"Metonymy is the main motive for word-formation"

Abstract

I propose that metonymy is the primary cognitive motive for word-formation. While this proposal is not entirely new, it has never been tested at the scale of an entire system of a language. I present an empirical study of the inventory of suffixal word-formation in three languages, Russian, Czech, and Norwegian. This study documents the role of metonymy in word-formation in detail. The system of classification is designed to maximize comparability across domains as well as across languages. Comparison between lexical metonymy and metonymy in word-formation reveals that whereas metonymy can be described in nearly identical terms across the two domains, there are important differences. While many metonymic relationships are shared across the lexical and grammatical domains, some are specific to one domain, and overall grammatical metonymy turns out to be more diverse than lexical metonymy. Both lexical and word-formational metonymy show asymmetries, but they are different, suggesting different preferences for vehicles and targets across the two systems. A systematic approach facilitates cross-linguistic comparisons, revealing differences in metonymic patterning across languages, and can ultimately be extended to other languages as well.

1. Introduction

Most linguistic works on metonymy have focused on lexical metonymy (cf. further discussion in 2.1). There are probably two reasons for this. The first is that metonymy has traditionally been understood as a literary device manifested lexically, and thus linguists also have initiated their investigations primarily via the lexicon. The second reason is that the field is dominated by studies of English, a language with a relatively modest system of word-formation. From the perspective of languages like Russian and Czech that boast rich derivational systems, the role of metonymy in word-formation is more pronounced. A set of examples in English, Russian and Czech illustrate metonymy and how it functions in both lexicon and word-formation.

1) PART FOR WHOLE
   a) *We need a good head for this project.*
   b) Russian *brjuxan* (lit. 'belly'-*an*) 'person with a large belly'
   c) Czech *břicháč* (lit. 'belly'-*áč*) 'person with a large belly'

2) CONTAINED FOR CONTAINER
a) *The milk tipped over.* (cf. Peirsman & Geeraerts 2006: 281)
b) Russian *saxarnica* (lit. 'sugar'-*nica*) 'sugar-bowl'[1]
c) Czech *květináč* (lit. 'flower'-*áč*) 'flower-pot'

The English examples illustrate lexical metonymy, while parallel examples of metonymy in word-formation are presented in Russian and Czech. In both 1) and 2) vehicles are used to access targets. Examples in 1) involve a vehicle that names a PART but is used to access the WHOLE as a target. When we need a clever person for a project, their head (and particularly the brain therein) is salient, and we can use the body part to refer to the whole person. The Russian and Czech examples show a similar PART FOR WHOLE metonymy in which a whole person is identified by means of a salient body part. The underlined segments are the roots that signify the vehicle in the two languages. The nouns in the examples are derived from the words for 'belly': Russian *brjuxo* and Czech *břicho*. The vehicle in 2) is the contents of the container that is thus accessed as a target. It is not the milk itself that tips over, but the glass or carton the milk is in. Word-formation performs parallel CONTAINED FOR CONTAINER metonymies in the Russian and Czech examples, which are derived from *saxar* 'sugar' and *květina* 'flower, flowering plant' respectively. Comparison of the Czech examples in 1c) and 2c) illustrates an important point about word-formation. Note that the same suffix, *-áč*, signals two different metonymies in these examples. In fact, this suffix can also signal a third metonymy, namely CHARACTERISTIC FOR ENTITY, as we see in the word *naháč* 'naked person', derived from the adjective *nahý* 'naked'. The Russian suffix in 2b), *-nica*, likewise signals three different metonymies, and the closely related suffix *-ica* is associated with eleven metonymies. Multiple metonymy designations are common among suffixes: Norwegian has up to eleven metonymies for a given suffix, and the figures for Russian and Czech are fifteen and sixteen respectively (for more detail, see section 3.4). The point is that a word-formational affix can be highly non-specific in terms of identifying the relevant metonymy. Often the affix does little more than signal that a metonymy is present. In this sense there is a fundamental difference between the Russian and Czech words in 2b) and 2c) and the English compounds that are their glosses. Whereas the English compounds overtly

[1] Whereas in some examples it would make sense to distinguish between suffix and desinence (as in Russian *-nica*, which could be segmented as *-nic-a*), complex morphophonemics make this segmentation difficult and/or artificial in some cases, so for the purposes of this article, such segmentation has not been attempted.

identify both the vehicle and the target,[2] the derived nouns in Russian and Czech overtly identify only the vehicle. The only consistent clue offered is the word class of the target item, since the suffix is specific for word class. In essence, the Russian word tells us: "Take *saxar* 'sugar' and perform a metonymy to get a target that is a noun". This difference between derivational word-formation and compounding is important because it shows us that different languages use different strategies to solve the same problems. In particular, various languages make very different investments in metonymy via word-formation. As I show below, Norwegian has a much more restricted repertoire of metonymy in the derivation of words. Neither PART FOR WHOLE nor CONTAINED FOR CONTAINER metonymies are attested in the word-formation of Norwegian, which relies more strongly on compounding (cf. Nesset forthcoming for a comparison of Russian word-formation vs. Norwegian compounding). Furthermore, the emphasis on certain metonymy designations is to some extent language-specific.

I begin this article with a brief survey of relevant previous scholarship in section 2, sampling both works on metonymy (2.1) and works on word-formation (2.2). Section 3 presents a comparative empirical study of the metonymies signaled by suffixes in Russian, Czech, and Norwegian. After addressing some overall issues and challenges in designing the databases and classifying the data (3.1), I offer quantitative comparisons across the three languages in terms of metonymy designations (3.2), word class designations (3.3), and the relation of suffixes to both kinds of designations (3.4). Analysis of the data in Section 4 begins with a comparison of the metonymies found in word-formation vs. the lexicon (4.1). There I show that metonymy is more diverse in word-formation than in the lexicon and that the distribution of metonymy in word-formation supports the prototypicality claims made by Peirsman and Geeraerts (2006). In Section 4.2 I address the directionality of metonymy relationships in word-formation and its implications. A metonymy relationship can be either unidirectional or bidirectional. A unidirectional metonymy relationship allows only one combination of vehicle and target, but not the converse (for example WHOLE FOR PART is attested in Norwegian word-formation, but PART FOR

[2] Note, however, that although both vehicle and target are overtly present in a compound, the metonymic relationship between them is not necessarily specified. A *sugar-bowl* could refer to many things other than a CONTAINER; it could be a bowl made from sugar, or a bowl used in a sugar-making process, etc., cf. Langacker 2009.

WHOLE is not). A bidirectional metonymy relationship is reversible, but usually highly asymmetrical (both WHOLE FOR PART and PART FOR WHOLE are attested in Russian and Czech word-formation, but the latter is much more common than the former). Relative preferences for metonymy designations are partially language-specific, as shown in 4.3. Conclusions are offered in section 5.

2. Relevant previous scholarship

It is not possible to do full justice to the wealth of scholarly works on metonymy and word-formation in the scope of this article. My purpose in this section is to build upon relevant previous achievements while at the same time pointing out the specific gap that this study aims to fill. In gross terms, it is possible to divide the relevant previous studies into two groups: one is focused on metonymy and has made few connections to word-formation, whereas the other is focused on word-formation with a few rare mentions of metonymy. This survey will focus mainly on the exceptional works that draw connections between metonymy and word-formation.

2.1 Works on metonymy

The focus of most works on metonymy has been on lexical metonymy, how to describe it, and how to distinguish it from metaphor (cf. Lakoff & Johnson 1980; Lakoff 1987; Croft 1993; Kövecses & Radden 1998; Radden & Kövecses 1999; Seto 1999; Panther & Thornburg 1999 & 2007; Barcelona 2002; Kövecses 2002). At the risk of overgeneralizing, one can identify three main strategies for classifying metonymy:

1) Contiguity (Jakobson [1956] 1980, Peirsman & Geeraerts 2006);

2) Frames/ICMs (Kövecses & Radden 1998, Radden & Kövecses 1999, Panther & Thornburg 1999, Barcelona 2002);

3) Domains/Dominions (Croft 1993, Langacker 1993 & 2009, Ruiz de Mendoza 2000).

These strategies are by no means mutually exclusive or even entirely discrete. Peirsman & Geeeraerts (2006), while focusing primarily on contiguity, presents groupings of terms (such as an ACTION and PARTICIPANTS) that are compatible with a frame approach. Croft's (1993: 348) definition of metonymy as mapping within one "domain matrix" implicitly suggests contiguity. There are many such examples of relations among the current approaches to metonymy. For the purposes of the present

study, the differences between these approaches are not crucial. This study in no way contradicts any of these approaches, but rather elaborates upon them. Within the framework of cognitive linguistics these strategies have collectively contributed to the VEHICLE FOR TARGET model of metonymy used in the present study.

Taken together, scholarly works on metonymy make a strong case for metonymy as a pervasive, important cognitive process that motivates linguistic phenomena. Langacker (1993: 30) established an early landmark in this line of reasoning: "Metonymy is prevalent because our reference-point ability is fundamental and ubiquitous, and it occurs in the first place because it serves a useful cognitive and communicative function". In 2009, he takes this argument even further, stating that "the canonical situation in language is indeterminacy", and that grammar is inherently metonymic in structure (Langacker 2009: 45-46). However, despite these and similar claims (cf. Radden 2005), relatively little analysis of metonymy in grammar, and specifically in word-formation, has been produced. No existing work takes a systematic approach to metonymy in word-formation. Works that do exist are limited to a single or a small group of affixes or focus on arguably marginal subsystems of word-formation, such as conversion or compounding.

Perhaps the earliest reference to metonymy in word-formation is an oblique one made by Jakobson ([1956] 1980: 87): "Also, as a rule, words derived from the same root, such as *grant* -- *grantor* -- *grantee* are semantically related by contiguity". Given that a few pages earlier ([1956] 1980: 84) Jakobson identifies metonymy as a contiguity relationship and that the example he cites is of word-formation, if we read between the lines, it seems that Jakobson has made the connection between word-formation and metonymy. However, this is just a single tantalizing remark.

In the context of a detailed discussion of lexical metonymy in Russian, Padučeva (2004: 147, 163) in two places mentions that a metonymy expressed lexically in one language might be expressed via word-formation in another; for example the difference between *matin* and *matinée* that is marked via word-formation in French is handled via lexical metonymy in Russian, where the word *utro* 'morning' covers both uses. Conversely, Padučeva points out that the semantic shift present lexically in English *grow* (intransitive) vs. *grow (melons)* (transitive) is handled via word-formation in Russian, where the former is equivalent to *rasti* 'grow', and the latter to the derived verb *vyraščivat'* 'cultivate'.

Koch (1999) presents a theoretical argument that metonymy is even more ubquitous than metaphor and specifically important for word-formation, but offers only a pair of examples from the history of French. Basilio (2006) makes similar claims about the connection between metonymy (and metaphor) and word-formation, and illustrates them with an analysis of three suffixes in Brazilian Portuguese: *-dor* (*vendedor* 'seller'), *-nte* (*tranquilizante* 'tranquilizer'), and *-ista* (*pianista* 'pianist'). These suffixes are partially equivalent to English *-er*, which is the topic of Panther & Thornburg's (2002) analysis of the interaction of metaphor and metonymy in word-formation. Radden (2005) contributes an analysis of metonymy in English *-able* derivations. Both Warren (1999) and Dirven (1999) focus on conversion (also known as "zero derivation"; e.g., the verbs *clean* and *calve* and *holiday* derived from the corresponding adjective and nouns) in the formation of English verbs as an example of metonymy in word-formation. Dirven (1999: 280) identifies "event-schema metonymy" as the driving force behind the conversion process, with three types of schemata: action (involving participants in an event), location, and essive ("beingness"). All three of Dirven's schemata are indeed relevant for the model I present in section 3 (cf. Table 3), as are the "recurring patterns" of VEHICLE FOR TARGET combinations that Warren (1999:124) finds. Benczes (2005) examines noun-noun compounds in English, and shows how they can be motivated by metonymy (as in *jar lid*) and/or metaphor (as in *club foot*). Langacker (2009) also explores the indeterminacy of English compounds motivated by metonymy.

There is thus a growing body of evidence that metonymy is a decisive factor in word-formation. However, up till now this evidence is piecemeal, being limited to studies of only one or a handful of affixes or to phenomena that are somewhat peripheral to word-formation (conversion and compounding). Furthermore, the majority of studies focus on English, where the word-formational system has been compromised by massive borrowing.

The present article builds upon these achievements and takes the study of metonymy in word-formation in a new direction by applying a system-wide approach. This systematic approach makes it possible to view the overall effect of metonymy on word-formation, to spot trends and discover which types of metonymy are more robust or more marginal in the system. A systematic view of metonymy in word-formation facilitates comparisons across the domains of lexicon and grammar and across languages.

2.2 Works on word-formation

Again at the risk of over-generalizing, one can classify works on word-formation as either traditional or theoretical. While they provide a wealth of concrete details, most traditional works on word-formation are basically lists of affixes. They tend to be ad hoc and idiosyncratically organized and thus do not facilitate cross-linguistic, much less cross-domain, comparisons. Descriptions of the semantic roles of affixes tend to be haphazard, inconsistent, or simply absent. Most importantly, these works do not connect word-formation to a cognitive mechanism that would motivate a consistent structure. Mention of metonymy is rare, though not entirely absent. An exception here is Araeva (2009), who presents an enormous classification system for the Kemer dialect of Russian, identifying hundreds of "types", such as "mushrooms according to the shape of their hats" and "roads according to the material they are made from". On just one page Araeva (2009: 25) mentions metonymy as a possible motive for the relationship between a source word and a derived word, but for her metonymy seems strictly limited to WHOLE FOR PART/PART FOR WHOLE relationships. She cites only three examples: *medved'* 'bear' - *medvežatina* 'bearmeat'; *gorox* 'peas (collective)' - *gorošina* 'pea'; *zver'* 'beast' - *zver'e* 'beasts (collective)'.

The traditional sources of information about word-formation in Russian, Czech and Norwegian are their three reference grammars: Švedova 1980, Dokulil 1986, Faarlund et al. 1997. These works are organized primarily according to word classes, with some indications of semantic roles for source and derived words. None of these works mention metonymy. The same can be said of most other works more narrowly focused on the word-formational systems of Russian and Czech (Šanskij 1968, Townsend 1975, Janda & Townsend 2000, Townsend & Komar 2000, McFadden 1975, Maksimov 1975, Andrews 1996).

A few works deserve some additional mention since they support in various ways the present study. Rasch 1977 provides a classification of Russian deverbal nouns using terms remarkably similar to those used in both Peirsman & Geeraerts (2006) and the present study (including ACTION, STATE, EVENT, AGENT, INSTRUMENT, LOCATION). She attempts a transformational grammar account of this subsystem of Russian word-formation, but shows that it cannot succeed because it is impossible to establish rules to predict which suffix will result in which meaning for a deverbal noun. As I show in Section 3.4, suffixes are indeed rather non-specific in terms of the

metonymies they express. Lönngren (1978) does not mention metonymy, but does point out that Russian suffixes signal relations that can be symmetrical and cannot be analyzed as additive components. He finds two groups of such relations that reflect the overall structure of metonymies found in this study: associative (which roughly correspond to metonymies involving ENTITIES), and situative (which roughly correspond to metonymies based on a verb and its participants).

Relevant theoretical models of word-formation are those proposed by Lipka (1990; cited from Kastovsky (2005)), Dokulil (1962), and Mel'čuk (1996). Lipka, a Romance philologist, takes an eclectic approach, combining structuralist, generative, and lexical field theory to model the semantic structures of words. His work focuses on conversion (zero derivation) and includes metaphor and metonymy as systematic motives for this sub-type of word-formation. His model does not, however, extend to affixal word-formation, and allied approaches (such as that of Marchand) are largely restricted to compounding (cf. Kastovsky 2005: 112-115).

The Czech linguist Dokulil is the primary proponent of the onomasiological model of word-formation, detailed in his 1962 volume *Tvoření slov v češtině* (Word-formation in Czech). Dokulil (1962: 14) asserts that word-formation is underappreciated in linguistics and that this is a mistake, since, at least in the case of Czech, virtually the entire lexicon is composed of derivational families of words. In a few ways, this model is parallel with the one I advance in section 3. For example, Dokulil presents a set of terms used to define the relationships between the "mark" (= VEHICLE) and the "base" (= TARGET), and he analyzes derived words in terms of "onomasiological types", which contain a semantic relationship, a word-class relationship, and an affix. However, Dokulil's set of terms is very small and very abstract, consisting of only four items: "substance" (the aggregate of entities, collectives, materials and participants marked by substantives), "quality" (roughly the equivalent of characteristics marked by adjectives), "action" (covering all types of verbs), and "circumstance" (ranging over adverbial dimensions of time, space, and manner). Dokulil thus conflates the semantic and the word-class aspects of word-formation, rather than trying to tease them apart. He claims that all relationships are bi-directional, offering a cube to illustrate, where the eight corners correspond to his four terms, each of which serves as both "mark" (= VEHICLE) on one side of the cube and as "base" (= TARGET) on another side. The resulting sixteen possible combinations are illustrated by a handful of examples each (Dokulil 1962: 32-33).

Dokulil recognizes metaphor and metonymy only in their lexical uses, and states that these semantic relationships do not build new words, and furthermore that word-formation is an autonomous system (Dokulil 1962: 20; cf. Štekauer 2005: 210). Oddly enough, Dokulil (1986) does not organize his description of Czech word-formation in the academy grammar according to his onomasiological model, so our insights into how this model might be applied in a systematic fashion are limited.

Mel'čuk's (1996) "Lexical Functions" treat semantic relations as parallel to mathematical functions. Mel'čuk's model is very extensive, with several dozen Lexical Functions designed to describe "all types of genuine lexical relations that obtain between LUs [Lexical Units] of any language". Word-formation is thus just one of several phenomena that fit under this umbrella. Though metonymy is not directly named, the sub-phenomenon of "meronymy" (part-whole relationships) is recognized as the motive for five Lexical Functions (cf. Wanner 1996: 6). Given the universalist aims of the Lexical Functions model, it has not been tested out in a systematic way for word-formation in a given language. However, in many ways this model is highly compatible with the model proposed in the present article. Mel'čuk himself (1996: 51-55) recognizes a number of his Lexical Functions as relevant for word-formation (LFs 8-23) , and there are several additional candidates (LFs 24-26, 39, 42), which could be described using the terms suggested in Section 3.

The purpose of this article is to build a bridge between metonymy and word-formation in a way that facilitates meaningful comparisons and can be extended to future studies. This article proposes a systematic approach that works out in detail a theoretical model that can be applied to other languages.

3. Empirical study of word-formation

The three languages represented in the databases are Russian (an East Slavic language), Czech (a West Slavic language in close contact with a Germanic language), and Norwegian (a Germanic language). Data was culled primarily from the three most comprehensive and authoritative grammars of these languages: Švedova 1980, Dokulil 1986, and Faarlund et al. 1997.[3]

[3] I am grateful to Anna Baydimirova for assisting with the data on Russian adjectives and verification of the remaining Russian data. I also thank Tore Nesset for verifying the Norwegian data. Of course I retain all responsibility for errors.

The classification system presented here is consciously modeled after that found in Peirsman & Geeraerts 2006. Peirsman & Geeraerts have amassed an inventory of the lexical metonymy relationships attested in scholarly works.[4] My study of word-formation in Russian, Czech, and Norwegian is directly inspired by their classification, though it was necessary to modify it to some extent, as described below. The use of an equivalent classification maximizes the opportunity for making comparisons between lexical and word-formational metonymy.

3.1 Size and structure of the databases

As with any study, a number of choices had to be made in order to define a clear focus for analysis and structure the classification. And of course several challenges arose as well. This section describes the logic behind the structure of the databases.

This study is restricted to suffixal word-formation. This does not mean that other affixes are not relevant. Indeed, all three languages derive words via prefixes as well, and there is evidence of metonymy in that subsystem of word-formation also (cf. Janda 2008 and Nesset 2009). However, the behavior of prefixes in Slavic languages is focused primarily on aspectual derivation and thus very different from what we observe in Germanic languages. Since suffixes are responsible for the majority of word-formation in all three languages, limiting the study in this way facilitates collection of a maximally large yet comparable group of databases.[5]

The present study includes "conversion": word-formation achieved without the addition of an overt suffix. The decision to include conversion was based on two factors. Firstly, all three languages have conversion and list this type in the descriptions of suffixal word-formation in the grammars cited above. Some illustrative examples are Russian *vxodit'* 'enter' - *vxod* 'entrance' (an ACTION FOR LOCATION metonymy), Czech *péci* 'bake' - *pec* 'oven, stove' (an ACTION FOR INSTRUMENT metonymy), and Norwegian *søt* 'sweet' - *søte* 'sweeten' (a CHARACTERISTIC FOR ACTION metonymy; note that *-e* is the infinitival desinence, not a suffix). Secondly, scholars often describe conversion in terms of "zero-suffixation"

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[4] Although Peirsman & Geeraerts (2006: 277) state that their inventory "is by no means meant to be an exhaustive classification of types of metonymy" it is the most comprehensive systematic inventory available, representing most (if not all) types of lexical metonymy known to scholarship.

[5] To be consistent in treatment of aspectual morphemes, the semelfactive suffix (Russian *-nu*/Czech *-nou*) was also excluded from this study.

(cf. Townsend 1975); in other words, under some interpretations what we observe in these cases is a suffix that just happens to have no phonological substance. In this article I do not take a stance on whether zero morphemes exist or not, but I take the presence of conversion in all three reference grammars as an indication that a study of word-formation that left out conversion would be incomplete.

A number of kinds of data were excluded from this study on the grounds that they do not represent systematic phenomena, do not encode metonymic relationships, or are beyond the scope of the study. Isolated examples pertaining to only a single lexical item, dialectisms, occasionalisms, and examples from highly marked registers have been avoided in order to maintain focus on the systematic role of metonymy in the standard registers of the three languages.

Excluded on the grounds that they do not signal metonymy are the formation of hypocoristics, comparative adjectives and adverbs, and secondary imperfectives, and caritives. Hypocoristics include diminutives and augmentatives and in both Russian and Czech some of the same suffixes are used both to create hypocoristics and to signal metonymy. Russian and Czech share the diminutive *knižka/knížka* 'little book' formed via the suffix *-ka* from Russian *kniga* and Czech *kniha* 'book'. The same suffix encodes thirteen metonymic relationships in Russian such as MATERIAL FOR ENTITY in *žestjanoj* 'tin' - *žestjanka* 'tin can', and eleven metonymies in Czech such as ACTION FOR PRODUCT in *sbírat* 'collect' - *sbírka* 'collection (e.g., a stamp or coin collection)'. However hypocoristic forms do not signal a relationship between a vehicle and a target. Their function is instead to signal a pragmatic relationship between speech-act participants and an object (Wierzbicka 1980: 53-60; Taylor 1995: 144-149). Indeed some scholars argue that the formation of hypocoristics should not be considered a type of word-formation at all because this process does not yield new independent words and is thus more akin to inflection (cf. Townsend 1975: 196; note that Dokulil 1862: 46-48 also sets hypocoristics aside as a secondary, "modificational" phenomenon). I exclude the formation of comparative adjectives and adverbs, as well as secondary imperfectives on the grounds that these phenomena are marginal to word-formation and arguably can be included in inflection. Caritive or abessive forms corresponding to *un-* and *-less* in English likewise do not signal metonymy since their role is instead to express negation. There are no relevant suffixes in the three languages in this study (which use prepositions or prefixes to

express caritive), but other languages (e.g., Estonian; cf. Tamm 2009) do use suffixes for this type of word-formation.

Vacuous types of word-formation that change only the paradigm and/or gender of the word are likewise excluded. Examples of this type are for example deverbal nouns with no specialized meaning, such as Czech *zazvonění* 'ringing' (derived from the verb *zazvonit* 'ring') and the use of suffixes to effect gender changes as in *přítelkyně* 'female friend' (derived from *přítel* 'friend').

All data in this study involve examples containing only one stem to which a suffix is added, thus excluding compounding. This means that univerbations such as Russian *pjatiletka* 'five-year plan (lit. 'five-years'-*ka*)' are not represented, despite the fact that some of them, like this example, use the same suffixal morphology that is included in the database (cf. examples of Russian and Czech *-ka* immediately above). The rationale for restricting the study in this way was to limit the data to examples that identify only the vehicle and thus best correspond to the lexical use of metonymy, facilitating comparison across domains. Also beyond the scope of this study are examples that show stacking of multiple suffixes or chaining of metonymic relationships. While these phenomena are worthy of investigation (cf. Geeraerts 2002), it was decided that they would detract from the goal of establishing the overall baseline contours of metonymic word-formation.

The databases represent only type frequency. Each entry in each database is a type and thus a unique combination of a metonymy designation, a word class designation, and a suffix. In addition, each entry is supplied with a single illustrative example. Table 1 presents the sample entries corresponding to examples 1b-c) and 2b-c) and others presented in the text above. There are no duplicates of combinations of metonymy designation, word class designation, and suffix. No attempt has been made to represent the number of examples available for each type, nor has there been any attempt to discover the token frequencies of such examples. Both kinds of information are certainly valuable since a given type might have only a handful or perhaps dozens or even hundreds of exemplars, and some exemplars will be of very low frequency whereas others will be of high frequency. Obviously a type that has only a few low-frequency exemplars has a different status in a language than one with many high-frequency exemplars, but the task of collecting and analyzing that information goes beyond the scope of this article. My aim here is to establish a system for classifying

word-formational metonymy and to argue that this is a significant linguistic phenomenon; token frequency can be taken up in future studies.

metonymy designation		word class designation		suffix	illustrative example		language
vehicle	target	vehicle	target		source word	derived word	
PART	WHOLE	noun	noun	*(i)a/jan*	*brjuxo* 'belly'	*brjuxan* 'person with large belly'	Russian
PART	WHOLE	noun	noun	*áč*	*břicho* 'belly'	*břicháč* 'person with large belly'	Czech
CONTAINED	CONTAINER	noun	noun	*nica*	*saxar* 'sugar'	*saxarnica* 'sugar-bowl'	Russian
CONTAINED	CONTAINER	noun	noun	*áč*	*květina* 'flower'	*květináč* 'flower-pot'	Czech
CHARACTERISTIC	ENTITY	qualitative adjective	noun	*áč*	*nahý* 'naked'	*naháč* 'naked person'	Czech
ACTION	LOCATION	verb	noun	*Ø*	*vxodit'* 'enter'	*vxod* 'entrance'	Russian
ACTION	INSTRUMENT	verb	noun	*Ø (fem)*	*péci* 'bake'	*pec* 'oven, stove'	Czech
CHARACTERISTIC	ACTION	qualitative adjective	verb	*Øe*	*søt* 'sweet'	*søte* 'sweeten'	Norwegian
MATERIAL	ENTITY	relational adjective	noun	*ka*	*žestjanoj* 'tin'	*žestjanka* 'tin can'	Russian
ACTION	PRODUCT	verb	noun	*ka*	*sbírat* 'collect'	*sbírka* 'collection'	Czech

Table 1: Sample entries in the databases for examples cited above

Table 2 presents some overall measures of the databases. The most striking difference in the number of types is between the two Slavic languages and the Germanic one.[6] Norwegian expresses many of the concepts found in the Russian and Czech databases by other means, namely compounding and phrases. A parallel pattern is seen in the number of suffixes identified for each language, as shown in Table 2. Whereas both Russian and Czech have over 200 suffixes that signal metonymy in word-formation, Norwegian has only fifty-seven.

[6] It is possible that the three grammars were not equally extensive in their coverage of word-formation, and that this has affected the distribution of the data. There is, however, clear evidence (Dokulil 1962 & 1986) that the Czech and Soviet grammarians were in close contact and the relative dimensions of the databases correspond to my experience as a non-native learner of all three languages. Still, the comparison is best understood as impressionistic as opposed to exact.

Language	#types	# metonymy designations	# word class designations	# suffixes
Russian	747	110	33	274
Czech	561	105	23	207
Norwegian	177	60	12	57

Table 2: Total size of databases in terms of types, metonymy designations, word class designations, and suffixes

Several classificatory problems arose in collecting the data, primarily in identifying suffixes and metonymy designations. Allomorphy and its attendant issues (primarily morphophonemic alternations and simple vs. extended versions of suffixes) often made it difficult to know whether one or more suffixes should be recognized. As much as possible, I followed the conventions of the three reference grammars. At the same time every effort was made to be consistent across the three databases. In general, the trend is toward lumping together suffixes when variation is due to morphophonemic, prosodic or orthographic alternations. However, the trend is toward splitting as concerns suffixes and their extended versions. According to this classification, Russian *smut'jan* 'trouble-maker' (derived from *smutit'* 'trouble' via ACTION FOR AGENT) shares the same suffix as *brjuxan* 'person with a large belly'. The same is true for the Russian relational adjective suffix, which can be realized as *-nyj* or *-noj* depending upon stress; thus the following two examples have the same suffix: *mesjačnyj* 'monthly' (derived from *mesjac* 'month' via TIME FOR CHARACTERISTIC) and *oblastnoj* 'regional' (derived from *oblast'* 'region' via LOCATION FOR CHARACTERISTIC). Variations in vowel length are treated similarly in Czech, where *zubař* 'dentist' (derived from *zub* 'tooth' via PATIENT FOR AGENT) and *mlynář* 'miller' (derived from *mlýn* 'mill' via LOCATION FOR AGENT) share the *-a/ář* suffix. However, as mentioned above, Russian *-nic-a* in *saxarnica* 'sugar-bowl' and *-ica* in *teplica* 'hot-house' (derived from *teplyj* 'hot' via CHARACTERISTIC FOR LOCATION) are treated as separate suffixes, despite their etymological affinity. This differentiation is justified by the fact that the initial *n* cannot be motivated synchronically (e.g., as due to an alternation) and that the range of metonymies these two related suffixes signal is not the same.

A few derived words are ambiguous, encoding multiple metonymies that are disambiguated in context. For example, Czech *beranina* (derived from *beran* 'ram') can signal either 'mutton' (thus ENTITY FOR MATERIAL) or 'the smell of a ram' (thus

ENTITY FOR ABSTRACTION). Since the database was not designed to capture this level of detail and variation, it was decided to recognize only one (the most common) metonymy designation for each entry, but to include enough entries to cover the full range of possibilities. The first meaning of *beranina* ('mutton') is much more common, and is the only one recognized in connection with this example in the database. Another example (*rybina* 'fishy smell', derived from *rybí* 'fish') illustrates the type ENTITY FOR ABSTRACTION in this connection in the database. Norwegian *maling* 'paint, painting' is derived using the suffix *-ing* from the verb *male* 'paint' and can signal either the paint itself (thus ACTION FOR MATERIAL) or an act of painting (a vacuous type); in this case, only the former is recognized in the database.

Some derived words are unambiguous but hard to classify. For example, Czech *pec* 'oven' from *péci* 'bake' is classified as ACTION FOR INSTRUMENT in Table 1. But an oven is not a prototypical instrument and depending on its size it might be appropriate to classify it as a CONTAINER or even a LOCATION. Problems of this sort are particularly frequent among the group of metonymies that are related to PART FOR WHOLE: CONTAINED FOR CONTAINER, LOCATED FOR LOCATION, and POSSESSED FOR POSSESSOR.[7] Since the goal of the study was to explore the range of metonymy in word-formation rather than to arrive at a definitive interpretation of every example, the same general strategy was followed as for ambiguous words. When multiple classifications were possible, the one that was most salient was assigned and other entries were included in order to cover the range of possibilities.

By far the biggest challenge was to devise a system of classification that would do justice to the full range of metonymy designations found in word-formation while facilitating comparison both across languages and across the domains of grammar and lexicon. This system is described in more detail in the next subsection.

3.2 Metonymy designations

Overall the goal was to create a classification system that would be as parsimonious as possible while doing some justice to the variety of data observed. A compromise between these two goals would ideally also maximize the opportunity to compare data

[7] The potential overlaps in metonymy relations are addressed in Janda forthcoming. That article is based on a small pilot study restricted only to Czech, but the general outlines of that discussion apply to the data in this study. It is hoped that future studies across various languages will make it possible to tease apart the differences here and establish working definitions with cross-linguistic validity.

across languages. Given that Peirsman and Geeraerts (2006) have assembled a rather comprehensive inventory of metonymy designations and that the goal was to compare metonymy found in word-formation with previously attested metonymy, it seemed wise to implement the classification they offer. Thus the classification system used here is based on Peirsman and Geeraerts (2006), with an eye to maximize similarity. However Peirsman and Geeraerts did not design their system to account for metonymy found in word-formation. Furthermore, as shown in Section 4, the range of metonymy relationships encoded in word-formation is more extensive than that found in the lexicon, so it was necessary to elaborate Peirsman and Geeraerts' system in order to accommodate the word-formation data.[8] This was done by adapting and creating subtypes among the set of vehicles and targets. Table 3 presents the items that serve as vehicles and targets in this system, organized according to a rough thematic grouping (though others are possible).

Relating to **Actions**:	ACTION, STATE, CHANGE STATE, EVENT, MANNER, TIME
Relating to **Participants**:	AGENT, PRODUCT, PATIENT, INSTRUMENT
Relating to **Entities**:	ENTITY, ABSTRACTION, CHARACTERISTIC, GROUP, LEADER, MATERIAL, QUANTITY
Relating to **PART FOR WHOLE**:	PART, WHOLE, CONTAINED, CONTAINER, LOCATED, LOCATION, POSSESSED, POSSESSOR

Table 3: Classificatory terms for vehicles and targets

Here I briefly describe the correspondences between Peirsman and Geeraerts' system and the system used in this study. With the single exception of QUANTITY, the terms in this system have either been directly adopted from Peirsman and Geeraerts (2006) or result from an elaboration of their terms.

The following terms have been adopted directly from Peirsman and Geeraerts (2006): PART, WHOLE, CONTAINER, CONTAINED, LOCATION, LOCATED, ENTITY, MATERIAL, TIME, STATE, MANNER, POSSESSOR, POSSESSED, and CHARACTERISTIC. In the present system, ENTITY is also used to classify the terms ADJACENT ENTITY, SINGLE ENTITY, and OBJECT in Peirsman and Geeraerts (2006).[9] The term

[8] It is important to note that in addition to listing metonymy relations that had been reported by other scholars, Peirsman and Geeraerts (2006) suggest a prototypical analysis that involves some collapsing of types. While I agree with their analysis, I will in some instances preserve the more expansive inventory as required to cover the metonymically more complex phenomenon of word-formation.

[9] A lexical example of ENTITY FOR ADJACENT ENTITY would be English *leg* to refer to the leg of a pair of pants. This corresponds to the designation ENTITY FOR ENTITY in

ACTION/EVENT/PROCESS found in Peirsman and Geeraerts (2006) is broken down into several terms: 1) EVENT (some result from a verb, like Norwegian *trening* 'practice session' derived from *trene* 'train', though this term also covers other kinds of events like *høytid* 'festival, holiday' which serves as the vehicle for *høytidelig* 'ceremonious'), 2) CHANGE STATE for verbs that describe changes of state (as opposed to static states or actions; cf. Croft's (forthcoming) "directed activity" verbs and Mehlig's (1994: 590) "relative transformatives"); an example is Russian *kamenet'* 'turn to stone' a MATERIAL FOR CHANGE STATE metonymy motivated by *kamen'* 'stone'), and 3) ACTION (for all verbal actions not classed as STATE or CHANGE STATE; cf. examples of ACTION in Table 1). The single term PARTICIPANT in Peirsman and Geeraerts (2006) is realized in this classification as 1) AGENT, 2) PRODUCT, 3) PATIENT,[10] and 4) INSTRUMENT. Finally, COLLECTION in Peirsman and Geeraerts (2006) is rendered as GROUP in this system.[11] Although ABSTRACTION does not appear as a term in Peirsman & Geeraerts 2006, it can be subsumed under their system as an abstraction of ENTITY, since their system allows for various levels of abstraction. ABSTRACTION appears as the vehicle in the derivation of Norwegian *farlig* 'dangerous' from *fare* 'danger', an example of ABSTRACTION FOR CHARACTERISTIC. A similar argument can be made for the term LEADER, which is a more specific type of ENTITY. To illustrate, Czech *hitlerovec* 'follower of Hitler' derived from *Hitler* is an example of LEADER FOR ENTITY.

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the present system. SINGLE ENTITY appears in Peirsman and Geeraerts (2006) only in collocation with COLLECTION. This relationship is classed as ENTITY FOR GROUP or GROUP FOR ENTITY in the present system. Russian *žestjanka* 'tin can', cited in Table 1 is an example of MATERIAL FOR OBJECT in Peirsman and Geeraerts' (2006) inventory, but is listed as MATERIAL FOR ENTITY in this system since there is no operational way to distinguish between entities and objects.

[10] PATIENTS are pre-existing items, whereas PRODUCTS are created in the context of the metonymy relationship described. Thus Czech *sbírka* 'collection' has a PRODUCT as target since the collection did not exist prior to the collecting. But Czech *zubař* 'dentist' has a PATIENT as its vehicle since *zub* 'tooth' exists prior to the dentist's work on it.

[11] The rationale for this was that GROUP (or COLLECTION) was found to have metonymical relationships with more terms than (SINGLE) ENTITY, and for many of these the word GROUP was more felicitous. For example Czech *plukovník* 'colonel', derived from *pluk* 'regiment' illustrates GROUP FOR LEADER metonymy. Here the relationship is not merely of a single entity to a collection because a colonel is not a random member of a regiment and a regiment is not a collection of colonels.

The only term that constitutes a non-commensurate addition to the system is QUANTITY, which we see in Russian *dvoit'* 'double, divide in two' derived from the numeral *dvoe* 'two(some)' via QUANTITY FOR ACTION.

Despite the fact that metonymy designations are described here as binary combinations of terms, it is essential to note that this dos not imply any directionality in semantic structure. The combinations of terms should not be interpreted as a componential analysis of metonymy. Instead each metonymy relationship is a unique gestalt, akin in some ways to a construction. The parts are there, but they do not add up to make the whole, and in the context of different constructions, the same part can play different roles. For example, ACTION is the vehicle term for both *pekař* 'baker' (derived via ACTION FOR AGENT from *péci* 'bake') and *jídlo* 'food' (derived via ACTION FOR PATIENT from *jíst* 'eat'; both examples are from Czech). But in *pekař* 'baker' the ACTION identifies something that someone does, whereas in *jídlo* 'food' the ACTION identifies what happens to a PATIENT. The assumption here is that both bottom-up (compositional) and top-down (constructional) semantic processes are at work in word-formational metonymy, as described in Geeraerts' (2002) "prismatic structure".

In Table 2 we see that Czech and Russian are nearly equivalent in the number of metonymy designations they encode via suffixation, whereas Norwegian makes much less of an investment in this system. A closer comparison of which metonymy designations are more characteristic of one language than the others is presented in 4.3. Table 4 shows the ten most popular metonymy designations across the three languages. This was arrived at by aligning the metonymy designations that were represented by the most suffixes in each language. All ten designations listed in Table 4 are within the top fourteen designations for all three languages (the presence of ties made a comparison of less than fourteen impossible).

metonymy designation	illustrative example		language of example
	vehicle	target	
ABSTRACTION FOR CHARACTERISTIC	*mysl'* 'thought'	*myslennyj* 'mental'	Russian
ACTION FOR ABSTRACTION	*myslit* 'think'	*myšlenka* 'idea'	Czech
ACTION FOR AGENT	*bake* 'bake'	*baker* 'baker'	Norwegian
ACTION FOR CHARACTERISTIC	*bereč'* 'guard'	*berežnyj* 'careful'	Russian
ACTION FOR INSTRUMENT	*sušit* 'dry'	*sušička* 'dryer'	Czech
ACTION FOR PRODUCT	*stifte* 'establish'	*stiftelse* 'establishment'	Norwegian
CHARACTERISTIC FOR ABSTRACTION	*tixij* 'quiet'	*tišina* 'silence'	Russian
ENTITY FOR CHARACTERISTIC	*Kafka*	*kafkovský* 'Kafkaesque'	Czech
CHARACTERISTIC FOR ENTITY	*tøff* 'tough'	*tøffing* 'tough guy'	Norwegian
ACTION FOR EVENT	*zabastovat'* 'go on	*zabastovka* 'strike'	Russian

	strike’		

Table 4: Top ten metonymy designations shared by all three languages

3.3 Word class designations

The classification of word class designations is parallel to that of metonymy designations in that each designation consists of a vehicle term and a target term. The following terms serve as both vehicles and targets in all three languages: adverb, noun, numeral, qualitative adjective, relational adjective, and verb. The division of adjectives into qualitative vs. relational was justified on various grounds. Qualitative and relational adjectives behave differently along a series of parameters (formation of comparatives, abstract nouns, etc.) and these differences correlate with a distinction in meaning since qualitative adjectives refer to inherent qualities whereas relational adjectives relate the noun they modify to another referent (often this item describes the physical source of the noun’s referent). Furthermore, when relational adjectives serve as vehicles for metonymic word-formation, they encode a source MATERIAL rather than a CHARACTERISTIC. Note, for example, the way that Russian *žestjanoj* ‘made of tin’ (cf. Table 1) references the tin itself in forming *žestjanka* ‘tin can’ rather than a CHARACTERISTIC such as a tin-like quality. Contrast this with the behavior of a qualitative adjective as a vehicle in Czech *nahý* ‘naked’, which describes a CHARACTERISTIC of the target *naháč* ‘naked person’ (also in Table 1). Other word classes are less frequently encountered and attested only in the role of vehicle in the two Slavic languages: pronoun, interjection, sound, and preposition. Table 5 gives examples of the latter, less frequent word classes.

metonymy designation		word class designation		suffix	illustrative example		language
vehicle	target	vehicle	target		source word	derived word	
PRODUCT	ACTION	pronoun	verb	*kat*	*vy* ‘you’	*vykat* ‘say you to’	Czech
ABSTRACTION	MANNER	interjection	adverb	*ky*	*hop* ‘alleyoop’	*hopky* ‘fast, up’	Czech
PRODUCT	ACTION	sound	verb	*kat’*	*gav* ‘woof’	*gavkat’* ‘bark’	Russian
LOCATION	CHARACTERISTIC	preposition	relational adjective	*(a/e/i)šnij*	*vne* ‘outside of’	*vnešnij* ‘exterior’	Russian

Table 5: Examples of pronoun, interjection, sound, and preposition as word class vehicles

The Slavic languages have a more extensive system in that more word classes participate in word-formation and they also use more of the theoretically possible combinations of word class vehicle and target. However, if we compare the top ten

word class designations (those associated with the most entries in the databases), we find that eight of them are shared by Russian, Czech, and Norwegian. Table 6 lists these eight most frequent word class designations with examples or cross-references to examples previously cited.

word class designation		illustrative example
vehicle	target	
noun	noun	cf. Russian *brjuxan* 'person with a large belly' in Table 1
verb	noun	cf. Russian *vxod* 'entrance' in Table 1
noun	relational adjective	cf. Norwegian *bergensk* 'from/in Bergen' below
qualitative adjective	noun	cf. Czech *naháč* 'naked person' in Table 1
noun	qualitative adjective	cf. Norwegian *farlig* 'dangerous' above
noun	verb	cf. Russian *zavtrakat'* 'eat breakfast' below
verb	qualitative adjective	cf. Czech *váhavý* 'hesitant' below
relational adjective	noun	cf. Russian *žestjanka* 'tin can' in Table 1

metonymy designation	word class designation		illustrative example		language of example
	vehicle	target	source word	derived word	
LOCATION FOR CHARACTERISTIC	noun	relational adjective	*Bergen*	*bergensk* 'from/in Bergen'	Norwegian
PATIENT FOR ACTION	noun	verb	*zavtrak* 'breakfast'	*zavtrakat'* 'eat breakfast'	Russian
ACTION FOR CHARACTERISTIC	verb	qualitative adjective	*váhat* 'hesitate'	*váhavý 'hesitant'*	Czech

Table 6: Top eight shared word class designations

Word class designations are much more restricted than metonymy designations and there is strong agreement across languages as to which word class designations are preferred. This is partly because there are fewer terms involved in word class designations and four word classes, namely nouns, verbs, qualitative adjectives and relational adjectives, play a larger role in terms of type frequency in the lexicon. As we see below in 3.4, suffixes are also quite specific in terms of the word class designations they signal.

3.4 Suffixes in relation to metonymy and word class designations

The distribution of metonymy and word class designations among the suffixes of the three languages reveals some important characteristics of how suffixes signal metonymy in word-formation. Suffixes are much less specific in identifying the relevant metonymy target than in identifying the relevant word class target.

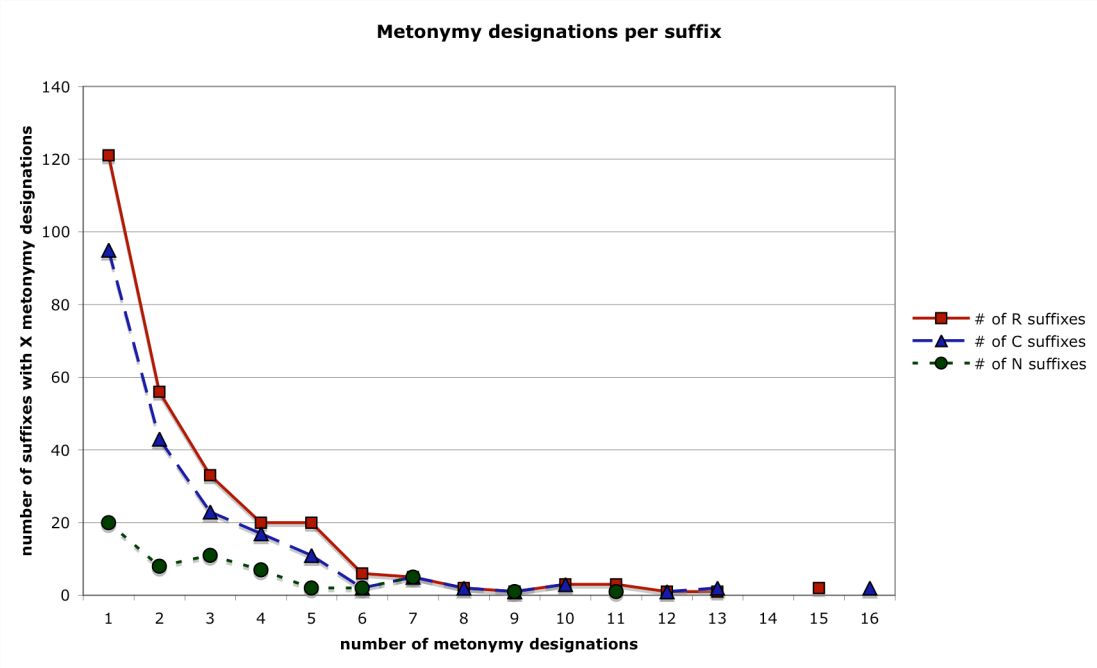

Figure 1: Metonymy designations per suffix

Figure 1 depicts the distribution of metonymy designations (along the x-axis) relative to suffixes (along the y-axis). To the left we see that each language has a number of suffixes with a unique metonymy designation: there are 121 such suffixes in Russian, ninety-five in Czech, and twenty-one in Norwegian. However, most suffixes are much less specific and some can signal a wide variety of metonymy designations. On the opposite extreme we have two Czech suffixes (*-ina* and *-ník*) that signal sixteen metonymy designations each, two Russian suffixes (*-ina* and *-nyj*) that signal fifteen metonymies each, and one Norwegian suffix (*-ing*) that signals eleven metonymies. Table 7 presents entries to illustrate such versatile suffixes.

metonymy designation		illustrative example	
vehicle	target	vehicle	target
Russian *-ina*: 15 metonymy designations (9 vehicles, 7 targets)			
CHARACTERISTIC	ABSTRACTION	*tixij* 'quiet'	*tišina* 'silence'
CHARACTERISTIC	ENTITY	*ženskij* 'female'	*ženščina* 'woman'
ENTITY	ABSTRACTION	*Dostoevskij*	*dostoevščina* 'Dostoevskian style'
ACTION	PRODUCT	*carapat'* 'scratch'	*carapina* 'scratch'
GROUP	ENTITY	*vinograd* 'grapes'	*vinogradina* 'grape'
GROUP	ABSTRACTION	*policejskij* 'police'	*policejščina* 'police repression'
ACTION	EVENT	*krestit'* 'christen'	*krestiny* 'christening'
CHARACTERISTIC	MATERIAL	*pušnoj* 'fur-bearing'	*pušnina* 'furs (collect.)'
CHARACTERISTIC	LOCATION	*ravnyj* 'equal'	*ravnina* 'plain'
CHARACTERISTIC	ENTITY	*rogatyj* 'horned'	*rogatina* 'bear-spear'
CHARACTERISTIC	GROUP	*obščij* 'common'	*obščina* 'community'
MATERIAL	ENTITY	*led* 'ice'	*l'dina* 'ice-floe'
ENTITY	MATERIAL	*kon'* 'horse'	*konina* 'horse-meat'

PART	LOCATION	*verx* ‘top’	*veršina* ‘summit’
PRODUCT	ENTITY	*maslo* ‘oil’	*maslina* ‘olive-tree’
Czech *-ník*: 16 metonymy designations (12 vehicles, 6 targets)			
ABSTRACTION	ENTITY	*služba* ‘service’	*služebník* ‘servant’
ACTION	AGENT	*pracovat* ‘work’	*pracovník* ‘worker’
ACTION	INSTRUMENT	*narazit* ‘collide with’	*nárazník* ‘bumper’
ACTION	LOCATION	*chodit* ‘walk’	*chodník* ‘sidewalk’
CONTAINED	CONTAINER	*čaj* ‘tea’	*čajník* ‘teapot’
ENTITY	ENTITY	*střevíček* ‘lady’s shoe’	*střevíčník* ‘lady-slipper (a flower)’
GROUP	ENTITY	*družstvo* ‘collective’	*družstevník* ‘collective farmer’
INSTRUMENT	AGENT	*soustruh* ‘lathe’	*soustružník* ‘lathe-worker’
LOCATED	LOCATION	*ryba* ‘fish’	*rybník* ‘fishpond’
LOCATION	AGENT	*knihovna* ‘library’	*knihovník* ‘librarian’
LOCATION	LOCATED	*skála* ‘cliff’	*skalník* ‘cotoneaster (grows on cliffs)’
MATERIAL	AGENT	*zlatý* ‘gold’	*zlatník* ‘goldsmith’
MATERIAL	ENTITY	*pára* ‘steam’	*parník* ‘steamboat’
PATIENT	AGENT	*papír* ‘paper’	*papírník* ‘seller of paper goods’
PRODUCT	AGENT	*kouzlo* ‘magic’	*kouzelník* ‘magician’
QUANTITY	ENTITY	*pět* ‘five’	*pětník* ‘5 crown piece’
Norwegian *-ing*: 11 metonymy designations (5 vehicles, 9 targets)			
ACTION	ABSTRACTION	*bake* ‘bake’	*baking* ‘baking’
ACTION	EVENT	*trene* ‘train’	*trening* ‘practice’
ACTION	GROUP	*regjere* ‘govern’	*regjerning* ‘government’
ACTION	LOCATION	*fylle* ‘fill’	*fylling* ‘landfill’
ACTION	MATERIAL	*male* ‘paint’	*maling* ‘paint’
ACTION	PRODUCT	*tegne* ‘draw’	*tegning* ‘drawing’
CHARACTERISTIC	ENTITY	*tøff* ‘tough’	*tøffing* ‘tough guy’
LOCATION	LOCATED	*Vestlandet*	*vestlending* ‘person from Vestlandet’
STATE	ABSTRACTION	*sone* ‘do time in jail’	*soning* ‘incarceration’
STATE	LOCATION	*skråne* ‘slant’	*skråning* ‘slope’
WHOLE	PART	*kveld* ‘evening’	*kvelding* ‘dusk’

Table 7: Highly versatile suffixes in Russian, Czech, Norwegian

The three languages studied here differ in terms of the numbers of metonymy relationships attested in their word-formation systems (cf. Table 2), as well as in terms of the non-specificity of suffixes. The mean number of metonymy designations per suffix is 5.3 for both Russian and Czech, but 3 for Norwegian. Still, this means that on average, suffixes are rather non-specific for the metonymy designations they signal.

Vehicles and targets play very different roles in the specificity of suffixes. Since words derived by suffixation explicitly name the vehicle, it is the variability of the target that is the greatest source of underspecification in the system. In other words, when confronted with a derived word, we can always access the vehicle via the source word, so variation among vehicles connected to a single suffix does not produce potential ambiguity. Accessing the target, however, is more challenging and thus variation among targets creates more potential ambiguity in the system. Table 8 compares the Russian suffix *-o/evyj* with the Czech suffix *-dlo*.

metonymy designation		illustrative example	
vehicle	target	vehicle	target
Russian *-o/evyj*: 10 vehicles, 1 target			
ABSTRACTION	CHARACTERISTIC	*vkus* 'taste'	*vkusovoj* 'taste, gustatory'
MATERIAL	CHARACTERISTIC	*benzin* 'gasoline'	*benzinovyj* 'gasoline'
ENTITY	CHARACTERISTIC	*slon* 'elephant'	*slonovyj* 'elephant'
TIME	CHARACTERISTIC	*čas* 'hour'	*časovoj* 'hour-long'
PART	CHARACTERISTIC	*gorlo* 'throat'	*gorlovoj* 'throat'
LOCATION	CHARACTERISTIC	*kraj* 'region'	*kraevoj* 'regional'
GROUP	CHARACTERISTIC	*orkestr* 'orchestra'	*orkestrovyj* 'orchestral'
INSTRUMENT	CHARACTERISTIC	*ščipcy* 'tongs'	*ščipcovyj* 'relating to tongs'
ACTION	CHARACTERISTIC	*torgovat'* 'trade'	*torgovyj* 'trading'
CHARACTERISTIC	CHARACTERISTIC	*černyj* 'black'	*černovoj (variant)* 'first draft'
Czech *-dlo*: 2 vehicles, 7 targets			
ACTION	AGENT	*zlobit* 'be naughty'	*zlobidlo* 'naughty person'
ACTION	GROUP	*plavat* 'swim'	*plavidlo* 'all types of boats'
ACTION	INSTRUMENT	*létat* 'fly'	*letadlo* 'airplane'
ACTION	LOCATION	*dívat se* 'watch'	*divadlo* 'theater'
ACTION	MATERIAL	*mýt* 'wash'	*mýdlo* 'soap'
ACTION	PART	*chodit* 'walk'	*chodidlo* 'sole of foot'
ACTION	PATIENT	*jíst* 'eat'	*jídlo* 'food'
STATE	LOCATION	*sedat, sedět* 'sit'	*sedadlo* 'seat'

Table 8: Multiple vehicles vs. multiple targets

Whereas Russian *-o/evyj* signals ten different metonymy designations, they all have the same target, CHARACTERISTIC, and thus the suffix is quite specific despite the proliferation of vehicles. The Czech suffix *-dlo*, on the other hand, signals eight metonymy designations, with only two vehicles but seven targets. Czech *-dlo* is thus much less specific. If you encounter a word formed by Russian *-o/evyj* you always know that it will encode a CHARACTERISTIC relating to whatever vehicle is named by the source word. But Czech *-dlo* doesn't tell you much more than to take the ACTION or STATE named by the source word and perform a metonymy. Figure 2 depicts the degree to which suffixes specify metonymy targets.

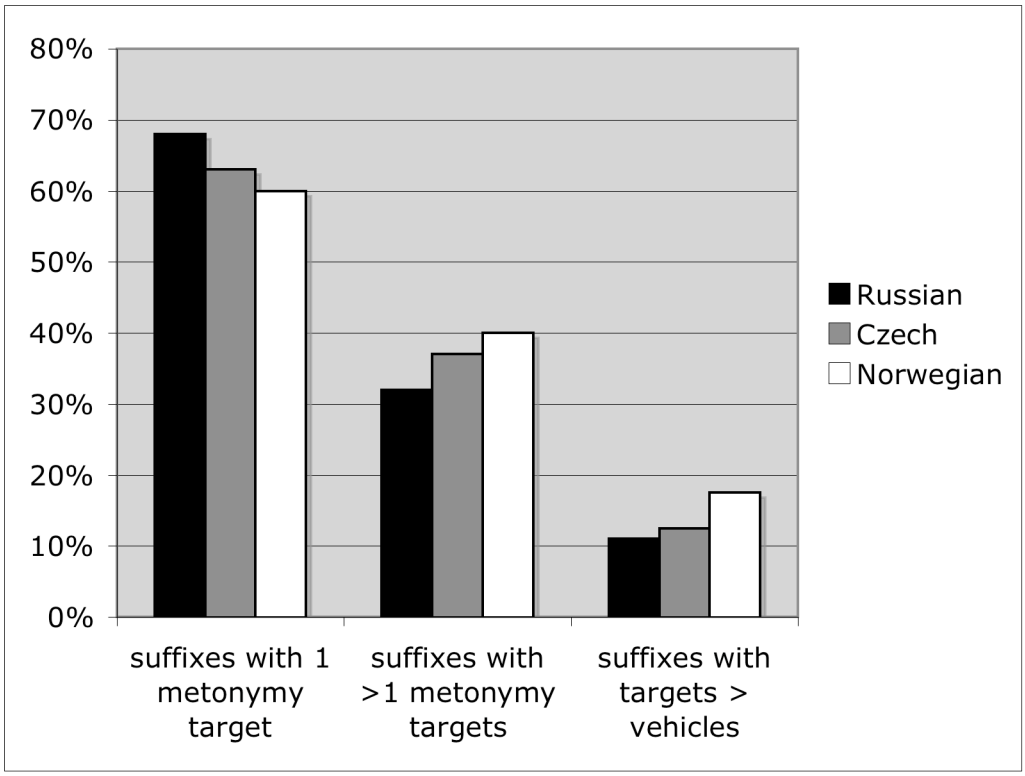

Figure 2: Target specificity of suffixes

The first two clusters of bars (these add up to 100% for each language) divide the suffixes according to whether they are associated with only one or more than one metonymy target. Whereas most suffixes (between 60% and 68%) are specific to a single target, many (between 32% and 40%) are not. Furthermore, between 11% and 17.5% of suffixes are associated with more targets than vehicles (like Czech *-dlo*), representing the high end of underspecification in the system.

The means for word class designations per suffix are nearly identical across the three languages, with 1.55 for Russian and Czech and 1.63 for Norwegian. These figures are also much lower than the means for metonymy designations per suffix. Suffixes are highly specific as to the word class of the target. A given suffix will usually signal only one word class for the target; the only significant source of variation here is among suffixes that derive adjectives, since often the same suffix can derive both qualitative and relational adjectives. The word-class specificity of suffixes is very important in understanding the role of metonymy in word-formation. A suffixed word contains the following complex of information: the metonymy vehicle plus a suffix that both signals the presence of a metonymic relationship and identifies the word class of the target. Usually there are no further clues to the identity of the target.

We can now further refine our discussion of the difference between word-formation and compounding initiated in 1.0 with a comparison of Russian *saxarnica* (lit. 'sugar'-*nica*) and English *sugar-bowl*. The English compound identifies both the vehicle and the target, leaving the user to figure out that it is understood as a CONTAINED FOR CONTAINER metonymy. The Russian derived word is less specific: it offers only the vehicle and the word class of the target. Both compounding and word-formation involve metonymy, but word-formation is considerably more schematic.

4. Observations

The classification system and databases were designed to facilitate comparison across the domains of lexicon and word-formation and across languages. This makes it possible to discover a variety of interesting asymmetries. It turns out that metonymy is not only widespread in word-formation, but also more diverse in that domain than it is in the lexicon. Also, certain metonymies are better adapted to one domain than the other. There are differences in the directionality of metonymies: some of them are highly bi-directional, some of them are strongly uni-directional, and sometimes the directionality is affected by the domain. Finally, we see that metonymy designations are to some extent language-specific: some languages have a strong preference for certain metonymies that are either rare or unattested in other languages.

4.1 Metonymies across the domains of lexicon and word-formation

One of the most surprising results of this study is that more metonymy designations are attested in the domain of word-formation than we find in Peirsman and Geeraerts' (2006) inventory of lexical metonymy.[12] Figure 3 compares the metonymy designations listed by Perisman and Geeraerts with those found in the databases of Russian, Czech, and Norwegian word-formation. All of the metonymies inventoried

[12] One of the metonymy types in Peirsman and Geeraerts' (2006) inventory is sometimes identified as "grammatical". This is the POTENTIAL FOR ACTUAL metonymy we observe in the use of the word *can* in a phrase like *Can you open the window?*, where the speaker is not interested in the hearer's ability to open windows, but is trying to express something akin to an imperative form instead. Despite the fact that this use has sometimes been identified as "grammatical", it can also be interpreted as a pragmatic use of a lexical item. At any rate, this use is not as systematic and widespread as the clearly grammatical function of word-formation. Therefore it is reasonable to consider Peirsman and Geeraerts' inventory as representing the lexicon (as they themselves suggest, cf. Peirsman & Geeraerts 2006: 310), whereas the present study represents word-formation.

in Peirsman and Geeraerts (2006) have been "translated" into their equivalent designations in my system, so that all of them are represented and the counts are commensurate. This means, for example, that "PARTICIPANT FOR PARTICIPANT" is counted as a series of more specific items according to my classification.

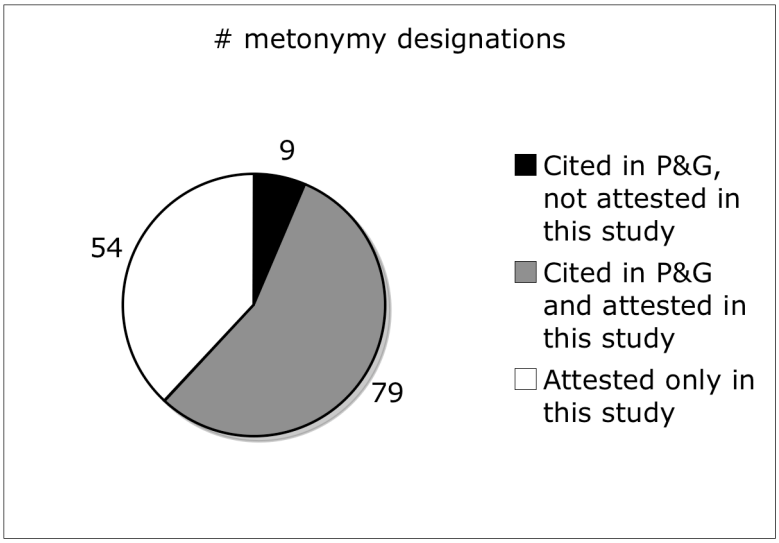

Figure 3: Comparison of metonymy designations across lexicon and word-formation

The majority of the metonymy relationships cited by Peirsman and Geeraerts were also found in the word-formation databases; only nine of their designations could not be found among our suffixes. However word-formation yields another fifty-four metonymy designations that are not observed among lexical metonymies. Since the terms are comparable, with only one added term (QUANTITY), the major source of diversity is increased flexibility in the kinds of combinations that are found. Table 9 compares the metonymies found in lexicon only, those found in both lexicon and word-formation, and those found in all three languages in this study but not attested in the lexicon. The table cites examples of lexical metonymy from various European languages found in Peirsman & Geeraerts' (2006) inventory, while the examples of word-formational metonymy are from Czech.

Metonymy designations found only in the lexicon (full list of 9 items):

- ACTION FOR TIME: *la saison* (< 'act of sowing')
- AGENT FOR PRODUCT: *(I'm reading) Shakespeare*
- TIME FOR ENTITY: *the sixties*
- CONSEQUENT FOR ANTECEDENT: *phobos* ('fear' < 'flight')
- SUBEVENT FOR COMPLEX EVENT: *mother is cooking potatoes* (involves also washing, peeling, etc.)
- CAUSE FOR EFFECT: *unlock the prisons* (meaning 'set the prisoners free')
- POTENTIAL FOR ACTUAL: *Can you see him?* (meaning 'Do you see him?')

- HYPONYM FOR HYPERNYM: *Kodak* (meaning 'camera')
- HYPERNYM FOR HYPONYM: *the pill* (meaning 'contraceptive pill')

Metonymy designations shared by lexicon and word-formation (sample from 79 items):

- ACTION FOR AGENT: *a snitch*; *hrabal* 'greedy person' (< *hrabat* 'rake')
- ACTION FOR INSTRUMENT: *Andenken* ('keepsake' < 'act of remembering'); *odměrka* 'measuring-cup' (< *odměřit* 'measure')
- ACTION FOR LOCATION: *Gang* ('corridor' < 'act of walking'); *parkoviště* 'parking-lot' (< *parkovat* 'park')
- INSTRUMENT FOR ACTION: *to ski*; *bičovat* 'beat with a whip' (< *bič* 'whip')
- ACTION FOR PATIENT: *achat* ('purchase' < 'act of buying'); *lízátko* 'lollipop' (< *lízat* 'lick'
- AGENT FOR ACTION: *to butcher*; *pytlačit* 'do poaching' (< *pytlák* 'poacher')
- CHARACTERISTIC FOR ENTITY: *a beauty*; *naháč* 'naked person' (< *nahý* 'naked')
- CONTAINER FOR CONTAINED: *(to drink) a glass*; *kapesné* 'pocket-money' (< *kapsa* 'pocket')

Metonymy designations found only in word-formation (sample from 54 items):

- ABSTRACTION FOR ACTION: *toužit* 'long for' (< *touha* 'desire')
- ABSTRACTION FOR MANNER: *honem* 'quickly' (< *hon* 'chase')
- ACTION FOR CHARACTERISTIC: *váhavý* 'hesitant' (< *váhat* 'hesitate')
- ACTION FOR EVENT: *zabijačka* 'pig-slaughtering' (< *zabíjet* 'kill')
- ACTION FOR GROUP: *plavidlo* 'all types of boats' (< *plavat* 'sail')
- CHARACTERISTIC FOR ACTION: *chladit* 'cool[verb]' (< *chladný* 'cool[adj]')
- CHARACTERISTIC FOR CHANGE STATE: *mládnout* 'grow younger' (< *mladý* 'young')
- CHARACTERISTIC FOR GROUP: *chudina* 'poor people' (< *chudý* 'poor')
- EVENT FOR CHARACTERISTIC: *válečný* 'war[adj]' (< *válka* 'war')
- GROUP FOR CHARACTERISTIC: *rodinný* 'familial' (< *rodina* 'family')
- LOCATION FOR CHARACTERISTIC: *městský* 'municipal' (< *město* 'city')
- MATERIAL FOR ACTION: *hnojit* 'fertilize' (< *hnůj* 'fertilizer')
- PATIENT FOR ACTION: *věznit* 'imprison' (< *vězeň* 'prisoner')
- PRODUCT FOR ACTION: *kadeřit* 'make curls' (< *kadeř* 'curl')
- STATE FOR ABSTRACTION: *nenávist* 'hatred' (< *nenávidět* 'hate')
- TIME FOR CHARACTERISTIC: *včerejší* 'yesterday's' (< *včera* 'yesterday')

Table 9: Comparison of metonymy designations across lexicon and word-formation

A comparison of the three lists in Table 9 is revealing. For most of the metonymies that appear to be specific to the lexicon, it is hard to imagine how they might be implemented in word-formation. Take for example the bi-directional designations HYPONYM FOR HYPERNYM and HYPERNYM FOR HYPONYM. In the former case we have lexical examples of brand names standing in as generic terms, as in the use of *Kodak* or *Xerox* to refer to any camera or any copy machine. In the latter case we have examples like English *the pill* to stand specifically for a contraceptive pill (cf. Peirsman and Geeraerts 2006: 306-308). Word-formation rarely, if ever, makes

use of hierarchical semantic relations in this way. A curious example is AGENT FOR PRODUCT, as in *Where's my Roget?*, where the author's name stands in for his famous thesaurus. This metonymy is bidirectional in the lexicon, where we also find examples of PRODUCT FOR AGENT (cf. French *coucou* 'cuckoo', cited by Peirsman and Geeraerts 2006: 298), but only the latter is found in word-formation, as in Czech *hrnčíř* 'potter' derived from *hrnec* 'pot'.

On the opposite end are the metonymy relationships that are attested only in word-formation. Only a selection of top items from this list are cited. Overall the greater diversity of metonymy designations associated with word-formation is not due so much to added terms (the only added term, QUANTITY, is fairly infrequent and not listed in the table) as to further combinations of existing terms.

The main purpose of Peirsman and Geeraerts' (2006) article is to propose a radial category structure for metonymy based on clines of prototypicality. Three such clines serve as axes for a three-dimensional category: strength of contact (part-whole, containment, contact, and adjacency), boundedness (bounded and unbounded), and domain (space, time, action/event/process, and assemblies & collections). The first cline serves as the major axis of the category and for the purposes of this study I restrict comparisons to classification along the strength of contact cline. A comparison of metonymies attested in word-formation supports the prototypicality claim made by Peirsman and Geeraerts (2006): the vast majority (eighty-nine) of word-formation metonymies are of the "part-whole" kind (this includes not only PART & WHOLE relations, but also ENTITY & MATERIAL, CHARACTERISTIC & ENTITY, and various relations of ACTION & PARTICIPANT, among others). The representation of "part-whole" along the strength of contact cline for word-formation thus parallels that found for lexical metonymy where this, the most prototypical end of the continuum was also the center of gravity in lexical metonymy: more metonymies were attested for "part-whole" than any other classification. Next along this cline is "containment", which includes relations involving CONTAINER & CONTAINED, ENTITY & GROUP, and ENTITY & TIME. Nine metonymy designations of this type are found in the word-formation databases. Further toward the periphery is "contact", which is dominated by location & located relations; sixteen such relations can be identified in the word-formation databases. Finally, at the periphery of the cline is "adjacency", with relations such as ENTITY & ENTITY, PARTICIPANT & PARTICIPANT, and location for product. At the "adjacency" end of the scale we find somewhat more metonymy designations,

nineteen, but this is due mainly to the differentiation among PARTICIPANTS as AGENTS, PATIENTS, PRODUCTS, INSTRUMENTS, etc. Relationships where there is clearly some ACTION that relates the PARTICIPANTS, but that ACTION is not named by either the vehicle or the target, are quite frequent in the word-formation databases. Still, the position of "part-whole" as prototypical and the differentiation of three more peripheral kinds of metonymy are justified from the perspective of word-formation.

4.2 Directionality of metonymy

The directionality of metonymic relationships is significant because it reveals asymmetries in the salience of referents. Very few metonymy relationships are entirely bi-directional, meaning that there is an equal likelihood that each of the two terms could serve as vehicle and target. Usually even the bi-directional relationships are highly unbalanced, with one direction strongly preferred over the other (cf. Kövecses & Radden 1998: 62-63). And many metonymy relationships are simply uni-directional. If relationships are bi-directional with a nearly equal balance in each direction, the salience of items is probably not inherent and influenced by contextual factors. If relationships are unidirectional or strongly skewed in one direction, this probably means that the vehicle is more salient than the target (Langacker 1993). A close examination of the directionality of metonymy designations can thus open a window on our mental address system, showing trends in the relative salience of concepts.

Figure 4 shows the distribution of bi-directional vs. uni-directional metonymy relationships across the three languages, which behave nearly identically according to this metric. Since there are usually two metonymies to count in the case of the bi-directional relationships (unless they are tautological), this means that twice as may types are reported as for unidirectional relationships. In the case of bi-directional metonymies, we thus divide by two and then add in the number of tautological metonymies.

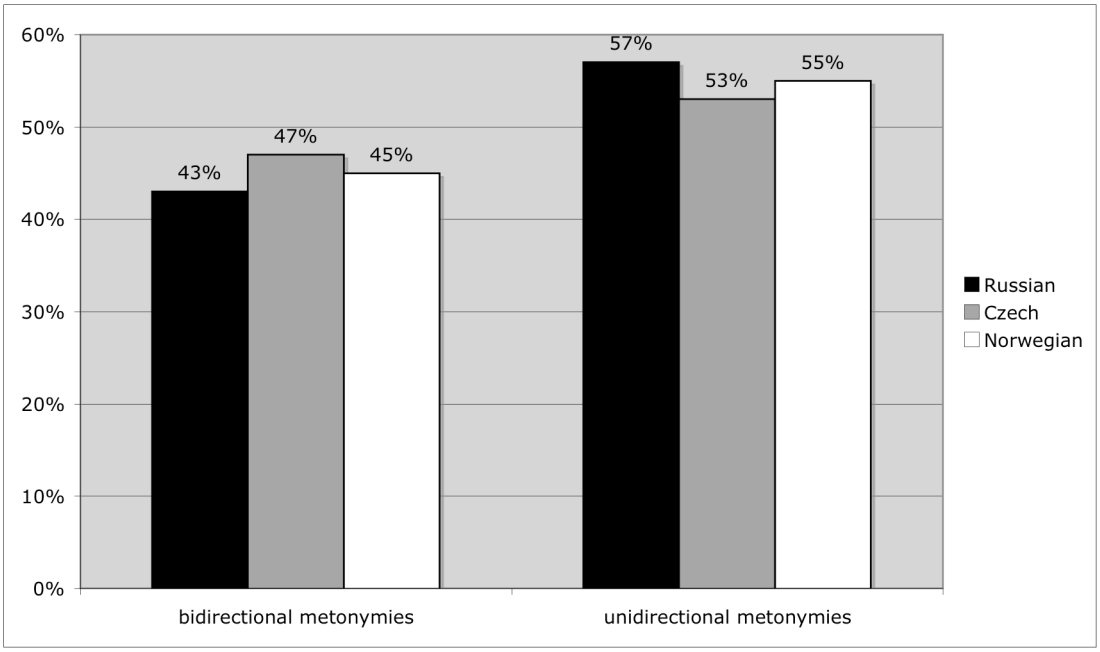

Figure 4: Directionality of metonymy designations

Though some of the uni-directional metonymies are rather rare, found among designations with only one suffix in any given language, others are quite strongly attested. Three examples illustrate particularly robust uni-directional metonymies that are found in all three languages, documented in Table 10.

PRODUCT FOR AGENT			
		illustrative example	
languages attested in	# of suffixes	vehicle	target
Russian	12	*stol* 'desk'	*stoljar* 'cabinet-maker'
Czech	6	*socha* 'sculpture'	*sochař* 'sculptor'
Norwegian	5	*musikk* 'music'	*musikant* 'musician'
INSTRUMENT FOR AGENT			
		illustrative example	
languages attested in	# of suffixes	vehicle	target
Russian	8	*lyži* 'skis'	*lyžnik* 'skier'
Czech	4	*soustruh* 'lathe'	*soustružník* 'lathe operator'
Norwegian	1	*cello* 'cello'	*cellist* 'cellist'
STATE FOR LOCATION			
		illustrative example	
languages attested in	# of suffixes	vehicle	target
Russian	5	*žit'* 'live'	*žiliště* 'living quarters'
Czech	4	*vězet* 'be stuck'	*vězení* 'prison'
Norwegian	1	*skråne* 'slant'	*skråning* 'slope'

Table 10: Some robust uni-directional metonymies

The first item in Table 10, PRODUCT FOR AGENT, is particularly interesting because the converse, namely AGENT FOR PRODUCT, is found only in the lexicon (Peirsman and Geeraerts 2006). Taken together, PRODUCT FOR AGENT and INSTRUMENT FOR AGENT

suggest that concrete objects associated with event situations are often used as vehicles to access an AGENT as the target. The uni-directionality of the third designation, STATE FOR LOCATION, seems reasonable since it is probably easier to name a location after a state experienced there than the other way around.

Table 11 presents examples of bi-directional metonymies that are either clearly balanced or strongly unbalanced across the three languages. The latter types are listed according to the directionality that is favored.

balanced bi-directional metonymies		
ENTITY & CHARACTERISTIC	ABSTRACTION & CHARACTERISTIC	ACTION & PRODUCT
unbalanced bi-directional metonymies		
LOCATION FOR AGENT	PATIENT FOR AGENT	ACTION FOR AGENT
ACTION FOR CHARACTERISTIC	ACTION FOR INSTRUMENT	ACTION FOR ABSTRACTION
ACTION FOR EVENT	PART FOR WHOLE	CONTAINED FOR CONTAINER
POSSESSOR FOR POSSESSED		

Table 11: Balanced and unbalanced bi-directional metonymies

It is nearly equally easy to access a CHARACTERISTIC via an ENTITY or ABSTRACTION as to do the reverse process and the same is true for ACTION and PRODUCT. The unbalanced metonymies tell us about asymmetries in the system. The first three items (the first row under "unbalanced bi-directional metonymies") continue the trend of using something else to access an AGENT that we see above with the first two robust uni-directional metonymies. Five of the unbalanced types have ACTION as the vehicle, which may indicate that ACTIONS are particularly salient. PART FOR WHOLE and CONTAINED FOR CONTAINER both indicate the use of a component item as a vehicle to access a larger item. POSSESSOR FOR POSSESSED may suggest an anthropocentric bias in salience.

4.3 Special investments

The implementation of metonymy across Russian, Czech, and Norwegian reveals not only quantitative differences, but qualitative ones as well, since the languages differ in which metonymy relations they prefer in word-formation. Figure 5 depicts the distribution of the 133 metonymy designations attested in this study across the three languages.

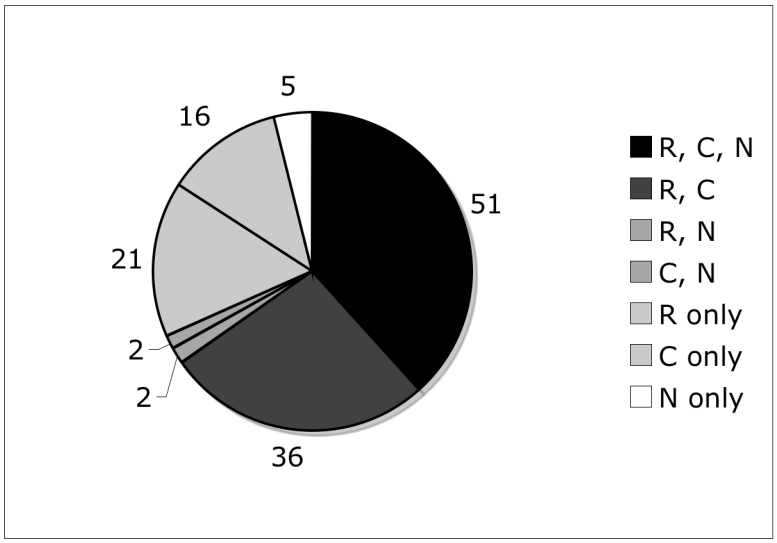

Figure 5: Distribution of metonymy designations across the three languages

This chart shows three patterns, each of which covers about one-third of the pie. Going clockwise from the top, metonymy designations shared by all three languages take up approximately the first third. The second third represents metonymy designations shared by two languages, and most of these are shared by Russian and Czech. The remaining third shows metonymy designations found in only one language.

A further metric for determining preference for certain metonymy designations in given language(s) is the number of associated suffixes. Often a given metonymy designation is attested in all three languages, but is proportionally more prominent in one language than the others. Table 12 presents metonymy designations that are particularly prominent in either the two Slavic languages or in only one of the three languages.

Russian and Czech			
		illustrative example	
metonymy designations	# of suffixes	vehicle	target
LOCATION FOR CHARACTERISTIC	22 (R), 14 (Cz)	*centr* ‘center’	*central’nyj* ‘central’
POSSESSOR FOR POSSESSED	18 (R), 11 (Cz)	*kráva* ‘cow’	*kraví* ‘cow’s’
STATE FOR CHARACTERISTIC	12 (R), 10 (Cz)	*želat’* ‘want’	*želatel’nyj* ‘desirable’
CHARACTERISTIC FOR LOCATION	11 (R), 6 (Cz)	*suxoj* ‘dry’	*suša* ‘dry land’
PART FOR WHOLE	9 (R), 9 (Cz)	*uši* ‘ears’	*ušák* ‘bunny’
Russian			
		illustrative example	
metonymy designations	# of suffixes	vehicle	target
CHARACTERISTIC FOR MATERIAL	9	*gustoj* ‘thick’	*gušča* ‘dregs’
INSTRUMENT FOR CHARACTERISTIC	4	*ščipcy* ‘tongs’	*ščipcovyj* ‘relating to tongs’
CHARACTERISTIC FOR CHARACTERISTIC	4	*velikij* ‘great’	*veličavyj* ‘stately, majestic’
Czech			

		illustrative example	
metonymy designations	# of suffixes	vehicle	target
CONTAINED FOR CONTAINER	11	*písek* 'sand'	*pískoviště* 'sandbox'
PRODUCT FOR LOCATION	6	*mléko* 'milk'	*mlékárna* 'dairy'
QUANTITY FOR ENTITY	6	*sedm* 'seven'	*sedmička* 'number 7 bus, highway, etc.'
Norwegian			
		illustrative example	
metonymy designations	# of suffixes	vehicle	target
LOCATION FOR LOCATED	8	Strømmen	*strømling* 'person from Strømmen'
PRODUCT FOR AGENT	5	*musikk* 'music'	*musikant* 'musician'

Table 12: Language-specific preferences for metonymy designations

The first group of examples in Table 12 is of metonymy designations that are relatively common in both Russian and Czech, but rare or unattested in Norwegian. For example, LOCATION FOR CHARACTERISTIC is signaled by twenty-two suffixes in Russian and by fourteen suffixes in Czech, but only two suffixes are associated with that metonymy designation in Norwegian. POSSESSOR FOR POSSESSED, signaled by eighteen Russian suffixes and eleven Czech suffixes, is signaled by only one suffix in Norwegian. The remaining metonymy designations in that group are absent in Norwegian.

In the Russian section of Table 12, the first designation, CHARACTERISTIC FOR MATERIAL is associated with nine Russian suffixes, but with only three Czech suffixes and no Norwegian suffixes. The other two designations in this section of Table 7 are exclusive to Russian. These designations suggest that Russian is particularly strong in metonymies that involve CHARACTERISTICS.

Czech excels in deriving nouns via three metonymy relationships that are either unattested or rare in the other two languages. PRODUCT FOR LOCATION is not found in Russian or Norwegian, and CONTAINED FOR CONTAINER is not found in Norwegian; otherwise these three relationships are represented by three or fewer suffixes in the other languages.

The two metonymy designations that are flagged for Norwegian are attested robustly in both Russian and Czech, but are ranked relatively higher (eighth and eleventh most common) in Norwegian. LOCATION FOR LOCATED, though it can identify objects in addition to people in both Russian and Czech, is specialized only to human targets in Norwegian.

It is tempting to speculate on possible cultural parallels to language-specific patterns. In addition to the bias toward CHARACTERISTICS noted above for Russian, it appears that Czech is very focused on quantification and commercial transactions.

The Norwegian preference for LOCATION FOR LOCATED seems to comport well with a strong sense of the connection between location and personal identity in Norway. However, this line of inquiry must be left for future studies. All I can establish at this point is that it is possible to compare languages and identify language-specific patterns.

5. Conclusions

The development of a unified classification system for metonymy that can apply both across domains (lexical and grammatical) and across languages facilitates comparisons that were previously difficult if not impossible to make. At the same time, such comparisons foreground a series of issues that merit further investigation. These include the relationship of affixal word-formation both to lexical metonymy and to compounding, the division of labor between grammar and lexicon, and typological phenomena.

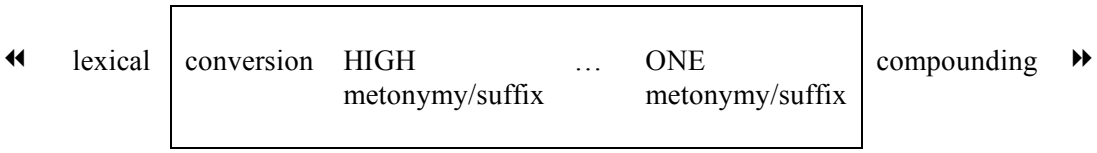

Figure 6: Continuum of metonymic target specification

Lexical metonymy, word-formational metonymy and compounding might be viewed as parts of a continuum of target specification, as depicted in Figure 6. At one extreme lexical metonymy offers only a vehicle and rather diffuse cues as to the presence of a metonymic reference. Word-formational metonymy is somewhat more explicit, offering both the vehicle and an (usually) overt cue to the presence of metonymy, such as an affix. In cases of conversion (a.k.a. "zero suffixation"), however, there may be little or no functional difference between lexical metonymy and word-formational metonymy. Usually conversion is recognized only when there is a change in word class and this accompanies a change in the paradigm of the word as well. Highly inflected languages like Russian and Czech, however, usually require that a word have a stem reflecting its word class so that the inflections have an appropriate place to attach. Conversion is not always capable of providing appropriate stems in such languages. This fact perhaps accounts for proportionally higher use of non-null suffixes in word-formation instead of conversion or lexical metonymy in highly inflected languages. The mid portion of the continuum ranges from suffixes

with a high metonymy ratio to those that signal only one metonymy. At the end of the spectrum, compounding (usually) provides both a vehicle and a target, leaving only the exact nature of the metonymy unspecified. A compound normally expresses only one metonymic relationship and therefore suffixes that express only one metonymic relationship are functionally very similar to compounds.

While many metonymies are shared by both lexicon and word-formation, some are exclusive to only one domain. Further research on this distribution could reveal more about how grammar and lexicon divide the task of bearing meaning in language, contributing to an on-going discussion of what can be expressed grammatically and what cannot (cf. Talmy 2005).

In a number of respects, the three languages in this study behave in a remarkably similar way. The distribution of metonymy designations per suffix and word class designations per suffix are similar, as are the distributions of metonymy vehicles and targets and directionality of metonymy. Furthermore, there is strong agreement on which metonymy and which word class designations are most prominent, and these patterns confirm the prototypicality of certain metonymy relationships as suggested by Peirsman and Geeraerts (2006). It would be important to extend this study to other languages, particularly ones outside of the Indo-European family, in order to explore typological patterns in these distributions. Although word-formation is not a universal phenomenon (cf. Evans & Levinson 2009: 431), it is found in the majority of languages, and in some languages (Finno-Ugric for example, cf. Karlsson 1999) is considerably more pervasive than in Slavic. If, for example, certain metonymies are very strongly represented across many languages, they might tell us something about what kinds of concepts are most likely to serve as vehicles and are thus most salient in human conceptual systems. At the same time, however, language-specific facts emerge, indicating certain differences in expression of metonymy. Some of these differences may be culturally relevant as well.

Finally, this study looked exclusively at type frequency. A given type in the databases might represent only two or several hundred derived words. And each of those words might be of very different token frequency. Frequency data would add a dimension to the measurement of prominence among metonymies.

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