

Adjectives and usage-patterns in the [X *enough to* VERB]-construction

1. Introduction

Recent constructionist research into adjectival gradability suggests that scalar adjectival constructions may feature implied relations of causality (e.g. Bergen & Binsted 2004, Fortuin 2013) The [X *enough to* VERB]-construction appears to be one such construction:

- (1) A couple of them were just puppies, but old enough to know it was good-bye. (COCA 2012 FIC AntiocRev)
- (2) But every time I try to get close enough to touch one, the mother shows her yellow teeth and growls. (COCA 2012 FIC Bk:IntoFreeNovel)
- (3) With its 18-inch barrel and collapsible stock, it is quite maneuverable and is light enough to carry with a scope mounted. (COCA 2012 MAG OutdoorLife)

The above examples suggest that the construction involves an implied pragmatic relation of force-dynamics between [X *enough*] and the infinitive clause, based on Johnson's (1987) force-dynamic image schema of enablement (Fortuin 2013 calls this function SUFFICIENCY). In this paper, we will, drawing on data from the *Corpus of Contemporary American English* (COCA) (Davies 2012), explore the construction in the perspective of usage-based construction grammar with a view to gaining insight into its functionality and mapping some of its usage-patterns as we address the issue of whether [X *enough to* VERB] covers one adjectival construction or more adjectival constructions and, in extension, take a look at the function(s) of [X *enough to* VERB]?

Firstly we will introduce the data and methodological framework used in this paper. Then, applying a covarying collexeme analysis (Stefanowitsch & Gries 2004), we will address the Schematic semantic and symbolic structure of [X *enough to* VERB]. Following this, the distribution of parts-of-speech in the X-position within the corpus will be accounted for. Finally, we will address propositional act functions of [X *enough to* VERB].

2. Data and method

Our source of data is the 2012 section of COCA; this subcorpus consists of 11,254,891 words. Using the online concordancer, 939 instances of [X *enough to* VERB] were retrieved.

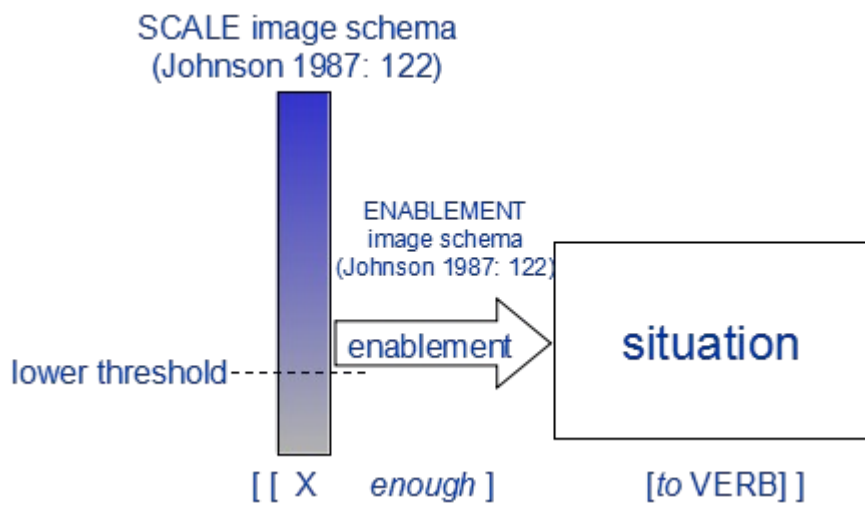
In addition to simple frequency counts, the following quantitative methods of analysis were applied. Simple collexeme analysis (Stefanowitsch & Gries 2003) and covarying collexeme analysis (Stefanowitsch & Gries 2005) were applied to address the semantics and schematic structure of the construction (in accordance with the principles of semantic compatibility [Stefanowitsch & Gries 2005:4] and semantic coherence [Stefanowitsch & Gries 2005:11]). Simple collexeme analysis measures the degree to which lexemes are attracted to one position in the construction, thus allowing us to address the semantics of that position. Covarying collexeme analysis allows us to address the degrees of coattraction among lexemes in two positions within a construction, thus allowing us to address the semantic relation between the two positions. Multidimensional scaling to address the degrees of similarity among the items appearing in the X-position.

The R platform was used for all quantitative analysis, and the simple and covarying collexeme analyses were further carried out using Gries' *Coll.analysis* script.

3. Schematic structure and function

The figure on the next page outlines the schematic structure of the construction. The [X *enough*] part expresses a scale of Xness – X being whatever feature the X-lexeme expresses – and the *to*-infinitive expresses an event or scenario (called 'situation' in the figure below), specified by the verb and other constituents in that clause. The scale of Xness can be described as an instance of the SCALE image

schema as defined by Johnson (1987: 122). A relation of ENABLEMENT is set up between the scale of Xness and the situation, understood such that a point on the scale is construed which force-dynamically enables the situation to take place; this point is located above a minimum threshold below which ENABLEMENT is not possible.



The overall function of the construction falls under what is called SUFFICIENCY by Fortuin (2013), who defines it as follows: "the degree (quantity) of X is appropriate with respect to a contextually given norm Y (and does not need to be higher)" (Fortuin 2013: 36). SUFFICIENCY is contrasted with EXCESS, defined by Fortuin (2013: 35) as follows: "such a degree (quantity) of X that it exceeds (is more than) the contextually given maximum (maximal appropriate degree) for Y". EXCESS is seen in the following example in which another construction – namely, [*too X to VERB*] – is used:

- (4) The mystery pinprick of light fading and reappearing was too dull to be another ship yet bright enough to make her wonder what the heck was out there. (COCA 2012 FIC Bk:RobertLudlumsThe)

To see whether the X-position in [*X enough to VERB*] is indeed semantically scalar, a simple collexeme analysis was applied to this position. Below are the 20 most attracted items in the X-position:

Rank	X-position	Coll.strength
1	long	732.6956
2	old	458.2563
3	strong	350.3541
4	lucky	327.4495
5	smart	239.7697
6	close	199.0064
7	fortunate	184.3276
8	well	183.7884
9	big	177.3281

10	large	142.1882
11	powerful	133.3399
12	fast	123.7422
13	good	119.5107
14	high	108.7592
15	hard	85.2380
16	kind	78.6768
17	severe	64.8988
18	far	62.9965
19	confident	62.3807
20	bright	60.8669

With all items in this list having scalar semantics (and the majority of items overall also havin scalar semantics), the X-position does indeed, and not surprisingly, seem to link up with a scalar semantic structure.

In order to address the proposed ENABLEMENT relation, a covarying collexeme analysis was applied to the X-position and the VERB in the *to*-infinitive. Below are the ten most strongly cocontracted pairs:

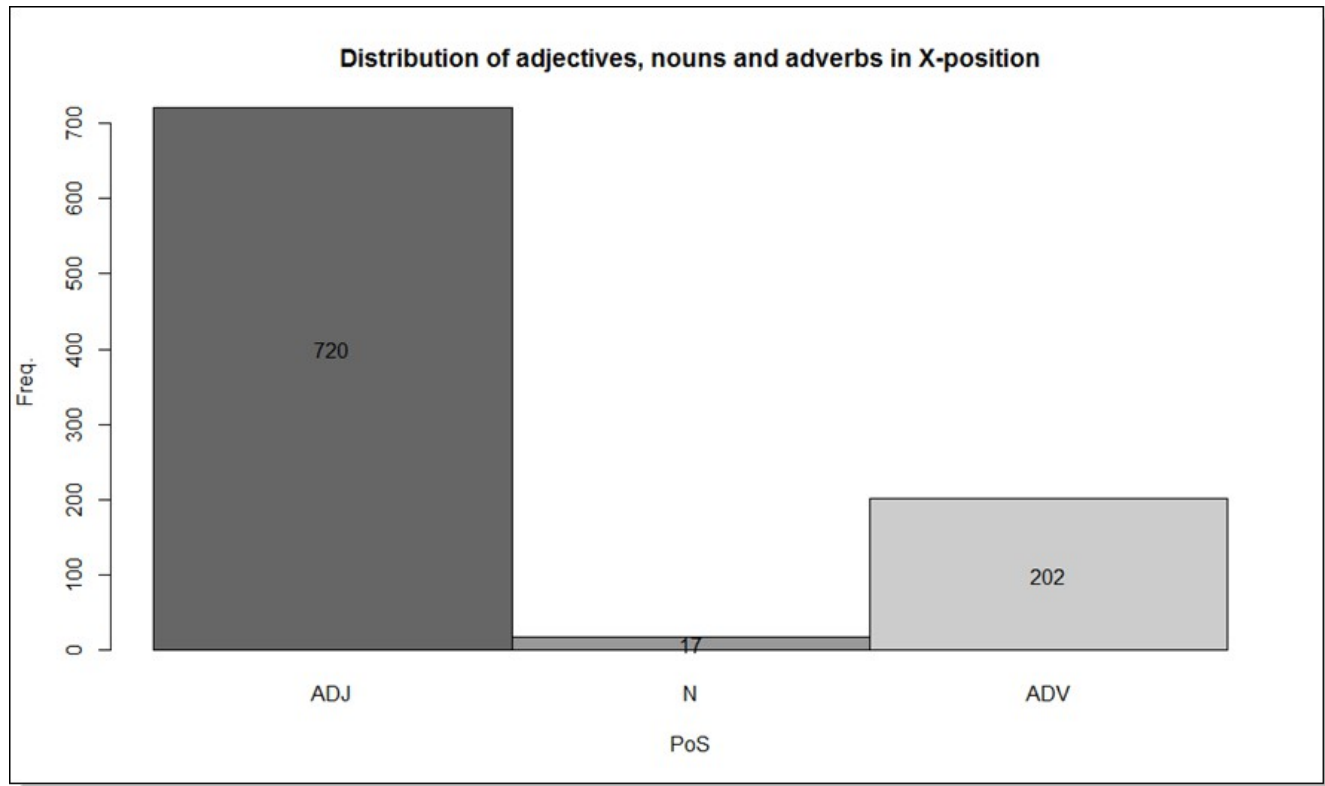
Rank	X-position	Verb	Coll.strength
1	kind	join	65.1861
2	cool	handle	44.5139
3	small	fit	33.3706
4	heavy	sink	31.4724
5	large	hold	29.4161
6	thoughtful	apply	28.6024
7	skilled	teach	24.7833
8	smart	know	18.9656
9	sensitive	detect	17.1537
10	hard	knock	16.8222

Outside this top ten, we find pairs such as *acidic-harm*, *complex-model*, *elasticity-stretch*, *loose-pluck*, *noteworthy-record*, *old-remember*, *old-understand*, *clever-figure out*, *thick-coat*. In all of the pairs listed here – and the vast majority of pairs overall – a logical relation of ENABLEMENT can arguably be set up. For instance we can expect there to be a point on the scale of SMALLNESS where the object in question is so small that it enables the object to fit into a container.

Thus, these two analyses indicate that the proposed proposed symbolic structure does indeed apply to this construction and that SUFFICIENCY is a central function.

4. PoS distribution

The following graph provides an overview of the distribution of word classes in the X-position in the corpus (the distribution is statistically significant - $\chi^2 = 848.5176$, $df = 2$, $p < 0.001$):

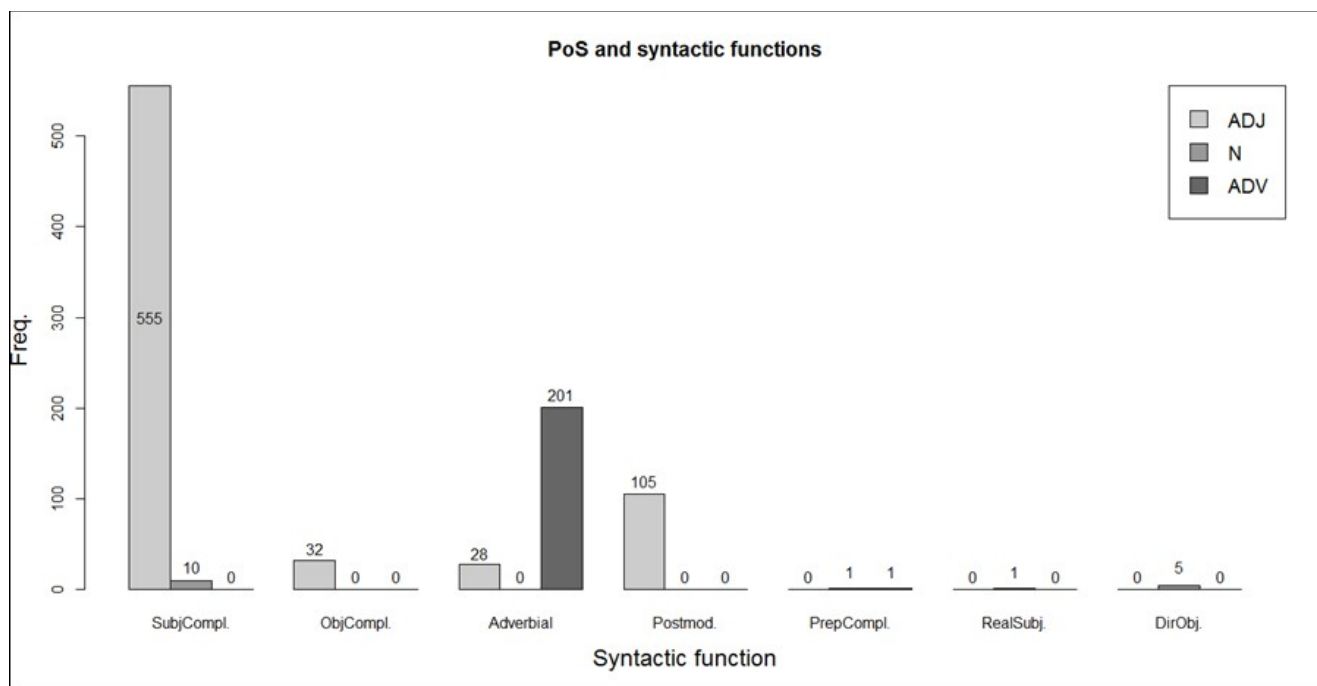


The only three word classes that appear in the X-position are adjectives, nouns, and adverbs. Below is an example of each:

- (5) ADJ: Just zip off the vesti and zip in the waterproof door panel (included) when rain is unlikely or mileage high. Or turn the entrance into a full-blown front porch with the optional Trekking Pole Vestibule (\$130, 1 lb.), which uses a staff to support the ceiling of a 24-square-foot vestibule that's big enough to seat four people or stash a pair of bikes (with front wheels removed). (COCA 2012 MAG Backpacker)
- (6) N: I told those ministry guys, I said, ' When we all die and go to heaven and you guys find out that I had no knowledge of it, I was not there, I had no participation in it, I don't know who did it, I hope you guys will be gentlemen enough to come and find me in heaven and tell me you're sorry.'(COCA 2012 SPOK NBC_Dateline)
- (7) ADV: There are good cameos by other musicians. Aretha Franklin appears long enough to drop a five-gallon jug of pickled pigs feet on a hotel lobby floor while wearing a mink coat. (COCA 2012 NEWS NYTimes)

The fact that the adjectives are by far the most frequent in this position seems to suggest that, we may be dealing with a primarily adjectival construction. However, this approach may be too simplistic, and perhaps we should take into account the syntactic function taken up by instances of the construction.

The following figure accounts for the distribution of word classes in the X-position over syntactic functions taken up by the construction in the corpus:



While adjectives are prominent in complements and postmodifiers, adverbs are more prominent in adverbials (which should perhaps be no surprise), and in direct objects, we find five nouns while the other word classes are absent. This suggests that we are not dealing with adjectival construction, but rather with an adjectival construction and an adverbial construction, seeing that the word classes seem to be associated with different syntactic function.

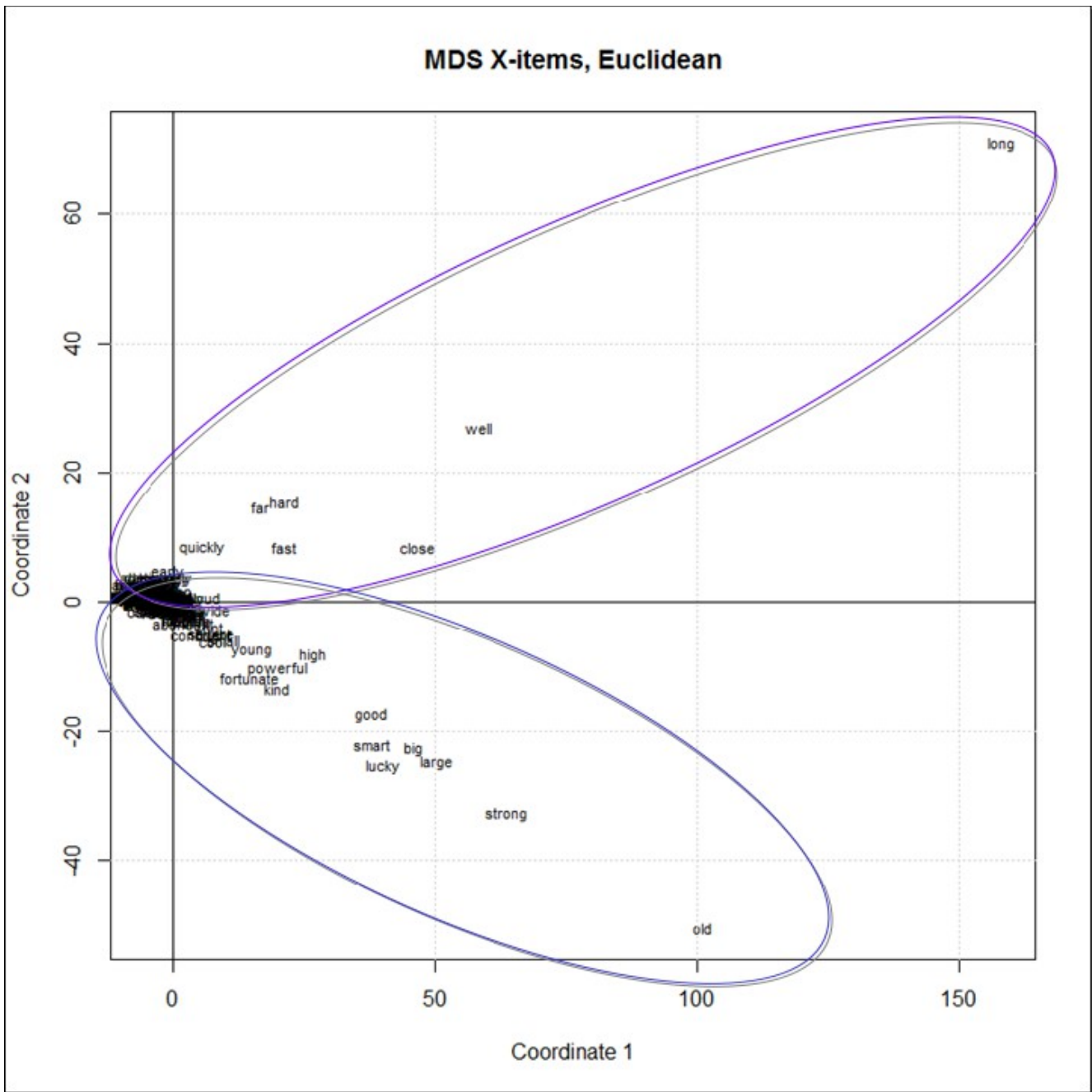
Addressing this issue further the a multidimensional scaling analysis was applied to the data, based on the following factors:

- PoS of X-element as annotated in the corpus (adjective, adverb, noun)¹
- Syntactic function of instance of construction (subject complement, object complement, adverbial, postmodifier in NP, prepositional complement, direct object, real subject)
- Aspect of to-infinitive clause (no aspect, perfective, progressive)
- Diathesis of to-infinitive clause (active, be-passive, get-passive)
- Genre/register in which instance occurs (academic, fiction, magazines, newspapers, spoken)

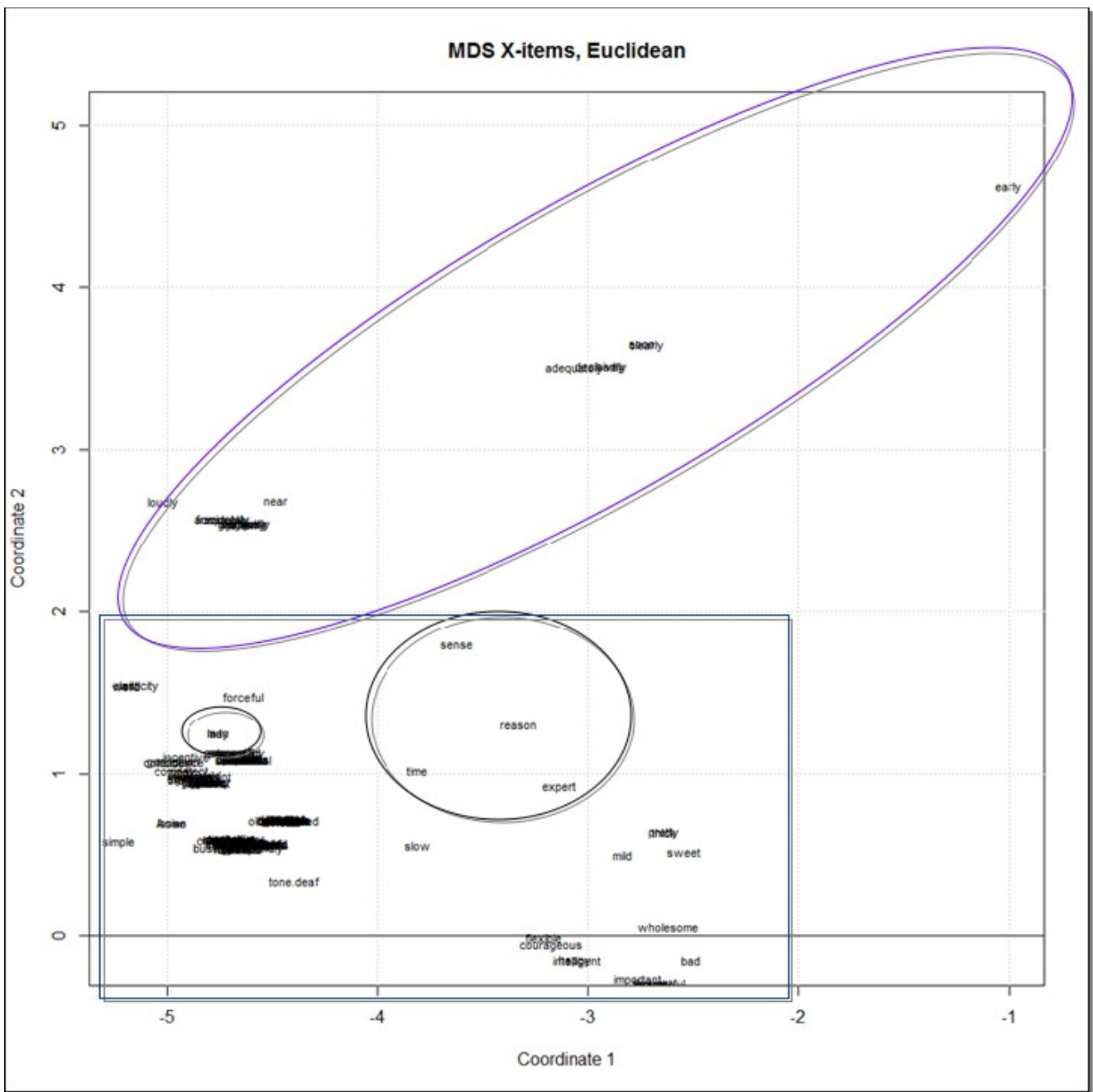
Based on these factors, a distance matrix is calculated for each lexical item in the construction, which is converted into coordinates to be inserted into a coordinate system. Within this system, distance means difference, and proximity means similarity. The main principle here is that similarities of X-position items as calculated in the analysis equal similarities in their discursive behavior in the construction. According to the tenets of usage-based construction grammar, such differences and similarities in discursive behavior may be indicative of constructions.

The multidimensional scaling analysis is seen in the graph on the following page. As you can see, adverbial-adjectival item and adverbial items are located above the zero-point on the vertical axis, while adjectival adjectives appear below this point:

¹ I also did an analysis without this set of factors, and the results were the same. Note that the PoS-tagging in the copurs is based on actual syntactic behavior – that is discursive behavior – of the words in question.



Admittedly there is a region centered around the zero-point where items cluster together to such a degree that it is difficult to distinguish between them. The figure on the next page zooms in on this region.



The first thing we learn is that it is not the zero-point that separates the two categories, but rather the vertical +2-point. This is a minor issue, but it does show us that taking a more fine-grained view often reveals more details in multidimensional scaling. More importantly, we see that the pattern seen in the figure above also applies within this region, with adverbial-adjectival and adjectival items appearing above this point, and adjectival ones appearing below this point. Furthermore, we see that nominal items appear alongside adjectival ones below that point.

5. Propositional act functions

Croft (2001: 88) proposes the model of propositional acts seen in the first figure on the next page. It seems that, in this model, our construction is an adjectival construction that primarily serves the propositional act function of predication. However, this would go against the findings above.

	Reference	Modification	Predication
Objects	UNMARKED NOUNS	genitive, adjectivalizations, PPs on nouns	predicate nominals, copulas
Properties	deadjectival nouns	UNMARKED ADJECTIVES	predicate adjectives, copulas
Actions	action nominals, complements, infinitives, gerunds	participles, relative clauses	UNMARKED VERBS

If we apply Halling's (2015) expanded version of the model, in which modification is split up into two categories – namely, MODIFICATION OF REFERENT and MODIFICATION OF PREDICATE - seen in the figure below, we can start mapping the constructional usage-patterns onto propositional act functions.

	Reference	Modification referent	Modification predicate	Predication
Objects	UNMARKED NOUNS	genitive, adjectivalizations, PPs on nouns	PPs on verbs	predicate nominals, copulas
Properties: DIMENSION AGE COLOR VALUE SPEED	deadjectival nouns	UNMARKED ADJECTIVES	UNMARKED ADVERBS	predicate adjectives, copulas
Actions	action nominals, complements, infinitives, gerunds	participles, relative clauses	participles, converbs	UNMARKED VERBS

The mapping is as follows:

- Postmodifying [ADJ *enough to* VERB] → MODIFICATION OF REFERENT (unmarked adjectival construction)
- [ADJ *enough to* VERB] as complement → PREDICATION (predicate adjectivals)
- Adverbial [ADV *enough to* VERB] → MODIFICATION OF PREDICATE (unmarked use of adverbials)
- [N *enough to* VERB] as direct object → REFERENCE (unmarked use of nominals)
- [N *enough to* VERB] as complement → PREDICATION (predicate nominals)

It should be pointed out that the [N *enough to* VERB] mappings should be taken with a grain of salt, as

there are not enough instances of this pattern in the corpus.

6. Concluding remarks

Based on the findings presented above, there seem to be two constructions: 1) [ADV *enough to* VERB] which has an adverbial function and serves the propositional act function of MODIFICATION OF PREDICATE, attracting primarily items marked as adverbs in the corpus, and 2) [ADJ *enough to* VERB], serving either as a postmodifier in a noun phrase or as a complement, thus serving the propositional act functions of MODIFICATION OF REFERENT and PREDICATION respectively (suggesting that perhaps we are dealing with two subconstructions here); [ADJ *enough to* VERB] attracts primarily scalar adjectives, and nouns in the construction are sometimes coerced into having scalar-like, adjective-like functions. Thus, [X *enough to* VERB] is perhaps best describe, not as a construction, but as a constructional network tied together by the SUFFICIENCY function.

Naturally, further features need to be investigated before any definitive statements can be made, such as participant roles in *to*-infinitive clause and intrasentential reference, aspect and voice realizations of *to*-infinitive clause, interaction between the construction(s) and register, and polarity of clause in which the construction appears. Furthermore, the following analytical steps are required in future research: comparison with other constructions (e.g. EXCESS constructions) and more/better similarity measures (e.g. MDS or hierarchical cluster analysis) of X-items.

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