CHAINED METONYMIES IN LEXICON AND GRAMMAR: A CROSS-LINGUISTIC PERSPECTIVE ON BODY PART TERMS

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1 Introduction

This paper investigates the construction of meaning through chained metonymies, which are metonymies that involve multiple conceptual shifts. Interest in the serial nature of metonymy goes back at least to Reddy (1979), who observed that expressions such as example (1) involve several metonymic mappings.

(1) *You'll find better ideas than that in the library.* (Reddy 1979: 309)[1]
ideas → words → pages → books

Reddy argues that hearers understand the sentence in (1) by inferring that ideas are expressed in words, printed on pages within books, which are found in libraries. More recently, several studies have taken up Reddy's observation (Nerlich and Clarke 2001, Geeraerts 2002, Ruiz de Mendoza and Diéz 2002, Barcelona 2003), showing its continuing relevance for cognitive linguistics. While these studies mostly focus on lexical chained metonymies, as found in idioms and other figurative expressions, a different strand of cognitively oriented work investigates the role of chained metonymies in grammar (Heine *et al.*1991, Bybee *et al*. 1994, Traugott and Dasher 2002). For example, Heine and Kuteva (2002: 129) suggest that Bambara *nyɛ́* 'eye' has grammaticalized into the temporal deictic marker 'before' through a chain of semantic shifts, as shown in (2).

(2) *à* *nà-na* *né* *nyɛ́* (Heine and Kuteva 2002: 129)
3SG come-PAST 1SG before
'She arrived before me.'
eye → face → front → before [2]

This paper investigates the nature of chained metonymies through a cross-linguistic survey of body part terms, and asks whether there are systematic differences between semantic extensions that lead to lexical and grammatical meaning. Body part terms have been identified as a productive source of figurative lexical meaning (Niemeier 2000, Deignan and Potter 2004, Hilpert 2006a, *inter alia*) as well as grammatical meaning (Heine *et al.*1991, Hollenbach 1995,

Matsumoto 1999, *inter alia*), which makes body lexis a fruitful point of departure for a comparison of different chained metonymies. The aim of the present analysis is to explore what serial metonymic mappings can be observed in semantic extensions of body part terms, and to identify the mappings that give rise to lexical and grammatical meaning.

The analysis is based on data from 76 languages, which represent a stratified probability sample of the world's languages (Bybee *et al*. 1994: 311).[3] Using bilingual dictionaries, the equivalents of English *arm*, *back*, *belly*, and thirteen other body part terms were looked up in order to identify the polysemous meanings of body part terms in these languages. For languages such as Khwe (Kilian-Hatz 2003), the entry for *back* lists secondary senses such as 'behind' and 'after', which are well-known examples of grammaticalization. However, we also find more unusual lexical semantic extensions, such as *arm* having the secondary sense 'elephant trunk' in Kanuri (Cyffer and Hutchison 1990), and *belly* denoting 'kangaroo pouch' in Wardaman (Merlan 1994). Most meaning extensions of body part terms can be shown to have a clear motivation through either metaphor or metonymy, as has been argued in many studies before (Allan 1995, Bowden 1991, MacLaury 1989, *inter alia*). All semantic extensions are pooled in a database to allow for the systematic analysis of metonymic and metaphoric mappings. This paper focuses on those extensions that appear to involve more than one conceptual mapping, and uses cross-linguistic evidence to motivate an analysis of these extensions in terms of chained metonymies.

Through the case study of body part terms, this paper addresses the more general questions whether lexical and grammatical chained metonymies involve different kinds of mappings, and whether different kinds of mappings tend to occur in different positions. Previous analyses (Goossens 2002, Taylor 2002) have argued on the basis of English data that metonymic mappings tend to precede metaphoric mappings, but as yet, these claims have not been empirically tested against cross-linguistic data. This paper is thus also intended as a contribution to the ongoing discussion about the interplay of metonymies and metaphors in the construction of meaning.

2 Chained metonymies

To introduce the notion of chained metonymies, a brief definition of metonymy is in order. In cognitive linguistics, metonymy is viewed a conceptual phenomenon, rather than a mere substitution of one word for another. Radden and Kövecses (1999: 21) thus define metonymy as the conceptual link between two entities in the same frame of reference:

> Metonymy is a cognitive process in which one conceptual entity, the vehicle, provides mental access to another conceptual entity, the target, within the same idealized cognitive model.

Radden and Kövecses go on to present a taxonomy of different metonymic relationships. Illustrating examples from English are given for the well-known examples PART FOR WHOLE and CAUSE FOR EFFECT, but also for less extensively discussed relationships such as PERCEPTION FOR THING PERCEIVED and SOUND FOR EVENT CAUSING IT. This paper uses the metonymic relationships proposed by Radden and Kövecses as a framework to analyze the meaning extensions encountered in the database, and aims to find regularities in the sequences of conceptual steps that lead to lexical and grammatical meaning.

Much like metaphor, metonymy is ubiquitous in language, as in fact in general reasoning (Gibbs 1999, Panther 2005). Common metonymic mappings such as PART FOR WHOLE or CAUSE FOR EFFECT underlie everyday expressions like (3) and (4), which mean more than they literally state.

(3) *We need some new faces around here.* (Lakoff and Johnson 1980)
body part → person

(4) *General Motors had to stop production.* (Panther and Thornburg 2003: 11)
obligation to act → action

In (3), a body part stands for an entire person. Example (4) means that production was actually stopped, hence the obligation to carry out an action stands for the action itself. These conceptual shifts are achieved by metonymic mappings, which can be viewed as routine mental strategies of constructing meaning.

Chained metonymies involve more than one conceptual shift. In example (5), one single metonymic mapping seems insufficient to account for the meaning that is constructed from the utterance. A rough paraphrase of (5) would be that Bob presented some interesting ideas.

(5) *Bob gave an interesting paper.*
material → writing → ideas

Nothing in principle disallows a single metonymic mapping that has the material ‘paper’ directly stand for ‘ideas’. However, the chained metonymy suggested in (5), which maps ‘paper’ onto

'writing', which in turn stands for the expressed 'ideas', has several theoretical and empirical advantages (Hilpert 2006b). A theoretical argument in favor of chained metonymies is that these chains break up complex conceptual mappings into simple, well-motivated mappings with a strong experiential basis. The associations of 'paper' with 'writing' and 'writing' with 'ideas' emerge from everyday experience. Conversely, the association of 'paper' and 'ideas' is indirect, mediated only through the experience of reading and writing. A similar point is made by Grady (1997: 287), who argues for the decomposition of complex metaphors into basic metaphors which have a stronger experiential motivation.

While this theoretical evidence motivates an analysis in terms of a chained metonymy, it does not sufficiently constrain the analysis. How many links should realistically be posited in a chained metonymy? To justify intermediate links between vehicle and target, empirical evidence needs to be taken into consideration. The first empirical constraint is that all intermediate links should represent attested, authentic expressions. The chained metonymy in (5) presupposes the existence of examples such as (6), in which *paper* stands for 'writing'.

(6) *Bob found a typo in his paper.*
material → writing

The constraint of productive intermediate links thus requires independent evidence for each metonymic mapping that is posited. If such evidence is sparse or absent, a single metonymic mapping should be preferred as the more parsimonious analysis.

A second empirical constraint concerns the polysemy that is found with certain metonymic expressions. The chained model predicts that polysemous expressions convey meanings that correspond to adjacent links in the chained metonymy. Consider the following examples.

(7) *I have an eye on that new Powerbook.*
eye → vision → attention → desire

(8) *Could you have an eye on the kids while I'm out?*
eye → vision → attention

The English expression *have an eye on NP* is polysemous, conveying 'desire' in (7) and 'attention' in (8). The chained model naturally accounts for this polysemy, since people are

paying attention to the things they desire. An analysis in terms of a single metonymic mapping would fail to capture this generalization. Again, experiential motivation favors the chained model.

A third empirical constraint on chained metonymies is particularly relevant to the methodology of this paper. The chained metonymy in (7) makes the prediction of a cross-linguistic implicational hierarchy. Specifically, it predicts that if a language has a meaning extension of the body part term *eye* to the concept 'desire', the body part term should also have been extended to the meanings of 'vision' and 'attention'. If these extensions are absent, the analysis in terms of a chained metonymy is doubtful.

To summarize, while there is broad agreement in the field that chained metonymies do in fact exist, the respective analyses need to be constrained. Experiential motivation, productivity of intermediate links, polysemy across adjacent links, and cross-linguistic attestation of intermediate links are the constraints that guide the present analysis.

3 Body part terms and their chained metonymies

3.1 Methodology

This study explores semantic extensions of body part terms with the aim of identifying cross-linguistically common serial metonymic mappings. Special interest is devoted to the distinction between lexical and grammatical meaning, and how different mappings may give rise to each respective type. It goes without saying that the distinction between lexical and grammatical is not unproblematic. For the present purposes, grammatical meaning is defined as the instantiation of a functional category such as aspect or modality, as well as deictic reference to temporal, spatial, and interpersonal relations (Heine and Kuteva 2002: 15). By exclusion, lexical meaning is defined as the remaining semantic space. The starting point of the study is the list of sixteen body part terms that is given in (9).[4]

(9) arm, back, belly, buttocks, ear, eye, face, finger, foot, forehead,
hand, head, heart, jaw, mouth, tongue

The equivalents of these English terms were looked up in bilingual dictionaries that represent a sample of 76 languages. For each entry, it was determined whether the body part term was used to convey secondary senses. A dictionary entry from Ma'di (Blackings 2000: 68) is shown in (10).

(10) mī *noun* 1. eye 2. a haunting spirit: mī nā ká nyì ko rá *the spirits will haunt or afflict you*, mī àko *blind*, mī āko *blindness*, mī ‘bí *eyelash*, mī īnggwɛ *flirtation*, mī īnì *seriousness*.

From this entry, the semantic extensions of *eye* for Ma’di are entered in the database as *spirit*, *blind*, *flirtation*, and *seriousness*. The meaning *eyelash* is disregarded, because its component parts are semantically transparent. By contrast, the component parts of ‘mī àko’ *blind* literally mean *without eyes*, such that the targeted meaning is more specific than what is literally stated. Likewise, the component parts of ‘mī īnggwɛ’ *flirtation* literally mean *bright eyes*, which also underspecifies the targeted meaning. While these secondary senses are metonymically motivated, none of them appear to be related to each other through a chained metonymy. Also, none of them convey grammatical, functional meaning. The Ma’di term for *back* (Blackings 2000: 81), however, exhibits grammatical meaning extensions that suggests a chain of semantic extensions. The lexical entry is given in (11).

(11) ògū *noun* the back of a thing; back. ‘bārá nikā ògū gá *carrying a child on the back*, ògū nā opí ‘i *Opi was born after her*.
ògū *postposition* behind, at the back.
ògū *adverb* next to come; after this or that.

From this entry, the semantic extensions *back part*, *behind*, and *after* are entered into the database. Arguably, these senses are closely related. It has been argued that body part terms such as *back* first develop into object part lexemes, then grammaticalize into deictic spatial markers, and from there on acquire temporal meaning (Heine *et al*.1991: 66, Matsumoto 1999: 22). The proposed sequence of meaning extensions is shown in (12).

(12) *ògū nā opí ‘i* (Blackings 2000: 81)
‘Opi was born after her.’
back → back part → behind → after

The semantic changes are motivated by metaphor and metonymy. The first step involves the metaphor OBJECTS ARE HUMAN BEINGS, such that inanimate objects can be said to have a back. This conceptual metaphor is traditionally known as *personification*. The next step is metonymic,

being based on the contiguity relationship between a part of an object and the area towards which it is oriented. This mapping can be called the PART FOR ORIENTATION metonymy.[5] The final step in the chain is again metaphoric, drawing on the metaphor TIME IS SPACE. The chain of meanings in (12b) predicts that if a language has a meaning extension of the body part term *back* to the temporal concept *after*, the meanings of *behind* and *back part* should also be present. The lexical entry from Ma'di dovetails with the sense development as proposed by Heine and colleagues, but it is an empirical question whether all languages with a temporal meaning of *back* display the same polysemy, or whether some languages actually derive the meanings *behind* or *after* directly from the human body part. The present study thus aims to provide the study of chained metonymies with a sound basis of cross-linguistic data.

While data from dictionaries provide much useful information, they cannot replace native speaker intuition, let alone knowledge of a language's history. It is hence beyond the scope of this paper to discuss grammaticalization processes that were accompanied by morpho-phonological reduction. Cases in which the morphological substance of a body part term has been altered, or in which it has been reduced to a grammatical affix go unnoticed by the current methodology, unless the dictionary compilers included a reference under the entry of the full lexical form. Another caveat concerns the fact that dictionary compilers may have left out a secondary sense which actually exists in the language. Since this is a realistic possibility, generalizations in this paper will not be made from the singular presence or absence of entries in individual dictionaries, but preferably from convergent evidence that reflects the characteristics of more than one language. As a last qualification, dictionaries do not offer much information about the syntactic behavior of their entries. Corpus-based studies of figurative language (Deignan and Potter 2004, Hilpert 2006a) have shown that collocation and colligation patterns are instrumental in the disambiguation of polysemous elements. Information of this kind is not provided here.

Despite these caveats, a comprehensive collection of meaning extensions of body part terms yields potentially instructive insights in three ways. First, it makes it possible to determine what lexical and grammatical concepts are typically targeted, and which of these targets tend to be co-present in the investigated languages. Second, the observed implicational hierarchies show that some metonymic extensions are semantically dependent on other extensions, thereby suggesting a chained metonymy. Finally, the pool of different chained metonymies encountered in the database can be used to draw generalizations about the nature of serial metonymy and meaning extension in general.

3.2 Results

Virtually every language investigated in the survey exhibits a rich set of semantic extensions of body part terms, underscoring the importance of the human body for lexical and grammatical structure (Lakoff and Johnson 1999). Most extensions are motivated through metaphor and metonymy. Very frequently, the term for *eye* refers to 'vision' through the INSTRUMENT FOR ACTION metonymy, and *arm* refers to 'branch' through the PLANTS ARE HUMAN BEINGS metaphor. With some body parts, it cannot be readily decided whether a secondary sense is truly an extension, or whether the term is simply vague to begin with. In twenty-six languages of the sample, the term for *hand* can refer to 'arm' and vice versa. In another twenty, the term for *finger* also means 'toe'. In forty languages, the term for *foot* can refer to a 'leg'. While this kind of multifunctionality is readily explained in terms of metonymy, it is hard to determine which sense is more basic and which is the extension. For the present purposes, these body part terms are thus assumed to be vague. Table 1 presents the most frequent semantic extensions of body part terms.[6]

Table 1: The most frequent extensions from body part terms

BODY PART	EXTENSION (in number of languages)
arm	hand (31), sleeve (12), branch (11), wing (9), handle (7), shoulder (5), strength (5)
back	back part (42), BEHIND (32), AFTER (12), spine (8), to turn (7), support (7), last (5)
belly	pregnancy (15), INSIDE (8), defecate (4), diarrhea (4), character (4), emotions (4)
buttocks	anus (15), back part (7), BEHIND (5), bottom part (4), hip (4)
ear	hearing (30), deaf (24), handle (6), attention (6), ignore (6), mushroom (5)
eye	vision (39), blind (17), attention (14), glasses (7), tear (7), jealous (6), knot (5)
face	front (15), IN FRONT OF (8), countenance (7), appearance (6), expression (5)
finger	toe (20), hand (10), to point (5), ring (4), arm (3), measure (3)
foot	leg (40), measure (11), footprints (10), walk (9), base (8), wheel (6), step (6)
forehead	front (10), brow (6), face (5), top (3), cliff (3), IN FRONT OF (3), BEFORE (2)
hand	arm (26), handle (7), finger (7), power (6), sleeve (6), FIVE (6), help (5)
head	top part (19), hair (11), intellect (10), beginning (10), chief (10), summit (8)
heart	emotions (26), character (8), core part (7), center (6), courage (6), mind (6)
jaw	chin (17), cheek (8), slope (2)
mouth	speech (32), opening (19), edge (11), speech act (9), entrance (8), beak (7)
tongue	speech (26), lick (7), speech act (6), blade (2), word (2)

The table shows that on the whole, lexical extensions are much more frequent than grammatical extensions. However, a number of grammatical extensions occur with such frequency that they represent one of the most typical extensions for the respective body part term. The well-known spatial and temporal extensions of *back* and *forehead* are a case in point. Several other grammatical extensions are not frequent enough to be shown in the table, but will be discussed below.

3.2.1 {back, buttocks} → back part → behind → after

A chain of extensions from *back* to the grammatical meaning 'behind' is found in thirty-seven languages of the sample.[7] This number reflects the universality of this well-known grammaticalization process. Fourteen of those languages extend the meaning of 'behind' further to 'after'.[8] Corroborating the prediction of Heine *et al*.(1991) and Matsumoto (1999), all of those languages have the extension 'back part'. This justifies the chain of meaning extensions that was discussed above with example (12) from Ma'di. Structurally, this chain begins with the metaphor OBJECTS ARE HUMAN BEINGS, continues with the PART FOR ORIENTATION metonymy, and closes with the metaphor TIME IS SPACE.

A semantic development that unfolds in parallel to the above chain starts with the term for *buttocks*, and proceeds in the same steps as above. This process is not as frequently observed as the extension of *back*. Only five languages of the sample have the extension from *buttocks* to 'behind', one of which further extends it to 'after'.[9]

3.2.2 back → back part → behind → {follow, support}

Two lexicalization chains are conceptually dependent on the extension from *back* to *behind*. In five languages, this meaning is further extended to the activity *follow*.[10] This development is interesting from a theoretical perspective, since it appears to map a grammatical meaning back onto a lexical target. A number of authors (Heine *et al*. 1991, Lehmann 1995) explicitly reject the notion of degrammaticalization, but several counterexamples to strict unidirectionality challenge strong versions of this position (Campbell 2001: 127). The present example suggests that grammatical forms may indeed spawn off new lexical forms, while the grammatical form itself can stay grammatical. Similar changes can be observed to occur in English (e.g. *no ifs, ands, and buts*, cf. Heine 2003: 166). Whether or not these are true instances of degrammaticalization will be left to future debate.

The extension from *behind* to *follow* maps a deictic position onto an associated activity through what may be called the PLACE FOR ACTION metonymy. The metonymy is experientially

motivated, as certain places and positions are associated with matching activities. People who lead do so in the front, whereas people who follow are behind. Radden and Kövecses (1999: 42) point out that this metonymy is reflected in the English expression *I was behind the wheel all day*. Of the five languages that exhibit the described chained metonymy, four also have the extension from *behind* to *after*. Despite the close connection of spatial and temporal sequence, the cross-linguistic evidence suggests that these extensions are in fact independent, because a number of languages have just one of them.

The second chain that develops out of the extension from *back* to *behind* extends it to the meaning of *support* in seven languages.[11] Like the above example, this chain re-lexicalizes a grammaticalized form. The semantic extension from *behind* to *support* is again motivated through the PLACE FOR ACTION metonymy. The presence of people behind oneself in conflict or other tasks can be readily extended to the notions of help and support. Walsh (1994: 360) identifies this extension in expressions from Murrin-Patha and compares them to English examples such as *You have to back your mates*, underscoring the wide currency of this sense development.

For both this chain and the previous one, a direct mapping of 'back part' onto the respective activities would make them ordinary instances of lexicalization, rather than putative examples of degrammaticalization. However, in both cases the deictic position of the followers and supporters seems to be an integral semantic component. In addition, the fact that in all languages with these extensions the meaning of 'behind' is a conventionalized sense of *back* constitutes independent evidence for the latter view.

3.2.3 belly → inside part → inside → {inclusive, during}

An extension from *belly* to the grammatical meaning 'inside' is found in nine languages of the sample.[12] Like the extension of *back*, this change maps a body part term onto a deictic location. It is first extended to denote the 'inside part' of not only humans but also objects, and from there on assumes the function of a spatial adposition. Again, the OBJECTS ARE HUMAN BEINGS metaphor and PART FOR ORIENTATION metonymy motivate the semantic extension. As suggested by Heine *et al*. (1991: 130), the extension of *belly* onto a spatial concept is less frequent than the extension of *back*.

In the languages Hausa and Ngizim, *belly* has further grammaticalized into an inclusive marker, meaning 'one member within a set'. This meaning is motivated through the metaphor CATEGORIES ARE CONTAINERS (Lakoff and Johnson 1980). Example (13) illustrates this meaning.

(13) *gayi da kunu-k mainaucin Ngwajin* (Schuh 1981: 98)
one from belly-LINK prince.PL Ngwajin
'one of the princes of Ngwajin'
belly → inside → inclusive

Another extension found in Ngizim gives *belly* a temporal interpretation, which is rendered by Schuh (1981:99) as 'be engaged in'. The element functions as a temporal preposition that co-occurs with nouns that denote activities, as illustrated in example (14).

(14) *jàa kunu tləri* (Schuh 1981: 99)
1PL belly battle
'We were engaged in battle.'
belly → inside → during

While found only once in the sample, this mapping is well motivated through the metaphor TIME IS SPACE (Lakoff and Johnson 1980), which is very wide-spread. Heine and Kuteva (2002: 179) report numerous cases of extensions from spatial to temporal containment in different languages.

As a side note, the cross-linguistically common lexical extensions from *belly* to 'emotions' and 'character' seem to be independent from the conceptualization of the stomach as a container. Languages such as Rendille or Selepet associate 'anger' with the belly, but do not seem to conceptualize this emotion as a contained fluid (cf. Lakoff and Johnson 1980). Basque and Nandi attribute the character trait 'greed' to the belly, but lack the extension 'inside'.

3.2.4 belly → pregnancy → offspring

Cross-linguistically, the most common lexical extension of *belly* is 'pregnancy', often in expressions that literally mean 'big belly'. Of the fifteen languages that have this extension, Basque and Tahitian extend that meaning further to 'offspring'. These senses must be seen as conceptually dependent; no language without the first extension exhibits the second lexicalization. The first step in the chain is motivated by the CONTAINER FOR CONTAINED metonymy, as the womb contains the fetus. The second step can be viewed as a CAUSE FOR EFFECT metonymy, since progeny is the end result of pregnancy.

3.2.5 ear → hearing → {attention, disregard, obedience, hearsay}

Thirty languages of the sample map *ear* onto 'hearing' through the INSTRUMENT FOR ACTION metonymy. Many of these further extend the meaning onto more specific lexical concepts that stand in contiguity relationships with auditory perception.

In eighteen languages, the body part term *ear* stands for the concept of 'attention'.[13] This is arguably more specific than 'hearing', since it involves deliberate action on the part of the perceiver. Also, paying attention need not actually involve auditory perception. In English, one can *lend an ear to the needs of the community* without necessarily being able to hear. The PERCEPTION FOR ATTENTION metonymy thus maps a subconscious process onto a conscious mental activity. The mirror image of this meaning extension is the target 'disregard', which is precisely the absence of attention. It is found in Hausa, Kristang, Lushai and Tagalog. The same metonymies apply, but the interpretation is inversed. An alternative possibility to derive this meaning would be from the common lexical extension 'deaf', which occurs in twenty-four languages. However, of the four mentioned languages only Lushai has this sense of *ear*, which makes this derivation an unlikely possibility.

The languages Balti, Hani, Kyaka Enga, and Selepet map *ear* onto 'obedience', which is motivated through the CAUSE FOR EFFECT metonymy. The result of 'obedience' shows that the perception of a command has had a tangible effect.

In five languages, 'hearing' is further extended to mean 'hearsay'.[14] Here, an action stands for an associated object, which in this case is that which is perceived . The ACTION FOR OBJECT metonymy (Radden and Kövecses 1999: 37) underlies for example English de-verbal nouns such as *a drink* or *a bite*, and can be viewed as the motivation for this particular extension.

3.2.6 eye → vision → {attention, beauty}

Thirty-nine languages of the sample associate *eye* with 'vision' through the INSTRUMENT FOR ACTION metonymy. Two lexical extensions appear to be conceptually dependent on this mapping, extending it to 'attention' and 'beauty' respectively.

In fourteen languages, the term for *eye* stands for 'attention'.[15] Much as in the example of auditory perception, the concept of 'vision' maps onto 'attention' through the PERCEPTION FOR ATTENTION metonymy. There is considerable overlap between the languages that target this meaning via either of the two perceptual organs. Eleven out of the eighteen and fourteen respective languages use both *ear* and *eye* to denote 'attention'.

In Basque, Bokobaru, and Busa, expressions with *eye* convey the meaning 'beauty'. The English expression *eye candy* may serve as a comparison here. The notion of a perceived quality

presupposes the idea of perception, and hence the PERCEPTION FOR THING PERCEIVED metonymy (Radden and Kövecses 1999: 38).

Cross-linguistically, lexical extensions from *eye* to emotional and dispositional concepts are often encountered. Twenty languages of the sample associate *eye* with concepts such as 'jealousy', 'desire', 'hate', or the proverbial 'evil eye'.[16] Since only eleven of these languages extend *eye* to mean 'vision', the evidence does not permit an analysis of these mappings as chained metonymies.

3.2.7 {face, forehead} → front → in front of → {before, after}

The semantic development from *face* to spatial and temporal adpositions has been recognized as a common grammaticalization path, but it appears to be less common than the extension of *back*. A suggestion to this effect has been made in Heine *et al*. (1991: 130). While twenty languages of the sample extend face to 'front' via the OBJECTS ARE HUMAN BEINGS metaphor, only nine languages further apply the PART FOR ORIENTATION metonymy to derive the spatial meaning 'in front of'.[17] With *back*, the analogous process can be observed in thirty-seven languages. Interestingly, the subsequent mapping via the TIME IS SPACE metaphor in six languages yields the interpretations of either 'before' or 'after'. While the languages Guarani and Lushai map the space in front onto anteriority, the reverse happens in Bokobaru, Hiri Motu, Karok, and Ma'di.

The body part term *forehead* also serves as a source for the developments discussed above, albeit less frequently so. Only Ge'ez, Hausa, and Kongo derive a spatial adposition from *forehead*. All three languages further extend it to a temporal meaning. In Ge'ez and Hausa we find the meaning 'before', whereas Kongo has the meaning 'after'.

3.2.8 head → top part → {over, beginning, end}

Twenty languages of the sample generalize *head* to 'top part' through the OBJECTS ARE HUMAN BEINGS metaphor, which has been observed earlier with *back*, *face*, and *forehead*. Similar to those body part terms, *head* takes on the grammatical meaning of 'over' through the PART FOR ORIENTATION metonymy, but this development is restricted to Finnish, Kurdish, and Ma'di. There is no temporal extension of this spatial concept. More common targets are the lexical concepts 'beginning' and 'end', which are observed in eleven and eight languages respectively.[18] The extension of *head* to mean any extreme object part regardless of spatial orientation is accomplished through the MEMBER OF A CATEGORY FOR THE CATEGORY metonymy (Radden and Kövecses 1999: 34).

3.2.9 {mouth, tongue} → speech → {speech act, word}

Both of the body part terms *mouth* and *tongue* are tightly associated with language cross-linguistically. Since language is a multifaceted phenomenon that comprises both speech, writing, and meaning, it cannot be precisely determined what individual dictionary entries mean by it. In order not to overinterpret the dictionary compilers, the sense 'language' has been collapsed into the sense 'speech' in the present analysis.

Thirty-two languages of the sample extend *mouth* to the lexical concept 'speech' through the INSTRUMENT FOR ACTION metonymy. Of these, nine languages have secondary targets of various speech acts, such as 'agreement' (Basque), 'gossip' (Maidu), or 'exaggeration' (Efik).[19] The relation between speech in general and these speech acts in particular is captured by the MEANS FOR ACTION metonymy (Radden and Kövecses 1999: 37). Speech is the means to accomplish a wide range of social activities, so the metonymy has a strong experiential motivation. The body part term *tongue* undergoes the exact same developments with comparable frequency. Twenty-six languages have the extension of 'speech', and six of these have the additional meanings of different speech acts.

An infrequent lexical extension of both *mouth* and *tongue* is 'word', which is also dependent on the intermediate step of 'speech'. Efik and Sedang derive the concept from *mouth*, while Inuktitut and Zapotec derive it from *tongue*. Like the idea of language, the idea of a word is fairly complex. For the present purposes, it is taken to mean the Saussurean symbolic relation of a string of sounds with a concept. The mapping of 'speech' onto such a form-meaning pair thus constitutes what Radden and Kövecses (1999: 24) call the FORM FOR CONCEPT metonymy.

4 Discussion

In the introduction it was asked whether systematic differences obtain between serial conceptual mappings that lead to lexical and grammatical meaning respectively. The survey of body part terms yields that most serial extensions begin with one of two conceptual steps, namely the OBJECTS ARE HUMAN BEINGS metaphor or the INSTRUMENT FOR ACTION metonymy. From there on, semantic extensions are motivated by a wider variety of metonymic and metaphorical mappings. The main difference between lexical and grammatical targets in the database concerns their initial conceptual mappings. Table 2 shows that the most important initial mapping for lexical extensions is the INSTRUMENT FOR ACTION metonymy. Less frequent starting points for

lexical extensions are the OBJECTS ARE HUMAN BEINGS metaphor, and the CONTAINER FOR CONTAINED metonymy.

Table 2: Serial extensions onto lexical meanings

OBJECTS ARE HUMAN BEINGS > PART FOR ORIENTATION > PLACE FOR ACTION
back → back part → behind → {follow, support}
CONTAINER FOR CONTAINED > CAUSE FOR EFFECT
belly → pregnancy → offspring
INSTRUMENT FOR ACTION > PERCEPTION FOR ATTENTION
ear → hearing → attention
ear → hearing → disregard
eye → vision → attention
INSTRUMENT FOR ACTION > CAUSE FOR EFFECT
ear → hearing → obedience
INSTRUMENT FOR ACTION > PERCEPTION FOR THING PERCEIVED
ear → hearing → hearsay
eye → vision → beauty
OBJECTS ARE HUMAN BEINGS > MEMBER OF A CATEGORY FOR THE CATEGORY
head → top part → {beginning, end}
INSTRUMENT FOR ACTION > MEANS FOR ACTION
{mouth, tongue} → speech → speech act
INSTRUMENT FOR ACTION > FORM FOR CONCEPT
{mouth, tongue} → speech → word

As is well-known, body part terms frequently develop into grammatical markers of spatial relations. Semantically, this development is dependent on the personifying metaphor OBJECTS ARE HUMAN BEINGS. Table 3 shows that in fact all targeted grammatical meanings make use of this metaphor in a first conceptual step. Of equal importance is the PART FOR ORIENTATION metonymy, which maps the meaning of object parts onto projected areas. The resulting spatial meaning may be further extended metaphorically.

Table 3: Serial extensions onto grammatical meanings

OBJECTS ARE HUMAN BEINGS > PART FOR ORIENTATION > TIME IS SPACE
back → back part → behind → after
belly → inside part → inside → during
{face, forehead} → front part → in front of → {before, after}
OBJECTS ARE HUMAN BEINGS > PART FOR ORIENTATION > CATEGORIES ARE CONTAINERS
belly → inside part → inside → inclusive
OBJECTS ARE HUMAN BEINGS > PART FOR ORIENTATION
head → top part → over

The difference between the two tables illustrates how body parts can be conceptualized in two basic ways. On the one hand they metaphorically evoke spatial relations, on the other, they metonymically stand for activities and their associated concepts. It is worth noting that also the secondary extensions in Table 2 are exclusively metonymic in nature. While the metaphorical conceptualization of body part terms thus commonly leads to grammatical meaning, the metonymic conceptualization accounts for a wide range of lexical concepts.

5 Conclusion

The semantic analysis of body part terms in cognitive linguistics has yielded a plentitude of insights, to which the present analysis makes a small contribution with respect to serial conceptual mappings. The observed data confirm earlier observations (Goossens 2002, Hilpert 2006b) that extensions are much more frequently simple than serial. In the investigated sample of languages, body part terms such as *foot*, *hand*, and *heart* give rise to a wealth of figurative meanings, but do not project serial extensions. With respect to such series of mappings, both Taylor (2002: 342) and Goossens (2002: 367) report that metonymies based on metaphors are rare in their data, which comprises English dictionaries and corpora. In the present analysis, such mappings are indeed found rarely for lexical targets, but the extension of body part terms onto spatial relations appears to be metaphorically based. Since this semantic development is robustly attested cross-linguistically, it is probably not the purported exception. The observed differences between the mappings of body part terms onto lexical and grammatical meanings provide a hypothesis that hopefully future research will test against other semantic domains.

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Notes

[1] Linguistic examples in this paper are cited along with their published source. If such a reference is absent, the example has been constructed by the author.

[2] The last step in the semantic development is actually not metonymic, as it involves the conceptual metaphor TIME IS SPACE (Lakoff and Johnson 1980).

[3] The sampling method employed by Bybee *et al*. (1994) represents all language families and subbranches in proportion to their respective sizes. While this paper adopts the general sampling scheme, the actual languages were chosen based on the availability of comprehensive bilingual dictionaries. The sampled languages are: Aitchin, Alabama, Anejom, Anywa, Awa, Balti, Bantawa, Basque, Bokobaru, Busa, Carolinian, Cayuga, Chantyal, Chechen, Danish, Delaware, Efik, Finnish, Ge'ez, Greek, Guarani, Hani, Hausa, Hiri Motu, Hopi, Ilocano, Inuktitut, Iraqw, Kanuri, Karok, Kayardild, Khwe, Koiari, Kolami, Kongo, Koyukon Athabaskan, Kristang, Krongo, Kurdish, Kwoma, Kyaka Enga, Lushai, Ma'di, Maidu, Mandarin, Mara, Marshallese, Nandi, Nez Perce, Ngizim, Oneida, Pahlavi, Piro, Puget Salish, Rendille, Rhade, Sedang, Selepet, Senoi, Shona, Southern Sierra Miwok, Spanish, Tagalog, Tahitian, Thao, Tohono O'odham, Tümpisa Shoshone, Turkish, Uzbek, Vietnamese, Wardaman, Yir-Yoront, Yogad, Yoruba, Yugambeh, and Zapotec. Full bibliographical reference to the dictionaries and a key to the genetic affiliations of the above languages can be found at <http://www.ruf.rice.edu/~hilpert/metonymy>. The reference section of this paper only includes sources that are cited in the body of the text.

[4] As a typographical convention, body part terms such as *back* or *eye* are rendered in *italics* when they refer to a linguistic form of either English or some other language. Semantic extensions of body part terms, such as 'behind' or 'attention' are rendered in 'single quotes'. Conceptual metaphors and metonymies, as for example PART FOR WHOLE, are presented in SMALLCAPS.

[5] Radden and Kövecses do not include the PART FOR ORIENTATION metonymy in their survey, and I am presently not aware of any other study that explicitly mentions it. Heine et al. (1991: 123) even characterize the mapping of body part terms onto locative meaning as metaphorical, and invoke an 'OBJECT TO SPACE metaphor' as the underlying motivation. This study advances an analysis in terms of metonymy, because the relationship of an object part and its functional orientation is based on contiguity rather than similarity.

[6] In Table 1, lexical concepts are rendered in lower case, while grammatical concepts are presented in SMALLCAPS.

[7] The languages that extend *back* to 'behind' are Balti, Bantawa, Bokobaru, Busa, Chantyal, Danish, Efik, Ge'ez, Guarani, Hausa, Ilocano, Inuktitut, Kayardild, Khwe, Koiari, Kolami, Kongo, Kurdish, Kyaka Enga, Lushai, Ma'di, Maidu, Mandarin, Marshallese, Nez Perce, Oneida, Pahlavi, Sedang, Selepet, Tagalog, Thao, Turkish, Wardaman, Yir-Yoront, Yogad, Yoruba, and Zapotec.

[8] The languages that extend *back* to 'after' are Busa, Chantyal, Hausa, Khwe, Kolami, Kurdish, Kyaka Enga, Lushai, Ma'di, Marshallese, Nez Perce, Selepet, Thao, and Zapotec.

[9] The languages that extend *buttocks* to 'behind' are Aitchin, Danish, Koyukon Athabaskan, Oneida, and Rhade, Koyukon Athabaskan also has the extension to 'after'.

[10] The languages that extend *back* to 'follow' are Bantawa, Chantyal, Hausa, Kolami, and Lushai.

[11] The languages that extend *back* to 'support' are Danish, Efik, Hausa, Kurdish, Oneida, Pahlavi, and Turkish.

[12] The languages that extend *belly* to 'inside' are Guarani, Hausa, Kanuri, Kayardild, Kurdish, Ma'di, Ngizim, Tohono O'odham, and Zapotec.

[13] The languages that extend *ear* to 'attention' are Balti, Busa, Chechen, Danish, Finnish, Greek, Hani, Hausa, Ilocano, Iraqw, Khwe, Kristang, Kurdish, Piro, Rendille, Tagalog, Turkish, and Yogad.

[14] The languages that extend *ear* to 'hearsay' are Chechen, Danish, Hausa, Kristang, and Turkish.

[15] The languages that extend *eye* to 'attention' are Busa, Chechen, Danish, Finnish, Greek, Guarani, Hani, Hausa, Ilocano, Kurdish, Kyaka Enga, Rendille, Spanish, and Yogad.

[16] The languages that extend *eye* to emotional and dispositional concepts are Basque, Bokobaru, Chechen, Ge'ez, Greek, Hani, Ilocano, Iraqw, Kristang, Kyaka Enga, Ma'di, Pahlavi, Sedang, Selepet, Thao, Turkish, Wardaman, Yoruba, and Yugambeh.

[17] The languages that extend *face* to 'in front of' are Balti, Bokobaru, Busa, Guarani, Hiri Motu, Karok, Lushai, Ma'di, and Sedang.

[18] The languages that extend *head* to 'beginning' are Aitchin, Efik, Hausa, Kristang, Kurdish, Mandarin, Pahlavi, Turkish, and Uzbek. Awa and Balti have this extension despite no indication of the extension 'top part' in the respective dictionaries. The languages that extend *head* to 'end' are Aitchin, Finnish, Khwe, Kolami, Kongo, Mandarin, Pahlavi, and Turkish.

[19] The languages that extend *mouth* to speech act meanings are Balti, Basque, Busa, Efik, Kurdish, Kyaka Enga, Ma'di, Maidu, and Mandarin. The languages that extend *tongue* to speech act meanings are Basque, Iraqw, Koyukon Athabaskan, Marshallese, Turkish, and Nez Perce. The dictionary of Nez Perce does not list the prior extension to 'speech'.