On the verge of tears and the brink of death: A distinctive multivariate analysis of two functionally overlapping idiomatic constructions in English

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Abstract: The two idiomatic constructions *verge of* and *brink of* are often considered overlapping constructions that express impending future events. Moreover, it is held that *brink of* in particular tends to express negative events such as disasters, misfortune, and the like. While both are documented in many dictionaries of English, and *verge of* is sometimes described in English grammars, neither construction had really been systematically studied before Wiliński published a research article in 2017 in which a distinctive collexeme analysis mapped distinctive patterns in the lexical items appearing after *of* in either construction. Taking a step further, the present study, drawing on data from the *Corpus of Contemporary American English*, applies a corpus-based multivariate version of distinctive collexeme analysis to the two constructions, which not only takes collexemes into consideration but involves 11 additional variables, such as, for example, the preposition before *verge* and *brink*, semantic prosody, and discourse prosody as well as register. Thus, this article presents usage-based distinctive collo-profiles pertaining to the two constructions that offer more detailed pictures than traditional monovariate analyses can.

Keywords: Association rules analysis, collo-profiling, constructional multidimensionality, impending future constructions, usage-based construction grammar

1. Introduction

English is sometimes described as a language that lacks a genuine future tense, but instead has an impressive array of constructions that encode a wide range of different construals of future events and future temporal relations such as the use of *will* and *shall* as 'neutral' futurity markers; *going to* as a marker of future events certain to happen; the simple present tense to signal scheduled future events; *be to* to indicate future events outside the influence of their AGENTS; or *be about to* to express impending future events. Alternatives to *be about to* are the constructions seen in examples (1-2) below:

(1)   By depicting Mary in this manner, writers not only called into question her character, but also left little doubt that Mary – first drawn into the conspiracy by her grasping husband – was equally culpable, if not more so, in bringing Georgia to the brink of ruin. (COCA 2015 ACAD GeorgieHisQ)

(2)   Portland Timbers on verge of acquiring center back Claude Dielna. (COCA 2019 NEWS Baltimore Sun)

The idiomatic constructions *brink of* and *verge of* are interesting because, on the face of it, they seem to be semantically synonymous. Both constructions encode impending future events relative to the temporal vantage point. Furthermore, both constructions draw on the same metaphorical conceptualization of TIME in terms of SPACE. However, there are subtle differences between them. It is generally assumed that *brink of* has negative connotations while *verge of* is more neutral. This is something which is mentioned in numerous lexicographical reference works as well as a few grammars of English. In addition, in a very important study, Wiliński (2017) finds that there are usage-patterns in the lexeme-construction interaction which reflect subtle, but important, semantic differences that set the two constructions apart from one another.

The two constructions should be of central interest to construction grammarians as they encapsulate many of the key concerns in construction grammar (e.g. Fillmore et al. 1988; Goldberg 1995;

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Croft 2001; Hilpert 2019) such as, for instance, constructional synonymy, idiomaticity, metaphoricity, fixedness and schematicity, and constructional semantics. There has been a recent usage-based turn within not just construction grammar but cognitive linguistics at large. Against this background, we can assume that studying the usage of the two constructions can generate findings that have potentially important implications for our understanding of constructions as such and the relationship between language performance and language competence more broadly. In fact, Wiliński's (2017) study maps some central distinctive usage-patterns that set the constructions apart from one another

Unfortunately, while there are plenty of entries in reference works and grammars of English, the two constructions have not received much attention within construction grammar. Indeed, Wiliński (2017) seems to be the only serious construction-grammatical study of the two expressions. Important though it is, that study applies a monofactorial analysis, which definitely sheds light on the one dimension that it addresses – namely, construction-lexeme. However, it has been pointed out that a multidimensional approach is required if we want a more detailed understanding of constructions. For instance, Herbst (2018) advocates what he calls collo-profiles which subsume multiple features, not just collexemes, associated with constructions. Also, on a more methodological level, Olguín Martínez & Gries (2024) and Jensen & Gries (2025) show that the application of multivariate methods, which allow analysts to address constructions as multidimensional phenomena, generates findings that are very much akin to Herbst's (2018) collo-profiles.

The purpose of this article, then, is to present the findings of a corpus-based analysis of the two constructions, treating them as multidimensional linguistic phenomena. In addition to collexemes (thus acknowledging the importance of Wiliński 2017), this analysis includes 11 further variable dimensions as potential loci of distinctive features (that is, 12 dimensions altogether). Specifically, like in Jensen & Gries (2025), the multivariate data-mining technique of association rules analysis (Hahsler et al. 2005) is applied in this study to identify featural items and relations among them that are distinctive of the two constructions.

The article is organized as follows. In Section 2, basic and important principles from usage-based linguistic theory and construction-grammatical theory are introduced. This section also provides a brief overview of the two constructions and their formal, functional, and symbolic structures. Section 3 describes the method, accounting for the retrieval of usage-data as well as the annotation scheme. The technique of association rules analysis is also described here, and some important methodological disclaimers are issued. Section 4 presents the findings in a manner based on iterative and interactive heuristic sorting and summarizing, while Section 5 outlines the distinctive collo-profiles that emerge from the findings.

2. Construction and usage

2.1 Usage-based linguistics and construction-grammar theorizing

The main theoretical framework of this study is usage-based construction grammar and, more broadly, cognitive linguistics. In construction grammar (e.g. Fillmore et al. 1988; Goldberg 1995; Croft 2001; Hilpert 2019; see also Traugott & Trousdale 2014), constructions – seen as the basic units of grammar – are pairings of form and conventionalized meaning. Constructional form covers syntax, morphology, and phonology, while constructional meaning covers semantics, discourse-pragmatics, and social meaning. Constructions may be formally fixed, formally schematic, or somewhere in between. Also, grammar is not modular. Nor is it the case that some linguistic domains are primary while others are not. Instead, the language system is envisioned as a so-called 'construct-i-con' – a network of constructions organized along the same principles as prototype categories with all information pertaining to a construction stored as part of the construction itself.

Usage-based construction grammar incorporates principles from usage-based language modeling (e.g. Kemmer & Barlow 2000; Bybee & Hopper 2001) into construction-grammar

theorizing. In this perspective, the language system emerges as generalizations over recurring usage patterns: the more frequently a pattern occurs, the more entrenched it becomes in speakers. Because of this experiential nature of language, (i) linguistic performance and linguistic competence are not separated as they continuously influence one another, (ii) language is interconnected with other cognitive systems, and (iii) context plays a crucial role in the operation of the linguistic system (Kemmer & Barlow 2001). In usage-based construction grammar, then, constructions are, as Croft (2005: 274) notes, pairings of form and conventionalized meaning that are entrenched in the speech community. Patten (2014: 91) summarizes all of this quite neatly:

> humans are not innately programmed with grammatical knowledge; instead, all aspects of language are learned from the input (or rather from the speaker's linguistic experiences). Both language learning and language change involve the speaker inductively generalizing over instances to form mental schemas (or constructions) which are represented in the language system. On a usage-based model then, constructions are simply conventionalized chunks of linguistic knowledge… From this, it follows that the storage and organization of grammatical knowledge is dependent on, and can change according to, patterns of use.

Consequently, rather than being neat and simple, constructional networks may contain multiple subconstructions with their own subnetworks, and intra-constructional redundancy can be found anywhere in the network.

Seeing that context is crucial in the operation of the language system, information on contexts where a construction is frequently used is part of speakers' constructional knowledge and thus part of the construction itself. Such contextual features can be anything from recurring co-textual elements and other features of the construction's discursive context to situational and social contexts. This means that, in a usage-based perspective, in order to understand the workings of a construction, it is necessary to consider patterns in the contexts it occurs in as well as its internal structural properties. As Juul (2020: 36) argues, calling for more context-sensitive studies of structural variants, it is necessary to seriously consider contextual patterns as fundamental elements of speakers' linguistic competence.

With this in mind, it arguably makes sense to reintroduce Fillmore's (1988: 36-37) distinction between internal and external constructional properties back into construction grammar. The former covers formal, semantic, and symbolic structures, and the latter covers recurring contextual patterns. Both types of properties are equally essential to a construction, so it is not the case that internal ones are primary and external ones are secondary. The distinction has to do with where, relative to the structure of the construction, the properties are found. Both types of property are *bona fide* constructional properties, and features that define the construction and set it apart from other constructions may be found among both the internal properties and the external properties.

In sum, then, a construction is a pairing of form and conventionalized meaning that is entrenched in a speech community and whose properties include not just structure-internal ones but also recurring contextual elements, which, through the principle of frequency, are also part of speakers' knowledge of the construction.

2.2 The two constructions
While, as Wiliński (2017) points out, the contrast between the two constructions under investigation has received very little attention, *verge of* is occasionally covered in descriptive grammars of English. Here it is typically treated under the heading of 'futurity' or 'future reference'. More specifically, *verge of*, typically conflated with *on the point of*, is often classified, along with *be about to*, as a so-called future reference construction which indicates events in the immediate future (e.g. Leech &

Svartvik 1975: 73; Hjulmand & Schwartz 2017: 223). Bringing style into the picture, Carter & McCarthy (2006: 636) classify *verge of* together with *be about to*, *on the point of*, *due to*, *be certain to*, *be likely to*, *be supposed to*, and *be obliged to* as forms that enable "reference to future events treated as occurring immediately or in the near future"[1] and are "mainly used in more formal contexts".

Focusing on variants of the two constructions where the position after *of* is filled by a noun, Wiliński (2017: 432) writes that they are "near-equivalent expressions [that] are used to refer to a point at which a situation or an event, usually an unwelcome one, is about to happen or very likely to happen". Wiliński (2017: 432-433) uses entries from the *Oxford Advanced Learner's Dictionary* (7th ed.) and the *Cambridge Advanced Learner's Dictionary* (2nd ed.) to corroborate this and further adds that *brink of* carries negative connotations while *verge of* seems more neutral and can be used with both negative and positive nouns such as *tears* and *success*. *Merriam-Webster*'s entries on the two constructions further corroborate this with *verge of* defined simply as "the point when (something) is about to happen or is very likely to happen" (Merriam-Webster n.d. a) while *brink of* is defined as "a point that is very close to the occurrence of something very bad or (less commonly) very good" (Merriam-Webster n.d. b).

Both have the same syntactic structure: a preposition followed by a noun phrase in which another preposition is followed by another noun phrase. Both are partially schematic and partially fixed: *verge of* and *brink of* are fixed, but what appears after *of* is lexically open. Wiliński (2017: 432) suggests that *verge of* also displays variability in terms of the preposition, as *on* can sometimes be replaced with *in*. In example (2) above, we see that the preposition may also be left out. Example (1) suggests that *brink of* similarly displays variability in terms of the preposition, as the preposition in that example is *to* rather than *on*. Note also that *the* is absent in (2), suggesting variability in the determiner that precedes *verge*. Since (2) is a headline from a news report, the absence of both the preposition and the determiner illustrate how the construction conforms to the conventions of the headlinese register (Hughes & McArthur 1992). Lastly, while Wiliński (2017) specifies the position after *of* as being a noun, we see that it is actually a verb in (2). As it happens, some grammars of English even characterize *verge of* as a verbal construction where *of* is followed by a verb in the *ing*-form (e.g. Hjulmand & Schwarz 2017). Based on these considerations, we can generalize the syntactic structures along the lines of [PREP D *verge of* X] and [PREP D *brink of* X], 'X' simply indicating not just lexical schematicity but also openness in terms of word class.

Brink of and *verge of* are semantically similar idioms. Both draw on the same basic TIME IS SPACE metaphor (Wiliński 2017: 431). Here, the TEMPORAL VANTAGE POINT is conceptualized as a BOUNDARY BETWEEN TWO AREAS, and the IMPENDING FUTURE EVENT is conceptualized as THE AREA BEYOND THE BOUNDARY. They differ in terms of the nature of the boundary though, as a verge is just the outer rim of an area, while a brink is the extreme edge of land (like the vertical extreme of a slope or a cliff) or the edge between land and a body of water. Consequently, there is more danger associated with a brink than a verge, and this may well feed into the negative connotations of the *brink of* construction. According to semantic prosody theory (e.g. Bublitz 1996; Hunston & Francis 1999; Stubbs 2001), then, we can expect *brink of* to occur more frequently with negatively leaning lexemes in the X-position, while *verge of* should not have a preference in terms of this.

Wiliński (2017), applying a distinctive collexeme analysis (Gries & Stefanowitsch 2004), which identifies inter-constructional differences in terms of collexemic attraction patterns, indeed finds that *brink of* tends to occur with nouns that express negative or unpleasant situations like, for instance,

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[1] It has to be said that this classification is unfortunate as it conflates immediacy with obligation, which are arguably ontologically different categories.

war, *disaster*, *death*, *ruin*, and *insolvency*, while *verge of* occurs with both negatively leaning nouns like *tears*, *collapse*, and *breakdown*, and positively leaning ones, like *success*, *victory*, and *laughter*.

3. Data and method

This study is based on the 2010-2019 portion of Davies' (2008-) *Corpus of Contemporary American English* (henceforth, COCA), which contains 248,145,425 word tokens and represents the registers ACADEMIC, FICTION, MAGAZINES, MOVIES, NEWS, SPOKEN, and TV. The simple search string `brink|verge of`, which retrieves all instances of *brink of* and *verge of* in the corpus, was used. After duplicates were weeded out, there were 1023 concordance lines altogether: 412 instances of *brink of* and 611 instances of *verge of*. While not incredibly large, this is an exhaustive dataset in that it represents all instances of the two constructions in the 2010-2019 portion of COCA.

Since we are interested in addressing potential differences between the two constructions, a traditional distinctive collexeme analysis (Gries & Stefanowitsch 2004) was performed, much like in Wiliński (2017), except this analysis is not restricted to nouns after *of*. Table 1 lists the Top 10 most distinctive collexemes according to log-likelihood ratio (Gries 2024 was used to carry out this calculation).

Table 1. Top 10 distinctive collexemes

Rank	Collexeme	Preference	LLR
1	war	brink of	45.9222
2	extinction	brink of	19.8792
3	tear	verge of	19.3761
4	crisis	brink of	14.6452
5	elimination	brink of	12.6459
6	death	brink of	12.3230
7	disaster	brink of	8.0869
8	lose	verge of	7.6865
9	conflict	brink of	7.2991
10	become	verge of	6.8816

Some interesting observations can indeed be made from this. Firstly, this analysis is very much in line with Wiliński's (2017) findings. For instance*,* like in Wiliński's study, *tears* is most strongly attracted to *verge of* while *war* has a strong preference for *brink of*. Moving beyond Wiliński's study, our analysis further shows that only *verge o*f is preferred by verbs (namely, *lose* and *become*) while all the collexemes that prefer *brink of* in the Top 10 are nouns. Also, apart from *become*, all the collexemes express very negative situations. These observations are indeed illuminating.

However, if you take another look at (1-2), you will see that there are more potential loci of distinctiveness than the collexemes after *on*. For example, we already know that there is variability in terms of the preposition, the determiner of *verge*, and the word class of the collexeme. Furthermore, while *ruin* belongs to a semantic field of DESTRUCTION and is clearly negatively leaning, *acquiring* cannot be said to be negative and also belongs to the completely different semantic field of OBTAINMENT. This indicates variability in the semantic class of the collexeme as well. Note also that, in (1), *brink of* appears in a clause structure where the verb is *bring*, which might suggest that there could be variability in the choice of verb whenever at least *brink of* appears in a clause. Finally, the two examples come from different registers: (1) is from the ACADEMIC register, and (2) is from

the NEWS register. Given the usage-based principles of frequency and the importance of context, it makes sense to assume the two constructions might be contrasted not only in terms of collexemes but also in terms of other features, which may well be external constructional properties.

The point of this article is not to criticize traditional monofactorial distinctive collexeme analysis (but see Jensen & Gries 2025), and the importance of Wiliński (2017) is acknowledged and genuinely appreciated as well. However, if we want a more detailed picture of how the two constructions may differ from one another, we need to take a multivariate approach that considers multiple features simultaneously. Therefore, application of a multivariate method is desirable (see also Olguín Martínez & Gries 2024).

That is why, like in Jensen & Gries (2025), the multivariate data-mining technique known as association rules (Hahsler et al. 2005) is applied in this study. Essentially, when applied in the context of collostructional analysis, the method is a three-step process consisting of (i) annotation of concordance lines, (ii) computation of association rules, and (iii) interpretation and presentation of the results.

3.1 Annotation
The first step is to annotate every concordance line for variable categories and their features, or levels. This study makes use of no less than 12 feature categories, some of which have 100+ levels, and this section describes the annotation scheme.

Instances were annotated for COLLEXEMES after *of*. No less than 456 COLLEXEME types were observed in this position. Since one of the supposed differences between the two constructions has to do with the type of situation expressed, it made sense to annotate for SEMANTIC PROSODY and DISCOURSE PROSODY as well. Semantic prosodies are emergent semantic categories among the collocates of a node word or, like in this study, the collexemes of a construction. Discourse prosodies are stance judgments of the situations expressed by the node word or construction in question. Like semantic prosodies, discourse prosodies emerge from collocates and collexemes. For example, Stubbs (2001: 89-95) observes that *undergo* tends to take as direct objects nouns from the semantic fields MEDICINE, EDUCATION AND ASSESSMENT, and CHANGE (which then constitute its semantic prosodies) and that these are associated with unpleasant experiences (meaning that *undergo* has negative discourse prosody).[2] Both phenomena are considered prosodic as they extend beyond the individual unit (Stubbs 2001: 65) and are conventionalized as discourse functions associated with the unit in question. While DISCOURSE PROSODY is a ternary category, covering *positive*, *negative*, and *neutral*, SEMANTIC PROSODY subsumes 133 levels.

There are more variables that relate to X-position collexemes. There is variability in word class membership. In addition to nouns and verbs, as seen in (1-2), X-position collexemes may also be adjectives. Consequently, annotating for PART OF SPEECH was found relevant. This category covers *noun*, *verb*, *adjective*, and *pronoun*. There is also variability in PHRASE STRUCTURE, with the two only phrase structures observed being *VP* and *NP* (in all examples of adjectives appearing after *of*, the adjective serves as the head of an NP). Due to this PART OF SPEECH and PHRASE STRUCTURE variability,

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[2] For more on semantic prosody and discourse prosody, see Bublitz (1996), Hunston & Francis (1999), Jensen (2017, 2025), Louw (1993), Partington (2004), Stubbs (2001), and Tognini-Bonelli (2001). The terminology used in this article diverges from the traditional terminology. What is called 'semantic prosody' in this paper is traditionally called 'semantic preference', and what is called 'discourse prosody' in this paper is traditionally called 'semantic prosody'. The reason behind this is that, in my opinion, the traditional distinction between 'semantic preference' and 'semantic prosody' is misleading. In fact, only semantic preference has to do with semantics. 'Semantic prosody', being a matter of stance, is ultimately more of a discourse-pragmatic phenomenon. Also, both phenomena are prosodic, so why only call one of them 'prosody'?

it made sense to also include the basic meaning categories from Croft's (2001: 84-104) conceptual space approach to word classes in the annotation scheme. CROFTIAN MEANING covers the very basic types of concept expressed by a linguistic unit; that is, whether it expresses an *object*, a *property*, or an *action*.[3]

In cases where the collexeme appears in NP structures, variability was observed with regards to the determiner. In addition to the *zero-determiner* in (1) such nominal collexemes also occurred with the *definite article*, a *demonstrative pronoun*, the *indefinite article*, an *indefinite pronoun*, or a *possessive pronoun* as the DETERMINER. Similarly, with verbal structures, variability was observed and annotated for in connection with DIATHESIS, as both *active* – as seen in (2) – and *passive* voice realizations were observed.

As seen in (1-2), there is also variability in terms of the DETERMINER of *brink* and *verge*, meaning that this was also annotated for, with the category levels being *definite article*, *indefinite article*, and *zero-determiner*. To distinguish between this and the collexeme determiner mentioned above, we will refer to this as DETERMINER$_1$ and the collexeme determiner as DETERMINER$_2$. We also know that there is variability in terms of the preposition in front of *brink* and *verge*. Therefore, the concordance lines were also annotated for PREPOSITION, the levels here being *along*, *at*, *beyond*, *from*, *in*, *near*, *on*, *to*, and *toward*. Like we also saw in connection with (1-2), there may be variability in the VERB in the clause that the two constructions occur in whenever they do appear in clauses, so this was annotated for too. This category subsumes 75 levels.[4]

Finally, concordance lines were also annotated for REGISTER, the features here being the registers of the portion of the corpus used for this study – namely, *ACADEMIC*, *FICTION*, *MAGAZINES*, *MOVIES*, *NEWS*, *SPOKEN*, and *TV*.

The sets of levels under each variable category are exhaustive as they represent no more and no less than what is observed in the corpus. For instance, the reason why only *noun*, *adjective*, *verb*, and *pronoun* are features under PART OF SPEECH and not, say, *adverb* is that adverbs were not observed in the dataset. Whenever a category did not apply, the annotation *NONE* was used.

As an example of the application of the annotation scheme consider the following:

(3)   Peyton Manning is on the verge of setting two more NFL records, one of which will likely come in Denver's opening drive, if not opening play (COCA 2015 NEWS Denver)

The COLLEXEME after *verge of* is *set* which, in terms of PART OF SPEECH, is a *verb* in a *VP* PHRASE STRUCTURE, and it is in the *active* voice when it comes to DIATHESIS. The SEMANTIC PROSODY of *set* here is *SUCCESS*, and the DISCOURSE PROSODY is obviously *positive*. The basic CROFTIAN MEANING of the collexeme is *action*. DETERMINER$_1$ is the *definite article*, while the PREPOSITION is *on*, and the construction here appears in a clause in which the VERB is a form of *be*. Finally, the usage-event occurs in the *NEWS* REGISTER. Table 2 summarizes the annotation of (3).

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[3] Croftian meanings are prototypically associated with speech act functions, word classes, and phrase structures. For instance, verbal structures prototypically express actions via the function of predication, and nominal structures prototypically express objects through the function of reference. However, in marked uses, there will be a discrepancy between the word class and speech act function on the one hand and the meaning on the other, such that, for instance, a noun may express an action, or a verb may express an object. I could also have annotated for CROFTIAN SPEECH ACT FUNCTIONS, but that would overlap 100% with the phrase structure annotation and unnecessarily complicate the annotation scheme.

[4] Please keep in mind that *verb* and VERB are different: in italics, it is the category feature within the PART OF SPEECH category, and, in small caps, it is the variable of lexical units serving as verbs in clauses in which *verge of* and *brink of* occur.

Table 2. Features assigned to (3)

Variable	Feature
VERB	*be*
DETERMINER$_1$	*definite article*
PREPOSITION	*on*
COLLEXEME	*set*
SEMANTIC PROSODY	*SUCCESS*
DISCOURSE PROSODY	*positive*
PHRASE STRUCTURE	*VP*
PART OF SPEECH	*verb*
DETERMINER$_2$	*NONE*
DIATHESIS	*active*
CROFTIAN MEANING	*action*
REGISTER	*NEWS*

As should be clear to the reader, the annotation scheme is mainly inductive and based on observed variation among the usage-events retrieved from the corpus. The reason is that this is an exploratory study anchored in usage-based theory, and we can therefore assume that contextual patterns may turn out to be constructionally distinctive. However, apart from COLLEXEME, SEMANTIC PROSODY, and DISCOURSE PROSODY, we do not yet have an idea about exactly what contextual categories may be distinctive. This is a natural part of exploratory studies, and the findings are often what identifies relevant and irrelevant features. By the same token, of course, this study cannot be said to provide the full picture: there may well be relevant contextual features left out. For instance, sociolinguistic variables like AGE, GENDER, and LOCAL VARIETY could be relevant, but, unfortunately, this information is not provided in this particular corpus. Also, there may well be co-textual features too that this study has not taken into consideration that might be important as well.

3.2 Association rules
Association rules analysis (Hahsler et al. 2005) is used to discover patterned relations among multiple items in complex datasets, and an association rule has the form of conditional statement. For example, association rules can be used to show the probability of guests at a fast-food restaurant buying a product based on other products they also buy. If many customers who buy hamburgers, fries, ketchup, and hotdogs also tend to buy soft drinks, then a corresponding association rule would be:

If   hamburger: *yes*
       fries: *yes*
       ketchup: *yes*
       hotdog: *yes*
then   soft drink: *yes*

The four protases (i.e. the four *if*-elements) constitute the left-hand side (LHS) of the association rule and the apodosis (i.e. the *then*-element) constitutes the right-hand side (RHS).

An association rule's probability is typically measured via three values:

- Support: the proportion of items in the dataset that the rule applies to (i.e. how many out of all purchases in the fast-food restaurant were purchases of hamburgers, fries, ketchup, hotdogs, and soft drinks?).
- Confidence: the proportion of all the times the RHS occurs with the LHS out of all occurrences of the LHS (i.e. how many out of all purchases of hamburgers, fries, ketchup and hotdogs were also purchases of soft drinks?). This way, confidence is essentially the number of times that the rule is correct.
- Lift: the ratio of the observed support to the expected support if LHS and RHS were completely independent of one another. A value of 1 indicates independence, and any value above 1 indicates the degree of probability of RHS occurring if LHS occurs.

In this study, association rules analysis is applied to the variable category levels accounted for in Section 3.1. To calculate the association rules, the Apriori algorithm in the R package `arules` (Hahsler et al. 2005) was used. Following Jensen & Gries (2025), a minimum support threshold was set to 0.01 to maximize the recall of rules, and a minimum confidence threshold was set to 0.5 ensuring that only rules that are correct at least 50% of the time were included. With these screening parameters in place, 310,558 rules were generated and sorted according to lift. However, as is always the case in association rules analysis, a large number of these rules were redundant and thus not necessary. Rule redundancy occurs when the LHS of a more specific rule is included as a subset of the LHS of a more general rule with a confidence value the same as, or higher than, that of the specific rule. Redundant rules must be filtered out, and this was done using the `is.redundant` function in `arules`. 5,330 rules survived this process. Lastly, all rules with other items than *verge of* and *brink of* in the RHS were filtered out, resulting in 807 rules, so as to focus only on contrasts between the two constructions.

For the sake of illustration, Table 3 shows an example of one of the 807 association rules.

Table 3. An association rule

Construction	*verge of*
VERB	
DETERMINER$_1$	
PREPOSITION	*on*
COLLEXEME	
SEMANTIC PROSODY	
DISCOURSE PROSODY	*neutral*
PHRASE STRUCTURE	
PART OF SPEECH	
DETERMINER$_2$	
DIATHESIS	*active*
CROFTIAN MEANING	*action*
REGISTER	*FICTION*
Frequency	29
Support	0.0283
Confidence	0.9063
Lift	1.5173

This rule shows the following. There are 29 occurrences of this rule in the dataset out of 32 ($^{29}/_{0.9063}$) instances of the configuration PREPOSITION *on*, DISCOURSE PROSODY *neutral*, DIATHESIS *active*, CROFTIAN MEANING *action*, and REGISTER *fiction*. Consequently, the support is $0.0283 \approx {}^{29}/_{1023}$ and the confidence is $0.9063 \approx {}^{29}/_{32}$. The lift value shows that the rule occurs around 1.5 times as many as expected by chance. There is an built-in agnosticism in the rule as well when it comes to all other variables: the rule states that, if PREPOSITION is *on*, DISCOURSE PROSODY is *neutral*, DIATHESIS is *active*, CROFTIAN MEANING is *action* and REGISTER is *FICTION*, then – regardless of the values of VERB, DETERMINER$_1$, SEMANTIC PROSODY, PHRASE STRUCTURE, and DETERMINER$_2$ – the preferred construction is *verge of*.

Since there are 807 association rules with 12 variable categories and multiple category levels each, it is necessary to present findings using interactive and iterative heuristic sorting and summarizing via prose. The alternative would be one massive table with 807 rows, 12 columns and literally thousands of data points, and this would be overwhelming and not very helpful at all.

3.3 Some methodological disclaimers
Some disclaimers to prevent unnecessary misunderstandings in readers must be issued before we proceed to presenting the findings.

Firstly, while association rules analysis and Gries & Divjak's (2009) behavioral profiling analysis both involve concordance line annotation for multiple variable categories and levels, they are far from the same. In addition to involving completely different statistics, behavioral profiling addresses <u>occurrence</u> of multiple features but association rules analysis addresses <u>co-occurrence</u> of multiple features, and so they belong to two different categories of multivariate analysis (Gries 2010: 340-342). That is, association rules analysis shows not only that features x, y, and z are often used with Construction A, but also that x and y, when appearing together, prefer Construction A, but, although all three features often used with Construction A, whenever y and z occur together, they actually prefer Construction B. In this study, while the point is not at all to argue for association rules being superior, behavioral profiling would not be an appropriate method because it involves agglomerative hierarchical cluster analysis, and this study only compares two constructions. Cluster analysis of two items would be completely pointless for obvious reasons.

Secondly, despite the dataset being relatively small, it is not a simple dataset. In fact, it is a very complex dataset due to the many variable categories and category levels that are included in the study. There are 12 variable categories, and some of these contain 100+ levels. Hence any accusations of the dataset being (made) simple to make sure that the method actually works would betray a lack of understanding of dataset complexity and the purpose of association rules analysis. Association rules analysis was actually developed to handle very complex datasets with numbers of items that would overwhelm most other algorithms, so using a simplified dataset to make sure the method works would be pointless.

Thirdly, association rules analysis is, as mentioned above, an exploratory method. It does not involve hypothesis-testing. In other words, association rules analysis is not a matter of falsification or verification. Like with all other exploratory methods, validation of findings would consist in application of the same method to further datasets and comparing the results for overlaps and divergences.

Fourthly, one might protest that this study only addresses recurring patterns in the context surrounding the two constructions and not really the two constructions themselves. However, as mentioned above, this study adopts a usage-based perspective in which recurring contextual patterns may be entrenched as part of speakers' linguistic competence as *bona fide* external constructional properties. Consequently, as already mentioned above, looking at recurring contextual patterns equals looking at the construction itself.

4. Findings
As mentioned earlier, the findings will be presented and discussed via summarizing based on iterative and interactive heuristic sorting. However, as a starting point, consider Tables 4 and 5. Table 4 isolates all the rules in which a COLLEXEME prefers *brink of*.

Table 4. Rules with COLLEXEMES that prefer *brink of*

VERB								
DETERMINER₁								
PREPOSITION								
COLLEXEME	*collapse*	*death*	*extinction*	*extinction*	*war*	*war*	*war*	*war*
SEMANTIC PROSODY								
DISCOURSE PROSODY								
PHRASE STRUCTURE								
PART OF SPEECH								
DETERMINER₂			*zero*				*zero*	
DIATHESIS								
CROFTIAN MEANING								
REGISTER	*NEWS*				*NEWS*	*SPOK*		
Support	0.0108	0.0215	0.0274	0.0274	0.0117	0.0137	0.0352	0.043
Confidence	0.5789	0.7097	0.7778	0.7568	1	0.875	0.9231	0.8462
Lift	1.4375	1.7621	1.9312	1.879	2.483	2.1726	2.292	2.101
Frequency	11	22	28	28	12	14	36	44

There is only one COLLEXEME that is distinctive on its own – namely, *death*. The three other COLLEXEMES appear in distinctive configurations with other features. *Collapse* prefers *verge of* in the *NEWS* register, whereas *extinction* appears in a rule along with *zero* DETERMINER₂. *War*, while solidly preferring the construction, is not distinctive on its own, as it tends to prefer the construction when DETERMINER₂ is *zero*, or when appearing in the *NEWS* and *SPOKEN* REGISTERS.
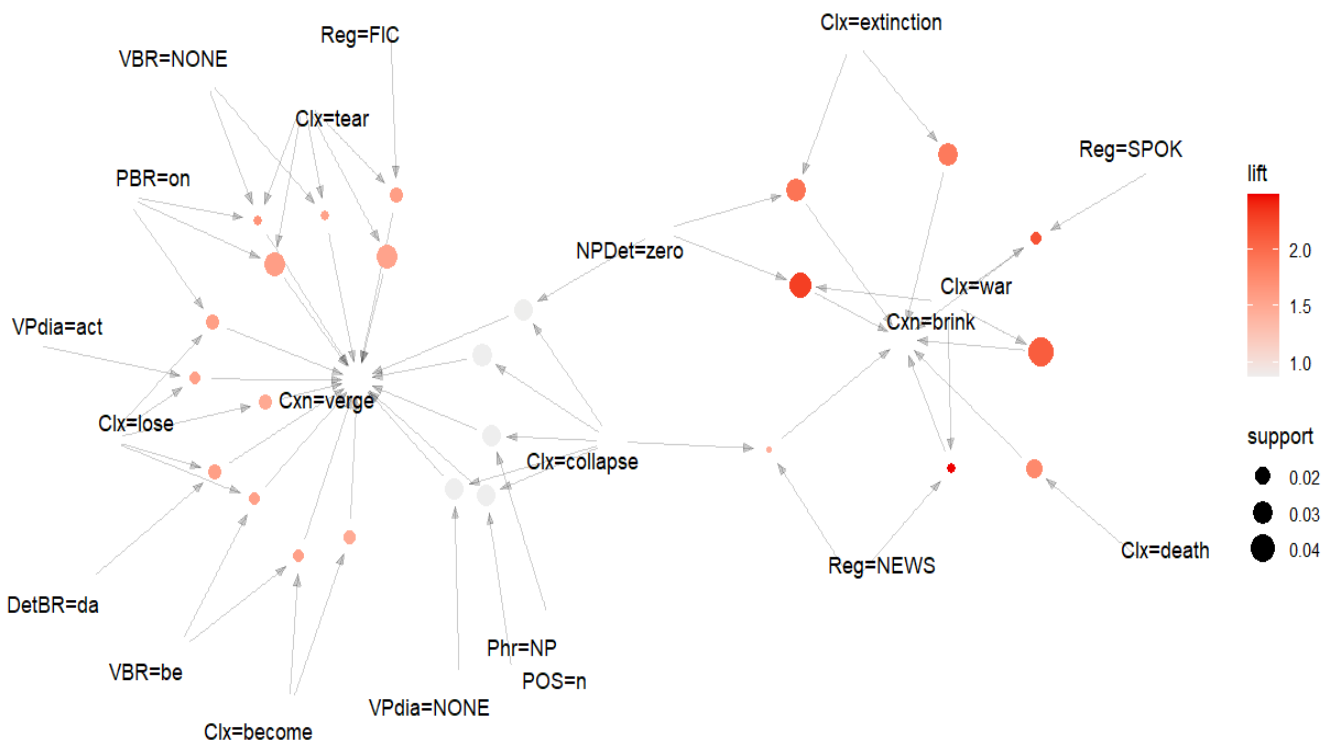
Table 5. COLLEXEMES that prefer *verge of*

VERB	*be*									*be*				*NONE*		*NONE*	
DETERMINER₁										*definite article*							
PREPOSITION										*on*				*on*	*on*		
COLLEXEME	*become*	*become*	*collapse*	*collapse*	*collapse*	*collapse*	*collapse*	*lose*	*lose*	*lose*	*lose*	*lose*	*tear*	*tear*	*tear*	*tear*	*tear*
SEMANTIC PROSODY																	
DISCOURSE PROSODY																	
PHRASE STRUCTURE						*NP*											
PART OF SPEECH					*noun*												
DETERMINER₂				*zero*													
DIATHESIS			*NONE*					*active*									
CROFTIAN MEANING																	
REGISTER													*fiction*				
Support	0.0137	0.0147	0.0264	0.0254	0.0264	0.0264	0.0283	0.0137	0.0156	0.0156	0.0137	0.0156	0.0166	0.0117	0.0323	0.0117	0.0323
Confidence	0.9333	0.8824	0.5192	0.5200	0.5192	0.5192	0.5179	0.9333	0.9412	0.9412	0.9333	0.8889	0.9444	1.0000	0.9429	0.9231	0.9167
Lift	1.5627	1.4773	0.8694	0.8706	0.8694	0.8694	0.8671	1.5627	1.5758	1.5758	1.5627	1.4883	1.5813	1.6743	1.5786	1.5455	1.5348
Frequency	14	15	27	26	27	27	29	14	16	16	14	16	17	12	33	12	33

Table 5 isolates all rules where COLLEXEMES prefer *verge of*. Note that *collapse* also appears in this table, but here it appears in configurations along with *zero* as DETERMINER2, *noun* as PART OF SPEECH, and *NP* as PHRASE STRUCTURE as well as *NONE* as DIATHESIS. This shows that *collapse* is attracted to both constructions, but in the company of different other features. *Tear* prefers *verge of* but especially in the *FICTION* REGISTER or with *on* as the PREPOSITION as well as *NONE* as VERB. Similarly, *lose* prefers the construction particularly in the context of *be* as VERB, the *definite article* as DETERMINER1, *active* voice as DIATHESIS, or *on* as PREPOSITION. *Become* also is associated with the construction in conjunction when the VERB is *be*.

The information in Tables 4 and 5 is summarized in Figure 1 which was generated using the `arulesViz` package in R. In this type of visualization, rules are represented by vertices, or bubbles, in the graph. Size indicates confidence value (the bigger the bubble, the higher the confidence), and color indicates lift value (the redder the bubble, the higher the lift). Arrows pointing from labels towards vertices indicate LHS, and arrows pointing from vertices towards labels indicate RHS. Since there are only two RHS items in this study – namely *verge of* and *brink of* (labeled 'Cxn=verge' and 'Cxn=brink' in the graph respectively) – the RHS-indicating arrows create two convergences, which gives us a good idea of how the features relate to the constructions (in this figure, Cxn=verge is the convergence to the left, and Cxn=brink is the one to the right).
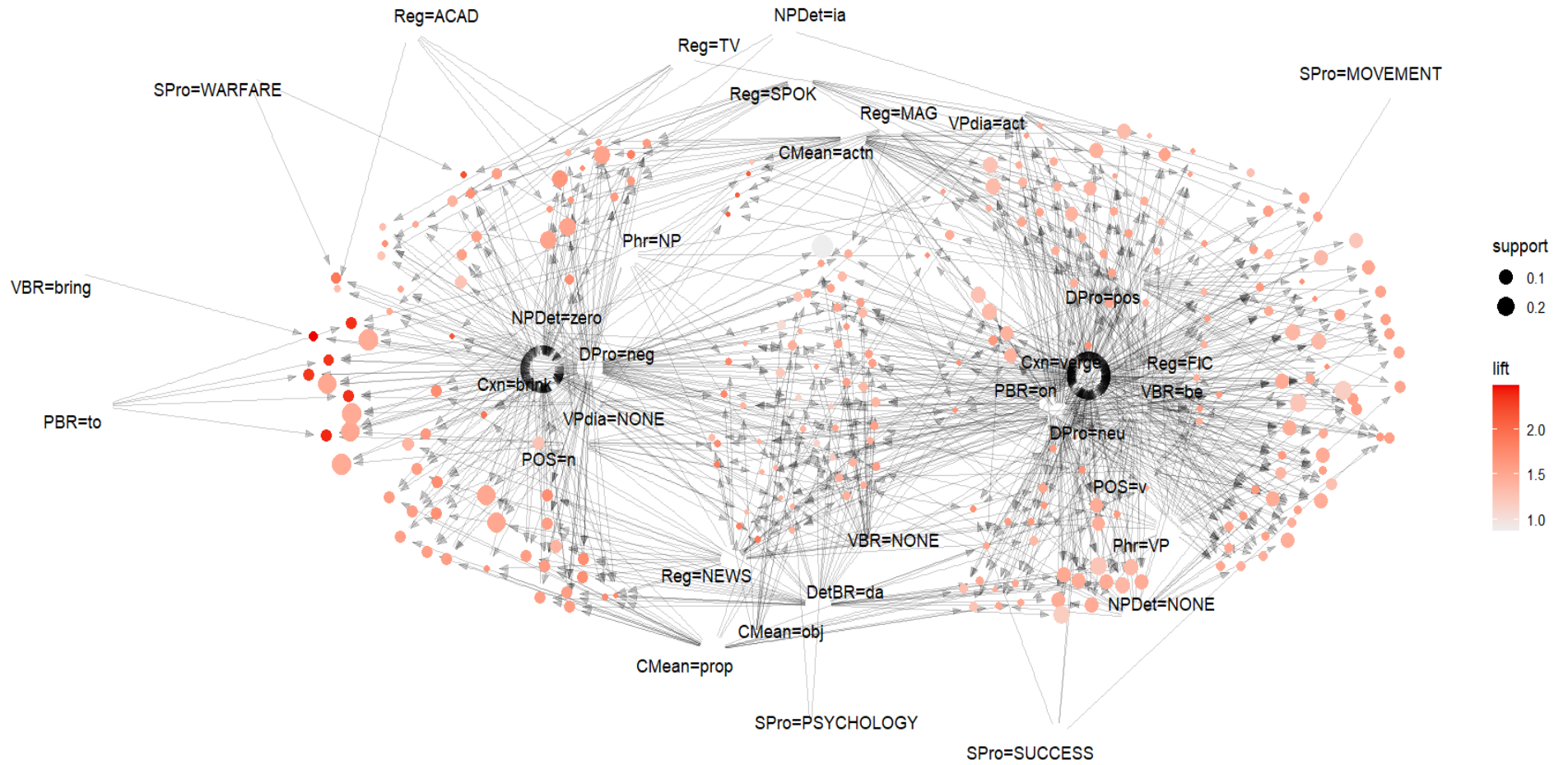
Figure 1. Visualization of rules with COLLEXEMES in LHS

For example, the COLLEXEME *collapse* ('Clx=collapse') appears between the two convergences with arrows pointing in the direction of both of them. As you can see, there is an arrow pointing from

collapse to a small vertex which is also connected to the *NEWS* REGISTER ('Reg=NEWS'). This represents the rule in Table 3 in which *collapse* and *NEWS* form a distinctive configuration that prefers *brink of*. You also see that *collapse* links to several vertices with arrows pointing towards *verge of*. These represent the rules from Table 5 where *collapse* forms distinctive configurations with *zero* as DETERMINER2 ('NPDet=zero'), *noun* as PART OF SPEECH ('POS=n'), and *NP* as PHRASE STRUCTURE ('Phr=NP') as well as *NONE* as DIATHESIS ('Vida=NONE') respectively. There is also an arrow pointing to a vertex with no other labels connecting to it. This represents the rule were *collapse* is the sole LHS-element. Note also how *death*, *war*, and *extinction* are linked to *brink of* and how *war* also points to rules also including the *NEWS* and *SPOKEN* REGISTERS, indicating the distinctive configurations in Table 4 where *war* is distinctive along with these two registers.

There is definitely some overlap between Tables 4 and 5 (and Figure 1) on the one hand and Table 1 (and also Wiliński 2017) on the other. However, the number of distinctive collexemes is much smaller in Tables 4 and 5 which in turn reveal some potentially vital details left out in the monofactorial analysis in Table 1, such as the association between certain COLLEXEMES and REGISTERS with *brink of*. Also, since there are 807 rules altogether, but only 25 of them involve COLLEXEMES, it logically follows that there are multiple non-collexemic variables that are distinctive. This is something that the analysis in Table 1 obviously would not be able to account for.

If we expand the scope from only COLLEXEME to also include SEMANTIC PROSODY and DISCOURSE PROSODY, there do not seem to be any preferences in terms of DISCOURSE PROSODY, as all three DISCOURSE PROSODY levels appear in configurations associated with either construction. However, Figure 2 indicates that the DISCOURSE PROSODIES are not equally associated with the two constructions. The figure obviously contains much information as it summarizes all rules with a DISCOURSE PROSODY feature as an LSH element. There are 257 such rules, and in the vast majority of them, the DISCOURSE PROSODY features are part of multi-featural configuration.

Figure 2. Visualization of rules with DISCOURSE PROSODY in LHS

Thus, the figure is admittedly cluttered, but it is possible to gleam some fundamental details from it. Importantly, *negative* DISCOURSE PROSODY ('DPro=neg') leans more towards *brink of*. As you can see in Figure 2, DPro=neg is located just to the right of Cxn=brink, and it links to a range of features that are primarily associated with *brink of* as well (mainly the ones located to the left of Cxn=brink, which is the convergence to the left in this figure) and also some that are associated with both constructions (mainly the ones located in the space between Cnx=brink and Cxn=verge). In contrast, both *neutral* and *positive* DISCOURSE PROSODIES ('DPro=neu' and 'DPro=pos' respectively) lean towards *verge of*, as they are located near the Cxn=verge (more specifically, just underneath it and above it respectively. Also note that Cxn=verge is the convergence to the right). Both features link to other features primarily associated with *verge of* (located mainly to the right of Cxn=verge) and associated with both constructions (located in the middle between Cxn=verge and Cxn=brink). Arguably, it does seem that *brink of* is associated with negative connotations, while *verge of* leans towards more neutral and positive ones. The DISCOURSE PROSODIES are simply just not distinctive on their own but in conjunction with other features. *Negative* DISCOURSE PROSODY prefers *brink of* generally, but particularly in the following contexts:

- the *ACADEMIC* and *TV* REGISTERS,
- the CROFTIAN MEANING of *property*,
- *bring* as the VERB and *to* as the PREPOSITION.

The *SPOKEN* REGISTER also prefers *brink of* with *negative* DISCOURSE PROSODY, but, with *positive* DISCOURSE PROSODY, the preferred construction is *verge of*. Only two SEMANTIC PROSODIES are distinctive on their own – namely, *CAUSATION* and *VERBIAGE* both of which prefer *verge of*. We see examples in (4-5) below:

(4) We are on the verge of making America great again. (COCA 2017 MOVE Get Me Roger Stone)
(5) I was on the verge of telling him he couldn't stay and make me go to the sideboard where I kept a spare key. (COCA 2015 AntiochRev)
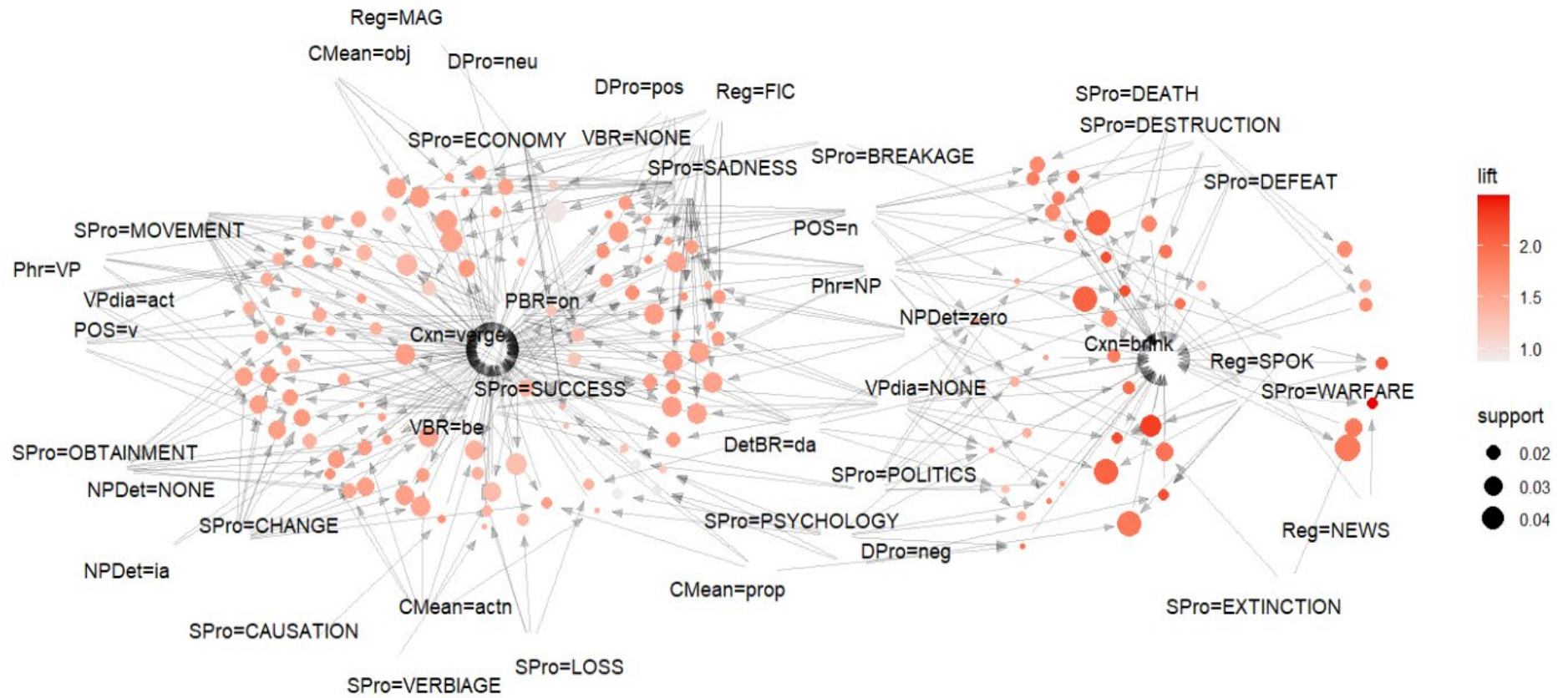
In (4), the COLLEXEME is *make*, which is used in its causative sense, which is reflected in its argument structure construction where the object complement expresses the RESULTANT STATE to which the referent of the direct object is caused to change. The example in (5) is a fairly typical instance of *verge of* in contexts of the SEMANTIC PROSODY *VERBIAGE*. It encodes a scenario in which the AGENTIVE participant is just about to produce an utterance. This example shows that the impending future event, in this case the utterance, can be canceled before it takes place. The SEMANTIC PROSODIES *CHANGE, ECONOMY, VERGE, SADNESS, OBTAINMENT*, and *SUCCESS* also prefer *verge of*, but all in distinctive configurations and not as distinctive features on their own:

- *SUCCESS, OBTAINMENT*, and *MOVEMENT* with CROFTIAN MEANING *action*,
- *ECONOMY* with CROFTIAN MEANING *property*,
- *CHANGE* with CROFTIAN MEANINGS *property* and *action*,
- *SADNESS* with CROFTIAN MEANING *object* (this is the only SEMANTIC PROSODY that prefers *verge of* with CROFTIAN MEANING *object*) or with REGISTER *FICTION* (none of the other SEMANTIC PROSODIES form configurations with REGISTERS).

SEMANTIC PROSODIES that prefer *verge of* tend to also occur with *on* as the PREPOSITION and *be* as the VERB. In fact, *verge of* as such is not preferred by any other VERBS or PREPOSITIONS. These interactions are captured in Figure 3, which also shows that *CHANGE* and *MOVEMENT* are further associated with *verb* and *VP* in connection with *verge of*. As you can see in the figure, which admittedly does contain much information (this time summarizing 145 rules – namely, the ones with SEMANTIC PROSODY IN LHS), *CHANGE* ('SPro=CHANGE') and *MOVEMENT* ('SPro=MOVEMENT') are situated to the left of Cxn=verge (in this figure Cxn=verge is the convergence to the left). They link to vertices that are also linked to by *verb* and *VP* ('POS=v' and 'Phr=VP' respectively), representing rules where *verge of* is preferred by configurations containing *CHANGE* or *MOVEMENT*, *verb*, and *VP*. In contrast, *SUCCESS* ('SPro=SUCCESS') appears with both *VP* and *NP* as PHRASE STRUCTURE well as *verb* and *noun* as PART OF SPEECH but only with *action* as CROFTIAN MEANING ('CMean=actn') – see (6-8) for examples.

(6)   Now they're on the verge of securing a free-agent commitment from Kyrie Irving, the first legitimate superstar the franchise has ever signed as an outside free agent. (COCA 2019 MAG Bleacher Report)

(7)   We're on the verge of transforming the science of lie detection. (COCA 2016 TV Limitless)

(8)   She was on the verge of crying. (COCA 2016 FIC Alive)

Figure 3. Visualization of rules with SEMANTIC PROSODY as LHS

The following Semantic prosodies prefer *brink of*:

- *DEATH*, *DEFEAT*, and *DESTRUCTION* with phrase structure *NP*, part of speech *noun*, and *zero* determiner2,
- *EXTINCTION* with *zero* determiner2 but without specifications in terms of phrase structure and part of speech,
- *WARFARE* with phrase structure *NP*, part of speech *noun*, and *zero* determiner2 as well as the *SPOKEN* and *NEWS* registers.

Below are examples of *DEATH*, *DEFEAT*, and *DESTRUCTION* appearing in instances of the construction (see 12-13 for examples with *WARFARE*):

(9)   On the brink of death, Mary laments that she had abandoned "the religious doctrine of my own people," which she attributes to the influence of Thomas, who had become an apostate. (COCA 2015 ACAD GeorgieHisQ)

(10)   Several other teams put themselves on the brink of elimination by picking up a sixth loss. (COCA 2016 MAG Bleacher Report)

(11)   Poaching has taken the Siberian tiger to the brink of extinction, but, since the 80s, their numbers have slowly increased. (COCA 2019 TV Our Planet)

It is also interesting to note, as seen in Figure 4, that the rules where *brink of* is preferred are generally stronger with higher lift values than the ones where *verge of* is preferred. Below, you see examples of the semantic prosody *WARFARE* (and the collexeme *war*) in the *brink of* construction in the *NEWS* and *SPOKEN* registers respectively:

(12)   On brink of civil war. (COCA 2015 NEWS SCMonitor)

(13)   Well with the U.S. on the brink of war with Korea and Syria, it's worth asking what would happen if that actually happen [sic], if war broke out? (COCA 2017 SPOK Fox:Tucker Carlson Tonight)

There are other semantic prosodies than *BREAKAGE* that prefer either construction in different distinctive configurations. Here are two examples:

- *POLITICS* prefers *verge of* with verb *be*, but in the context of phrase structure *NP*, part of speech *noun*, and determiner1 *definite article*,[5] the preferred construction is *brink of*,
- *PSYCHOLOGY* prefers *verge of* with preposition *on*, Croftian meaning *action*, and *negative* semantic prosody, but with phrase structure *NP*, Croftian meaning *property*, and part of speech *noun*, the preferred construction is *brink of*.

The division of phrase structure and part of speech among the two constructions in connection with semantic prosody reflects a broader underlying pattern, as we shall see later.

In terms of verb, *push* and *teeter* prefer *brink of* without any other featural restrictions,suggesting a particularly strong association between that construction and those verbs.

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[5] In fact, determiner1 is, with one exception, always a *definite article* in multiple configurations and displays preferences for both constructions. The one exception is that the *zero article* alone as determiner1 shows a very weak preference for *verge of*.

In (14-15), we see examples of *teeter* and *push* in the VERB position:

(14)   Yossie teetered on the brink of his future, hoping he still had one. (COCA 2019 FIC Sexual and Relationship Therapy)

(15)   One illness can push people to the brink of financial ruin. (COCA 2017 MAG MarkeWatch)

These examples show that there is semantic coherence in the metaphor that underlies the construction at the level of the source domain (see Lakoff and Johnson 1980 for more on the structure of conceptual metaphors), which is something that Wiliński (2017) also finds. In (14), the spatial relations between *teeter* (which means BALANCE UNSTEADILY), *on*, and *brink* are very clear, and an image of someone balancing on the edge of a cliff or an abyss is evoked. In fact, *teeter* is very strongly associated with *brink of* to the point that it figures as a single distinctive feature with the confidence of 0.96 and a lift of 2.38. This suggests that *teeter* is perhaps so strongly associated with *brink of* that they may form a more specific subconstruction within the *brink of* constructional network (this would support those dictionaries that list *teeter on the brink of* as a separate idiom). We see something similar in (15) where there is also a strong sense of spatiality within the source domain. This time, the VERB *push* expresses CAUSED MOTION, and the PREPOSITION *to* expresses directionality. That is, (15) evokes imagery in which an object (metaphorically, people) is CAUSED TO MOVE ALONG A PATH TOWARDS AN EDGE in danger of FALLING INTO THE ABYSS (metaphorically, financial ruin). As it happens, *push* is even more strongly attracted to *brink of* according to confidence (1.00) and lift (2.44). *Bring* also prefers *brink of* but in conjunction either *negative* DISCOURSE PROSODY or *action* as CROFTIAN MEANING (both rules also have a confidence of 1.00 and a lift of 2.44). An example is seen in (16):

(16)   It won't be simple, and it won't be quick. Bringing a state back from the brink of failure never is. (COCA 2018 ACAD Foreign Affairs)

Note again the strong sense of spatiality and motion, but here the MOVEMENT is ALONG A PATH AWAY FROM the metaphorical EDGE and ABYSS as indicated by the PREPOSITION *from* and the directional adverb *back*. Like *push*, *bring* encodes external AGENCY in the sense that the OBJECT (metaphorically, the state in question) is caused to MOVE ALONG THE PATH AWAY FROM THE EDGE AND ABYSS (metaphorically, failure) rather than engaging in self-propelled motion. It is indeed interesting that *teeter*, *push*, and *bring* all have dynamic Aktionsart, because the VERBS that prefer *verge of* are *be* and *seem*, which have stative Aktionsart. Neither *be* nor *seem* is distinctive on its own though. *Be* appears in several distinctive configurations with *on* as PREPOSITION and *definite article* as DETERMINER₁. Multiple SEMANTIC PROSODIES and all DISCOURSE PROSODIES with *VP* as PHRASE STRUCTURE and *verb* as PART OF SPEECH appear in configurations with *be*. However, when the SEMANTIC PROSODY is *SUCCESS*, then the preferred PHRASE STRUCTURE is *NP* and the PREFERRED PART OF SPEECH is *noun*. We see an example of this in (17):

(17)   But Ingot doesn't want to stop him because she thinks he's on the verge of a breakthrough. (COCA 2016 MOV Dead Rising: Endgame)

Notice the difference in metaphorical spatiality. In this example, there is no sense of movement although (17) also encodes a situation about to occur in the immediate future, and the basic temporal metaphor is similar. We know from Table 5 that the only COLLEXEMES occurring in distinctive configurations with *be* as the VERB are *become* and *lose*:

(18) He starts us in the horror of the present moment, on a frozen lake near the Minnesota-Canada border, where Max is on the verge of becoming just like one of the monsters he tracks down and arrests. (COCA 2017 NEWS Minneapolis Star Tribune)

(19) A lot of records are also on the verge of being lost to the rate at which they are deteriorating, and need to be properly duplicated for the purpose of preservation of the contents of such collection. (COCA 2018 ACAD Library Philosophy Practice)

As with (17), the relation between the impending event and the main participant of the event is static, but the event itself if dynamic in (18-19) as well as in (17). This is something that both constructions have in common: they tend to lean towards the impending future event being dynamic. However, there are also patterns where it is more static and relational. *Seem* prefers *verge of* too, but in particular if CROFTIAN MEANING is *action* as seen in *he seemed on the verge of drafting an obsessive social-media post (COCA 2018 FIC NewYorker)*. What is interesting about this pattern is that *seem*, unlike *be*, has connotations of uncertainty and, consequently, *seem on the verge* of might serve as a type of modal marker emphasizing that the dynamic situation that looms in the near future is possible, probable, or maybe even likely, but it is not certain.

When it comes to PREPOSITION, *at* and *from* prefer *brink of*, but *from* is a distinctive feature on its own whereas *at* forms a distinctive configuration with *zero* DETERMINER₂:

(20) Koji even found himself reciting it at the brink of sleep when Yumi would take over, whispering it in his ear. (COCA 2019 FIC MassRev)

(21) And it's brought us back from the brink of war. (COCA 2018 SPOK PBS_Newshour)

Arguably, both *from* and *at* are coherent with the conceptual substance of the source domain of the metaphor underlying *brink of* as an idiomatic construction. (21) and (16) above are very similar, representing the same pattern: VERB *bring* + PREPOSITION *from* + DETERMINER₂ *zero*. Both examples also serve as more evidence that the impending event is cancelable. *At* may also be more semantically compatible with *brink of* than *verge of*, as *at* often expresses a spatial relation pertaining to a point while *on* often expresses one pertaining to a surface. Conceptualizing a brink as a point arguably emphasizes the sense of danger and risk even more. This conceptualization probably would not have the same effect in connection with a verge. There is only one PREPOSITION that prefers *verge of* and that is *on*, which appears in many distinctive configurations. Here, it is important to point out that this does not mean that *on* does not occur with *brink of* (see examples 9-14).

(22) In the final episode, a very pregnant Claire is also on the brink of a nuclear war she threatened in order to distract from the fact that many powerful people want her dead. (COCA 2018 MAG Hollywood Reporter)

Nor does it mean that *verge of* does not occur with other PREPOSITIONS, because it does (for instance, it occurs with *at* a handful of times). What it means is simply that *on* has a stronger association with *verge of* than with *brink of*, and *from* and *at* have stronger associations with *brink of*. Whenever the VERB is *NONE*, the PREPOSITION is always *on* – both with *verge of* and *brink of* as preferred constructions. This might possibly suggest that, in the absence of a verb in the surrounding syntactic context, the default preposition in either construction is *on*.

VP as PHRASE STRUCTURE exclusively prefers *verge of*, mostly with *neutral* and *positive* DISCOURSE PROSODIES. However, in the *NEWS* REGISTER, while the preferred construction is still *verge of*, *VP* tends to occur with *negative* and *positive* DISCOURSE PROSODIES and the SEMANTIC PROSODIES *CHANGE*, *MOVEMENT*, and *SUCCESS*. In contrast, *NP* tends to prefer *brink of* and

appears in distinctive configurations along with the SEMANTIC PROSODIES *DEATH*, *DEFEAT*, *DESTRUCTION*, *POLITICS*, *PSYCHOLOGY*, and *WARFARE*. However, when the SEMANTIC PROSODY is *SUCCESS* or *SADNESS*, the preferred construction becomes *verge of*, which is also the case when the COLLEXEME is *collapse*. *NP* appears in rules alongside all REGISTERS except *MOVIES*. The preference of *VPs* for *verge of* is also reflected in connection with DIATHESIS:

- *active* and *passive* only prefer *verge of*,
- *NONE* appears in rules with both constructions.

This is because *brink of* is exclusively preferred by *NPs*, which obviously do not have diathetic structures. Only 3 rules involve *passive* voice as DIATHESIS in their LHS, while 79 rules involve *active*, and 57 involve *NONE*.

A particularly interesting observation is that, although the prototypical use of *NP* structures would be the expression of objects, *NP* never occurs in any configurations along with *object* as CROFTIAN MEANING. It only occurs with *action* and *property*, both of which are marked uses of NPs according to Croft (2001). Consider the following examples:

(23) After a year of partisan warfare that brought Virginia to the brink of a state government shutdown, Gov. Terry McAuliffe has started showing Republicans so much love that he has some Democrats worried. (COCA 2015 NEWS WashPost)

(24) One day shaped the most formative years of our lives, hitting us right at the brink of adolescence when our minds were developing and absorbing everything around them. (COCA 2018 MAG Fortune)
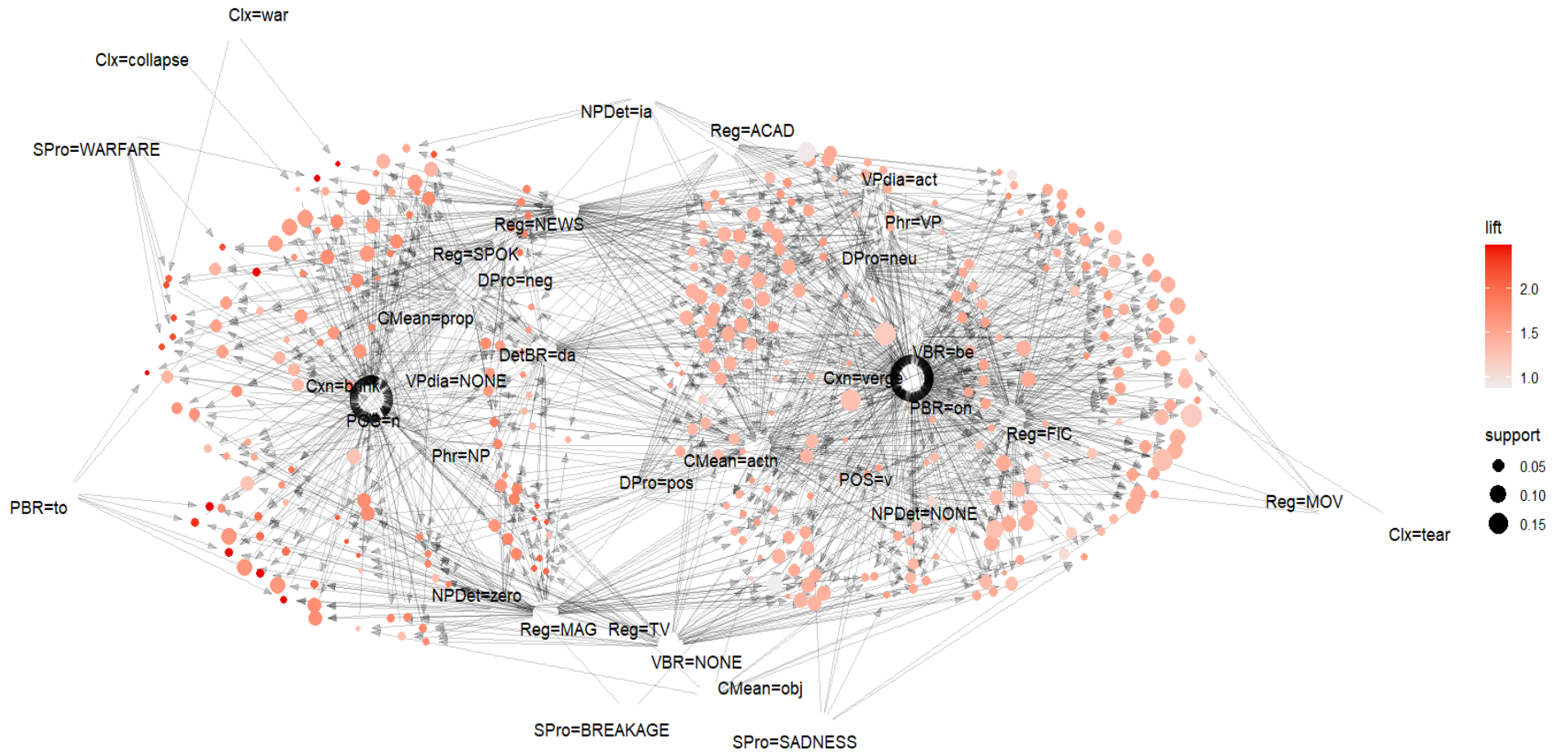
In (23), the deverbal noun *shutdown* (derived from the phrasal verb *shut down*) appears after *of*. A shutdown is clearly a dynamic action that involves not just activity but also a change of state. The example in (24) has *adolescence* as the COLLEXEME after *of*. While a shutdown is an *action*, adolescence is a *property* in terms of CROFTIAN MEANING in the sense that it is a stage of life of a person. This way, it has more in common with a state. While the examples in (23-24) are thus marked in terms of Croft's (2001) conceptual space approach, our findings indicate that *brink of*, even when the COLLEXEME is realized by a nominal form, conventionally is more associated with the CROFTIAN MEANINGS *action* and *property* than *object*. *Verge of* is more prototypical in that, as mentioned above, it is exclusively preferred by *VP* in conjunction with *action* as CROFTIAN MEANING (and more weakly so with *property*, but not with *object*).

This is also reflected in the PART OF SPEECH variable:

- *verb* is exclusively associated with *verge of,* typically with the CROFTIAN MEANING *action* (and less typically, with *property*),
- *verb* tends to appear in REGISTER *NEWS* with *negative* and *positive* DISCOURSE PROSODIES and in the *FICTION, SPOKEN*, and *MAGAZINES* REGISTERS with *neutral* DISCOURSE PROSODY,
- *noun* is mostly attracted to *brink of*, but, with *positive* DISCOURSE PROSODY, *verge of* is preferred,
- *noun* also prefers *verge of* with COLLEXEME *collapse* or the SEMANTIC PROSODIES *SADNESS* or *SUCCESS*.

As with *VP* as PHRASE STRUCTURE, when PART OF SPEECH *noun* prefers *brink of*, it is primarily along with the CROFTIAN MEANINGS of *action* and *property*.

Figure 4. Visualization of association rules with SMALLCAPS REGISTERS in LHS

This is also where an important pattern emerges in terms of the basic communicative functions of both constructions: both seem to be used primarily to express dynamic situations and secondarily to express relational states. However, while *verge of* displays more communicative prototypicality with its preferential relationship with *VP*, *verb*, and *action*, *brink of* is less communicatively prototypical with its preferential relationship with *NP*, *noun* and *action*.

Apart from *MOVIES* and *FICTION*, which only prefer *verge of*, all REGISTERS have preferences for either construction. This is illustrated in Figure 4 which, summarizing no less than 355 rules (all the rules with REGISTER features as LHS-elements), is very informationally dense; what the reader should focus on are only the labels containing 'Reg'. As you can see, *FICTION* and *MOVIES* ('Reg=FIC' and 'Reg=MOV') only link to the *verge of* convergence (in this figure the Cxn=verge convergence is the one to the right, and Cxn=brink is the one to the left), while *ACADEMIC* ('Reg=ACAD'), *TV* ('Reg=TV'), *MAGAZINE* ('Reg=MAG'), *SPOKEN* ('Reg=SPOK'), and *NEWS* ('Reg=NEWS') link, to varying degrees, to both convergences. In *FICTION*, the only SEMANTIC PROSODY is *SADNESS*, and the only COLLEXEME is *tear*. In (25), you see a very representative example of this configuration:

(25)   Ms. Moriyama herself looked on the verge of tears. (COCA 2016 FIC FantasySciFi)

This indicates that the expression *on the verge of tears*, while it can appear in any REGISTER, is used particularly often in fictional narratives, perhaps as a conventionalized trope for describing characters who are in states of distress and are close to emotional breakdowns. It is not uncommon that certain expressions are conventionalized within fictional writing and similar registers like fictional TV-shows, movies, or theater plays and are encountered there more often than in 'everyday language use' – even in fictional representations of 'everyday language use'.[6] Here are some more observations:

- in the *ACADEMIC* REGISTER, the preferred construction is *brink of* with *negative* SEMANTIC PROSODY,
- in the *ACADEMIC* REGISTER, when *NPs* or *nouns* occur with CROFTIAN MEANING *action*, the preferred construction in *ACADEMIC* is also *brink of*,
- in the *ACADEMIC* REGISTER, with *VPs* or *verbs*, or with PREPOSITION *on*, the preferred construction is *verge of*,
- *NEWS* prefers both constructions, but, with the SEMANTIC PROSODIES of *BREAKAGE* and *WARFARE* and the COLLEXEMES *war* and *collapse*, *brink of* is preferred,
- in *NEWS*, *brink of* is preferred by *negative* and *neutral* DISCOURSE PROSODIES, but *verge of* has all three DISCOURSE PROSODIES in this REGISTER,
- in the *SPOKEN* REGISTER, *brink of* is preferred by SEMANTIC PROSODY *WARFARE*, COLLEXEME *war*, and *negative* DISCOURSE PROSODY, but, with *positive* and *neutral* DISCOURSE PROSODIES, *verge of* is preferred,
- in the *TV* REGISTER, *brink of* is preferred by *negative* DISCOURSE PROSODY, but *verge of* is preferred by *positive* DISCOURSE PROSODY.

With *MAGAZINES* as REGISTER, the only SEMANTIC PROSODY that appears in a rule is *SUCCESS*, in which case the preferred construction is *verge of*. Interestingly, in *MAGAZINES*, the preferred construction in the context of *positive* DISCOURSE PROSODY is not *verge of* but *brink* of; both constructions ions are linked to *negative* and *neutral* DISCOURSE PROSODIES in this REGISTER though.

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[6] For instance, Jensen & Gries (2025) find that *GO (a)round Ving* is particularly strongly associated with registers that feature fictional representations of spoken language but not really associated with the actual spoken register itself.

5.   Toward distinctive collo-profiles
Let us try to make sense of the findings presented in the previous section and address the main emergent distinctive patterns.

One important underlying pattern has to do with the basic communicative functions of both constructions. Both constructions appear to primarily express dynamic situations and, secondarily, relational properties as impending future events. This is reflected in the preferential relationship between the CROFTIAN MEANING of *action* and both constructions. However, *verge of* is more attracted to *verbs* and *VPs* whereas *brink of* is preferred by *nouns* and *NPs*. Consequently, while *verge of* is more prototypical in terms of Croft's (2001) overall conceptual space model, *brink of* would be more marked. Now, a protest could be made that the verbal elements that appear in the X-position are *ing-*forms, or present participles, and, according to Croft's (2001) conceptual space approach, participles have the speech act function of modification. However, as seen in examples (2-8, 18-19, 24), the *ing-*forms serve as verbals in clause structures, so their job is clearly not modification but predication. This difference between the two constructions is interesting because it means that, while both constructions primarily express dynamic actions, they do so with different construals. If one accepts Langacker's (1987) distinction between sequential scanning and summary scanning, these two modes of scanning can be used to describe this functional difference. Scanning has to do with the extent to which a situation is construed as a process or as a set of atemporal relations. Sequential scanning construes a situation as a process unfolding over time, while summary scanning construes the situation atemporally as a gestalt. Verbal forms conventionally present sequentially scanned situations, while nominal forms present summarily scanned events. Consequently, what our findings suggest is that *verge of* sequentially scans the impending future event, presenting it as a process, while *brink of* presents it more atemporally via summary scanning.

This has some interesting implications for our understanding of the constructions and whether they are nominal or verbal constructions. Ultimately, they are both somewhere in between, because both do appear with *NPs* and *nouns* on the one hand and *VPs* and *verbs* on the other hand, but *verge of* leans more towards being a verbal construction while *brink of* leans more towards being a nominal construction. This is something that requires more research, to be sure, but it could have consequences for how they should be presented in reference works and grammar books in the future.

This study has also highlighted another contrast between the two constructions which has to do with REGISTER. Overall, they are both associated with most REGISTERS in COCA, and there is no REGISTER that has particularly strong preferences for *brink of* alone (but there are REGISTERS that prefer *brink of* in conjunction with other features). However, *verge of* is strongly preferred by *FICTION* and *MOVIES* – and the expression *on the verge of tears* is particularly strongly associated with *FICTION*. *NEWS* is interesting because, while it shows preferences for both constructions, it prefers *brink of* in the company of *negative* and *neutral* DISCOURSE PROSODY as well as the COLLEXEMES *war* and *collapse* along with the SEMANTIC PROSODIES of *WARFARE* and *BREAKAGE*. In other words, in *NEWS*, it seems that *brink of* is preferred when reporting on particularly severe states-of-affairs. This makes sense in the following ways. Firstly, the underlying metaphor of *brink of*, due to the more extreme spatial properties of a brink, lends itself better to the expression of potentially dangerous situations such as international conflicts or global, and local, economy (it should be mentioned that *collapse* and *BREAKAGE* are used very often with *brink of* in reports on economy). Secondly, the same metaphor also has a built-in 'drama' to it which is not incompatible with the sensationalization often seen in news media. *SPOKEN* is similar to *NEWS* in that *brink of* is preferred with *WARFARE* and *war* as well as with *negative* DISCOURSE PROSODY, while *verge of* is preferred with the two other DISCOURSE PROSODIES. This seems strange, but I believe it has to do with the type of data categorized as spoken language in COCA – namely, transcriptions of conversations and interviews from television. In particular, news-based talk shows and televised news reports are

included as spoken data. That is, the spoken data in the corpus are very much restricted to the domain of news. Like in the *SPOKEN* REGISTER, *brink of* is particularly strongly associated with *negative* DISCOURSE PROSODY in the *ACADEMIC* REGISTER. It is also interesting to note that, returning to our discussion of PHRASE STRUCTURE, PART OF SPEECH, and CROFTIAN MEANING above, the preferential relationship between *NP*, *noun*, and *action* on the one hand and *brink of* on the other is particularly prevalent in the *ACADEMIC* REGISTER. This might owe to the general tendency in academic writing to use nominalizations. One might expect both constructions to mainly be associated with *neutral* DISCOURSE PROSODY in *ACADEMIC*, but even here *brink of* mainly has connection with *negative* DISCOURSE PROSODY.

This takes us to the next point – namely, DISCOURSE PROSODY itself. This study shows that, while not as neat as it is made out to be in grammar books and dictionaries, the two constructions are indeed linked to positive and negative connotations, with *brink of* conventionally being associated with negative connotations and *verge of* with positive and neutral connotations. However, this is not clear-cut in a multivariate perspective, as it depends on other features. For example, while *brink of* is preferred by *negative* SEMANTIC PROSODY in most REGISTERS, in *MAGAZINES*, it is the preferred construction by *positive* DISCOURSE PROSODY while *verge of* is preferred by *negative* and *neutral* DISCOURSE PROSODIES. Here, *brink of* is primarily used in articles describing impending successes and victories rather than disasters and wars. *Verge of* is also used in such positive contexts in *MAGAZINES*, but there is a tendency to simply use it much more frequently in connection with impending negative scenarios such as health problems, failures, defeats at sports events, and disrepair and the like.

A final contrast between the two constructions lies in their spatiality, which is reflected in the preferential patterns relating to PREPOSITIONS and VERBS with *verge of* drawing on a more static spatial source domain whereas *brink of* draws on a more dynamic one, where there can be movement towards, from, and on the temporal dividing point metaphorically encoded by *brink*. However, in the absence of a VERB, the default preposition seems to be *on*.

Ultimately, this study does not, it should be pointed out, negate Wiliński (2017). If anything, it supports Wiliński's findings but does provide a more informational and complex profile of the contrasts among the two constructions, in which external features like REGISTER interplay with COLLEXEMES, SEMANTIC PROSODIES, and DISCOURSE PROSODIES. Moreover, co-textual features such as lexemes and grammatical categories seem to figure as distinctive features – sometimes by themselves, but often in distinctive configurations. Importantly then, this study shows that the constructions are probably best viewed as multidimensional phenomena and should be treated as such in contrasting analyses. When it comes to Carter & McCarthy's (2006) characterization of *verge of* as belonging mainly to more formal contexts, however, there is nothing in our findings to support this. In order for this statement to have been supported, *verge of* should be more strongly associated with the *ACADEMIC* REGISTER and not with other REGISTERS – especially, *SPOKEN*, *FICTION*, and *MOVIES* – but that is not the case.

Now, one thing is guaranteed and that is, while this study has uncovered a hitherto unseen level of detailed information pertaining to the differences between the two constructions, it is far from the final word, and in future work, more features can, and should, be included such as, for example, the topical domain of the concordance lines. I suggest this as a future avenue because several such topics recurred in the data set such as SPORTS, FINANCING, INTERNATIONAL CONFLICTS, MENTAL HEALTH, and EMOTIONS.

6.   Final remarks

It is hoped that this article has illustrated how the two constructions are distinct, differing along multiple dimensions including, but not limited to, the COLLEXEMES that appear after *of*. Applying

association rules analysis in a similar fashion to Jensen & Gries (2025), this article has proposed what could be steps towards distinctive collo-profiles along the lines of what Herbst (2018) advocates. In distinctive collo-profiles, distinctive features and featural configurations emerge from complex interplays between SEMANTIC PROSODY, DISCOURSE PROSODY, COLLEXEMES, various co-textual grammatical and lexical features, and REGISTER. Our main takeaways relating to the constructions themselves are as follows. First, in addition to supporting the general assumption – also confirmed in Wiliński (2017) – that *brink of* is mostly negatively leaning while *verge of* is more neutral, this study also shows that both constructions mainly specify *actions*, in the Croftian (2000) sense, as the impending future events, but categorizing both constructions as verbal constructions or as nominal constructions is incorrect. Rather, *brink of* seems to be more of a nominal construction which construes the impending event atemporally through summary scanning, while *verge of* is a more prototypical verbal construction that construes the impending event as a process via sequential scanning. Second, Wiliński's (2017) monofactorially based confirmation of the general assumption about the connotative functions of the constructions is strengthened by our multifactorial approach in which COLLEXEMES, SEMANTIC PROSODIES, and, importantly, DISCOURSE PROSODIES together indicate the negative leanings of *brink of*. Moreover, the inclusion of contextual features like VERB and PREPOSITION has shown that the underlying metaphorical conceptualizations of TIME as SPACE are reflected in the verbs and prepositions that occur in conjunction with the constructions. What should be interesting to cognitive linguists in particular is that there is a complex interplay between the conceptual semantic functions and pragmatic functions of the constructions and recurrent patterns of use. Third, our study shows that neither construction is a monolith, as either construction displays different behaviors in different registers, which reminds us that constructions can display cross-varietal variability.

Arguably, this study has implications for our understanding of the two constructions, but there are also at least five major implications for construction-grammatical theorizing more broadly.

Firstly, it suggests that, in a usage-based perspective, viewing constructions as multidimensional linguistic phenomena opens up for more detailed accounts. This is because, in accordance with basic principles from usage-based theorizing (e.g. Kemmer & Barlow 2000; Bybee & Hopper 2001), patterns of recurring con- and co-textual features can be part of speakers' constructional knowledge as *bona fide* external constructional properties. This means that constructions that seem either semantically synonymous or which seem meaningless from a semantic perspective may be distinguished on other dimensions (as external properties can be defining constructional features). Similarly, in the case of semantically empty constructions, their functions might be discourse-pragmatic and might be discoverable through other aspects of the constructions than their semantic and symbolic structures.

Secondly, in including register and showing how register seems to play a role as a distinctive dimension (see also Jensen 2025 and Jensen & Gries 2025), this study suggests that constructions may play particular roles in particular varieties. Currently, construction grammarians are waking up to the very likely possibility of constructions not only being cognitive-linguistic phenomena but also sociolinguistic phenomena in the sense that, like other linguistic phenomena, they may display variation across varieties. This article, of course, limits varieties to registers due to the organization of COCA, but – despite this delimitation – we do see that one of the constructions, *verge of*, is particularly strongly associated with registers associated with fiction while the other construction seems more generic in terms of register.

Thirdly, the notion of markedness is also challenged to some extent. While, in the greater scheme of things, the use of nominal structures to express actions is marked, the question is whether the same type of markedness applies at the micro-level of individual constructions. If, as seems to be the case with *brink of*, a conventionalized function is the expression of actions via nominal structures, can we really say that using the construction exactly for that purpose is marked? Perhaps the notion

of markedness needs to be split up into two levels: the large-scale typological level that Croft (2001) addresses and the small-scale constructional level that is addressed in this study. This is clearly something that cannot be settled in this article, but it is definitely something that is worth thinking about.

Fourthly, this study indicates that constructional idiomaticity is somewhat fine-grained. Now, in a construction grammar perspective, this is not really a new discovery. Much early research in construction grammar (e.g. Fillmore et al. 1988) addressed idiomaticity, and it was often found that idiomaticity was a complex interplay between conceptual-semantic and pragmatic factors. In some cases, the same formal expression was even found to display different degrees of idiomaticity in different contexts of use (e.g. Lipka & Schmid 1994). Both this study and Wiliński (2018) show that the two target constructions are both idiomatic and demonstrably functional. This study further shows that there is a complex interplay between conceptual meaning and idiomaticity. Not only are the two constructions metaphor-based idioms (Kövecses & Szabó 1996), they are based on two related but distinct ways of conceptualizing TIME as SPACE. Moreover, these underlying metaphors are reflected in specific conceptualizations linked to patterns of language use, such as the tendency of *brink of* to be associated with category levels that are oriented towards more dynamic scenarios at the semantic level as reflected in the PREPOSITIONS and VERBS appearing in usage-events.

Fifthly, as suggested under the first point above, this study feeds into extant research on constructional synonymy within construction grammar, providing further support for construction grammarians' skepticism towards total synonymy as a linguistic phenomenon. This skepticism is encapsulated by Goldberg's (1995: 67) Principle Of No Synonymy which holds that syntactically distinct constructions are also semantically or pragmatically distinct. This principle can be further traced back to Bolinger's (1968: 127) statement that "a difference in form always spells a difference in meaning" because a "language that permitted syntactic divergences to be systematically redundant would represent a strange kind of economy". The Principle Of No Synonymy has proven to be too simplistic, focusing only on syntax and ignoring social meaning, and Leclerq & Morin (2023: 10) propose a more realistic Principle Of No Equivalence. This principle holds that constructions that differ in form (not just syntax, but also phonology, morphology, orthography or any other formal structure) are bound to be distinct semantically, pragmatically, and/or socially. Traditional distinctive collexeme studies, such as Wiliński (2018), have generated much evidence showing how seemingly synonymous constructions turn out to be semantically distinct. However, multivariate studies such as this one, Olguín-Martinez & Gries (2024) and Jensen & Gries (2025) are able to take into account multiple features that may reveal different types of functional differences among constructions. This also allows for (i) a more detailed and nuanced definition of constructional functionality and, consequently, (ii) more detailed and realistic criticisms of constructional synonymy which are in line with the principle of no equivalence.

As suggested in Jensen & Gries (2025; see also Olguín Martínez & Gries 2024), who, inspired by Herbst (2018), call for distinctive multidimensional collo-profiles in contrastive analyses of constructions, multivariate descriptions are more informative than more traditional monovariate ones. Our study of *verge of* and *brink of* indeed supports this, and the distinctive collo-profiles – while obviously far from exhaustive – that emerge from the findings presented in this article indicate that the two constructions are very complex. Wiliński (2018) finds that the semantic contrasts between the two constructions are very subtle and that these subtleties are reflected in their collostructional patterns. This article confirms this but maps additional subtle, yet fundamental, differences in other variables in addition to the collexemes. While much more research is required, one of this article's take-home messages is that descriptions of the two constructions, such as those found in grammar books and other reference works, if the ambition is to describe the constructions as they are actually used, would have to be updated to provide more detailed information – essentially, to provide collo-profiles.

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