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A MOUNTAIN OF EVIDENCE? A CORPUS STUDY OF THE ARGUMENT STRUCTURE OF TRANSFERRED SENSES OF NOUNS IN ENGLISH

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Abstract: Based on an earlier observation, the study poses the question of whether the presence or absence of a valency complement of a noun relates to whether the noun is used literally or non-literally, in a transferred sense (typically based on metaphor). Two case studies are presented, one concerning 13 body part nouns (such as *foot*) and their transferred uses, and the other concerning two landscape nouns, *mountain* and *flood*. Both studies show that non-literal uses of nouns are much more likely to take an overt complement. This might relate in part to the type shift of sortal nouns into relational nouns and in part to the low degree of lexicalization of some transferred senses, which renders them more reliant on contextual cues, such as the use of a complement, for adequate interpretation.

Keywords: argument structure, complement, Part-*of*-Whole construction, metaphor, pseudo-partitive construction, quantifier, valency

1 INTRODUCTION

While noun valency is still somehow "in the shadow of the valency of verbs" (Spevak 2014, p. ix), there is a relatively large body of literature on this subject. Generativist linguists – largely in continuation of the tradition started by such influential works as Chomsky (1970) and Grimshaw (1990) – have focused almost exclusively on deverbal nominalizations, often overindulging in theorizing without much regard for empirical data (cf. Newmeyer 2009; Lieber 2016). On the other hand, functional linguists have studied various types of complex noun phrases in English empirically – but often without explicitly and systematically addressing issues of argument structure (e.g. Keizer 2007; ten Wolde 2023). In this somewhat scattered landscape of literature on English noun valency, it appears that various phenomena have gone unexplored. One of them is the interaction between metaphor (or transferred, non-literal senses more generally) and noun valency.

In a previous corpus study of noun valency (Sláma 2020, p. 445), it was suggested that nouns that appear not to be valent (i.e., not to require arguments) might

be used in the part-*of*-whole pattern both literally and metaphorically, as illustrated by examples (1) and (2) below, taken from the British National Corpus (BNC). What is interesting here is the fact that the *of*-phrase in the second, metaphoric example cannot be omitted (without this resulting in an essentially nonsensical sentence).

(1) *The underlying cause for this decision was the awful damage caused by* ***the savage winter of 1709****.* (BNC)

(2) *When a man reaches* ***the winter of his life****, there's nothin' he can look forward to but death.* (BNC)

Even though the metaphoric reading of the noun might be somewhat responsible for the fact that the *of*-phrase is essentially obligatory (and thus perhaps somehow closer to being a valency complement rather than a modifier), to my knowle.g. the interaction of metaphor and argument structure has not been studied. This paper is thus an attempt to contribute towards bridging this gap.

Section 2 introduces the distinction between sortal and relational uses of nouns, which I believe to be relevant here, as what we see in example (2) appears to be the reinterpretation of an inherently sortal noun (*winter*) as a relational noun. Section 3 provides a little background on the role of metaphor in language and in grammatical constructions more specifically, and presents two corpus studies, one focusing on transferred senses and complementation of polysemous body part terms (such as *foot*) in a subcorpus of the corpus InterCorp (Section 3.1), and the other examining two landscape nouns, *mountain* and *flood*, in the BNC (Section 3.2). Section 4 proposes some explanations for the observations reported on in this paper.

2 SORTAL VS. RELATIONAL USES OF NOUNS

Behaghel (1932, p. 22) was perhaps one of the first scholars to distinguish between absolute concepts (*absolute Begriffe*) and relative concepts (*relative Begriffe*), a distinction commonly interpreted today as one between **sortal nouns** and **relational nouns** (e.g. Mackenzie 1997). For instance, *cat* is a sortal noun; when hearing the word *cat*, one knows what is meant, and upon seeing a cat, one can (generally) identify it as a cat without any further information. On the other hand, when seeing a woman, one cannot identify her beyond any doubt as a mother or a non-mother, as a woman is a mother only in relation to some other person (hence the frequent relational use of the noun, as in, for instance, *my mother*, or *the mother of my friend*); *mother* is thus a relational noun. This distinction has been repeatedly implicated as relevant for valency: while sortal nouns are avalent, relational nouns have valency properties (e.g. Löbner 1985, p. 292; Plag 2003, p. 148).

Löbner (2011, 2015) discusses the distinction in more detail and further distinguishes sortal nouns into (unique) **individual nouns** (e.g. *Paula*, *pope*, and *weather*) and (non-unique) **sortal nouns** proper (e.g. *cat*, *table*, and *water*), and relational nouns into (unique) **functional nouns** (e.g. *father*, *mouth*, and *surface*) and (non-unique) **relational nouns** proper (e.g. *brother*, *part*, and *eye*). These four concept types differ with respect to their use with markers of definiteness, number, and possession.

Löbner differentiates between congruent and incongruent uses of nouns; congruent uses are those in which the use of the noun corresponds to its inherent semantics. For instance, *father* is a functional noun (i.e., an inherently unique and relational noun), and thus its use in *The father of Peter is tall* with the definite article is a congruent one; on the other hand, its use in *A father has called* is an incongruent one, leading to a concept shift, whereby *father* is interpreted as a sortal rather than a relational noun (Brenner et al. 2014, pp. 22–23). Instead of viewing sortal and relational nouns as two separate classes of nouns, it thus appears more adequate to think of nouns in terms of their relational or sortal uses, with many nouns commonly crossing the boundary. Having conducted two corpus studies and a psycholinguistic experiment, Brenner et al. (2014) conclude that their results "support the hypothesis that nouns are lexically specified with respect to the conceptual features uniqueness and relationality but that a relatively high proportion of their actual uses is incongruent with their lexical specification."

3 THE ROLE OF METAPHORS: TWO CASE STUDIES

Especially since the advent of Cognitive Linguistics as a new theoretical framework (cf. Croft and Cruse 2004), a renewed interest in metaphor has flourished. It has been recognized that the metaphor is much more than an ornate device used in literature, and the pervasiveness of conceptual metaphors in language has been documented. For instance, the conceptual metaphor TIME IS MONEY is reflected in everyday English expressions such as *You're wasting my time*, *That flat tire cost me an hour*, or *This gadget will save you hours* (Lakoff and Johnson 1980, pp. 7–8), which parallel the way we talk about money.

Some attention has been paid to the fact that conceptual metaphors also affect the way some grammatical constructions are used (cf. Dancygier and Sweetser 2014, pp. 127–161; Sullivan 2025). For instance, Sláma (2022, p. 259; 2024, p. 171) suggests that Czech perfective verbs with the prefix *pro-* that require an obligatory direct object referring either to an amount of money or an amount of time are instances of a construction (in the sense of Construction Grammar) with two senses, also based on the TIME IS MONEY conceptual metaphor: 'to spend money by doing something' (as in (3) below) and 'to spend time by doing something' (as in (4)).

(3) *Jinde lidé vždy vice peněz **projedí** než „**probydlí**“.* (Sláma 2022, p. 258)
lit. ‘Elsewhere people always **eat away** more money than they **live away**.’
‘People elsewhere always spend more money on food than on housing.’

(4) *Celá devadesátá léta **jsme provečírkovali**.* (Sláma 2022, p. 259)
lit. ‘The whole nineties we partied away.’
‘In the nineties we spent/wasted all the time partying.’

Within a project concerned with noun valency in English, I created a database of complex nominals with potential complements. The nominals were identified manually in a corpus of the seven *Harry Potter* novels by J. K. Rowling and three accompanying books by the same author. The database contains about 22,000 complex nominals with further annotation; the details are not of importance here. What is relevant, however, is that in the database it was also annotated whether the head noun of a nominal is used in its literal sense (e.g. *the **feet** of a man with hair and beard so overgrown Harry could see neither eyes nor mouth*) or in its transferred (e.g. metaphorical) sense (e.g. *the **foot** of the stairs*/*page*/*bed*). Tab. 1 shows the ten nouns with potential complements that are found most frequently in the database in their transferred senses:

Noun	Transferred sense uses
foot	78
head	61
cloud	25
stream	19
shower	18
trace	15
heart	15
arm	15
wave	15
sea	14

Tab. 1. Ten head nouns in the database with the highest number of uses in transferred senses

It is apparent from Tab. 1 that two semantic groups of nouns are represented most often: body part nouns (*foot*, *head*, *heart*, *arm*) and nouns referring to parts of the landscape and related natural phenomena (*cloud*, *stream*, *shower*, *wave*, *sea*). This is not surprising, as both body part terms and landscape terms have been shown to often involve polysemy and metaphor (e.g. Lewandowska-Tomaszczyk 2020; Wierzbicka 2007; Burenhult and Levinson 2008; Bromhead 2013). The following two corpus-based case studies thus focus on these two groups of nouns.

3.1 A corpus study of body part nouns

From the above-mentioned *Harry Potter* database, I filtered out all body part nouns that are attested with an *of*-phrase relating the (body) part meronymically to a whole, which could be seen as a complement (e.g. Müller 2000, p. 75). I selected only nouns attested in the database non-marginally in both a literal and a transferred sense. This resulted in a list of 13 English nouns, listed here with an example of each in a transferred sense: *arm* (*each arm of Harry's chair*); *back* (*the back of his seat*); *face* (*the face of the white moon*); *foot* (*the foot of the stairs*); *hand* (*the luminous hands of his clock*); *head* (*the head of the stairs*/*broom*); *heart* (*the heart of the Forest*/*maze*); *knee* (*the knees of his jeans*); *leg* (*the legs of the chair*); *mouth* (*the mouth of the tent*/*alleyway*/*cave*); *neck* (*the neck of the dressing gown*); *spine* (*the leather spines of books*); *tail* (*the tails of his frock-coat*).

Given the necessity to annotate the uses of the nouns manually both for their sense (literal vs. non-literal) and the presence or absence of the complement (as not every *of* following a body part noun is relevant) and given the high frequency of the body part nouns, I had to work with a rather small subcorpus. Given the fact that the seven main *Harry Potter* novels are included in the corpus InterCorp v16 – English, I created a subcorpus containing only these seven novels, identified in it all instances of the 13 lemmas, excluded all irrelevant instances (e.g. *back* used as a verb), and annotated the rest for their sense (literal vs. non-literal) and the presence or absence of a complement.

The results are provided in Tab. 2.

Noun	Literal interpretation		Non-literal interpretation	
	Complement	No complement	Complement	No complement
arm	3 (0.49%)	612 (99.51%)	15 (93.75%)	1 (6.25%)
back	6 (2.36%)	248 (97.64%)	195 (89.45%)	23 (10.55%)
face	23 (1.47%)	1,545 (98.53%)	7 (50.00%)	7 (50.00%)
foot	2 (0.30%)	674 (99.70%)	81 (31.15%)	179 (68.85%)
hand	5 (0.31%)	1,604 (99.69%)	4 (20.00%)	16 (80.00%)
head	31 (2.34%)	1,291 (97.66%)	17 (77.27%)	5 (22.73%)
heart	1 (0.39%)	258 (99.61%)	18 (100.00%)	0 (0.00%)
knee	1 (0.64%)	156 (99.36%)	4 (100.00%)	0 (0.00%)
leg	6 (1.84%)	320 (98.16%)	3 (25.00%)	9 (75.00%)
mouth	1 (0.22%)	451 (99.78%)	6 (85.71%)	1 (14.29%)
neck	5 (2.55%)	191 (97.45%)	12 (70.59%)	5 (29.41%)
spine	3 (42.86%)	4 (57.14%)	1 (25.00%)	3 (75.00%)
tail	8 (9.64%)	75 (90.36%)	4 (50.00%)	4 (50.00%)
Total	95 (1.26%)	7,429 (98.74%)	367 (59.19%)	253 (40.81%)

Tab. 2. (Non-)literal senses of 13 body part nouns and the presence/absence of a complement

In their literal uses, body part nouns are used with a complement only marginally (1.26% of instances); note that this in no way contradicts my assumption that body part nouns are inherently relational, as very common uses with, for instance, possessives (*his hand*) also showcase the relational behavior of these nouns while not featuring an *of*-complement.

In the transferred senses of body part nouns, however, the proportion of uses with a complement rises to 59.19%. If we exclude the noun *foot*, as it skews the data (in its frequent sense of a unit of measure, in which it never appears with an *of*-phrase functioning as a complement), the percentage rises even higher – to 79.44%. Mostly (in cases different from that of *foot* in the sense of a unit), when there is no complement with a non-literal use of the noun, the underlying argument is expressed as a premodifier or an adnominal determiner:

(5) *"The tree was placed at* ***the tunnel mouth*** *to stop anyone coming across me while I was dangerous."* (InterCorp v16 – English)

(6) *Harry opened his eyes and stared through his fingers at* ***the wardrobe's clawed feet****, remembering what Fred had said* […]. (InterCorp v16 – English)

3.2 A corpus study of landscape nouns

Landscape nouns (e.g. *mountain* and *sea*) and similar, typically weather-related nouns (e.g. *shower* and *cloud*) are also often prone to polysemy based on metaphor and have been identified in the *Harry Potter* database as a significant group illustrating the association between metaphor and argument structure. For a case study of such nouns, I originally chose to work with the British National Corpus (BNC). However, in the corpus, nouns such as *mountain* and *sea* are highly frequent and it would be impossible to annotate manually all of their occurrences if multiple high-frequency nouns were chosen. Since this study is intended as a first step towards investigating the interactions of metaphor and valency, I decided to annotate all occurrences of only two nouns: *mountain*, a noun presumably quite representative of this group, and the less frequent *flood*. Both can be used as quantifiers in pseudo-partitive constructions (e.g. Koptjevskaja-Tamm 2001), i.e., with presumable complements, as in *mountains of debt* or *the flood of complaints*.

For both lemmas, all instances in the BNC were identified, compounds (e.g. *mountain biking* and *flood gates*) were excluded, and so were other irrelevant examples (e.g. the verb in *I can flood them with data* or the proper noun in *James Flood*). The remaining instances were annotated for whether their use is literal or transferred, and for the presence or absence of the complement. Instances with *of*-phrases that are more plausibly seen as modifiers rather than complements (e.g. *the destructive floods of autumn 1981*) and instances of specific constructions (as in *a veritable mountain of a man*; cf. ten Wolde 2023) were not included as complements. The results are summarized in Tab. 3.

Noun	Literal interpretation		Non-literal interpretation	
	Complement	No complement	Complement	No complement
mountain	156 (4.28%)	3,485 (95.72%)	209 (71.33%)	84 (28.67%)
flood	1 (0.13%)	785 (99.87%)	360 (89.55%)	42 (10.45%)
Total	157 (3.55%)	4,270 (96.45%)	569 (81.87%)	126 (18.13%)

Tab. 3. Literal vs. non-literal senses of *mountain* and *flood* and the presence vs. absence of a complement in the BNC

In their literal uses, the two nouns are used with an *of*-complement in 3.55% of cases only (the only instance of this with *flood* is found in the context *a flood of water gushed from the McMonnies Lake*, which can be understood both as a literal flood and an expression of great quantity); in their non-literal, usually quantifying uses, the two nouns occur with an *of*-complement in 81.87% of cases. This is clearly a significant difference. The cases in which a non-literal reading co-occurs with the absence of a complement are generally accounted for by idiomatic expressions (most often, *to be in full flood*, as in *discussion was already in full flood*), instances where the underlying argument is expressed as a premodifier, as in examples (7) and (8), and instances in which the argument is inferable from the context, as in examples (9) and (10):

(7) *It is **a huge and rapidly growing rubbish mountain**, the largest, per citizen, in the world.* (BNC)

(8) […] *could lead to **an immigration flood** exceeding "the worst fears" of many of his backbench colleagues.* (BNC)

(9) *Michael was happy enough with his "batburger", but preferred the chips on Karen's plate to **the mountain** on his own.* (BNC)

(10) *The flow of Albanian escapees across the southern border into Greece accelerated dramatically in December, and turned into **a flood** in early January.* (BNC)

4 CONCLUSION

The first case study of 13 body part nouns and their transferred senses (Section 3.1) and the second case study of two landscape nouns, *mountain* and *flood* (Section 3.2), both show beyond any doubt that at least with some nouns, transferred senses are significantly more likely to take an overt *of*-complement than literal senses.

In part, especially with the landscape nouns, this arguably relates to what was discussed in Section 2. While *mountain* and *flood* are by default sortal nouns in the narrow sense discussed by Löbner (i.e., they refer to non-unique and non-relational concepts), they might be used incongruently with their inherent concept type and be shifted into relational nouns when used as quantifiers.

In part, especially since body part nouns are already inherently relational and do not need to undergo a type shift to be used relationally, this can be accounted for if we presume that transferred senses that are not very strongly lexicalized (unlike the fully lexicalized *foot* in the sense of a unit of measurement) might need some sort of contextual support: if we are talking about the face of a clock, for instance, we need to somehow specify this (as in *the face of a clock*, *the clock's face*, or *its face*) – unless it is evident from the context that we are talking about a clock (rather than a person's face, which is presumably the default expectation when the word *face* is used), as in:

(11) *Harry liked the clock. It was completely useless if you wanted to know the time, but otherwise very informative. It had nine golden hands, and each of them was engraved with one of the Weasley family's names. There were no numerals around* ***the face****, but descriptions of where each family member might be.* (InterCorp v16 – English)

On a general level, I hope to have illustrated that metaphor and other phenomena giving rise to transferred senses, such as metonymy, are relevant for the study of valency and grammatical constructions more generally. Hopefully, further studies of similar phenomena might illuminate more clearly some of the reasons why the interaction between literal vs. non-literal senses and the presence vs. absence of complements might be so significant.

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