Constructions www.constructions-online.de; ISSN : 1860-2010, DOI: XXX

Argument structure constructions and syntactic productivity

The case of Swedish motion constructions

Joel Olofsson
University of Gothenburg

Abstract

This article investigates the productivity of the Swedish intransitive motion construction verb.intr-iväg 'off', which contains a verb, the directional adverb iväg 'off' and an optional PP.

In a usage-based construction grammar (Goldberg 1995; Goldberg 2006; Barðdal 2008; Bybee 2010) syntactic productivity concerns the possibility of using argument constructions with new verbs (or other argument taking heads) as well as with ordinary verbs with a new function. This notion of productivity is based on type frequency, semantic variability and similarity.

The article is based on two case studies. The first study investigates this construction in a corpus of blogs. The study gave 17,330 hits, with a type frequency of 193 verbs and a semantic variability of 41 frames. These usage findings are incorporated into a formal description of the construction. The second study investigates the semantic variability of the construction by using lexical units associated with six semantic frames in the Swedish FrameNet. The study accounts for 135 verbs, the majority of which are considered rare.

The article shows that even though speakers tend to use the same small prototypical set of verbs in this construction, it is also possible to use the construction with a wide variety of verbs, which are used with the same functions as the more established ones.

Keywords: syntactic productivity, constructions, Swedish, motion, type frequency, semantic frames

1. Introduction

In this article[1] I investigate the syntactic productivity of a Swedish motion construction called verb.intr-*iväg* 'off', with a focus on the variety of lexical units (especially verbs) that can occur in the construction.

According to Talmy's (2000b) typological distinction, Swedish can be classified as a *satellite language*, since verbs used in Swedish motion descriptions usually encode manner of motion, while adverbs encode direction. Previous studies of Swedish motion expressions (Strömqvist 2009; Zlatev & David 2003) have mainly focused on the lexicon, and on the fact that Swedish is considered a satellite language mainly because of the number of verbs containing manner of motion in their inherent lexical meaning. However, with a constructional approach it is also possible to describe the variety of verbs that can function as manner of motion verbs (as well as having other functions), even though they do not include any sense of motion. This is illustrated with the following examples:[2]

(1) a. Vi sprang iväg till affär-en
1 PL run-PST off to store-DEF

'We ran off to the store'

b. Börja med att knäcka
Start-INF by to-INFM crack-INF

iväg till Chocobo Square
off to Chocobo Square

'Start by cracking off to Chocobo Square'

The examples in (1) instantiate the verb.intr-*iväg* 'off' construction, which is used to encode translocative motion in Swedish. They include the adverb *iväg* 'off', describing the direction of the motion, and a PP with the preposition *till* 'to', describing the goal. (1) illustrates how speakers use not just ordinary motion verbs like *springa* 'run' (1a), but also verbs such as *knäcka* 'crack' (1b). *Knäcka*, in this context, could be interpreted as a manner of motion verb, meaning 'move in a forceful manner', because it is used in the same way as other manner of motion verbs, such as the verb *klampa* 'tramp', which also denotes force. The possibility of using such a variety of verbs is evidence of the productivity of motion constructions, and will be the focusof this article, since this has not been dealt with before with regard to Swedish motion constructions.

In this article I will describe two case studies involving the verb.intr-*iväg* 'off'. One aim of the case studies is to discuss the construction from the perspective of productivity, providing an overview of the kinds of lexical items (especially verbs) that can be used, and the potential of the construction to be used with new lexical items, as well as with established items with a new function. Another aim is to combine a formal description (an enriched Goldberg 1995 analysis by using the toolbox used in *Sign-Based Construction Grammar*, henceforth SBCG, Sag 2012) with a usage-based approach (Tomasello 2003; Israel 1996; Bybee 2010;

Goldberg 2006; Ellis 2012), a perspective rarely taken in constructional approaches.

2. Motion in Swedish

In this section I will give a brief overview of how motion scenes are typically described in Swedish. Thereafter, in Section 2.1 I present a set of subtypes and motion frames, and finally, in Section 2.2, I present four functions that a verb may have in a motion construction.

Swedish makes a lexical (morphological) distinction between directional and locative adverbs, the former typically consisting of a single morpheme (*ut* 'out', *in* 'in', *upp* 'up', *ner* 'down', *hem* 'home', etc.), while the latter are derivatives where the stem usually consists of a directional adverb and the suffix *-e* or *-a* (*ute* 'outside', *inne* 'inside', *uppe* 'up', *nere* 'down', *hemma* 'at home', etc.). The difference is illustrated in (2):

(2) a. Kim gick in i rumm-et
Kim walk-PST in-DIR in-LOC room-DEF

'Kim walked into the room'

b. Kim gick in-ne i rumm-et
Kim walk-PST inside in-LOC room-DEF

'Kim walked in the room'

Directional adverbs are used in Swedish to describe *translocative* scenes, where the moving object shifts from one point to another (Talmy 2000b; Zlatev & David 2003), as well as marking whether a boundary has or has not been crossed (Slobin 1996 refers to this as *boundary crossing*). Both ideas are illustrated in (3):

(3) a. Mann-en springer in i hus-et
man-DEF run-PRS in to house-DEF

'The man runs into the house'

b. Mann-en springer till hus-et
man-DEF run-PRS to house-DEF

'The man runs to the house'

c. Mann-en springer i hus-et
man-DEF run-PRS in house-DEF

'The man runs inside the house'

Both (3a) and (3b) are translocative, but only in (3a) is a boundary crossed; this is marked by the directional adverb *in*. In (3a) the *man* is at one point outside the house and at the next inside the house, crossing a line when moving in. The subject in (3b) is also moving between two (imaginary) points but without crossing a boundary. Finally, (3c) is locative, which means that it is neither translocative nor boundary crossing, but rather a movement within a specified area.

2.1 Subtypes and frames of motion

A construction grammar assumes that structures form networks with other related structures (Goldberg 1995: 67). In this sense we can talk about families of constructions, where the members share a set of features. In such a model, one construction type within a family has a central status, to which the other types are related.

In Olofsson (2010), the subtypes of an intransitive motion construction (shown in Figure 1) were observed through a study of the PAROLE corpus.[3] The subtypes in the figure are roughly based on different motion frames in the Berkeley FrameNet (henceforth BFN, <https://framenet.icsi.berkeley.edu>). The figure shows how verbs, depending on their lexical information, give different interpretations of the overall abstract motion construction.

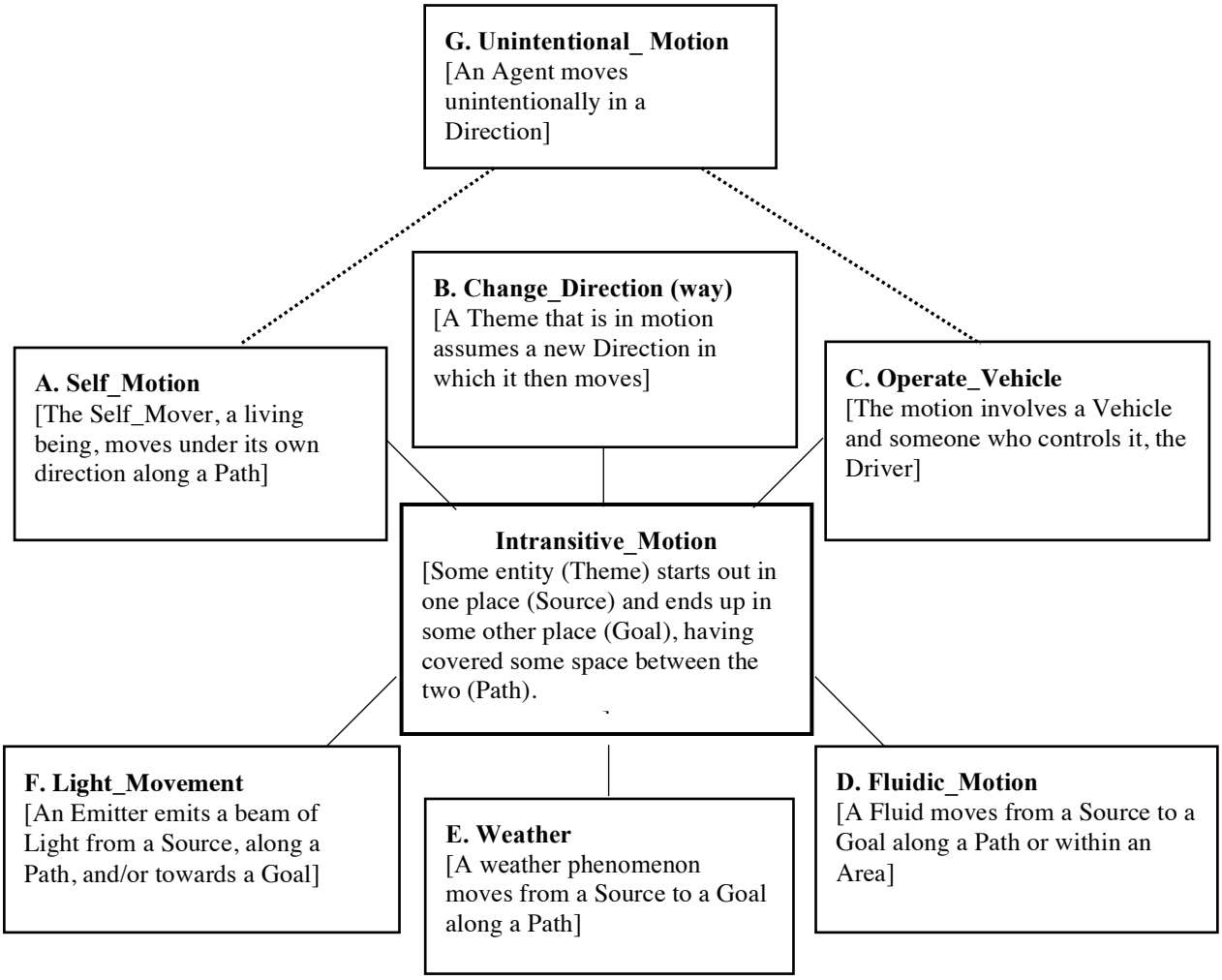

Figure 1. *Subtypes of intransitive motion*

Self_Motion (A in Figure 1) can be seen as the prototypical type found in the Swedish motion construction. Of the 96 motion verbs found in the corpus study (Olofsson 2010), 50 were typically Self_Motion verbs, i.e. where the subject argument has the intention of moving in one direction, and where the verb indicates the manner in which the subject is moving, as in (4):

(4) Lars rusa-de in i bod-en
Lars rush-PST in-DIR in-LOC shed-DEF

'Lars rushed into the shed' [A]

Changed_Direction (B) is a scene, often with an Agent as subject, where the verb has an inherent path or direction:

(5) Reine återvänd-e in i ateljé-n.
Reine went.back-PST in-DIR in-LOC studio-DEF

'Reine went back into the studio.' [B]

Operate_Vehicle (C) is a scene where someone is moving into a space by using some kind of vehicle. These verbs generally have a vehicle argument, e.g. the verb *cykla* is associated with an assumption that a bike is involved. Sometimes the vehicle argument is omitted, as in (6), where it is understood that the Swedish Viking is using a boat:

(6) den svenske viking-en segla-de
DEF Swedish viking-DEF sail-PST

in i nuvarande Ryssland-s
in-DIR in-LOC current Russia-GEN

floddelta
river.DELTA

'the Swedish Viking sailed into the current Russian River Delta' [C]

Fluidic_Motion (D), Weather (E) and Light_Movement (F) are based on the fact that the subjects consist of specific phenomena with which the verbs are typically associated. For example, it is a typical feature of water to *strömma* 'flow' (7a), of the wind to *blåsa* 'blow' (7b), and of the sun to *skina* 'shine' (7c). These three types could also be regarded as subtypes of a more general type: Natural_Phenomena. Common to all three is that the subject is typically inanimate and has the role of Theme.

(7) a. […] att vatten strömma-t
[…] that water flow-SUP

in i skepp-et
in-DIR in-LOC ship-DEF

'water flowed into the ship' [D]

b. vind-en blåste in
wind-DEF blow-PST in-DIR

i rumm-et
in-LOC room-DEF

'the wind blew into the room' [E]

c. Vårsol-en lyser in
spring.sun-def shine-prs in-dir

i rumm-et[4]
in-loc room-def

'The spring sun shines into the room' [F]

Unintentional_Motion (G) is associated with verbs such as *ramla* 'fall', *snubbla* 'stumble' and *halka* 'slip', i.e. where the motion is accidental. In example (8), the subject of both *snubbla* 'stumble' and *ramla* 'fall' has no intention of coming into physical contact with the painting:

(8) Då snubbla-de hon och ramla-de
Then stumble-PST 3SG and fall-PST

in i Pablo Picassos "Skådespelaren".
in-DIR in-LOC Pablo Picassos "the Actor"

'Then she stumbled and fell into Pablo Picasso's "the Actor".' [G]

Unintentional_motion is not a subtype of motion construction per se, but rather a type that can be connected with Self_Motion (A) and Operate_Vehicle (C), illustrated by the dashed lines in Figure 1, since it contrasts with the intentionality of those types.

It seems reasonable to raise the question of whether these types should be regarded as constructional polysemy (Goldberg 1995), or whether they are better analyzed as being one construction type within which the verbs that occur evoke different semantic frames. One reason for assuming the latter is that one motion frame may be expressed through many different constructions. In this article I will move towards the latter approach.

2.2 Manner, means, incremental or result

The verb in a motion construction can have different functions, which means that it can connect to a certain frame element or evoke an additional frame. It may be used to describe the way someone moves (manner), the way the motion is achieved (means), some activity that occurs at the same time as the movement (incremental), or a result of the motion.

The first function, illustrated in (9), is called *manner of motion*, i.e. the verb describes some characteristic of the motion, the way someone moves, etc.

(9) John sprang in i rumm-et
John run-PST in-DIR in-LOC room-DEF

'John ran into the room'

According to Slobin (2004: 255): "'Manner' covers an ill-defined set of dimensions that modulate motion", including motor pattern (*hoppa* 'jump', *skutta* 'skip'), rate of motor pattern (the difference between *gå* 'walk', *lunka* 'jog' and *springa* 'run'), attitude (*flanera* 'stroll' compared to *gå* 'walk'), rhythm, posture (*krypa* 'crouch'), force dynamics (*klampa* 'tramp'), how the motion is performed (*simma* 'swim', *gå* 'walk') and so on.

The next function is *means of motion* (Goldberg 1995; Israel 1996), that is, the means by which the motion is achieved. (10) is an example of means from Goldberg (1995: 199), with the Swedish counterpart from Lyngfelt (2007):

(10) Frank grävde sig ut ur fängelse-t. (Lyngfelt 2007)
Frank dig-PST REFL out from prison-DEF

'Frank dug his way out of prison.' (Goldberg 1995: 199)

A verb with a means function, such as *dig* in (10), evokes the Means frame:

(11) An Agent makes use of a Means (either an action or a (system of) entities standing in for the action) in order to achieve a Purpose. (BFN)

Besides the digging in (10), verbs associated with the Operate_Vehicle type typically evoke means (*rida* 'ride', *cykla* 'bike'), since the vehicle could be seen as the Means that the Agent in (11) uses in order to achieve the motion.

The third function is *incremental* (Israel 1996), that is, some activity occurring at the same time as the movement, as in the following example taken from Lyngfelt (2008):

(12) några par skratta-de iväg
some couples laugh-PST off

nerför trapp-or-na och ut
downwards stair-PL-DEF and out

på grusplan-en.
on gravel-DEF

'some couples went laughing off down the stairs and out onto the gravel.'

The laughing is an incremental activity, because it happens while the couples are moving, and is not considered part of the motion itself.

The fourth function is *result* (Goldberg 1995), and implies that the verb denotes a result or a consequence of the motion act. This function is typically represented by sound verbs such as *susa* 'whistle', *braka* 'crash', *krascha* 'smash':

(13) Boll-en susa-de in
Ball-DEF whistle-PST in-DIR

i bortre gavel-n (Olofsson 2010)
in-LOC far gable-DEF

'The ball whistled into the far gable'

Of the four functions presented in this section, the *manner* function roughly corresponds to the Self_Motion type in the former section, while *means*, as pointed out, could be associated with Operate_Vehicle. The *result* function is sometimes associated with Self_Motion, while the *incremental* function is rarely associated with any of the motion types in Section 2.1, allowing the construction to be combined with a variety of activities.

3. Productivity

In a usage-based construction grammar (Goldberg 1995; Goldberg 2006; Barðdal 2008; Bybee 2010), syntactic productivity concerns the possibility of using argument constructions (or other argument-taking heads) with new verbs as well as with ordinary verbs with a new function.

According to Suttle & Goldberg (2011: 1239), there are two very general restrictions that must be fulfilled for a novel verb to be used with an argument construction:

(14) a. The coinage must be semantically sensical.

b. The coinage must not be preempted by a conventional formulation with the same or a more appropriate function.

(14a) basically means that if we want people to understand us, we do not coin expressions that do not make sense. In order to make sense, the semantics of the lexical units that occur in the expression must be consistent with the semantics of the construction, and/or sometimes "[c]ontext can often ameliorate otherwise ill formed expressions if it serves to provide a sensical interpretation" (Suttle & Goldberg 2011: 1239). Preemption (14b) means that speakers learn not to use a construction if a competing construction with the same function is consistently experienced. However, in this article I will not take preemption in consideration. For more on preemption see Goldberg (2006), Suttle & Goldberg (2011).

In addition there are three gradient factors that contribute to productivity: a) type frequency, b) semantic variability and c) similarity.

a) Type frequency refers to how many different items occur in a schematic slot in a construction (e.g. the verb slot or the prepositional phrase slot). It is assumed to contribute to productivity, since the higher the type frequency the higher the likelihood that speakers will use new items in the slot. Type frequency differs from token frequency, which refers to the number of times a specific item occurs in a slot. For instance, if the verb *springa* 'run' occurs 20 times in a corpus, then its token frequency is 20 but it is only 1 type.

b) Semantic variability corresponds to the semantic range of the types experienced. One way to map a construction's variability is to categorize the verbs that occur into semantic verb classes (Levin 1993; Goldberg 1995; Barðdal 2008; Olofsson 2010). Another way is to categorize them into the semantic frames they evoke (lexically). In this article I will approach semantic variability with the latter method.

c) One way of defining *similarity* is to say that "Coinages are acceptable to the extent that they are similar to an existing attested

instance" (Suttle & Goldberg 2011: 1239). This statement is based on the idea that productivity is fundamentally related to patterns of analogy. Similarity is often confounded with type frequency and semantic variability: if speakers experience a high proportion of types, then it is more likely that the verbs represent different semantic features, and there will be more candidates (types) from which to make analogical extensions.

Some authors have argued for an approach that allows for both item-based analogy and generalizations (Ross & Makin 1999; Goldberg 2006). This distinction could be illustrated by following Itkonen (2005), where two types of generalizations are proposed, as shown in Figure 2.

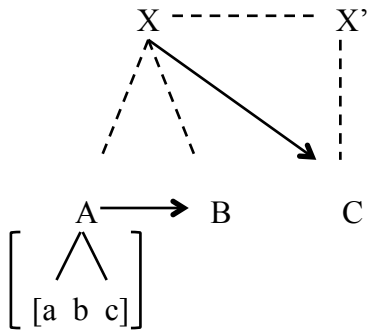

Figure 2. Two types of analogical generalizations (Itkonen 2005)

X in Figure 2 represents the first type of generalization, and concerns the structural-functional similarities between A and B. That is, the similarity between A and B is not only based on similarity in shape, with the three constituents (a, b, c), but also on the relationship between the constituents, which is based on their functions (Itkonen 2005: 1). The X generalization corresponds to the typical case of item-based analogy where the new expression (B) is coined based on structural-functional similarity with a specific attested model (A).

The X' generalization in Figure 2 is the case in which C is coined in analogy with a previous generalization (X), where the generalization X' is a more abstract structure, and the extension would go from X to C instead of from B to C. This is a kind of generalization of previous generalizations, which shows how abstract constructions are built from concrete expressions. Accordingly, there is no sharp line between the two types of generalizations. For instance, in cases where there is only one possible candidate (low type frequency) on which to base the extension (the traditional view of analogy), it is likely an X type of generalization. However, even in cases with many candidates (high type frequency) we cannot exclude the possibility that both X and X' are accessible (I discuss this futher in Section 6.).

In the following sections (4 and 5), I will present two case studies that investigate the three factors given above (a-c), as well as what makes a coinage sensical (14a). Both studies will focus on the intransitive motion construction [verb-*iväg* 'off'], which consists of a verb, the directional adverb *iväg* 'off' and an optional PP, as illustrated in example (1).

4. Case study 1: Corpus of blogs

In this section I will first present a corpus study that investigates the token and type frequencies for the construction. Then I will present a formal analysis of the construction, using feature structures as in SBCG (Sag 2012), and show a way to incorporate the usage-based information (frequency) from the corpus study into the analysis (following Zeldes 2012), since a usage-based approach builds on the idea that constructions are statistical abstractions of patterns of form-meaning correspondence in usage experience (Tomasello 2003; Bybee 2010; Ellis 2012).

4.1 Method

The empirical data is taken from the corpus Bloggmix, using searches with the corpus tool Korp (http://spraakbanken.gu.se/korp/). Bloggmix is a corpus of 344,826,785 tokens, 22,253,688 sentences, which consists of material from a selection of Swedish blogs.

I have used the following search string: [pos = "VB"] [word = "*iväg*"] [pos = "PP"]. The search string is locked to the word order where the verb is followed immediately by the adverb *iväg* 'off', which in turn is followed immediately by a PP. This implies a risk of missing some relevant results, where such expression has an inverted word order. However, the survey gave a total of 17,330 hits, which is more than enough to draw some reasonable conclusions.

4.2 Results

In this section I present the results of the corpus study. Section 4.2.1 deals with the token and type frequencies of the verb.intr-*iväg* construction, and Section 4.2.2 deals with the semantic variability of the construction, measured in semantic frames.

4.2.1 Tokens and types

Table 1 shows the token and type frequency of the construction based on the corpus findings.

Structure	Tokens	Types (verb)
V-*iväg*-PP 'V-off-PP'	17330	193
V-*iväg-till* 'V-off-to'	10484	170
V-*iväg-på* 'V-off-on'	5753	81
V-*iväg-mot* 'V-off-towards'	474	68
V-*iväg-från/ifrån* 'V-off-from'	358	57
V-*iväg-övrigt* 'V-off-other'	261	-

Table 1. Token and types for VERB.INTR-*IVÄG* 'OFF'

At the top of Table 1, the left column shows the structure that applies to the entire corpus search, that is, the investigated construction itself. This is followed by all the prepositions that are instantiated in the structure.

The middle column shows the number of tokens for each structure, i.e. the total number of times the structure is represented in the corpus. We can see that the most common preposition to be combined with the directional adverb *iväg* 'off' is *till* 'to' (10484), which is the head in a PP denoting the Goal of the motion:

(15) a. Men mak-en går iväg
But husband-DEF walk-PRS off

till jobb-et.
to work-DEF

'But the husband walks off to work.'

b. Kilar iväg till frisör-en!
Scamp-PRS off to hairdresser-DEF

'Scampering off to the hairdresser!'

Instances with *till* 'to' represent more than half of the search's total number of tokens (17,330). The second most common preposition is *på* 'on' (5753), which in turn is equivalent to about half the occurrences of *till* 'to'. So far, the results follow Zipf's law (Zipf 1935), which assumes that the words or patterns that have the highest frequency in a language constitute the majority of the tokens in that language, and the most common occurs about twice as often as the next most common. The second most common is in turn assumed to be twice as common as the next most frequent unit, but as we see in Table 1, Zipf's reasoning does not hold all the way, because there is a large gap before *mot* 'towards' and *från* 'from'. Instances with *på* 'on' correspond to Goal (16a), *mot* 'towards' corresponds to Benchmark (16b), and *från* 'from' corresponds to Source (16c):

(16) a. sen var jag tvungen att
then was 1SG forced to-INFM

cykla iväg på fotbollsträning.
bike off on soccer.practice

'then I had to bike off to soccer practice.'

b. Plötsligt vände sig den
Suddenly turn-PST REFL DEF

äldre och stappla-r iväg
elderly and stumble-PRS off

mot torg-et.
towards square-DEF

'Suddenly the elderly person turns and stumbles off towards the square.'

c. Petra och jag kila-de iväg
Petra and 1 SG scamper-PST off

från kontor-et och köpte sushi till lunch
from office-DEF […]

'Petra and I scampered off from the office and bought sushi for lunch'

The category *övrigt* 'other', on the lower line in the left column, contains 28 less frequent preposition types, such as *över* 'across', *mellan* 'between', *genom* 'through', *nerför* 'down', and so on. These are exemplified in (17):

(17) a. Springer iväg över sovrumsgolv-et.

run-PRS off across bedroom.floor-DEF

'Running off across the bedroom floor.'

b. men förhoppningsvis så hinner
but hopefully so manage-prs

vi åka iväg mellan Alice
1pl go off between Alice

och Melli-s kulle.
and Melli-gen hill.

'but hopefully we will manage to go between Alice and Melli's hill.'

c. och sedan började alla
and then begin-pst all

deltagare vandra iväg
participant wander-inf off

genom skog-en
through wood-def

'and then all participants began to wander through the woods'

d. Jag landar på fötter-na
1SG land-PRS on feet-DEF

som en katt, och försvinner
like a cat, and disappear-PRS

iväg nerför gata-n
off down street-DEF

'I land on my feet like a cat, and disappear down the street'

Table 2 shows the five most common verbs, i.e. the number of tokens for each verb and each structure.

	V-*iväg-till* 'V-off-to' (10484)	V-*iväg-på* 'V-off-on' (5753)	V-*iväg-mot* 'V-off-towards' (474)	V-*iväg-från* 'V-off-from' (358)
1.	*åka* (2260) 'go by vehicle'	*skola* (1335) 'shall/ should'	*åka* (72) 'go by vehicle'	*komma* (95) 'come'
2.	*dra* (1215) 'move'	*åka* (1287) 'go by vehicle'	*dra* (64) 'move'	*gå* (36) 'walk'
3.	*skola* (1065) 'shall/ should'	*vara* (1002) 'be/exist'	*gå* (30) 'walk'	*springa* (36) 'run'
4.	*komma* (674) 'come'	*dra* (668) 'move'	*fara* (26) 'go travel'	*åka* (36) 'go by vehicle'
5.	*gå* (628) 'walk'	*komma* (338) 'come'	*traska* (26) 'trudge'	*smita* (17) 'shirk'
Total	(5842)	(4630)	(218)	(220)

Table 2. The 5 most common verbs for each structure

The top row shows the structures and their total number of hits (tokens) in parentheses. On rows 1-5, the five most frequent verbs for each structure are presented, with the number of tokens in parentheses. The bottom row of the table shows the total number of tokens for the five verbs.

Åka 'go by vehicle' (underlined in the table) is by far the most common verb.[5] It is also the only verb that is among the top five in all of the four structures.

(18) Anders, Lina, Kajsa och jag
Anders, Lina, Kajsa and 1SG

åkte iväg till sandbank-ar-na.
go-PST off to sandbank-PL-DEF

'Anders, Lina, Kajsa and I went off to the sandbanks.'

In (18) the subject is moving to *sandbankarna* with some unexpressed vehicle (which sometimes is understood from the context and sometimes irrelevant). The total number of tokens for the verb *åka* is 3668. The verb can therefore be seen as one of the most prototypical verbs occurring in the construction.

The verbs *dra* 'move', *komma* 'come' and *gå* 'walk' appear among the top five verbs in three of the columns:

(19) a. Nu har jag packat
Now have 1SG pack-SUP

väska-n och drar iväg
bag-DEF and move-PRS off

mot World Class.
towards World Class

'Now I've packed the bag and will move off to the World Class.'

b. Carina & Caroline kanske inte
Carina & Caroline might not

kommer iväg till New York imorn!
come-PRS off to New York tomorrow

'Carina and Caroline might not come to New York tomorrow!'

c. Han gick iväg till
1SG walk-PST off to

jobb-et för några timm-ar sedan.
work-DEF for some hour-PL ago

'He walked off to work a few hours ago.'

Table 2 consists of 12 different verbs, which constitute about 6% (6,2 %) of the total number of 193 verb types for the overall corpus search. Yet these 12 verbs represent the majority of tokens for the corpus search. The total number of tokens for the

five most frequent verbs for each structure is 10,910 (= 5,842 + 4,630 + 218 + 220). This is more than half (~ 63%) of the hits for the overall corpus search (V-*iväg*-PP, 17330). This supports the idea that there are a few verbs that are lexically strong in the construction, and therefore often associated with it.

Another common verb is *skola* 'shall'. In Swedish it is possible to use an auxiliary verb alone in a motion construction, typically describing a possible motion, i.e. we do not know if it actually has or will take place (Olofsson 2010), as in (20).

(20) a. Vi ska iväg till Gefle och
1pl aux off to Gefle and

grilla med E och J och ett
grill-inf with E and J and one

till par.
more pair

'We shall head off to Gefle and grill with E and J and another pair.'

b. Thomas skulle iväg till
Thomas aux off to

CityGross imorse
CityGross this.morning

'Thomas should head off to CityGross this morning'

Table 2 shows that the verb *skola* 'should, shall, would' represent a total of 2,400 tokens (1,335 + 1,065), which is almost 30% (29.4%) of the number of tokens for the five most common verbs, and nearly 18% (17.6%) of the total number of tokens for the overall search. While it is unsurprising that some verbs are more prototypical than others, it is noteworthy that a verb that lacks any component of motion in its lexical meaning is so dominant in a motion construction.

The use of auxiliary verbs in a motion construction gives a good example how the verb does not necessarily evoke the motion frame and the related frame elements, but may deliver an additional frame. In a way one can say that one frame is being evoked by the verb and one by the construction. The verb *skola* evokes the Desiring frame, defined in (21):

(21) An Experiencer desires that an Event occur. (BFN)

The ability to use an auxiliary verb in a motion construction seems to be language specific. For instance, there is no obvious counterpart construction in English, as indicated by the examples in (23):

(22) a. *I will into the room

b. ?I must into the room

c. I will go into the room

d. I must go into the room

In English it seems to be more or less mandatory for the auxiliary verbs *will* and *must* to be constructed with a main verb as in (22c-d), since (22a) is ungrammatical and (22b) is doubtful.

4.2.2 Semantic variability

Turning to semantic variability in the construction, Table 3 presents the variability by listing the semantic frames evoked by the verbs that occur. The frames are arranged primarily on the basis of which frames the verbs are linked to in the lexical infrastructure Karp(http://spraakbanken.gu.se/karp/), which means that the verbs are classified based on their (prototypical) lexical information, and not on how they function in the construction (in which case all of them would be classified as motion verbs in one way or another).

Frame	**Types**
Self_motion	70
Operate_vehicle	23
Motion	14
Make_noise	12
Bungling, Fluidic_motion, Moving_in_place	5
Attempt, Departing, Fleeing	3
Bringing, Communication_manner, Communication_noise, Desiring, Mental_property, Sounds	2
Absorb_heat, Becoming, Being_active, Being_obligated, Body_movement, Cause_change_of_position_on_a_scale_decrease, Cause_change_of_state, Cause_motion, Cause_to_fragment, Cause_to_move_in_place, Change_direction, Desirable_event, Entity_specific_modes_of_being, Escaping, Existence, Experiencer_focus, Experiencer_obj, Impact, Motion_directional, Perception_active, Posture, Quitting_a_place, Removing, Ride_vehicle, Travel	1
Other (hard to categorize)	12
Total: 41 Frames	

Table 3. *Semantic variability*

All in all, the verbs in the corpus search could be connected to 41 different semantic frames. These are shown in Table 3, with the semantic frame in the left column, and the number of verbs associated to the specific frame in the right column.

As shown in the table, the most common verb types are motion verbs that evoke the Self_motion frame (70 types), including verbs such as *springa* 'run', *traska* 'trudge', *hoppa* 'jump' and *rusa* 'rush'. This is the prototypical frame with the verb.intr-*iväg* construction (as mentioned in Olofsson 2010, suggested as a prototypical subtype), even though Self_motion evoking verbs were less represented in Table 2. This shows a difference between prototypicality based on type versus token frequency.

The second most common frame is the Operate_Vehicle frame (23 types), including verbs such as *cykla* 'bike' and *paddla* 'paddle', which involve a vehicle and someone who operates it in order to perform a motion.

The third most common semantic frame is the overall Motion frame, which includes motion verbs with less specific information about manner, means or path, such as *glida* 'glide' which may involve Self_motion when intentionally 'moving in a gliding manner', or Unintentional_motion when gliding unintentionally. *Rulla* 'roll' could also evoke different motion frames: Self_motion frame as a manner verb, Operate_vehicle if it is a rolling vehicle. The Motion frame is also used for scenes where the subject is realized as an unintentional entity (Theme). The difference is illustrated in (23):

(23) a. John rullar iväg (på golv-et)
John roll-PRS off on floor-DEF

till nästa rum (Self_motion)
to next room

'John rolls off (on the floor) to the next room'

b. Bil-en rullar iväg till stan
(Operate_vehicle)

car-DEF roll-PRS off to town

'The car rolls off to town'

c. Boll-en rullar iväg till målvakt-en
(Motion)

ball-DEF roll-PRS off to keeper-DEF

'The ball rolls off to the keeper'

The definition of the overall motion frame, illustrated in Figure 1 in Section 2.1, indicates that the Agent element is more specific than the Theme element.

Some frames in Table 3 are more closely related to each other than others. Overall there are 14 frames that relate to motion (including the transitive Cause_motion and Cause_to_move_in_place). The Ride_vehicle frame, with only one occurrence, could be counted as Operate_vehicle. Four frames (Communication_manner, Communication_noise, Sounds, Make_noise) all have something to do with a sound-denoting verb, accounting for 18 verbs, as in (24):

(24) innan jag svischade iväg till Style
before 1SG swish-PST off to Style
'before I swished off to Style'

Some frames relate to types of mental process, experience or being:

(25) a. (Experiencer_focus)

Jag	måste	panika	iväg	till
1SG	aux	panic-INF	off	to

buss-en
bus-DEF

'I must panic off to the bus'

b. (Perception_active)

Nu	ska	jag	kika	iväg
now	aux	1sg	peek-inf	off

på	ett	mote
on	a	meeting

'Now I shall head off to a meeting'

Perception verbs such as *kika* 'peek' in (25b) are often interpreted as fictive motion when used in a motion construction (see Talmy 2000a, chapter 2; Olofsson 2010), which refers to variants where the motion is not physically present. However, (25b) is to be interpret as physical motion, and not as fictive motion.

The corpus study gave both common prototype verbs that are high in token frequency (as shown in both Table 1 and 2) and some rare items that are low in token frequency and unlexicalized with a sense of motion (see Zeldes 2012). In between, there are lexicalized types ranging from low to relatively high token frequency. The distribution of the three categories of verb types is illustrated in Table 4:

Construction	Common prototypes	Other stored types	Rare items
V-*iväg*-PP	19	131	43

Table 4. Prototypes and rare items

The 19 most common prototypes have already been presented in Table 2. The other 131 stored types mainly consist of Self_Motion and Operate_Vehicle verbs, illustrated in Table 3. These verbs vary in terms of token frequency, some low, some high (up to 100 tokens), but all have some type of motion in their lexical meaning. The 43 rare types consist of a variety of verbs, including 7 sound verbs, as well as the hard-to-categorize items in the category *övrigt* 'other' in Table 3. The rare verb *smurfa* is illustrated in (26):

(26) Strax ska jag smurfa
in.a.minute aux 1sg smurf-inf

iväg till jobb-et
off to work-def

'Soon I will smurf off to work'

Smurfa in (26) can be interpreted as manner of motion, meaning something like 'act like a smurf', or 'move in the style of a smurf'.

4.3 A formal analysis

In this section, I will present a formal analysis, which consists of feature structures, in the style of SBCG (Sag 2012). However, it is important to point out that this is not an SBCG analysis per se, which is a lexicalist approach. Instead, I assume an enriched Goldberg (1995) approach, where the verb, the adverb and the PP constitute a phrasal construction.[6] The main reason for this enriched description is increased formal precision for capturing properties of the construction that is not possible with the original Goldberg analysis for argument structure constructions. For instance, the addition of frames and frame elements evoked by the verb.

The analysis is illustrated in Figure 3. The top box presents the construction's external properties, i.e. the properties that apply to the construction as a whole. This is the mother (MTR) in the construction. SYN captures syntactic features such as lexical category and grammatical function. SEM shows semantic features such as the semantic frame evoked by the construction, and the frame elements that go along with the semantic frame. The syntactic and the semantic features are linked through unification indexes.

VAL indicates that the construction is yet to be combined with a syntactic subject. So, the subject NP-argument in the VAL, indexed with #1, is linked with the semantic role Agent or Theme in SEM, representing 'the thing that is moving'.

The Adv-argument is lexically filled with the directional adverb *iväg* 'off', and is linked to the semantic role Direction through the index #2. The optional PP-argument is linked to the semantic role that denotes the Goal, the Source or the Path of the motion, coindexed by #3. The verb is indexed somewhat differently from the Adv and the PP. The index s_1 is used to show how the verb is linked to one of the functions *manner*, *means*, *incremental* or *result* (illustrated in Section 2.2 above).

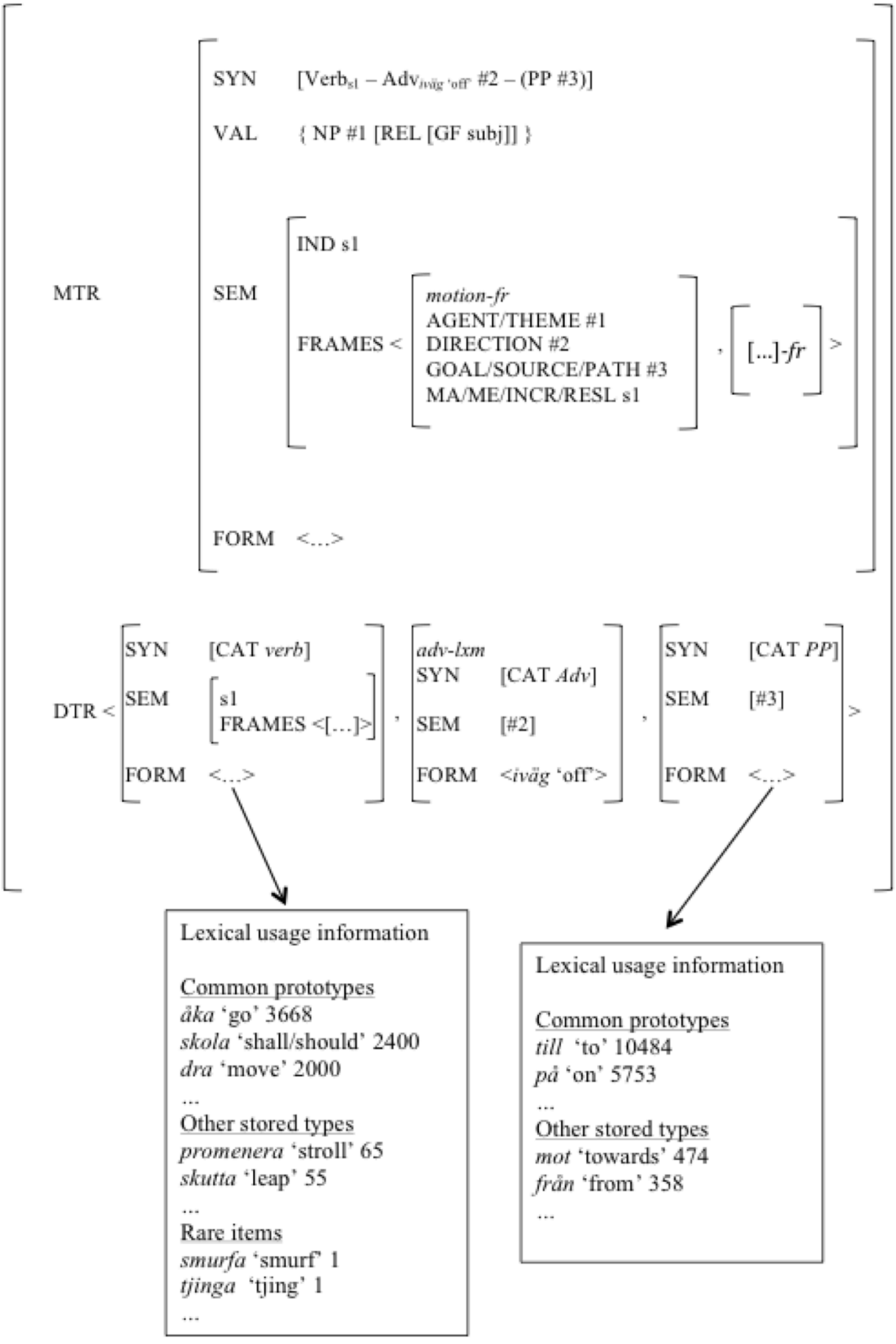

Figure 3. Formal analysis of VERB.INTR-IVÄG

This analysis allows for any of the four functions, depending on the semantics of the verbs and/or how the verb is used. This index is connected to the semantic feature IND s1 in the mother SEM, indicating a situational index, which refers to the kind of situation that is at stake (Sag 2012: 89).

The [..]-*fr* in the semantic features indicates that the occurring verb can sometimes bring an additional frame, especially when the verb does not evoke an motion frame. For example, the auxiliary verb *ska* 'shall' does not evoke any motion at all, but evokes the frame Desiring, which will be shown later, in Figure 5.

The boxes underneath the mother in Figure 3 represent the internal properties, that is, properties that apply to the different constituents of the construction, i.e. the daughters (DTR). The construction contains three daughters: a verb construction, an adv-lexeme construction and a PP construction, which are coindexed with their corresponding elements in the mother construction.

The two boxes outside the construction contain lexical usage information, which is a way of incorporating the usage-based frequency information from the corpus study into the formal analysis (following Zeldes 2012; also proposed by Wulff 2013: 284; Boas 2008: 137; cf. Hilpert 2010, and further discussed in Olofsson 2014).[7] The left box shows the kind of verbs that are typically used in the verb slot in the construction, as presented in Tables 2 and 3 above, and the right box shows the prepositions that occur in the construction, as presented in Table 1. In this sense this is not an analysis that restricts the kind of lexical units that may be generated with the construction, but is rather a usage-based generalization about how the construction is used. This also shows that the formal description is based on actual usage, and that it is formalized flexibly enough to account for the variety of lexical content found in the corpus study, and is therefore also open for possible future extensions, since those are expected to be built from the items already attested (Goldberg 2006; Bybee 2010).

In the following, I will give two examples of construct analyses based on the formal analysis above. By *construct* I mean the actual use of the construction. The first analysis, illustrated in Figure 4, is based on the following utterance:

(27) Vi cyklade iväg till affär-en
1PL bike-PST off to store-DEF
'We biked off to the store'

One difference between the analysis of the construction and this construct is that the valency feature has been fulfilled with *vi* 'we-1pl', and that the verb *cykla* 'bike' evokes the more specific motion frame Operate_vehicle, which replaces the motion frame in the semantic feature of the mother, and is coindexed #6 with the semantic feature frame in the verb daughter. Furthermore, the index s1 indicates that the verb is to be interpreted with a means function. Since this frame has more specific frame elements than the motion frame evoked by the construction, the verb will add the roles Driver and possibly Vehicle, which may be expressed or may be null (optional null). These frame elements are unified, since the Driver is a more specific subtype of the general Agent type, and is therefore compatible according to the semantic coherence principle, which states that "only roles which are semantically compatible can be fused" (Goldberg 1995: 50).

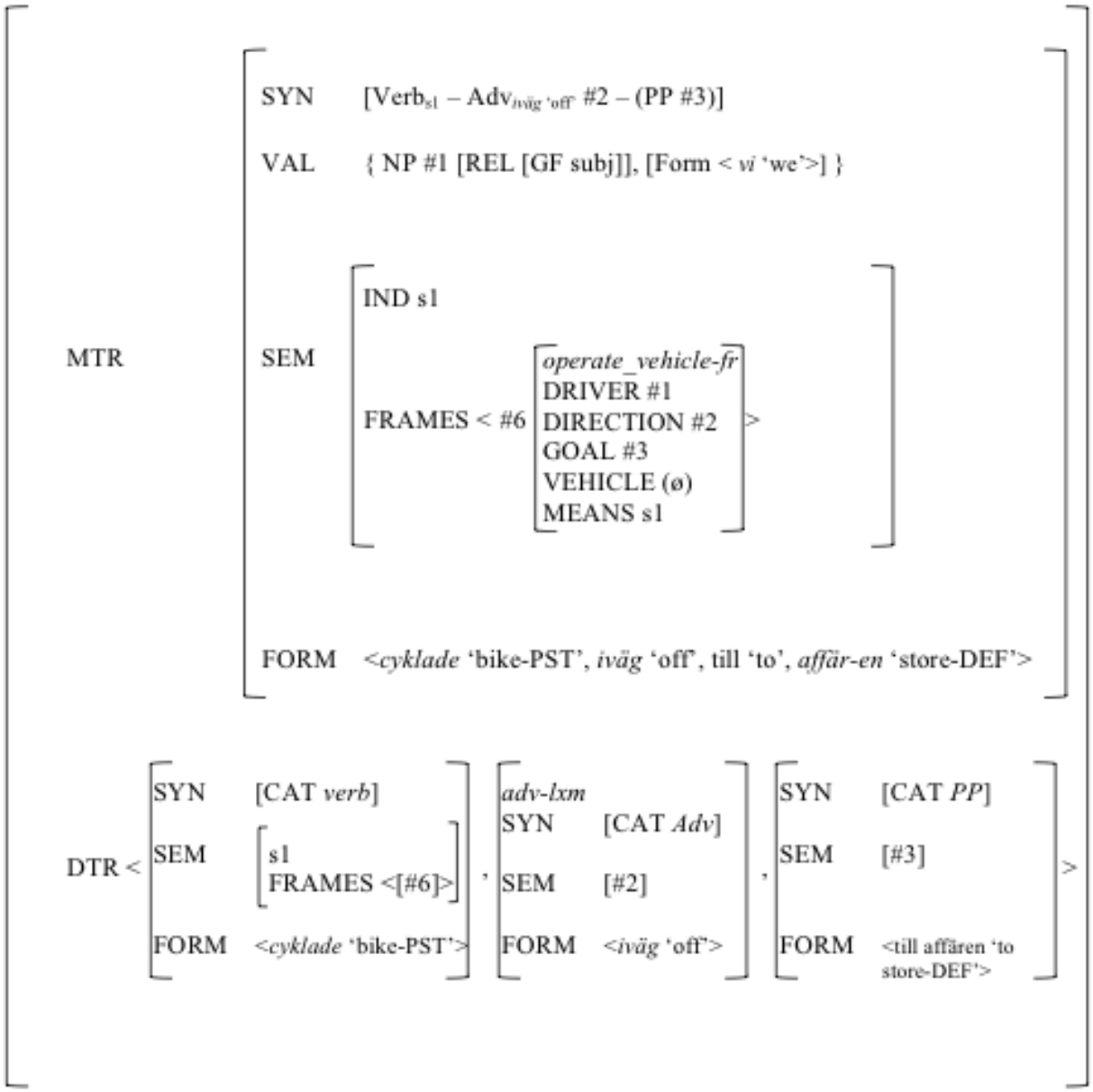

Figure 4. Construct analysis of cykla 'cycle'

The next construct analysis, illustrated in Figure 5, is based on the following utterance:

(28) Vi ska iväg till Gefle.
1PL aux off to Gefle
'We shall off to Gefle'

The interpretation of (28) is that of an 'possible motion', where the construction evokes the motion frame and the verb the Desiring frame, since all the information we get from (28) is that there is a desire for a motion, but we do not know if the motion will occur. The frame element Experiencer of #6 is unified with the Agent of #7 by the index #1, and the Event that the Experiencer is desiring is coindexed #7 with the whole motion frame.

A difference between the analysis for the Operate_vehicle verb above and the Desiring verb is that the latter can not be interpreted as a manner/means/incremental/result function; it will only bring an additional frame.

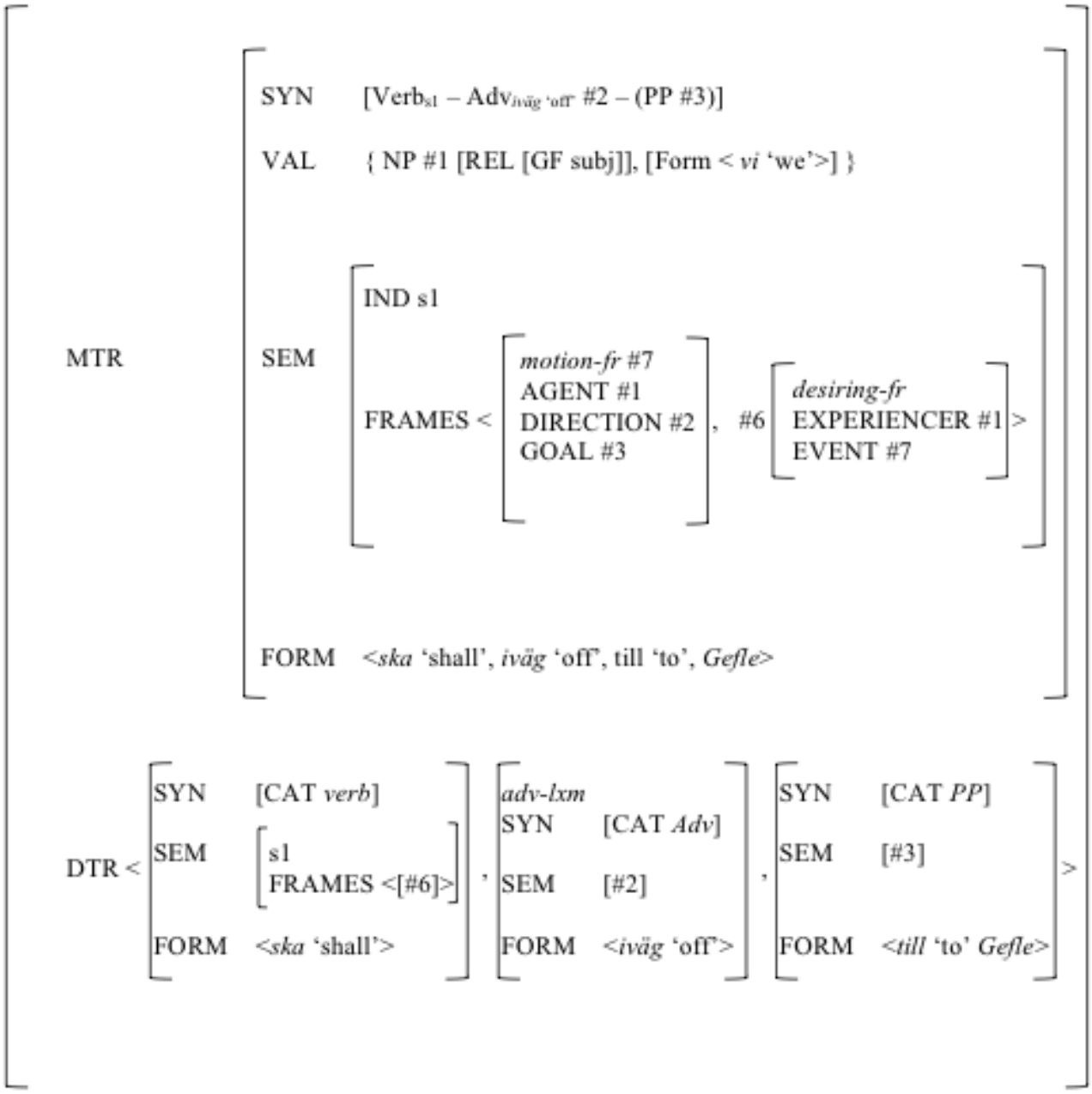

Figure 5. Construct analysis of *ska* 'shall'

In this section, I have showed a way of combining the usage-based ideas of generalizing over linguistic experiences with an explicit formal model (cf. Zeldes 2012).

5. Case study 2: Variability (and semantic frames)

The case study in this section builds on the idea that semantically similar verbs occur in the same types of syntactic constructions (Levin 1993), which is also a prerequisite for productivity, since speakers use novel verbs that are semantically close to verbs they have already experienced in a construction (Goldberg 2006; Bybee 2010; Suttle & Goldberg 2011). This study aims to show the semantic variability of the verb.intr-*iväg* construction. I do this by investigating a sample of six semantic frames whose lexical units are rarely associated with a motion frame. Five of the frames are from the Swedish FrameNet (henceforth, SweFN) and one frame is created by myself.

5.1 Method

The central object of investigation in this case study is the list of lexical units (LU) associated with the five semantic frames (Cause_to_fragment, Make_noise, Communication_noise,

Body_description_holistic, Animals) in the SweFN (which uses the same frame definitions as BFN), using the search engine Google to see whether the different LUs occur in the construction or not. One additional frame, the so called Party frame, is being investigated, but since there is no such frame in either BFN or SweFN, there is no available list of lexical units. In this case I have used synonyms of the prototypical verb *festa* 'to party' instead.
In the Google search engine I created search strings to see if I could find any examples of the LUs in the verb slot of the construction. An example of such a search string is (29):

(29) a. "bryta iväg"
'break off'
b. "bryta iväg till"
'break off to'

In (29a) there is a combination of the verb *bryta* 'brake' and the adverb *iväg* 'off', corresponding to the typical elements of the construction. I have then varied the tense of the verb, *bryta/bryter/bröt* 'brake/brake/broke'. (29b) has the preposition *till* 'to' added.

A LU list in FrameNet often contains words from different categories (nominals, verbs, participles and so on). However, in some frames there are no verbs in the LU list, as in the Animals frame, which mostly contains nominals (*hund* 'dog', *katt* 'cat' *älg* 'moose'). In these cases I have verbalized the nominals (*älg* 'moose' → *älga* 'to moose'). Other LU lists contain both verbal and nominal versions of a unit, e.g. *trasa* 'tear', *trasande* 'tearing' in the Cause_to_fragment frame. I count them only as one unit in this study, even though they represent two lexemes. In some lists compounds have been deleted if the main unit of the compound has already been spotted. This is first and foremost due to the limitations of the study, but also because it is not likely that compounds like *björnhund* 'bear dog' and *bandhund* 'watchdog' in the Animals frame will be used productively as motion verbs if *hund* 'dog' is not.
Most of the verbs that are presented in this case study have no (or rather vague) motion in their inherent lexical meaning. However, a few verbs have been conventionalized with a motion construction, while some of the verbs may not even exist outside the motion context (e.g. units from the Body_description and Animals frames, which are mainly based on adjectives and nouns).

5.2 Results

In this section I will present the six frames investigated. For each frame I will present a definition, together with some examples that illustrate how the LUs are used in motion constructions. I will end this section with a summarizing table showing the number of LUs the respective frame is associated with, and the number of types from that LU list that have been found in the construction.

5.2.1 Cause_to_fragment

The Cause_to_fragment frame contains a list of 15 LUs in SweFN, of which 8 (e.g. *knäcka* 'crack', *bryta* 'brake', *trasa* 'tear') are used in the construction. The frame is defined as follows:

(30) An Agent suddenly and often violently separates the Whole_patient into two or more smaller Pieces, resulting in the Whole_patient no longer existing as such. (BFN)

There is no trace of a motion scene in the definition in (30); however, there are some Cause_to_Fragment verbs that can be used in the construction:

(31)

Går	upp	kl	05.00	och
walk-PRS	up	clock	time	and
trasar iväg	i	mörkr-et.		
tear-PRS	off	in	dark-DEF	

'Wakes up at 5:00 and tears off in the darkness.'

For verbs such as *trasa* to be semantically sensical in a motion context, they have to be interpreted as manner verbs, that is, expressing the manner component of the motion act. In this case the verbs express some kind of effort, corresponding to the "violent" part of the definition (30), and meaning something like 'moving in a forceful manner'. They could also be interpreted as means of motion since they seem to describe some sort of resistance, e.g. defying the morning tiredness.

5.2.2 Make_noise

The Make_noise frame contains a list of 85 LUs in SweFN, of which 62 (e.g. *dåna* 'boom', *gnissla* 'squeak', *bullra* 'rumble', *prassla* 'rustle') are used in the construction. The frame is described in (32):

(32) A physical entity, construed as a point-Sound_source, emits a Sound. (This includes animals and people making noise with their vocal tracts. Sometimes the sound itself is referred to with a nominal expression, in which case it is called the Sound.) (BFN)

One of the most established verbs in this category, which also contains a lexicalized motion meaning, is *susa* 'whistle', even though the most prototypical meaning of the verb is 'generate a whistling sound'. In (33) *susa* could mean 'moving at high speed causing a whistling sound', which denotes a

consequence of the motion act, i.e. the sound is a result of the motion.

(33) Nicho och Emma susar iväg
Nicho and Emma whistle-PRS off

till skola-n
to school-DEF

'Nicho and Emma whistle off to school'

5.2.3 Communication_noise

The Communication_noise frame contains a list of 14 LUs in SweFN, of which 11 (e.g. *knorra* 'grumble', *mumla* 'mumble', *vråla* 'roar') are used in the construction. The frame is defined in (34):

(34) This frame contains words for types of noise which can be used to characterize verbal communication. (BFN)

(35) is an example of the type of incremental activity the verb can denote, that is, activity the subject is doing while moving.

(35) det är dags att knorra
it is time to grumble-INF

iväg till säng-s
off to bed-GEN

'it's time to grumble off to bed'

Knorra is not to be seen as a result of the motion, such as 'to move causing a grumbling sound'. Instead the grumbling is something that the subject is doing on its way to the bed, and may even be a consequence of the fact that the subject must go to bed, but not a consequence directly of the motion act.

5.2.4 Body_description_holistic

The Body_description_holistic frame contains a list of 61 LUs in SweFN, of which 15 (e.g. *knubbig* 'chubby', *plufsig* 'flabby', *spänstig* 'springy', *fet* 'fat') are used in the construction. The frame is defined as in (36):

(36) This frame covers descriptions of an entire human body, viewed as a gestalt (as opposed to descriptions based on salient body parts). (BFN)

As the frame definition indicates, items of this type have a lot to do with the manner of motion. For example, the verb *slinka*, with the meaning 'move quickly and almost imperceptibly', originates from the adjective *slank* 'slim'. The combination of the construction and the adjective can be interpreted as 'moving as if the body was slim'. (37a-b) are two other examples of such adjectives used in the motion construction:

(37) a. ska nog inte äta
aux probably not eat-INF

för jag ska knubba iväg
because 1SG aux chubb-INF off

till Pizzeria-n sen
to pizzeria-DEF later

'I probably should not eat because I'll be chubby off to the pizzeria later'

b. Nu ska jag plufsa iväg och
now aux 1SG flab-INF off and

checka in på närmaste sci-fi rehab.
[…]

'Now I will flabby off to check into the nearest sci-fi rehab.'

The adjectives are what enable the manner of motion interpretation. So, (37) means 'moving in a chubby/flabby manner' or 'moving like someone who is chubby/flabby'.

5.2.5 Party

There is no specific party frame in either BFN or SweFN, but the verbs (e.g. *parta* 'to party', *slarva* 'be on a spree', *kalasa* 'feast', *svira* 'binge') associated with this concept (of partying) could be related to the Social Event frame, which is defined in (38):

(38) A Social_event occurs at which Attendees are present to conduct a social function or joint activity. (BFN)

In a party frame, the partying people are unified with the Attendees in (38) as well as the Agent movers in (39). The party verbs specify simultaneous activity (incremental) and often the Intoxication frame, which concerns people being in an altered mental state that is induced by an Intoxicant.

(39) a. Så vi partajade iväg till
so 1PL party-PST off to

Kajskjul 8
Kajskul 8

'So we partied off to Kajskjul 8'

b. jag ska hänga med
1SG aux hang-INF with

tjej-er-na för att sen
girl-PL-DEF for to then

kröka iväg till Femman
booze-INF off to Femman

'I'll hang out with the girls and then booze off to Femman'

5.2.6 Animals

The Animals frame contains a list of 316 LUs in SweFN, of which 32 (e.g. *älg* 'moose', *snigel* 'snail', *mås* 'gull', *hjort* 'deer', *groda* 'frog', *apa* 'monkey', *krabba* 'crab') are used in the construction. The frame has no definition in BFN, but is described in the SweFN with the core element *animal*, and the non-core elements *Age*, *Descriptor*, *Origin*, *Persistent_characteristics* and *Systematics*. At least two verbs associated with this frame are conventional motion verbs: *älga* 'moose' and *orma* 'snake', shown in (40) and (41) with valency descriptions and lexical definitions from the dictionary *Svensk Ordbok* [*Swedish Dictionary*] (2009):

(40) Älga 'moose' (~ (*forward* or *to*) *somewhere*)
Definition: 'walk or run with big strides'

(41) Orma 'snake' (~ (*refl.*) (*somewhere*))
Definition: 'move along the surface with sinuous movements'

According to both definitions (40-41), the verbs describe the manner in which the act of motion is being performed. This seems to be the case for other animal verbs as well:

(42) a. Med det mena-de jag
with that mean-pst 1sg

ju absolut INTE att
to.be.sure absolutely not that

person-en i fråga skulle
person-def in question aux

hjorta iväg till veterinär-en och
deer-inf off to vet-def and

få operera bort problem-et!
have surgery away problem-def

'With that, I meant the person in question would absolutely NOT deer off to the vet and have surgery to remove the problem!'

b. Nå, sedan var det bara att
well, then was it just to

krabba iväg ut på plan-en
crab-inf off out on field-def

och börja öva.
and start-inf practice-inf

'Well, then it was just to crab off out on the field and start practising.'

The manner of moving like a *hjort* 'deer' (42a) could be interpreted as moving flexibly and fast, while *krabba* 'crab' (42b) could give a sense of quickness and/or the sideways movement which is characteristic for that animal.

5.2.7 Summary

In this section, I summarize the results of the second case study. In Table 5 the leftmost column shows the frame investigated, followed by the number of LUs associated with it, and thereafter the number of those LUs that were found as types in the verb.intr-*iväg* construction. The rightmost column shows the typical verb function for the LUs within a particular frame.

Frame	**LU**	**Types in the V-*iväg* construction**	**Typical function**
Cause_to_fragment	15	8	Manner
Make_noise	85	62	Result
Communication_noise	14	11	Incremental
Body_description_holistic	61	15	Manner
Party	-	7	Incremental
Animals	316	32	Manner
Total	-	135	

Table 5. Summary – frames and semantic variability

This study shows that the verb.intr-*iväg* construction can be used with at least 135 different verbs, not counting ordinary motion verbs or other frames. Most of them are considered rare items, which implies they are unlexicalized with motion content. This take on semantic variability gives a very different picture from the semantic variability of the corpus investigated in the previous case study.

The most common types are the items associated with the Make_noise frame, where 62 of the 85 lexical units in the frame occurred in the construction. The next most common type is Animals, but with a lower proportion than Make_noise since only 32 types, out of the 316 LUs in the frame, have been found. The rest of the frames have relatively low numbers of types, although

Cause_to_fragment and Communication_noise have been found to constitute the majority of their respective LU lists. The right column of Table 5 shows that most of the verbs in the study function as manner verbs or incremental activities, and could therefore also be analyzed in line with the formal analysis given in Section 4.2.3.

6. Discussion

Case study 1 shows that there are some highly entrenched instances of the constructions that speakers tend to prefer in usage, called *common prototypes*. These are typically ordinary motion verbs (e.g. *åka* 'go by vehicle') with high token frequencies. For example, of the 193 verbs found in the corpus, the 12 most common verbs represent 63% of the tokens. This indicates that speakers are quite conservative in their use of language. According to Bybee (2010: 95–96), token frequency seems to have a negative effect on productivity, since high token frequency gives the impression that the construction is only associated with these specific prototypes, and not open to others.
On the other hand, there are some verbs (e.g. *smurfa* 'smurf') in the study with a low token frequency, some of them occurring only once. These verbs are termed *rare items*. However, the rare aspect of type frequency is proposed to contribute to productivity, since a slot with a high proportion of rare items has an advantage in attracting novel items because it prevents the loss of analyzability due to highly entrenched instances (Bybee 2010; Zeldes 2012). Furthermore, it adds to the type frequency of the construction, thereby strengthening its productivity.
The rare aspect is explored further in case study 2, which shows that the construction can be used with a number of rare verbs, most of which lack translocative motion in their inherent lexical meaning. For example, adjectives describing body shape (*plufsig* 'flabby') can be used as verbs in the construction, and transitive verbs such as *knäcka* 'crack' and *bryta* 'brake' may be used intransitively. Furthermore, there are verbs that would hardly be perceived as verbs outside this construction, but rather as nominals or adjectives (e.g. verbs derived from animal nominals). The study is based on the idea that semantically similar verbs occur in similar constructions, as well as the proposal that similarity to already attested types is an important factor when a construction is extended to include new items (Goldberg 2006; Bybee 2010; Suttle & Goldberg 2011). One question to be raised at this point is whether such extensions are exclusively based on an item-based analogy, or on a more general/schematic level.[8] In usage-based construction grammars, it is widely recognized that high type frequency tends to lead to more general/schematic constructional slots (Barðdal 2008; Bybee & Thompson 2007):

> The more lexical items that are heard in a certain position in a construction, the less likely it is that the construction will be associated with a particular lexical item and the more likely it is that a general category will be formed over the items that occur in that position. The more items the category must cover, the more general will be its criterial features and the more likely it will be to extend to new items (Bybee & Thompson 2007: 275).

The quote above implies that as the type frequency goes up it is more likely that extension is the result of more abstract generalization than by the exemplar/item-based processes described in Bybee (2010).

According to Itkonen (2005: 3), "A typical analogy is a similarity between relations, not between entities". However, the lexical content is obviously also important when extending a construction. For example, consider the following examples of Animal verbs:

(43) a. Jag älga-de iväg till buss-en
1SG moose-PST off to bus-DEF

'I moosed off to the bus'

b. Vi skulle hjorta iväg till vetrinär-en
1PL aux deer-INF off to vet-DEF

'We would deer off to the vet'

c. Jag krabba-de iväg till park-en
1SG crab-PST off to park-DEF

'I crabbed off to the park'

(43a) and (43b) could easily be thought of as examples of item-based analogy, as in the generalization X in Itkonen's (2005) model (Figure 2 in Section 3), because of the structural-functional similarity provided by the construction and the lexical similarity of the verbs.

However, the verb *krabba* 'crab' (44c), is not similar to (43a) and (43b) in the same way, even though they share the semantic features of referring to animals. This coinage could instead be explained in terms of the generalization over Animal types giving speakers the competence that it is possible to use some sort of animal as a verb in a motion construction as long as that verb has the same function as other attested animal verbs (i.e. manner of motion).

A more clear case of X' concerns the Make_noise verbs, where it seems to be possible to use almost any sound-denoting item as a verb in a motion construction. It is therefore more likely that the extension of the construction with those verb types is the work of a more general process, rather than an item-based one.

On the other hand, since Itkonen's (2005) model shows how the expansion can take place both on an item-based level (X) and on a more abstract level (X'), a final assumption is that the construction can apply to multiple levels of abstraction simultaneously. It does not necessarily need to be a case of one or the other, as is the case with the Animal verbs in (43). Some Animal verb coinages might be more item-based because of stronger content similarity, while some are more general and abstract. The relationship between similarity, level of abstraction and productivity needs be further investigated in future work.

The conclusion from the two case studies is that the Swedish motion construction verb.intr-*iväg* can be used with a wide variety of verbs with different semantic content, as long as the verb can be associated with one of the four functions: Manner, Means, Incremental, Result, or in some cases, it can evoke another frame in addition to the motion frame (e.g. the auxillary verb *ska* 'shall' adds the Desiring frame to the motion scene).

By following ideas from Zeldes (2012) and Wulff (2013), among others, I have shown a way of incorporating the usage-based frequency information from the corpus study into a formal analysis. The challenge is to create an analysis that accounts for both soft and hard constraints. Future work might investigate improvements and further developments to such a model, as well as the relationship between frequency information and the co-occurance of constructional elements, as in a collostructional analysis (cf. Stefanowitsch 2013).

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Resources

Berkeley FrameNet, <http://fndrupal.icsi.berkeley.edu>

Korp, <http://spraakbanken.gu.se/korp/>

Karp, <http://spraakbanken.gu.se/karp/>

The Leipzig Glossing Rules, <http://www.eva.mpg.de/lingua/pdf/LGR08.02.05.pdf>

Swedish FrameNet, <http://spraakbanken.gu.se/eng/swefn>

Notes

[1] I would like to thank Benjamin Lyngfelt, Åsa Wengelin, John Löwenadler and two anonymous reviewers for valuable comments on previous versions of this article. Special thanks to Laura Michaelis for comments on the formal analysis in case study 1, and to Joan Bybee for discussions concerning case study 2. Also, I would like to thank the audience at ICCG-8 for comments on a presentation partly based on this article. All errors and oversights are my own.

[2] The glossing analysis is based on *The Leipzig Glossing Rules*. The following abbrevations are used: AUX = auxiliary, DEF = definite, INF = infinitive, PRS = present, PST = past, PL = plural, SG = singular, DIR = direction, LOC = locative, 1 = first person, 2 = second person, 3 = third person.

[3] Olofsson (2010) investigates a Swedish motion construction that consists of a verb, the directional adverb *in* 'in' and a PP with the preposition *i* 'in'. The PAROLE corpus <http://spraakbanken.gu.se/korp/> mostly consists of newspaper texts and fiction.

[4] One can argue whether *shine* is to be classified as a Light_Movement or if it is a case of fictive motion (see Talmy 2000a, chapter 2), i.e. a static direction. From a physics point of view, the rays of sun are a moving energy, so in this article I classify it as a concrete motion.

[5] The Swedish verb *åka* 'go by vehicle' is constrained to the use of some kind of vehicle, as opposed to the English counterpart *go*.

[6] For more on the debate on lexical versus phrasal approaches, see Croft (2003), Müller (2006), Boas (2008).

[7] Collostructional analysis (Stefanowitsch 2013) is another attempt to account for frequency, but somewhat different from my approach.

[8] Ross & Makin (1999) elaborate on this question through a discussion of prototype and exemplar models.

Processing Information

Submitted: 06.12.2013
Review results sent out: 11.07.2014
Resubmitted: 22.10.2014
Accepted: 14.11.2014