"Is this road lazy or just incompetent?" Conceptual proximity as a parameter of salience in metonymies

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Abstract

Conceptual metonymy is often defined as a way of referring to one entity (the target) by means of another entity (the vehicle (cf. Lakoff and Johnson 1980:36) or as a shift in profile, so that one aspect of a construal is highlighted instead of another (e.g. Langacker 2008:69). Both of these approaches acknowledge that metonymy involves entities which "are somehow associated" and that this association is salient for the conceptualizer (Radden and Kövecses 1999:17), but the nature of this salience is rarely discussed. This article attempts to account for and parametrize salience in terms of conceptual proximity within a cognitive domain. The key postulate is that usually the most salient concept is the one which is the closest to the target concept within a network of contiguity relations defined relative to a cognitive domain. The default cognitive domain for selecting the vehicle is the domain of observables or direct physical interaction, but the choice of the domain is highly context-dependent.

Konzeptuelle Metonymie wird oftmals definitiert als ein Verfahren, das ermöglicht auf eine Entität (das Ziel (*target*)) mittels einer anderen Entität (das Vehikel (*vehicle*)) zu verweisen (vgl. Lakoff/Johnson 1980:36), oder sie wird als ein Verschieben der Profilgebung beschrieben, indem ein Bestandteil eines Konzepts zu Ungunsten eines anderen Bestandteils hervorgehoben wird (siehe z.B. Langacker 2008:69). Beide Ansätze gehen davon aus, dass Metonymie mit Entitäten zu tun hat, die "irgendwie miteinander verbunden" sind und dass diese Verbindung für denjenigen, der die Konzeptualisierung vornimmt, salient ist (Radden / Kövecses 1999:17); welcher Art die Salienz ist, wird allerdings nur selten diskutiert. Der Artikel versucht die Salienz mit Hilfe des Moments der konzeptuellen Nähe innerhalb einer kognitiven Domäne zu erfassen und zu parametrisieren. Es wird postuliert, dass eine jeweilige kognitiven Domäne durch ein eigenes Netzwerk von Kontiguitätsrelationen charakterisiert ist und dass das salienteste Konzept dasjenige ist, das dem Zielkonzept in einem solchen Netzwerk am nächsten steht. Für das Vehikel wird, im unmarkierten Fall, die kognitive Domäne des konkret Beobachtbaren bzw. die Domäne direkter phyischer Interaktion gewählt, grundsätzlich ist die Domänenwahl aber stark abhängig vom Kontext.

1. Introduction

The study of conceptual metonymy has been at the very heart of cognitive linguistics from the very inception of the paradigm. Starting from the seminal *Metaphors We Live By* (Lakoff and Johnson 1980), many prominent cognitive linguists contributed to the study of this conceptual phenomenon. Since the basic literature on conceptual metonymy is well-known and widely available, it is hardly necessary to discuss the

basic assumptions about the conceptual device in great detail. It suffices to remind the reader that within the formalism of cognitive linguistics, metonymy is usually defined as a mapping within one cognitive domain (Croft 1993), within an Idealized Cognitive Model (Lakoff 1987), or as a shift in profile of an expression (Langacker 2008). Metonymy is traditionally related to a broadly understood referential function (Lakoff and Johnson 1980, Langacker 1993, Taylor 2009) where the referring concept is called "the vehicle" and the concept referred to is "the target." This article remains neutral as for whether conceptual metonymy is to be described as a mapping (the Lakovian approach) or as a shift of profile (the Langackerian approach). The question whether metonymy functions within a cognitive domain, an ICM, or any other knowledge structure will be left open as well. The terminology and the graphical conventions adopted in this article lean towards considering a metonymy as mapping within a cognitive domain, but the analysis can be transposed into a different formalism without much effort and without any loss of epistemic content

Cognitive linguists often point out that the choice of the vehicle concept in a metonymy is not arbitrary. Radden and Kövecses write that "[the] choice (…) appears to be motivated or restrained by cognitive principles" (Radden and Kövecses 1999:44) and that the vehicle and the target "are somehow associated" (1999:17). Langacker argues that metonymies reflect "our natural inclination to think and talk explicitly about those entities that have the greatest cognitive salience for us" (1993:30). Taylor, in turn, holds that "the essence of metonymy resides in the possibility of establishing connections between entities which co-occur within a given conceptual frame" (2009:125). All these observations point to important aspects of metonymic mappings: the mappings do not seem arbitrary and established solely through a linguistic convention, the vehicle is associated with the target in a salient way, and the two concepts co-occur within a conceptual frame (an ICM, a cognitive domain, etc.). Yet these observations shed little light on the mechanism of selecting the vehicle for a particular target. Beyond doubt, in Lakoff and Johnson's example (1980:37), repeated here as (1), FACE is somehow salient relative to an attractive person, but why is FACE salient rather than, say, FEET or NAILS?

(1) *She's just a pretty face.*

Co-occurrence of FACE and PERSON within one cognitive domain does not seem to be a convincing explanation, since FEET and NAILS co-occur with PERSON in the same frame, so in principle they should be available as potential vehicles. Intuitively, one may simply state that the face is the body part that people pay most attention to as far as physical attractiveness is concerned, but this adds very little to the claim that the face is "somehow salient" in the context of physical attractiveness: it hooks up salience to attention, but it fails to explain why more attention is given to the face as opposed to the feet. Apparently, there is some kind of salience at play in (2) again (once again borrowed from Lakoff and Johnson (1980:35)), because HAM SANDWICH in somehow salient relative to the customer.

(2) *The ham sandwich is waiting for his check.*

Yet how are the instances of salience in (1) and (2) related to each other? Is there anything they have in common or are all instances of salience entirely idiosyncratic? Is it merely a handy umbrella term for unrelated associations created in an opportunistic and ad hoc manner, or is there a more uniform and general cognitive mechanism for determining salience, and thus guiding the selection of the vehicle?

The general guiding hypothesis of this article is that there is such a cognitive mechanism of determining salience. More specifically, the vehicle selection is constrained by **conceptual proximity**. For the purpose of this article, I propose to define conceptual proximity more formally as the distance between the vehicle and the target concepts in a network of contiguity relations defined relative to a cognitive domain (the idea behind "a network of contiguity relations" will be discussed in more detail in the following section). Within this formalism, the salience of a concept, and hence its likelihood of becoming the vehicle, is inversely proportional to the distance between the potential vehicle concept and the target concept, that is the concepts closer to the target are more likely to be selected as vehicles. Conceptual proximity is not the only parameter of salience and in some cases it is not even the most important one (examples of salience determined by factors other than

proximity will be discussed in Sections 5 and 6), but it seems to be an important factor that underlies numerous metonymies analyzed frequently as distinct types. I will, therefore, argue that conceptual proximity represents a strong and pervasive constraint on the salience of concepts, but a constraint that may be overridden by other factors.[1]

The importance of something like conceptual proximity has already been highlighted by Radden and Kövecses, who include IMMEDIATE OVER NON-IMMEDIATE as one of the cognitive principles of salience in metonymies (1999:47). This observation is convergent with the main thesis of this discussion, but this point is worth taking a bit further. Radden and Kövecses list IMMEDIATE OVER NON-IMMEDIATE among many other cognitive principles (like SUBJECTIVE OVER OBJECTIVE, FUNCTIONAL OVER NON-FUNCTIONAL, and TYPICAL OVER NON-TYPICAL) without prioritizing any of them in any obvious way. I will argue that conceptual proximity captured by the principle IMMEDIATE OVER NON-IMMEDIATE underlies other principles listed by the authors. In effect, it appears that the principles can be seen as lower-level manifestations of the principle of conceptual proximity. The reason why the principle of conceptual proximity gives rise to other principles and, consequently, to many different metonymies is that the principle operates within different cognitive domains.

2. Networks of contiguity relations

Conceptual proximity is best illustrated in a fairly extensive network of contiguity relations within a cognitive domain. On the most schematic and abstract level, the network can be visualized as a graph in which vertices stand for concepts and edges represent associations between the concepts (see Figure 1). This representation is maximally schematic, and therefore it does not specify the kind of contiguity relations at play. On a more specific level, the relations may be partitive, causal, spatial, temporal; they may involve provenience, force interaction, social relations,

1 In general, salience is so relative and context dependent that (most probably) it cannot be captured by one cut-and-dry principle. Evaluation of salience is a matter of a complex heuristics rather than a straightforward algorithm, so no algorithmic rule can fully capture the process in all situations. At the same time, salience does not appear to be a "basic concept," which cannot be explained, described, or parametrized by means of something even more basic. Thus, providing a reductive account, or at least some parts of a reductive account, seems to be both feasible and desirable.

etc.

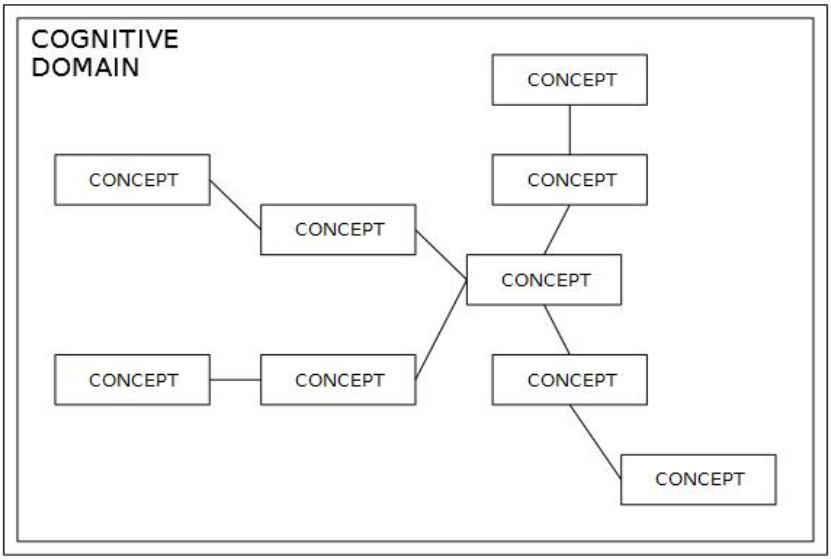

Figure 1: Maximally schematic network of contiguity relations

On this schematic level, the contiguity relations represented by the edges are not aligned hierarchically and do not have any inherent orientation, but elaborated relations may have these properties. For example, Langacker's "hierarchies consisting of successive whole-part relations," like body > arm > hand > finger > knuckle (2008:64) can be viewed as elaborations of the network in Figure 1. The partitive relations are inherently hierarchical and directional,[2] which is signaled in Figure 2 by arrowheads at the end of edges. The graph representation provides a handy way of "measuring" the distance between various concepts. The unit of

2 Directionality and hierarchy of this sort have a more formal interpretation. Directionality of the relation R between *a* and *b* is equivalent to asymmetry of R. Thus, R(a, b) is directional/asymmetric if it does not hold that R(b, a):R(a, b) → ~R(b, a) Asymmetry implies irreflexivity, so directionality assumes that ~R(a, a). Hierarchy of *a*, *b*, and *c* is equivalent to a strict partially ordered set of the elements with the relation R holding between them. In a strict partially ordered set (irreflexivity of R being implied in asymmetry), R is:

asymmetric:R(a, b) → ~R(b, a)

transitive: (R(a, b) ∧ R(b, c)) → R(a, c)

In the above body part example, a finger is a part of the hand, but not the other way around (so, partitive relations are directional/antisymmetric). Also, a finger is a part of the hand and a knuckle is a part of the finger, and technically a knuckle a part of the hand (so there is the hierarchy of hand > finger > knuckle).

measurement is simply an edge linking two vertices. For example, in Figure 2 BODY and ARM are one edge apart, BODY and HAND are two edges apart, BODY and KNUCKLE are four edges apart, etc.

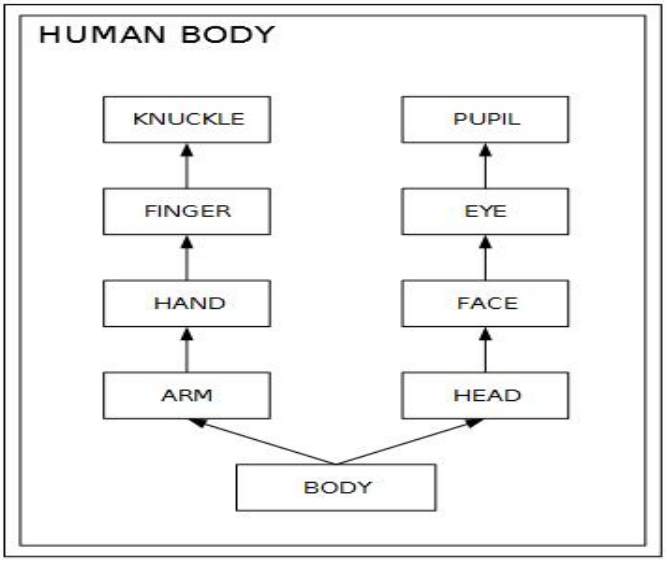

Figure 2: Network of partitive relations in the domain [HUMAN BODY]

Consider now the metonymy analyzed by Radden and Kövecses (1999:36) as an instance of SOUND FOR EVENT CAUSING IT, quoted here as (3a):

(3) (a) *The car screeched to a halt.*
(b) ??? *The car irritated (me) to a halt.*

Obviously, (3a) makes use of a causal contiguity association between a car halting and the sound accompanying the event. The chain of causation does not end here, however. The screeching sound is usually unpleasant for the hearer, so the feeling of irritation may be an effect of the sound. The question is why SCREECHING appears to be a natural choice for the vehicle in (3a), while the choice of IRRITATION results in semantic anomaly in (3b). The answer does not seem to be the perceptual salience alone, whatever the definition of perceptual salience may be, since both screeching and irritation are directly experienced by the conceptualizer. It is unlikely that co-occurrence is the best explanation either: halting of a car is not always accompanied by screeching. At best, one could argue that screeching co-occurs with a particular kind abrupt halting, so the metonymy is used to refer to this particular kind, but in a

similar vein one could argue that irritation caused by screeching co-occurs only with a particular kind of halting as well. But why is not irritation used to refer to this particular kind of halting? In sum, while co-occurrence may provide the motivation for the selection of the vehicle, it does not provide sufficient constraints on the selection.

Digressing a little from the domain of linguistics, a similar problem is raised by Bas van Fraassen (1980) in his discussion on causality in scientific explanation. Van Fraassen deliberates whether counterfactual situations used to detect causal relationships between events[3] can be used for singling out salient causal links required in a successful scientific explanation.

> Suppose David's alarm clock goes off at seven a.m. and he wakes up. Now, we cite the alarm as the cause of the awakening, and may grant, if only for the sake of argument, that if the alarm had not sounded, he would not (then) have woken up. But it is also true that if he had not gone to sleep the night before, he would not have woken in the morning. This does not seem sufficient reason to say that he woke up because he had gone to sleep.
>
> The response to this and similar examples is that the counterfactuals single out all the nodes in the causal net on lines leading to the event (the awakening), whereas 'because' points to specific factors that, for one reason or other, seem especially relevant (*salient*) in the context of our discussion. No one will deny that his going to sleep was one of the events that 'led up' to his awakening, that is, in the relevant part of the causal net. That part of the causal story is objective, and which specific item is singled out for special attention depends on the context. (1980:115; original emphasis)

The remark on context dependence is an important one and I will return to this point later in the article. For the time being, it is useful to think about salience in terms of the distance between nodes in a contiguity network ("causal net" in van Fraassen's passage). Concept A is salient relative to concept B if A and B are linked by only one edge in the network. More concretely, in van Fraassen's alarm clock example, the factor determining the salience of a node is the distance between the node and the target element. The alarm clock going off is the event immediately preceding the waking up, but going to sleep is an event "further down" the causal net. Thus, even though both of the event caused Adam's waking up (and counterfactuality tests can

3 Most generally, a causality test involving counterfactuals assumes that if "A is the (a) cause of (or: caused) B' is true, it is also true that if A had not happened, neither would B have" (van Fraassen 1980:115). The counterfactuality test is a handy rule of thumb for discriminating between genuine causation between events from merely co-occurrence of the two events.

confirm that), only the alarm clock would be considered as cognitively salient for explaining Adam's waking up.

Returning to linguistic examples, analogical causal proximity is the factor constraining the vehicle selection in (3). The causal net is sketched in Figure 3, where the actual vehicle concept is marked with the bold rectangle and the arrows at the ends of the edges signal the direction of causation (from the cause to the effect). In short, the screeching sound is cognitively salient relative to halting of the car, because it is only one edge away from the intended target concept, while irritation is two edges away, and is therefore less cognitively salient.

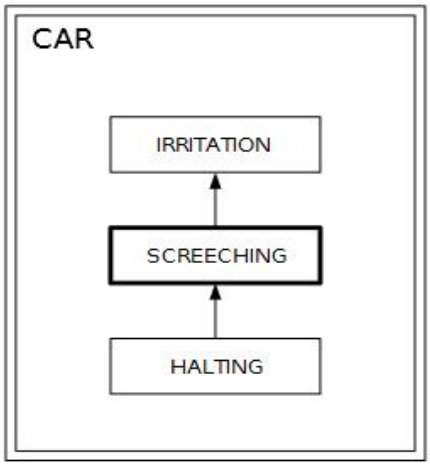

Figure 3: Network of causal relations in *The car screeched to a halt*

To conclude this part of the discussion, I propose a working version of the proximity hypothesis about the mechanism of vehicle selection in a metonymy:

> **Proximity hypothesis A:** *Ceteris paribus*, within a network of contiguity relations, the preferred vehicle is the concept closest to the target.

For the time being, the *ceteris paribus* clause limits the scope of the hypothesis to a situation in which: 1) all contiguity relations in the network are of the same type (i.e. all relations are exclusively causal, partitive, temporal, etc.); 2) all contiguity relations in the network belong to the same cognitive domain (e.g. the domain [HUMAN BODY]

in Figure 2).

3. Domain dependence of contiguity networks

One crucial point about the vehicle selection is that it operates within a specific cognitive domain. For this reason, one target concept can be metonymically associated with different vehicle concepts depending on which domain is activated without violating the proximity hypothesis. In this sense, the search domain,[4] i.e. the domain in which the network of contiguity relations emerges, also constrains vehicle selection. As a consequence, the explanatory potential of the proximity hypothesis A is somewhat limited, because the hypothesis says nothing about this domain dependence. Consider the expressions in (4) ((4a) after Radden and Kövecses 1999:38):

The target concept in (4a) is QUALITY OF ROAD metonymically referred to via QUALITY OF TRAFFIC. The contiguity relation employed in this metonymy (EFFECT FOR CAUSE) is grounded in a causal link between the two concepts. The same target concept is referred to in the metonymies CAUSE FOR EFFECT in (4b)-(4d), which employ causal links between the workers who built the road and the quality of the road: the road may be of poor quality, because the workers were incompetent or they were being lazy due to lack of motivation. The question is: why are the expressions in (4b)-(4d) semantically anomalous or at least very unlikely to be used in a normal context? Certainly, the reason is not the reversed causal orientation of the vehicle and the target orientation in (4b)-(4d), i.e. CAUSE FOR EFFECT rather than EFFECT FOR CAUSE, because the former metonymy is productive in English (cf. *Healthy complexion* in Radden and Kövecses (1999:38)). The network of causal contiguities relevant for the expressions in (4) is sketched in Figure 4.

4 I borrow the terms "search domain" from Hawkins (1981). It should be noted, however, that Hawkins used the term to account for locational prepositions rather than metonymies.

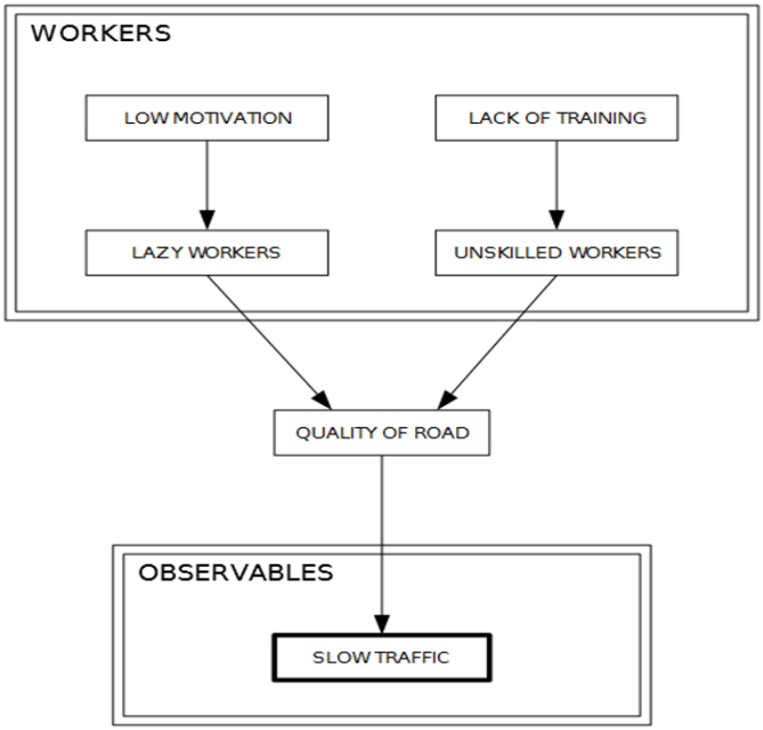

Figure 4: Network of causal relations in *This road is slow*

In this case, the proximity hypothesis is not enough to account for the fact that SLOW TRAFFIC is selected for the vehicle, because the concepts LAZY WORKERS and INCOMPETENT WORKERS are within the same distance (one edge) from the target as SLOW TRAFFIC. The only expression successfully ruled out by the proximity hypothesis A as semantically anomalous is (4c), where LOW MOTIVATION is two edges away from the target concept. The difference between (4a) and (4b)-(4d) can be accounted for in terms of the difference in search domains. Apparently, in (4) the domain of the observable phenomena is preferred over the domain of workers responsible for the quality of the road. To put this point plainly and more generally, the expressions in (4) suggest that when causal metonymies are at play conceptualizers tend to focus on observable causes/results rather than more speculative causes/results outside the realm of direct experience. In the light of this observation, the proximity hypothesis may be reforged in the following way:

Proximity hypothesis B: *Ceteris paribus*, within a network of contiguity relations inside a search domain, the preferred vehicle is the concept closest to the target. The preferred search domain is the domain of observables.

The modified version of the proximity hypothesis is capable of explaining the salience effects that clearly falsify the proximity hypothesis A. The expression in (5) (derived from "Revealed: Mosquitoes" 2014) is another example of a metonymy incompatible with the proximity hypothesis A, but successfully covered by the revised version:

(5) *Mosquitoes kill more people in 4 mins than sharks in a year.*

The article hinges upon a rhetoric device of comparing, to quote the accompanying infographics, "world's deadliest animals," including mosquitoes, snakes, sharks, crocodiles, etc. Some of the deadly animals are included via a metonymic association: what actually causes death is a disease carried by some of the animal rather than an attack of the animal itself. Thus, it can be argued that the victims of sharks, dogs, and wolves die due to wounds inflicted by the animals, but the bites of mosquitoes, tsetse flies, and assassin bugs are not direct causes of death.[5] Thus, the actual referent in (5), i.e. the direct cause of death, is a disease and a metonymy is employed to link the disease with an animal.[6] This "scientific understanding" of the causal chain in insect-borne diseases is sketched in Figure 5(a). The figure suggests that according to the proximity hypothesis A, the most likely vehicle concept should be Plasmodium, a genus of parasitic protozoa carried by mosquitoes and responsible for various sorts of malaria. After all, it is the protozoan that is the direct cause of the lethal disease

5 In fact, one may continue "zooming in" the causal network to find even more immediate causes of death. The causal net does not seem to have any "inherent granularity," so one may freely speculate about causes at any imaginable scale. For example, it can be argued that it is not a shark bite that causes death, but a hemorrhage caused by the bite. It is true that what counts as the *relevant* cause of an event is decided somewhat arbitrarily and the relevance of causal connections will be discussed in more detail the following section. For the purpose of this case study, I will assume that deaths are caused by something that a (micro)organism does to a human being, and not by further consequences of these actions or prior causes leading up to the action. For example, what qualifies as the cause of death is a shark bite or a disease brought about by a microorganism; however, the death is not caused by a mosquito bite that infects a person with the microorganisms or by authorities who failed to issue a shark warning.

6 In the article under analysis, an animal (and not a disease) is required, because the article and the accompanying infographics are about animals rather than lethal infections. Hence, the thematic coherence of the text forces a metonymy with an animal as the vehicle, even though a disease is the actual cause of death.

rather than the mosquito, and hence the protozoan is the deadliest animal. Yet this is not what happens in the metonymy in (5). Why does the mechanism of vehicle selection "skip" one vertex in the causal chain sketched in Figure 5(a) and selects a more distant concept?

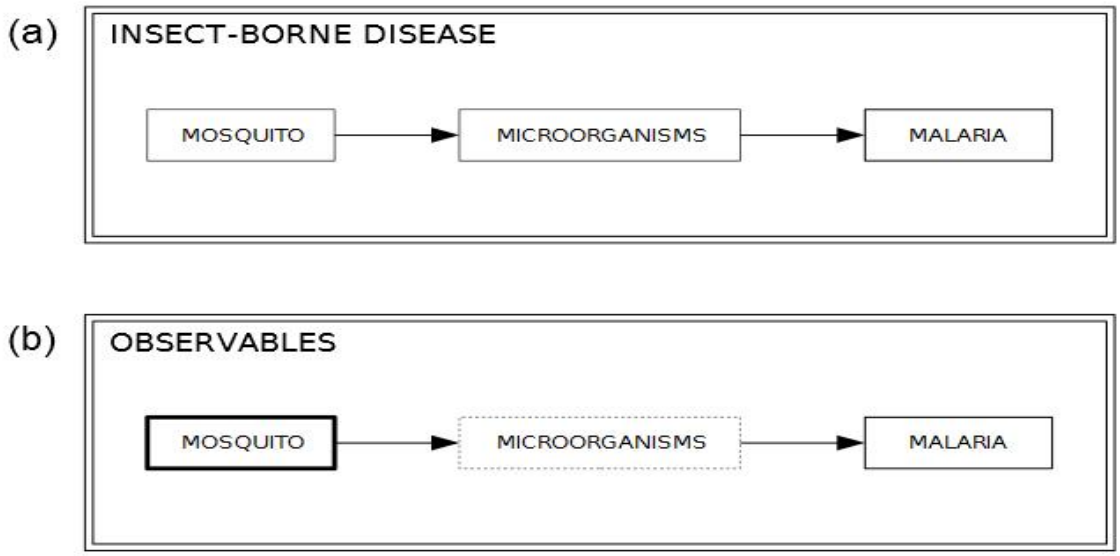

Figure 5: Network of causal relations in *Mosquitoes kill more people…*

Just like in the case of the expressions in (4), the answer is the cognitive preference for the domain of observables as far as the search domain is concerned. While Figure 5(a) represents the domain of the scientific knowledge about malaria, invisible microorganisms are absent from the domain of observable entities (this absence is signaled by the lighter, broken-line rectangle in the center of Figure 5(b)). Hence, the causal net in the domain [OBSERVABLES] is structured in such a way that the most immediate visible cause of malaria is the mosquito. In effect, the metonymy in (5) is compatible with the proximity hypothesis B in the sense that within the preferred search domain [OBSERVABLES] the mosquito is the concept closest to the target.

The analyses of (4) and (5) suggest that the domain [OBSERVABLES] has a special role in determining cognitive salience of the vehicle. In (4) this domain is merely the preferred search domain, but this fact alone may not be a particularly good indication of its importance. In (5), however, the effect is more prominent, as the

domain [OBSERVABLES] overrides the domain of scientific knowledge about insect-borne diseases. In other words, even when speakers have a fairly good understanding of malaria, they may still opt for a metonymy, which allows them to talk about less immediate causes of the disease, but which are readily available for direct observation. More generally, people may prefer to speak about entities and situations which are experienced directly, even at the expense of factual and scientific accuracy.[7]

The proximity hypothesis B helps to see a fundamental unity of some lower-level cognitive principles discussed by Radden and Kövecses (1999). This is particularly true for the principles CONCRETE OVER ABSTRACT, OCCURRENT OVER NON-OCCURRENT, GOOD GESTALT OVER POOR GESTALT, BOUNDED OVER UNBOUNDED, SPECIFIC OVER GENERIC, as well as perhaps MORE OVER LESS and COMMON OVER LESS COMMON. In all of the above principles concrete, occurrent, bounded, specific entities with good gestalts fall more squarely into the domain [OBSERVABLES], i.e. the preferred search domain for vehicle selection, than the other element of each pair. Analogically, MORE and COMMON are more easily observable than LESS and LESS COMMON, so the former fit in better in domain [OBSERVABLES] than the latter. To be fair, however, it should be noted that other principles discussed by Radden and Kövecses, like RARE OVER LESS RARE, pose a challenge to the proximity hypothesis B. This issue will be addressed at some length in the following section.

4. Context in domain selection

The *ceteris paribus* clause in the proximity hypothesis B is meant to signal that the hypothesis applies to default, neutral, and more typical cases of metonymies. The hypothesis could be paraphrased into "if no other factors are at play, the most salient concept selected for the vehicle is the concept one edge away from the target within the domain of observables." This hypothesis successfully accounts for semantic acceptability and anomalies in expressions (3)-(5). Yet the situation is not always as

7 Obviously, this conclusion should not come as a surprise, since it is an illustration of what Lakoff and Johnson term "experiential grounding" (cf. Lakoff and Johnson 1980, Lakoff and Johnson 1999, also Section 6 of this article).

simple as that. Many metonymies run counter this version of the proximity hypothesis, since they select "unobservable" vehicles, even though "observable" candidates are easily available. One example of such a metonymy is the already mentioned *healthy complexion*, (CAUSE FOR EFFECT; after Radden and Kövecses (1999:38)), where the health is not observed directly, but only indirectly through its effect on the complexion.

At this point, context of domain selection becomes crucial. Let us digress once again into more philosophical areas. In a simple thought experiment, Hanson asks us to imagine a car crash, with fatal consequences. A group of experts are sent on the site to examine the cause of death:

> There are as many causes of *x* as there are explanations of *x*. Consider how the cause of death might have been set out by a physician as 'multiple hemorrhage', by the barrister as 'negligence on the part of the driver', by a carriage-builder as 'a defect in the brakeblock construction', by a civic planner as 'the presence of tall shrubbery at that turning'. (1972:54)

Van Fraassen concludes that "the salient feature picked out as 'the cause' in that complex process, is salient to a given person because of his orientation, his interests, and various other peculiarities in the way he approaches or comes to know the problem – contextual factors" (1980:125).

Within the formalism of cognitive linguistics, this aspect of metonymy encapsulating the "orientation, interests, and various other peculiarities of the approach" can be described in terms of search domain selection. As far as Hanson's car crash example is concerned, a cognitive linguist may say that a physician activates the domain [HUMAN BODY] to determine the cause of death, the barrister activates the domain [TRAFFIC REGULATIONS], a carriage-builder activates the domain [CAR CONSTRUCTION], etc. Since each of the experts sets up the causal net in a different cognitive domain, each net features different elements, and therefore the principle of proximity picks out a different salient cause in each case.

A good illustration of context dependence is Lakoff and Johnson's example of the metonymy CONTROLLER FOR CONTROLLED (1980:38), quoted here as (6a):

(6)(a) *Nixon bombed Hanoi.*

(b) *Airplanes bombed Hanoi.*

The clearly metonymic (6a) can be juxtaposed with (6b), which is metonymic in a less obvious way. The latter sentence is metonymic, because there is a clear sense of agency implicit in the action of bombing and airplanes can hardly be viewed as actual agents. At best, the airplanes can be described as instruments and agency is reserved for the crew of the airplanes. Since agency requires volitional control over one's behavior, it would be hard to argue that airplanes were literal agents of the bombing, even if the bombs were released accidentally, due to technical malfunction, and not due to a conscious action of the crew. Therefore, if one thinks of the bombing of Hanoi as deliberate action, the most direct agents of the bombing are the crew of the airplanes. For this reason, (6b) is more adequately analyzed as an instance of the metonymy CONTROLLED FOR CONTROLLER.

What are the semantic differences between (6a) and (6b)? One of them is that (6a) instantiates the metonymy CONTROLLER FOR CONTROLLED, while (6b) is an example of CONTROLLED FOR CONTROLLER. But this is not the whole story. The two expressions are clearly about different aspects of the same event: (6a) refers to the political responsibility for the attack, while (6b) is more closely related to the on-site experience of the event. In this sense, the two examples express different what van Fraassen calls "orientation, interests, and various other peculiarities in the way he approaches or comes to know the problem" (1980:125). For instance, (6a) could be produced by a journalist or a political opponent of Nixon, who wishes to highlight the political and moral responsibility of the president. (6b), in turn, provides a dry factual account of what happened from the point of view of someone who may have witnessed the bombing. Neither of the expressions is semantically anomalous, because both of them comply with the proximity hypothesis B. The reason why they select different vehicle concepts is that they operate within different cognitive domains. Thus, in (6a), where the domain of political responsibility is activated, president Nixon is the most immediately responsible agent of the attack, even though he was not over Hanoi during the bombing. Since prototypical responsibility for an action presupposes freedom of taking or not taking the action, the pilots of the

bombers and their military superiors are not included in the domain [POLITICAL RESPONSIBILITY] (or perhaps they are included very peripherally), because they are not free to disobey the president's orders. (6b) is more compatible with the "default" case of vehicle selection, when the preferred search domain is [OBSERVABLES]. Here, the visible entities most closely associated with the military pilots are the airplanes, and therefore they are picked out as the vehicle (cf. Figure 6).

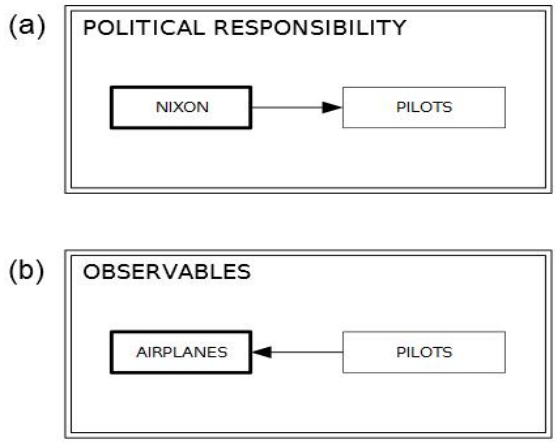

Figure 6: Network of control relations in *Nixon bombed Hanoi*

5. Effective reference requirement

The proximity hypotheses A and B parametrize salience in terms of distance of concepts within a contiguity network. Additionally, the latter version of the hypothesis points to the domain [OBSERVABLES] as the preferred search domain. This, however, is not to say that proximity is the only parameter of salience, even within the default search domain. An important constraint on the parameter, or a factor that can override it, is the need for ensuring effective metonymic reference to the target concept. If selecting the concept closest to the target within a contiguity network does not secure effective reference to the target, the proximity hypothesis B may be violated and a more distant concept may be selected instead. A good illustration of this is the names of species of Amazon parrots, some of which are listed in Table 1[8]:

8 The Latin names in Table 1 has been derived from www.birdlife.org

English name	Latin name	Distinctive feature
blue-fronted amazon	*Amazona aestiva*	blue patch between eyes
yellow-headed amazon	*Amazona oratrix*	yellow head
yellow-naped amazon	*Amazona auropalliata*	yellow back of head
yellow-crowned amazon	*Amazona ochrocephala*	yellow top of head
red-crowned amazon *red-headed amazon*	*Amazona viridigenalis*	red forehead and top of head
red-spectacled amazon	*Amazona pretrei*	red rim around eyes
yellow-shouldered amazon	*Amazona barbadensis*	yellow upper rim of wings

Table 1: Names of Amazon parrots and their distinctive features

Clearly, the English names were created on the basis of metonymic associations between the birds and their distinctive visual features (which is an instance of the popular metonymy PART FOR WHOLE). The examples in Table 1 are compatible with the second part of the proximity hypothesis B in the sense that the search domain is [OBSERVABLES] rather than domains of scientific or cultural knowledge about the parrots, even though the latter domains are rich sources of potential vehicles. For example, even though some of Amazon parrots are good at imitating human speech, none of them is called +*talking amazon*,[9] +*talking green parrot*, +*red-crowned chatterbox*, or anything of that ilk. The domain of talking is not activated when the vehicles for the metonymies are selected, despite the fact that in Western culture there is a strong association between parrots and the ability to "talk".[10] However, not all the names in Table 1 are compatible with the first part of the proximity hypothesis B, because not all body parts used as vehicles in Table 1 are in immediate partitive relation with the whole body of the bird. Thus, if one assumes that the target concepts in Table 1 are

9 Throughout the article, I will use a superscript plus sign (e.g. +*talking amazon*) to mark grammatical or grammatically plausible expressions which are not used in actual metonymic reference for some reasons.
10 Which of course amounts to the ability to imitate sounds without comprehension.

the whole bird, some of the metonymies select different (more distant) vertices of the contiguity network than the proximity hypothesis B would predict. The networks behind the names in Table 1 are sketched in Table 2 (the vehicles selected are written in bold).[11]

English name	Contiguity network (partitive relations)	Distance in edges
blue-fronted amazon	BODY → HEAD → **FRONT (OF THE HEAD)**	2
yellow-headed amazon	BODY → **HEAD**	1
yellow-naped amazon	BODY → HEAD → **NAPE**	2
yellow-crowned amazon	BODY → HEAD → **CROWN**	2
red-crowned amazon	BODY → HEAD → **CROWN**	2
red-headed amazon	BODY → **HEAD**	1
red-spectacled amazon	BODY → HEAD → **RIM AROUND EYES**	2
yellow-shouldered amazon	BODY → WINGS → **UPPER RIM OF WINGS**	2

Table 2: Partitive relations in names of Amazon parrots

Table 2 shows that only in the case of *yellow-headed amazon* and *red-headed amazon* the vehicles are one edge away from the target. In all other examples more distant vertices are selected, which blatantly violates the proximity hypothesis B. This time it is impossible to resort to the explanation used in the analysis of (5), that is to claim that the "skipped" vertices are absent from the domain [OBSERVABLES], because all body parts included in Table 2 are observable.

The easiest way to deal with this unexpected selection of the vehicle is to evoke the *ceteris paribus* clause, that is to say that in this case "not all things are equal." By resorting to this clause, one would effectively say that there are some additional

11 I will ignore metaphorical projections in *yellow-crowned amazon* and *red-crowned amazon* (TOP OF THE HEAD IS CROWN), *red-spectacled amazon* (RIM AROUND THE EYES ARE SPECTACLES), and *yellow-shouldered amazon* (UPPER RIM OF THE WING IS SHOULDER). I will assume that the main function of these metaphors is delineating subpart of bird's body that do not have non-metaphoric equivalents or whose non-metaphorical equivalents are not used in everyday English. Under this interpretation, the metaphors make the subparts available for selection as vehicle concepts, but they do not interfere in any other way in the mechanism of the selection. For this reason, the presence of the metaphors can be ignored for the purposes of this article.

factors at play that interfere in the selection of the vehicle concept in such a way that the selection is no longer governed by the proximity hypothesis B. This provisional solution would defend the proximity hypothesis from outright falsification, but it would not provide any new insights into the matter of salience. Let us then take the analysis one step further and determine the factor responsible for the unpredicted selection of the vehicle. We will then use these insights to improve the proximity hypothesis.

Commonsensically, *yellow-crowned amazon* is the English name of *Amazona ochrocephala*, because only the top of the bird's head, i.e. the crown, is yellow. Thus, *yellow-crowned amazon* is simply more perceptually accurate than $^{+}$*yellow-headed amazon* as far as this particular species of parrot is concerned and it is this factor that overrides the proximity hypothesis. Yet in general, perceptual accuracy does not seem to be a crucial factor for motivating the way people refer to objects. The most typical example of overriding perceptual accuracy in establishing reference are expressions involving active zones (cf. Langacker 1987: section 7.3.4; Langacker 2008: section 10.2.5). For example, Langacker notices that "the yellow portion of a *yellow croquet ball* may be limited to a stripe around its circumference. In this case, the stripe is said to be the croquet ball's active zone with respect to the yellow relationship" (Langacker 2008: 103). More abstractly, the active zone mechanism allows for referring to objects via a property X, even though the property is not perceptually dominant in the target object. Consequently, perceptual accuracy could have been overridden by the active zone mechanism, which would give rise to $^{+}$*yellow-headed amazon*: the name compatible with the proximity hypothesis B. Thus, if $^{+}$*yellow-headed amazon* is cognitively plausible, why is *yellow-crowned amazon* used instead?

One possible answer is that *yellow-crowned amazon* is simply a conventionalized and entrenched exception to the proximity hypothesis B. This may well be the case, but this solution has at least two serious disadvantages. Firstly, it creates a precedent for automatic labeling of all expressions that do not comply with the proximity hypothesis as exceptions to the hypothesis. If this solution were adopted, almost all items from Table 2 would be discarded as unprincipled conventional exceptions,

which neither deserve, nor require any systematic explanation. This would be a handy strategy of defending the proximity hypothesis from falsification, but this would be an ad hoc solution. Secondly, the fact that so many expressions in Table 2 behave "exceptionally" suggests that perhaps the expressions are not so exceptional after all. It may be the case, that there is an additional factor at play, which brings some regularity into the data and can contribute to our understanding of vehicle selection. Explaining away the unexpected expressions as conventionalized exceptions may obscure this factor. Let us then try to find some deeper principle governing the names in Table 1.

An important "perceptual" fact is that all parrots have predominantly green plumage. For this reason, it may be argued that the problem of coining the appropriate name for the parrots in Table 1 consists in finding, what Bateson aptly calls, "the difference which makes a difference" (2000 [1972]:459) between the birds. Therefore, the salience of a potential vehicle of a metonymy is not determined merely by the distance within the network of partitive relations, but also by the need for discriminating between the birds effectively. A closer look at the birds in Table 1 reveals that the proximity hypothesis B in conjunction with the active zone mechanism cannot ensure this kind of salience. For example, if the proximity hypothesis B and the active zone mechanism were the only mechanisms determining salience, a yellow-headed amazon, a yellow-naped amazon, and a yellow-headed amazon would be all called *yellow-headed amazons*. The reason for this is that activation of an active zone would "extend" the color of one part of the head (the crown or the nape) to the whole head. This kind of extension by means of an active zone would indeed produce a name compatible with the proximity hypothesis B (the head is in an immediate partitive relation to the rest of the body), but it would not provide sufficiently fine-grained distinctions between different species of the parrots. One would simply refer to all three biologically and visually distinct species as $^{+}$*yellow-headed amazon*.

The constraint resulting from the need for effective metonymic reference is also recognized by Radden and Kövecses, who note that "[metonymy] may only arise

when the intended target is uniquely accessible" and "[the] greater the conceptual contrast between vehicle and target, the better is a relationship suited to be exploited metonymically" (both quotations from 1999:30). In the case of Amazonian parrots, selecting the concept closest to the target does not secure unique accessibility within the class of the birds, since it does not produce sufficient conceptual contrast between the vehicle and the target.

Yet even when the need for fine-grained perceptual distinctions does not interfere with the proximity hypothesis, speakers may still favor perceptual accuracy over partitive proximity. Consider the examples from Table 1 involving the color red. *Amazona viridigenalis* has two alternative names, *red-crowned amazon* and *red-headed amazon*, and it is distinguished from an *Amazona pretrei* called *red-spectacled amazon*. In the case of the former species, the metonymy in *red-headed amazon* selects the vehicle concept in compliance with the proximity hypothesis B and the active zone mechanism, but *red-crowned amazon* and *red-spectacled amazon* violate the proximity hypothesis. The incompatibility of *red-spectacled amazon* with the proximity hypothesis can be explained analogically to the "yellow" parrots discussed in the previous paragraph: selection of a less immediate vehicle is justified by the need of providing more detailed distinctions between various species of parrots. Yet why does the *red-crowned amazon* (incompatible with the proximity hypothesis B) still exist if *red-headed amazon* (compatible with the proximity hypothesis B) is already used as a name of this species? There are several plausible explanations, but perhaps the simplest one is that the items in Table 1 give rise to a local regularity in naming convention (perhaps even a local "constructional schema" in Langacker's nomenclature (cf. 2008: chapter 8)). This regularity consists in a tendency to use "parts of body parts" rather than "body parts" while coining names for Amazonian parrots. Of course, this is merely to say that *red-crowned amazon* is an exception after all, but an exception principled by the local regularity. This example shows limitations of the proximity hypothesis, but the word "limitations" is not meant to have negative connotations. Section 7 will discuss briefly the explanatory scope of the proximity hypothesis and stipulate that the hypothesis is not meant to be an

exceptionless covering law; instead, it is meant to capture a vast and non-trivial regularity in the process of vehicle selection, even if the regularity does not work across the board.

In order to incorporate some of the findings from the analysis of the Amazonian parrot names, the proximity hypothesis B has to be revised. The proximity hypothesis C includes the constraints of effective metonymic reference:

> **Proximity hypothesis C**: *Ceteris paribus*, within a network of contiguity relations inside a search domain, the preferred vehicle is the closest concept which ensures effective reference to the target. The preferred search domain is the domain of observables.

The proximity hypothesis C covers all the cases accounted for by the previous versions of the hypothesis and explains why certain vertices in contiguity networks sketched in Table 2 are "skipped" when the vehicle is selected. On this account, the vertices one edge away the target are omitted, because the metonymies based on them would not secure effective reference within the class of Amazonian parrots. Successful reference can be achieved when vehicles from the parts "further down" the partitive network are selected.

6. Cultural conventions

In a broad sense, culture defines, or at least heavily influences, all aspects of vehicle selection. To talk about responsibility in (6a), one needs to have a detailed understanding of the American political system and the prerogatives of the president. To make sense of *The ham sandwich is waiting for his check*, one needs to know how restaurants function. The sentence *The car screeched to a halt* would make no sense in cultures that do not use cars, like in 19th century Europe. Metonymies like *She's just a pretty face* are conventionalized to a large extent and they belong to the Anglophone culture by the virtue of the linguistic conventions.[12] In this sense, target and vehicle concepts, entire metonymic associations, and cognitive domains in which

12 This point was brought to my attention by Enn Veldi in a private conversation.

networks of contiguity relations arise are embedded in broadly understood cultural knowledge about the world. This section of the article investigates the role of culture in a narrower sense. The following case studies demonstrate how cultural factors influence vehicle selection when the proximity hypothesis C alone does not provide sufficient constraints on the process.

The role of culture is particularly evident when several potential vehicle are within the same distance from the target. Usually in such cases, the proximity hypothesis alone is not enough to determine the relative of potential vehicle concepts. One illustration of this kind of culture dependence is the metonymic association between LOVE and HEART predominant in Western culture, and LOVE and LIVER evident in the Bahasa Indonesian language. Linguistically, the contrast between these metonymies can be found in the English expression *broken heart* and its equivalent in the Bahasa Indonesian *patah hati* ('broken liver') (cf. Siahaan 2008; also Niemeier 2003). The difference between the metonymies cannot be explained by means of conceptual proximity alone, since both vehicles are within the same distance from the target within the network of contiguity relations. The difference cannot be accounted for by means of alternate selection of cognitive domains, because both vehicles are in the same domain [HUMAN BODY]. In the formalism proposed in this article, this mapping can be visualized as the target being connected to two equidistant vertices, both of which can be used as the vehicle of the metonymy (cf. Figure 7).

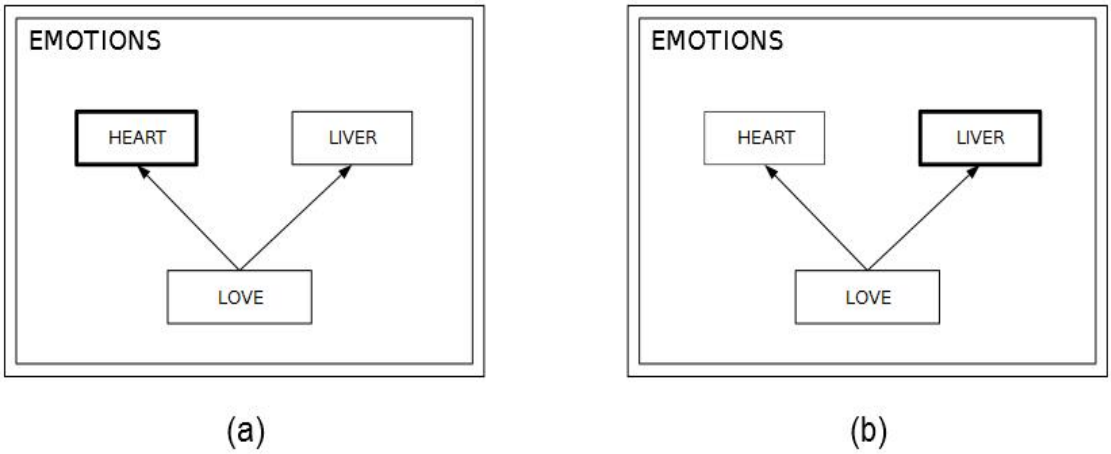

Figure 7: Network of culturally established associations in HEART/LIVER FOR LOVE

The most likely explanation of the choice of the vehicle is significance of the two organs is cultural factors. According to Siahaan, the selection of liver for the vehicle is motivated by the role attributed to the organ in traditional Indonesian rituals and beliefs, including divination techniques in local religions and "an animistic belief that the liver is the seat of life" (Siahaan 2008: 48). This contrasts with relative importance of the heart in pre-modern Western and Islamic cultures, where the heart was usually considered to be a seat of complex emotional and psychological process, while the liver was believed to perform "lower" biological functions like digestion (cf. Baig et al. 2007).

In the case of LOVE metonymies, cultural conventions are instrumental in "picking out" one of otherwise equivalent vertices of a contiguity network. Yet cultural factors may also influence the selection of the cognitive domain in which the network is established. Consider the English expression *fountain pen* and its Polish equivalent *wieczne pióro* ('eternal pen'). Both the nominal modifier *fountain* and the adjective *wieczne* 'eternal' refer to the writing device via a metonymy, but the two metonymies evoke different aspects of a pen's functionality. The English *fountain pen* is more in accordance with the proximity hypothesis C, because it activates [OBSERVABLES] as the search domain of the metonymy. The Polish *wieczne pióro* violates the proximity hypothesis in that it selects a more abstract domain capturing the functionality of the pen over an extended period of time: the pen is "eternal," because when the ink runs out, the pen can be refilled (and therefore used "eternally"). Nonetheless, the Polish expression complies with the proximity hypothesis in that it selects the vehicle from among the concepts in the vicinity of the target (cf. Figure 8).

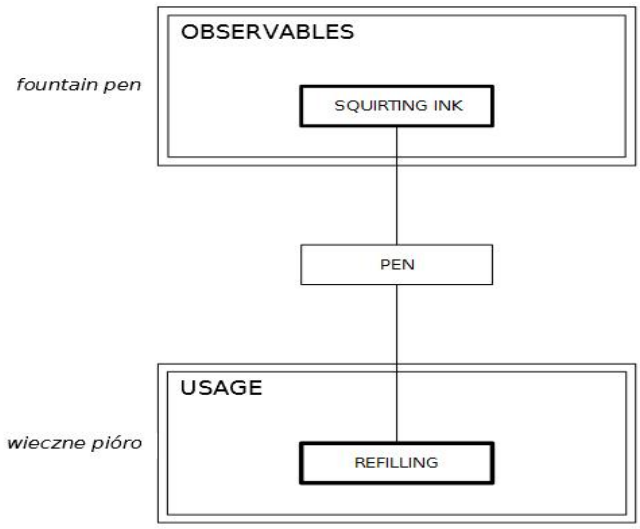

Figure 8: Network of "interactional" relations in *fountain pen/wieczne pióro*

The *fountain pen* example provides another opportunity for revising the proximity hypothesis. As already noted, the Polish *wieczne pióro* violates version C of the hypothesis, because refilling of the pen does not belong to the domain [OBSERVABLES]. Nevertheless, there is a sense in which observable facts and typical usage of physical objects belong together. Unsurprisingly, the common denominator is the Lakoff's and Johnson's experiential grounding. Of course, the conclusion that metonymies are grounded experientially is neither original, nor unexpected within the paradigm of cognitive linguistics (cf. Lakoff and Johnson 1980, Lakoff 1987, Lakoff and Johnson 1999). In the early days of the paradigm, Lakoff and Johnson stated explicitly that

> [experience] with physical objects provides the basis for metonymy. Metonymic concepts emerge from correlations in our experience between two physical entities (e.g. PART FOR WHOLE, OBJECT FOR USER) or between a physical entity and something metaphorically conceptualized as a physical entity (e.g. THE PLACE FOR THE EVENT, THE INSTITUTION FOR THE PERSON RESPONSIBLE). (Lakoff and Johnson 1980:59)

Beyond doubt, both observation and active physical manipulation of concrete objects may give rise to "systemic correlates within our experience" (Lakoff and Johnson 1980:58). These case study of *fountain pen* and *wieczne pióro* provides an opportunity to integrate experiential grounding the proximity hypothesis more explicitly:

> **Proximity hypothesis D:** *Ceteris paribus*, within a network of contiguity relations inside a search domain, the preferred vehicle is the closest concept which ensures effective reference to the target. The preferred search domain is the domain of direct sensory or physical experience.

7. Concluding remarks

The starting point of the article was a crude hypothesis about the mechanism of vehicle selection in metonymies. Throughout the article, a number of case studies were examined; some of them corroborated the hypothesis, and others challenged it. The falsifying examples were used to refine the proximity hypothesis up to the point where version D was proposed. This version is a significant improvement over the

initial hypothesis in terms of explanatory power (it covers more instances of metonymies) and epistemic content (it provides richer insights into the mechanisms of metonymy). The study should be concluded with several general points.

Firstly, the proximity hypothesis D is not to be treated as a "covering law" applying to all metonymies. Salience of one concept relative to other concepts is determined by many factors and what counts as salient for a particular conceptualizer in a particular situation cannot always be captured by a simple rule. More likely, the process of vehicle selection is a complex heuristics, in which many factors compete for predominance. One example of metonymies where the proximity hypothesis D fails to sufficiently constrain the selection of the vehicle is the English *broken heart* vs. the Indonesian *patah hati* ('broken liver') discussed briefly in Section 6. Even though these expressions are compatible with the proximity hypothesis D, the hypothesis fails to select a single vehicle concept from all plausible candidates. In this case, cultural conventions are needed to provide additional constraints. Nonetheless, the final version of the proximity hypothesis seems to capture an important part of the vehicle selection process and it allows for making accurate generalizations about many specific types of metonymies.

Secondly, it should be borne in mind that the proximity hypothesis D is not the final, definitive, or the best possible version. Even though the three revisions undertaken in the light of falsifying evidence helped to enhance the explanatory power of the hypothesis, further revisions may help to improve it even further. In principle, the *ceteris paribus* clause bulwarks the hypothesis against all falsifiers, because a researcher may simply claim that a piece of evidence is incompatible with the hypothesis as "not all things are the same in this case." This, however, would be at best an instance of poor research practice. Excessive and gratuitous use of the *ceteris paribus* clause would immunize the proximity hypothesis to falsification, but also to improvement. Metonymies challenging the hypothesis signal the presence of additional factors that influence the selection of the vehicle. It may be worthwhile to pay closer attention to these factors.

Thirdly, the study of metonymies in other semiotic systems could provide more

support and challenges to the proximity hypothesis. I (offhandedly) propose that metonymies in visual signs, comic books and graphic novels, sign languages, etc. are mostly compatible with the proximity hypothesis D, but this claim requires extensive testing. Perhaps, some evidence for the proximity may be provided by the analysis of indexical signs (in Peirce's (1998 [1894]) sense), since this type of signs is motivated by contiguity between the expression and the content. It seems plausible that the selection of salient concepts used as vehicles in metonymies and expressions of indexical signs is guided by the same cognitive mechanism operating along the lines of the proximity hypothesis.

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