits together with the possibility of literally shedding either type of clothing might lead the understander up a the literal garden-path of taking the cloaks themselves to be real. Goatly (1997) discusses the metaphor-signalling function of words such as “metaphorically.”

## 5.11 Stolen Love

From now on we examine examples somewhat more schematically than before. In particular, no diagrams of the processing are provided .

“Sooner or later the stealing ceases, for the love that was symbolically stolen in the form of money or goods is now given.” [Goatly p.127; from corpus]

This rests at base on on a familiar metaphorical view of POSITIVE MENTAL/EMOTIONAL ORIENTATION AS TRANSFERRED PHYSICAL ENTITY. In particular it is common to talk about “giving” one’s love to someone (as indeed the Goatly example itself does), or “taking” someone else’s love. It is common to talk of giving “all” one’s love to someone; and it would be unexceptional to say that one had “no love left over” for someone else. Affirming a state of being loving to someone is viewed as giving a physical object, the love itself, to that person. Similar comments apply to positive orientations to people other than loving them, such as having respect for someone (cf. “awarding a tremendous amount of respect to someone”).

In the example, we presume that someone else’s loving was not obtained in the past, so the stealer tries to steal some love from elsewhere. The example is complicated by the fact that this love is only imagined by the stealer, so we can consider the reality space outside the metaphorical pretence to itself be replaced by a hypothetical context.

Let us assume that the understander has no mapping relationship for the notions of stealing, money or goods as part of the above metaphorical view. Thus, the sentence is map-transcending in these respects. The stealing is easily handled, because a simple within-pretence inference tells the understander that the stolen money or goods were transferred to the stealer, so that this person becomes loved (in his/her imagination). The transferring of the money/goods is mapped to the becoming-loved by the the known mapping relationship in the metaphorical view. But, clearly, the understander must first identify (i.e., establish a mapping relationship between) the love and the money-or-goods. However, this identification is explicitly stated by

the sentence itself, through the phrase “in the form of.” The fact that the identification is metaphorical is signalled by the word “symbolically.”

Although the under needs to create a mapping relationship between the desired love and the particular money/goods referred to, note that there is no need to create a mapping relationship between the notion of money/goods and the notion of love, or to search for additional elements of analogy. It is just the particular instances of money/goods on the metaphorical-pretence side and the particular instances of desired loving feelings from the other person that are put into correspondence.

We also observe that positive emotions the stealer may experience as a result of having the money/goods map to the (desired) positive feelings arising from the (desired) love, because of the Mental/Emotional States VNMA. Similarly, the person’s and the understander’s value judgments that money/goods are desirable maps to the person’s and understander’s assessments of the love as desirable, because of the Value-Judgment VNMA.

A somewhat unusual feature of this example is that the money and goods are metaphorical source items but are nevertheless real objects. Because of this, one might be tempted to interpret the sentence as metaphorically viewing the money and goods as the loving feelings desired from someone else, rather than viewing the loving feelings as money/goods as in our analysis. However, the phrases “in the form of” and “symbolically” indicate a metaphor of love-as-money/goods, not the other way round. In any case, it is not that uncommon for metaphorical source items to be real, as in saying something like Thatcher was the Reagan of the UK, where Reagan is a source item but was a real entity.

## **5.12 A Mechanical Smile**

“it was that mechanical sort of smile that suggested gears and pulleys” [Goatly p.181; from corpus]

This rests on a familiar metaphorical view of CREATURES AS MACHINES. The adjective “mechanical” is a stock manifestation of this. (Of course, there could be grounds for saying that, scientifically, creatures

really are machines. But creatures are common-sensically not viewed literally as being machines.) A process being mechanical, in a metaphorical pretence, is mapped to its happening in reality by the strict following of a procedure, without emotional warmth, etc. We assume the metaphorical view does not map the notions of gear and pulley to something to do with CREATURES, so that the utterance is map-transcending in this respect.

Clearly, the “gears and pulleys” add extra vividness to the example’s stock manifestation of CREATURES AS MACHINES. But what do they add, more precisely? It could be that they serve merely to enhance the mechanicalness within the pretence. This effect could be handled by the Qualitative Degree VNMA. But it is possible also that an understander would imagine the person’s face to contain parts that play roles analogous to those of gears and pulleys in a machine. For example, the understander might come up with joints and tendons (or, rather, the visible facial signs of these), and set up mapping relationships between the notion of a gear or pulley wheel and the notion of a joint, and between the notion of a pulley rope and the notion of a tendon. However, since no particular structure of gears and pulleys is given by the discourse, there is no need to search for complex structural isomorphism – a rough similarity of role is all that needs to be looked for, such as the role of controlling movement.

It is possible also that the gears and pulleys suggest in the pretence an elaborate process of creating the smile, with the elaborateness being judged as negative. Elaborateness is a matter of the structure of the process, so that it would be transferred to the real smile-creation by the Event Structure VNMA. The negative evaluation would be carried over by the Value Judgment VNMA. These transfers may actually be more important for understanding the utterance than the possible correspondences between gears/pulleys and joints/tendons. Indeed, the construction of those correspondences could even be regarded as a distraction from the real point of the utterance.

### **5.13 Economic Osmosis**

“this process, a kind of economic osmosis” [Goatly p.181; from corpus]

This rests on the familiar metaphorical views of MONEY (and other economic items) AS LIQUID (cf. flow of capital; liquid assets) and POSSESSION AS LOCATION. Presumably the context makes clear what economic assets are in question. Once the word “economic” has suggested that the target items are economic entities (see Goatly on adjectives being frequently used to hint at target domains), it is not much work to conjecture that the target items are the already-salient economic assets.

We take the osmosis to be map-transcending. Literally, osmosis is slow transfer of liquid through a physical barrier. (Actually, osmosis is more complex than this, but the passage may only rely on a primitive common-sensical understanding of osmosis.) Therefore, the possession of the economic assets in question changes slowly, because of the Rate VNMA.

In the pretence, the physical flow is inhibited to an extent by some barrier. Assuming the barrier can be made to correspond to something specific in the co-text or situational context, then the inhibition of the physical flow is mapped to inhibition in the economic domain by the Causation/Ability VNMA. Finding the barrier-correspondent may involve a small amount of analogy construction.

It is possible also that a mapping relationship is created between the concept that describes the found thing (e.g., the distinction between two sectors of the economy) and the notion of a physical barrier, though it is not clear what this would add to understanding. But it is reasonable to suppose that, because of the form of the sentence, with its ostensible categorization of the economic process in question as osmosis, the understander creates a mapping relationship between the nature of the real process depicted and the notion of osmosis.

### **5.14 The Super-Horse**

“as long as we consider the automobile a sort of super-horse” [Goatly p.183; from corpus]

This transcends an arguably familiar metaphorical view of ARTIFICIAL LAND VEHICLE AS CREATURE, where the creature may well be a horse (cf. “iron horse” for train). It transcends it in talking about

*super-horses*. Of course, the understander does not have to work out a mapping relationship from super-horses to automobiles — the mapping is given by the sentence. But neither do the particular qualities on which automobiles are to be considered superior to real horses need to be worked out by any analogy-discovery process, because they are presumably the same qualities as are mapped by the existing metaphorical view. These are qualities such as being able to carry people, going faster than a person, having great endurance, and (possibly) indicating relatively high social status. So, the utterance is talking about automobiles being superior to horses in their greater ability to carry people, their greater speed-advantage over people, etc.

The sentence might, by some understanders, also be taken to convey that there are also *further* respects in which automobiles are superior to horses. But it is arguable that the understander can simply note that there may be such respects without working out what they are. To claim that the understander is obliged to work them out would be as unwarranted as claiming that the utterance “cars are like horses” should induce the understander already familiar with ARTIFICIAL LAND VEHICLE AS HORSE to work out similarities over and above those he/she/it already knows, as opposed simply to recalling the known similarities and keeping in mind that extra ones may exist.

A notable feature of the example is that it postulates an *ad hoc*, imaginary category—super-horses—in an otherwise familiar source domain. Most metaphor, even when map-transcending, just uses familiar aspects of the source domain (though these aspects may be merely stereotypically attributed rather than veridical). However, ad hoc distortions of familiar source domains are not uncommon in the service of metaphorical effect. See, for instance, Musolff (2004), where one example is that of the EU being viewed as a marriage of eleven nations (at one point in history), even though in the prevailing culture marriage can really only involve two partners. The use of such distortions strengthens the case for saying that metaphor involves pretence, not just the exploitation of a source domain. The pretence usually consists merely of casting target aspects as source aspects, but can go further in distorting source aspects themselves.

## 5.15 Worm Squirm

“The worms of loathing” [Goatly p.220; from *Punch* magazine]

We cannot tell from Goatly (1997) whether this is from mundane discourse or from a literary work. We include it here for interest in any case. It manifests the familiar metaphorical view of MENTAL/EMOTIONAL ENTITIES AS ANIMATE BEINGS (cf. the examples of IDEAS AS PERSONS OR OTHER ANIMATE BEINGS category in our databank: Barnden, n.d.). It is common, for instance, to talk of troublesome matters “gnawing away” at people. Also, the phrases “worm of care” and “worm of conscience” are noted in *Webster’s Third New International Dictionary* (1961). However, for the sake of example, let us assume that the metaphorical view does not contain a mapping for worms in particular, though it does contain, let us say, a mapping from “gnawing” at the agent to causation of some type of continuous psychological suffering by the agent. *Webster’s* mentions the worm of conscience “gnawing.” (Actually, even this is not necessary, as physical gnawing could be claimed to cause physical suffering and hence psychological suffering, and the Mental/Emotional States VNMA would carry this over.)

The phrase “worms of loathing” plausibly conveys (i) a metaphorical categorization of loathing as a collection of worms (paraphrase: “the worms that symbolize loathing”), rather than, say, (ii) a possessive or part-whole relationship (paraphrase: “the worms belonging to loathing”) or (iii) a causation relationship (paraphrase: “the worms caused by loathing”; cf. “tears of anger” for tears caused by anger). See Goatly for many examples of type-(i) usage of the genitive, including in metaphorical contexts. Strangely, however, Goatly himself says that the example is to be analyzed in terms of worms *causing* loathing—the reverse of (iii)—a stance that we find highly unintuitive.

Give our stance on the example, whereby the understander creates a mapping relationship between loathing in general and a collection of worms, we might consider whether the understander needs to search for or create additional, associated mapping relationships, between aspects of worms and aspects of loathing. But we claim that it is enough to note that worms gnaw, where gnawing is *already* known to be mapped by the familiar view to production of a type of psychological suffering, and therefore infer that loathing causes that type of psychological suffering in the loather. If this is consistent with what the understander knows about loathing in general, then there is no need for the understander to look further. If it is not, of course, then the understander does need to embark on a more elaborate search for an analogy.

## 6 ATT-Meta and its Message for Language Learning

The paper has shown that the ATT-Meta approach can derive, at least, what seem to the present author to be the most important informational contributions from fifteen real-discourse metaphor examples in English, out of the 170 metaphor examples in Goatly (1997). The fifteen examples are all those that can strongly be claimed to be non-sidelined, map-transcending, mundane usages of familiar metaphorical views.

Clearly, as we only treated fifteen examples, and in any case Goatly's set of examples is not claimed to be statistically representative, the paper is limited as an evaluation of our approach. However, the obvious wide diversity of content of the examples, their complexity, and the fact that they were collected by Goatly independently of ATT-Meta concerns provides substantial evidence that the approach is a promising one in general.

As for the message for language learning, at least in the case of learning English, the analyses of the examples support the claim that great economy can be achieved in the number of *view-specific* mapping relationships that are needed per metaphorical view. This economy is achieved as a combined effect of allowing extensive inference in the pretence and of postulating the view-neutral mapping adjuncts. The inferencing and the VNMA's are powerful tools in deconstructing metaphorical views that are presented in the literature, as they make redundant many of the component mappings that tend to be postulated in conceptual metaphor theory. For instance, in using the view of LOVE AS A JOURNEY, the VNMA that maps DIFFICULTY between the source and the target gives the effect that a physical obstacle to the journey causes difficulty for the progress of the love relationship, because it causes difficulty for the physical journey. There is therefore no need to have a specific mapping between journey difficulties and relationship difficulties, such as the correspondence between difficulties in a love relationship and impediments to travel in Lakoff (1993: 207).

Wallington and Barnden (2006) give further examples of this factoring out of many aspects of conceptual metaphors into VNMA's. The values of this approach is magnified when one realizes that discussions in the literature on conceptual metaphor often tend to leave some assumed mapping abilities purely tacit, without any specific explanation. For example, in the discussion of "We're driving in the fast lane on the

freeway of love” in Lakoff (1993), it is said that the excitement the imaginary travellers experience in travelling fast transfers to the target to become excitement of the lovers. But no mapping is provided that relates emotions on the source side to emotions on the target side—there is simply a tacit assumption that the emotion transfers. By postulating explicit VNMAAs we are, in part, attempting to bring such tacit assumptions out into the open and make them into theoretically interesting aspects of metaphor in their own right. This move also has the benefit of raising the need to explicitly consider exceptions to VNMAAs, e.g. exceptions to the general rule that emotions of source agents map over to emotions of corresponding target agents.

Not only do our examples show the economy achievable in the understander’s existing knowledge of view-specific mappings, but they also suggest that map-transcendence in metaphor generally does not require the understander to do much in the way of searching for complex structural analogies between source-domain scenarios and target-domain scenarios in order to cope with unmapped elements.

Our economizing on the mapping relationships per metaphorical view is somewhat reminiscent of Grady’s (1997a,b) reworking of conceptual metaphor theory by means of more general purpose primary metaphors, which are similar in their scope and generality to the type of mapping relationships that we assume to be involved in metaphorical views. However, as indicated in Wallington & Barnden (2006), we go considerably further in the deconstruction of conceptual metaphors, by factoring out much of the job of mapping into completely view-neutral mappings, which apply whatever metaphors are in play, primary or otherwise. To take a specific case, consider the CERTAIN IS [physically-]FIRM primary metaphor in Grady (1997a). Actually, Grady’s account of this suggests that the metaphor is really one of (RELATIVELY-)FINAL IS [physically-]FIRM, where FINAL is as in “our decision is final”, i.e. meaning unable to be changed. But we can get the effect of this primary metaphor by means of the ability to infer in the pretence that physically firm things are resistant to change (in certain senses), together with the effect of the Causation/Ability and Change VNMAAs, the former of which handles the resistance. Moreover, *any* scenario in the pretence that leads to a conclusion that a (mappable) entity is resistant to change (in any sense, physical or otherwise) allows via the VNMAAs the conclusion that the corresponding entity in reality is resistant to change: something being physically-firm is just one very special, if common and important, case.

In summary, although someone learning a language needs to become familiar with the metaphorical views commonly used in that language, which is a substantial task, this task is not as imposing as it may appear to be, because of the small amount of mapping that needs to be learned per view, in the case of English at any rate. The VNMA's need to be learned but this is only a significant burden to the extent that they are not shared between languages. We argue that much metaphor understanding involves considerable inferencing within the pretence cocoon, but this inferencing is of the same type that one would need to be able to perform in the relevant source domains anyway, when dealing with literal language about those domains.

## **7 Conclusions and Matters for Future Research**

The ATT-Meta approach offers a radical degree of economy in the amount of knowledge needed specifically for particular metaphorical views. As a result, it sends a relatively optimistic message about a major aspect of the task of helping learners to grapple with metaphors in English, and perhaps also in other target languages.

The main issue thrown up for further research is the extent to which the approach applies to metaphor in other languages. And, even if the approach does so apply, there is the issue of whether different languages use the same view-neutral mapping adjuncts.

It would also be interesting to investigate the applicability of the approach to non-linguistic forms of expression, such as pictures. Some initial work on applying the approach to graphical forms of expression used in computer interfaces is reported in Barnden *et al.* (2004b).

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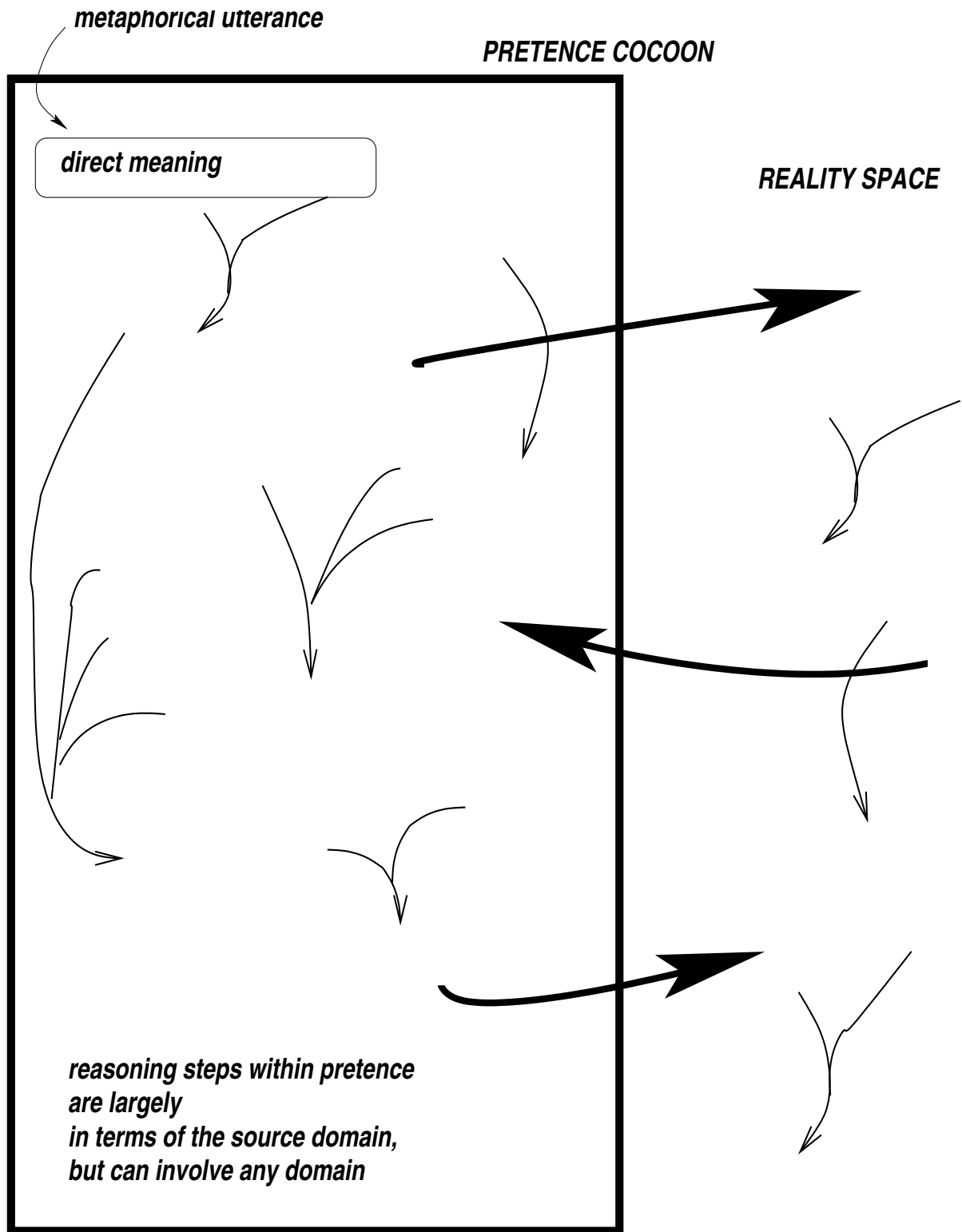


Figure 1: **General nature of reasoning in the ATT-Meta approach.** The bold box shows the pretence cocoon. Bold arrows show the action of mapping relationships, between source-domain information in the pretence cocoon and target-domain information in reality. (Target-to-source mapping actions are allowed in the approach, for reasons explained in Barnden *et al.* (2004a). An example occurs in Figure 10.) Other arrows, apart from the one at the top, show reasoning actions within reality or within the pretence.

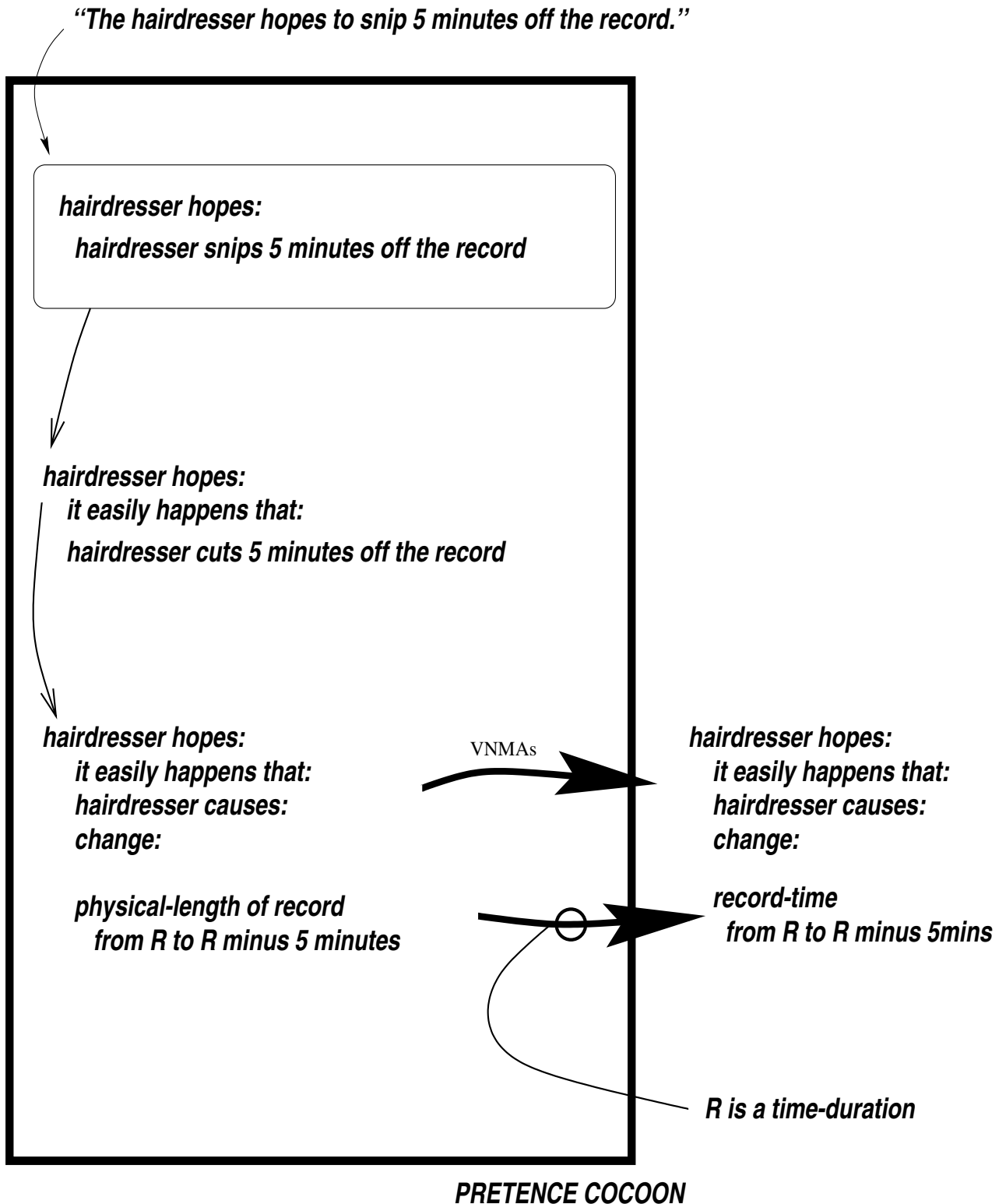


Figure 2: **The Fast Hairdresser.** In this and later figures, a mapping arrow labelled VNMA or VNMA's shows the action of one or more view-neutral mapping adjuncts. A mapping arrow marked with a circle shows the action of a non-identity mapping relationship specific to a particular metaphorical view. When an entity is in both the pretence and reality it is considered to map to itself, and such links are mostly not shown in the figures. The direct meaning of the utterance is shown in a small box near the top of the diagram. The propositions within the cocoon box and to its right are English glosses of expressions in some internal representation scheme used by the understander. In our figures only a selection of the possible propositions and inferential links are shown.

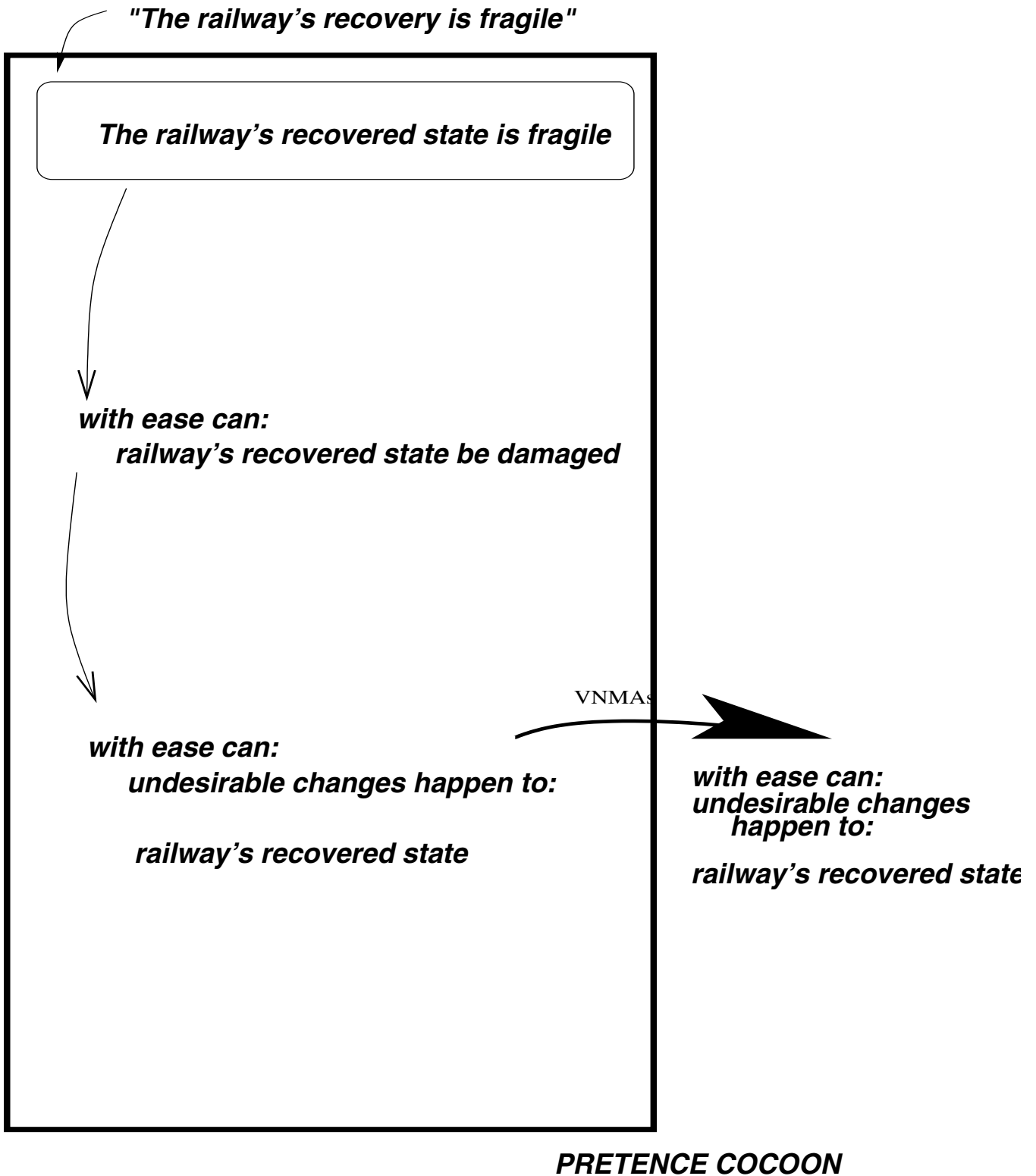


Figure 3: Broken Railway.

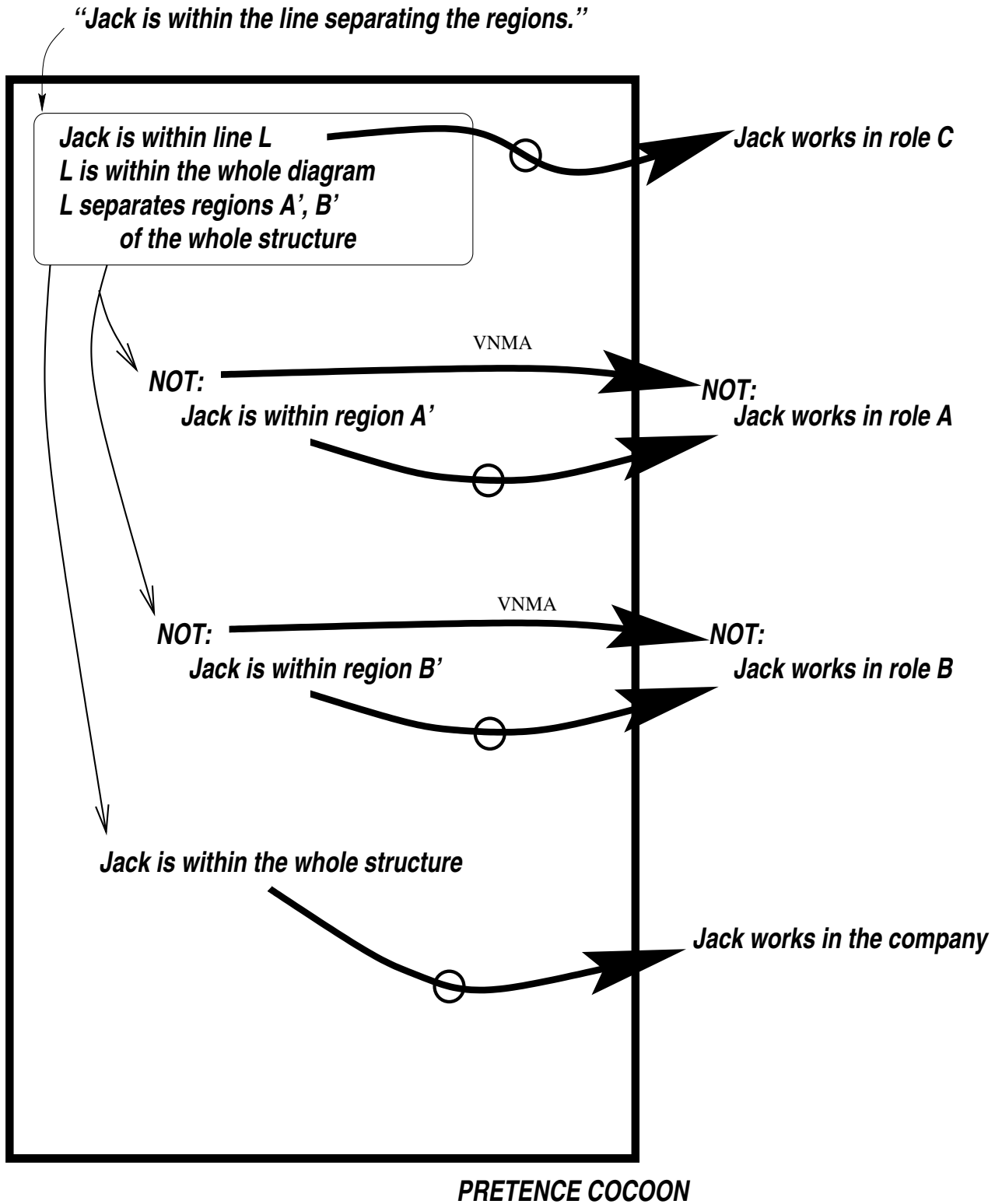


Figure 4: **People on the Line.** The “structure” is a configuration drawn in the diagram, and corresponds to the company. A' is region of the structure corresponding to work-role A in the company. Similarly B'.

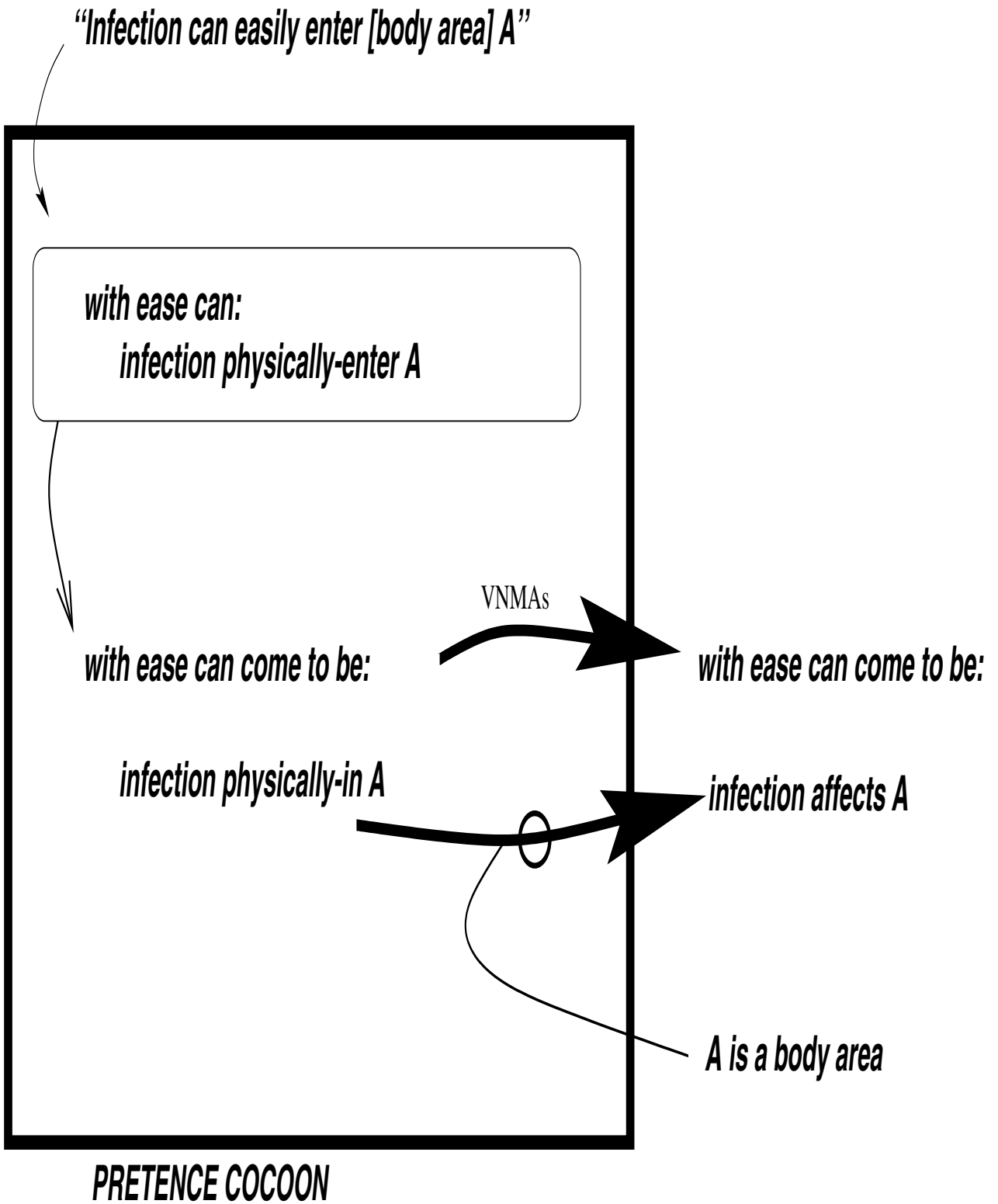


Figure 5: **Infection Entering.**

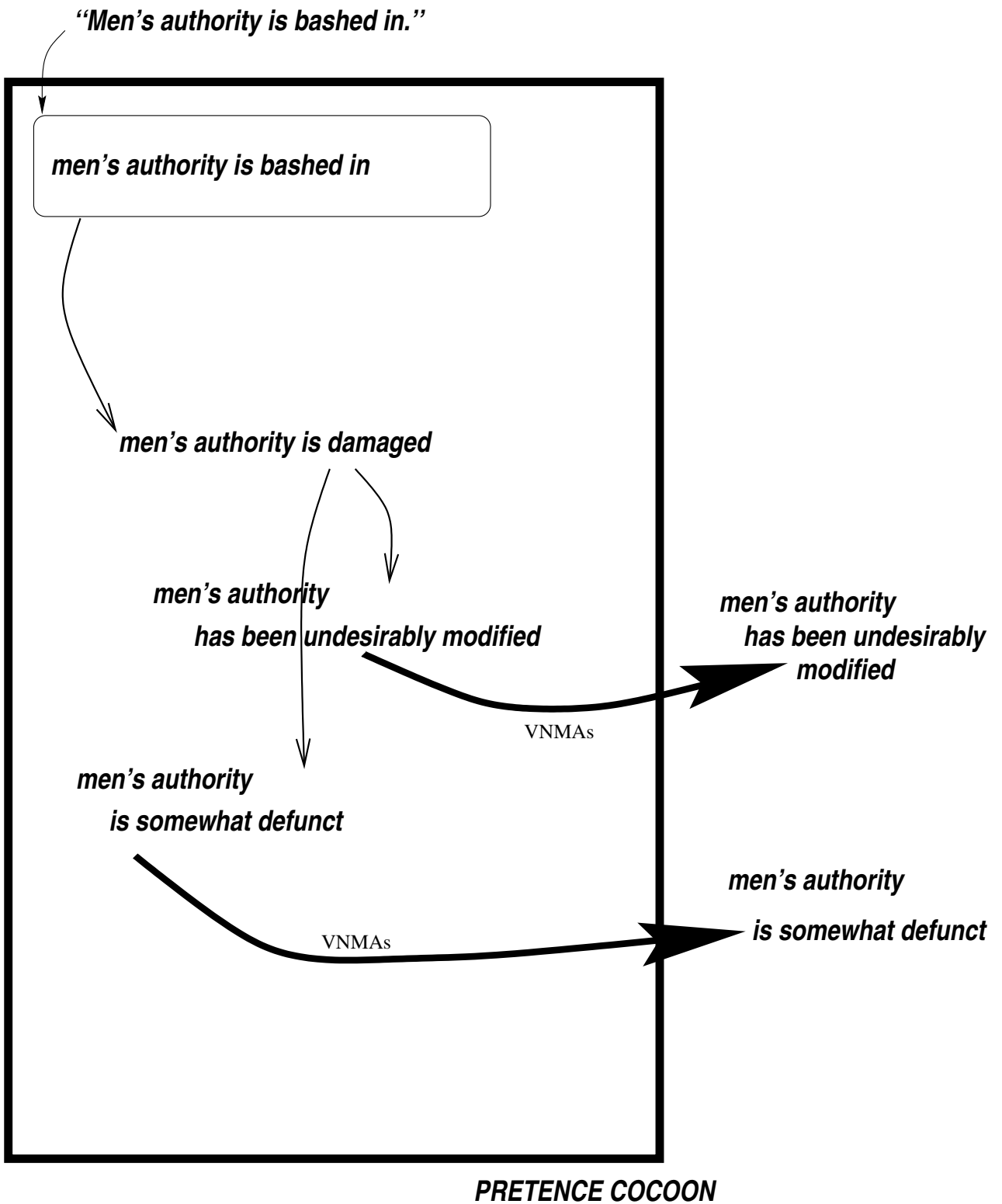


Figure 6: **The Battered Trilby.** Identity mapping of men's authority is not shown.

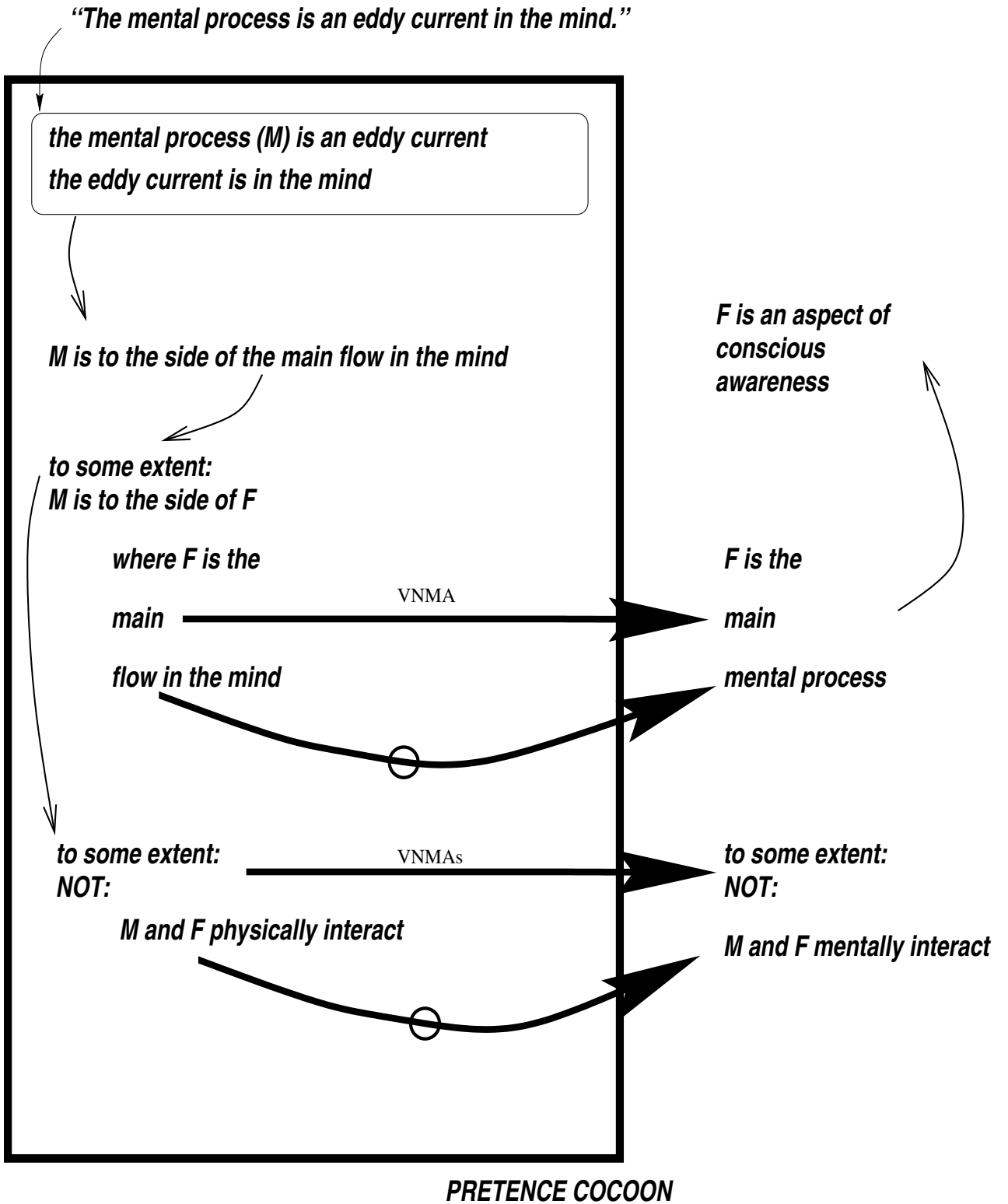


Figure 7: **Going with the Flow.** The example additionally provides a simple illustration of the fact that metaphorical understanding may require reasoning within the reality space as well as the pretence cocoon.

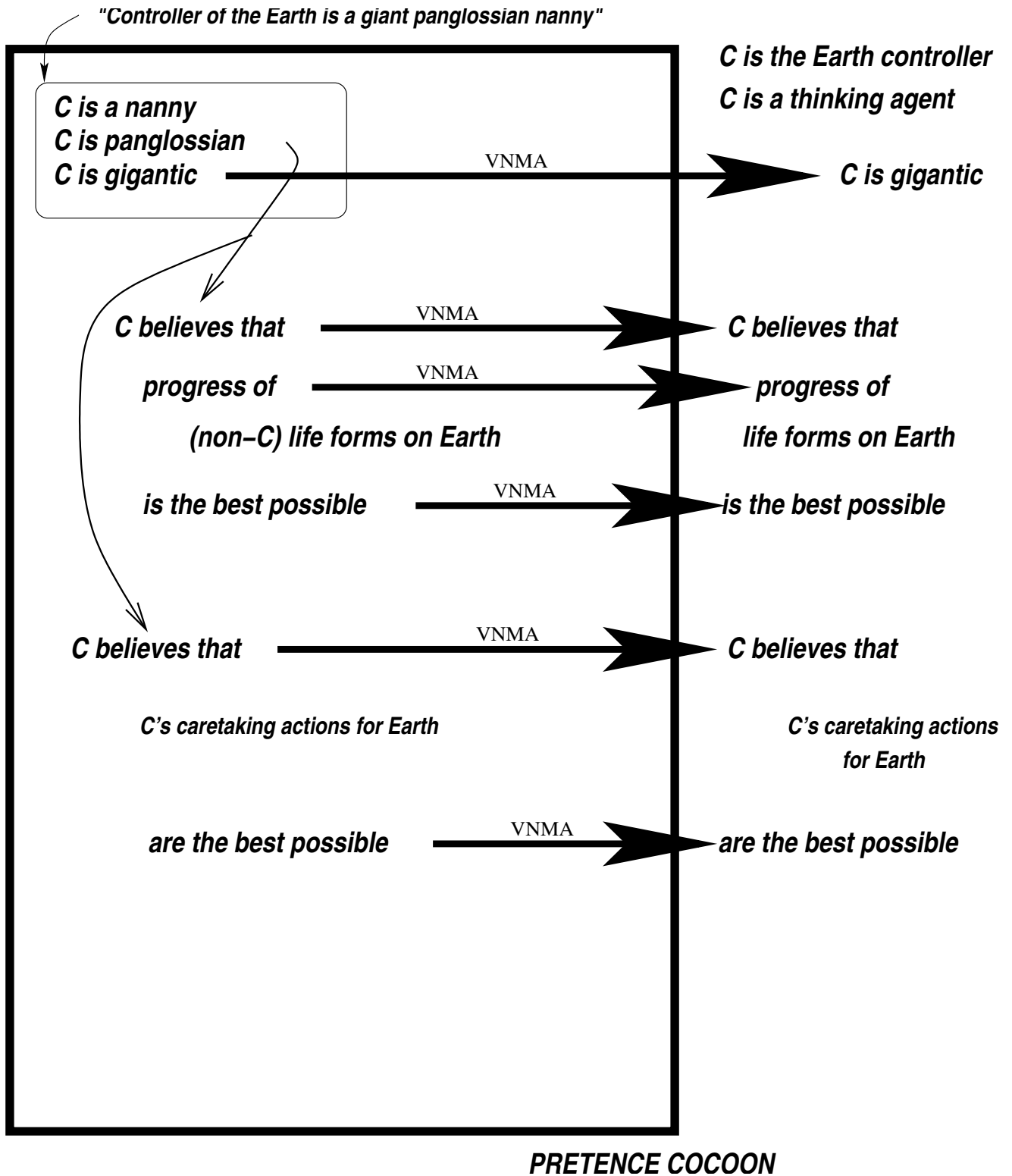


Figure 8: **The Nanny State.** Note that in this example the “reality” space is from the point of view of Doolittle’s critique (see text), according to which the planetary controller really is a thinking agent.

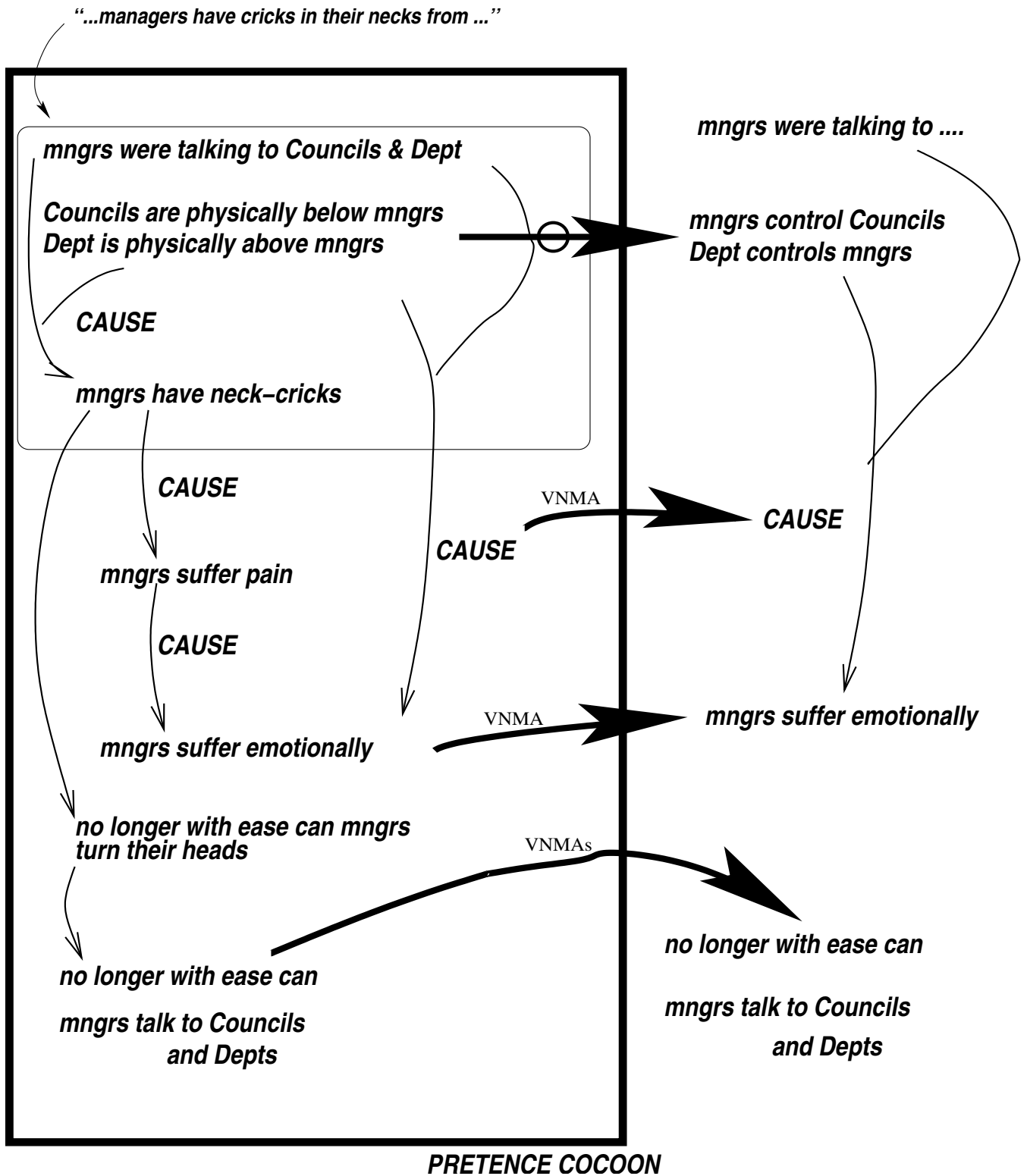


Figure 9: **The Neck-Cricked Managers.** The causation link in the right-hand side of the pretence box is derived by transitivity from the causation links to the left. Note also that the talking is present in both pretence and reality, and is considered to map to itself.

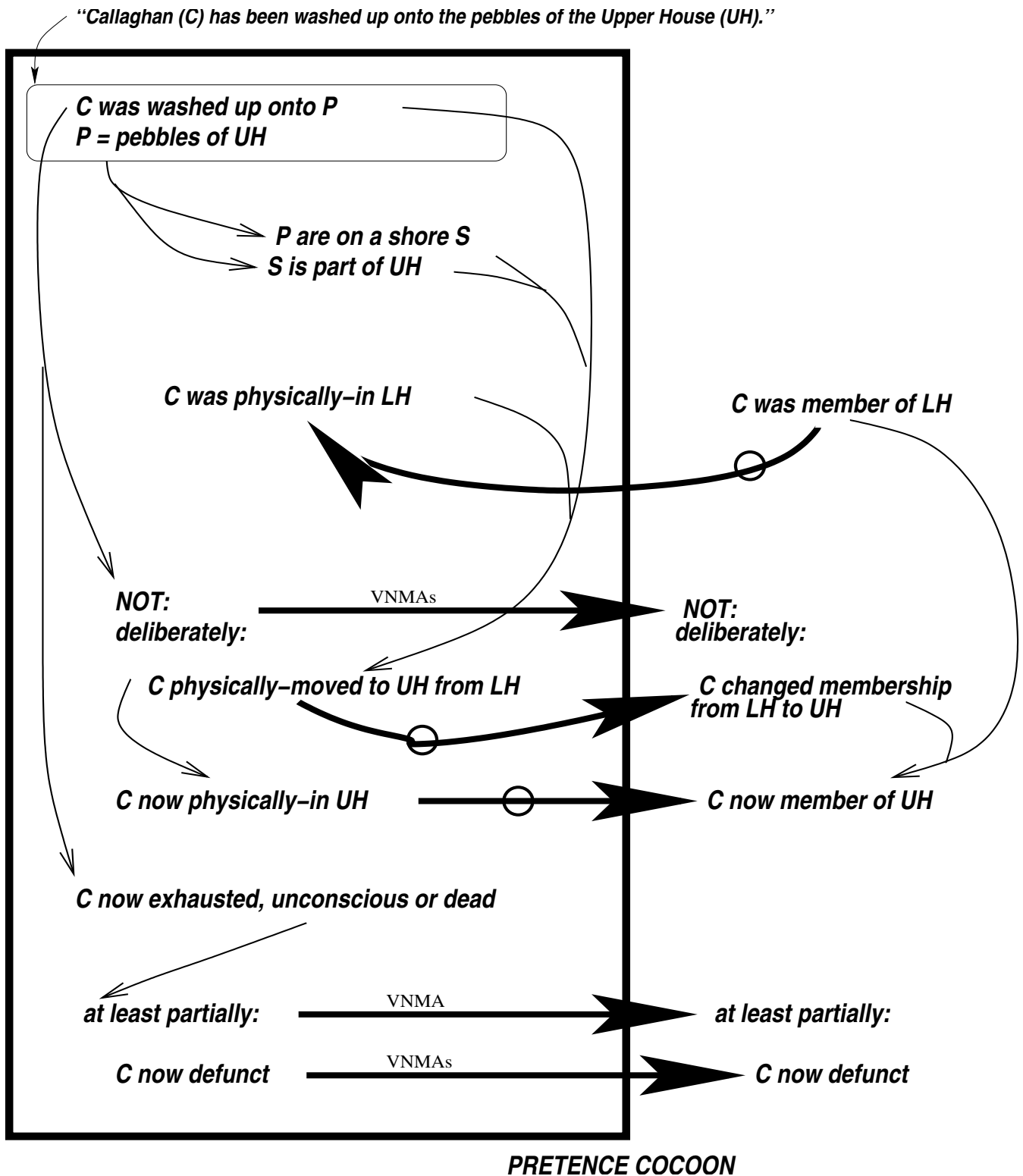


Figure 10: **Political Flotsam**. This example includes target-to-source mapping (Barnden *et al.* 2004a), though it is not strictly necessary for the example to work. Also (in this example and others), tense in the English glosses of propositions is actually handled by the Time-Order VNMA. Therefore, the mapping arrows marked by a circle as view-specific represent may in actuality also involve the operation of that VNMA.

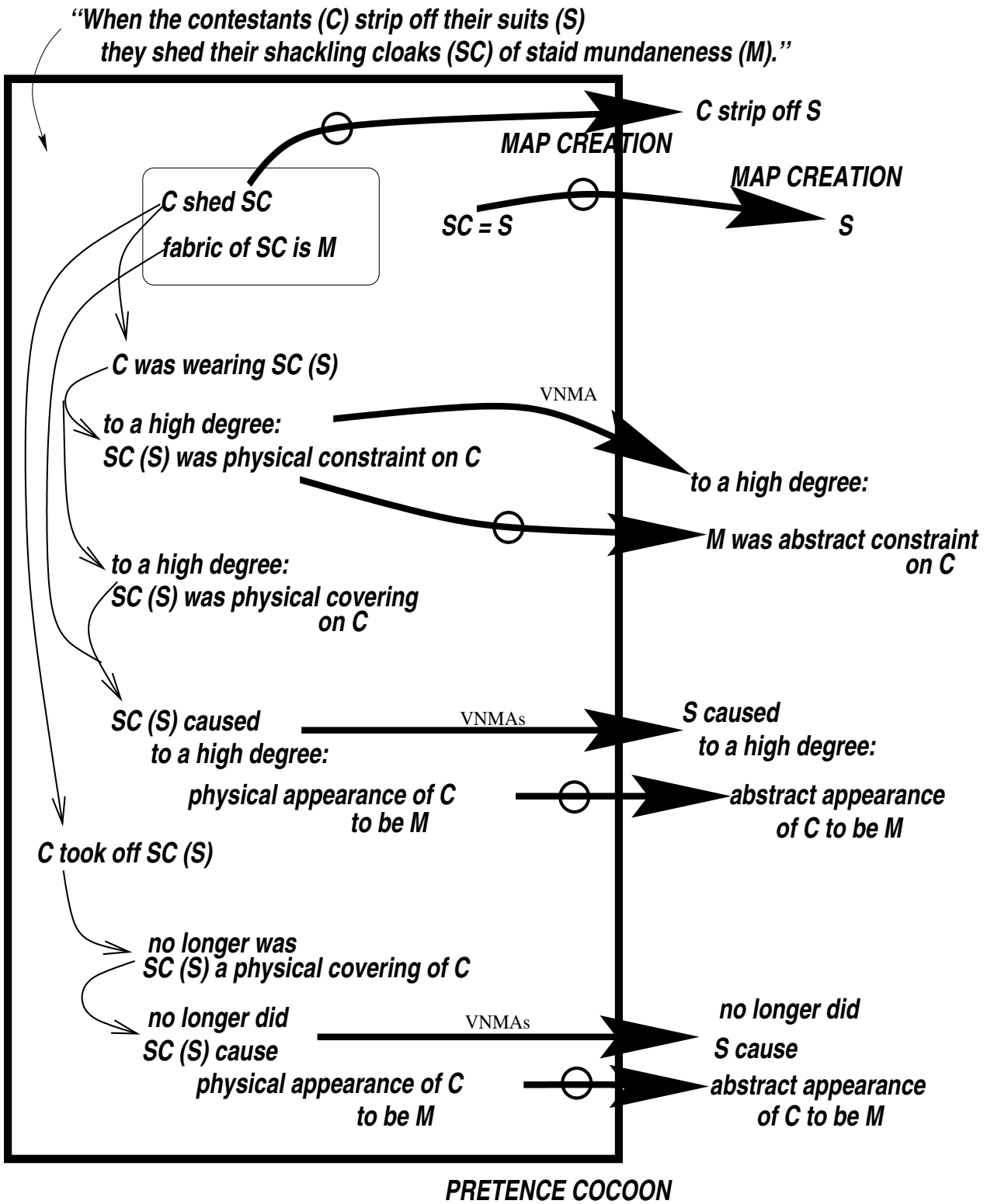


Figure 11: The Staid Strippers.