FACULTY OF ARTS AND PHILOSOPHY

DEPARTMENT OF LINGUISTICS
RESEARCH GROUP: GLIMS

LANGUAGE PRODUCTIVITY @ WORK

THE PRODUCTIVITY OF MINIMIZING CONSTRUCTIONS IN PRESENT-DAY NETHERLANDIC DUTCH

*DAT BOEIT ME GEEN ****

Margot Van den Heede & Peter Lauwers

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BELGISCHE KRING VOOR LINGUÏSTIEK

THE MINIMIZING CONSTRUCTION

Het interesseert me geen zier.

‘It doesn’t interest me a ZIER’

Ik begrijp er geen hol van.

‘I don’t understand an arse of it’

Hij hoefde er geen seconde over na te denken.

‘He didn’t have to think a second about it’

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THE GOAL OF THIS TALK

On the basis of my dataset of minimizing nouns, we want to learn more about…

- the productivity of the different minimizing constructions in present-day Dutch
- productivity in general, namely the correlations between the different productivity measures

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OVERVIEW

1. The minimizing construction
2. General overview of the dataset
3. Productivity measures
4. Principal Components Analysis (PCA)
    - 4.1 Two macro-dimensions of productivity
    - 4.2 Productivity and semantics
5. Conclusion

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1. THE MINIMIZING CONSTRUCTION

A construction with different slots:

[geen] [MINIMIZING NOUN] [PREDICATE]

↓

the element of negation (quantifier)

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1. THE MINIMIZING CONSTRUCTION

A construction with different slots:

[geen] **[MINIMIZING NOUN]** [PREDICATE]

↓

a noun that denotes a small quantity

and that is used to reinforce sentential negation

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1. THE MINIMIZING CONSTRUCTION

A construction with different slots:

[geen] [MINIMIZING NOUN] **[PREDICATE]**

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1. THE MINIMIZING CONSTRUCTION

A construction with different slots:

[geen] [MINIMIZING NOUN] [PREDICATE]

NOT included (if the minimizer has a lower-level scope)

*U betaalt geen cent **extra*** ‘You don’t pay a penny extra’

*Hij heeft geen greintje **geduld*** ‘He doesn’t have a grain (of) patience’

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2. General overview of the dataset

Synchronic corpus research: Dutch Web 2014 (nlTenTen14), available on Sketch Engine

↓

Netherlandic Dutch subcorpus: 1.9 billion tokens

[lemma="geen|gene|genen|geene|geenen"] [] {0,2}

[word="bal"] within <s/>

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2. General overview of the dataset

Synchronic corpus research: Dutch Web 2014 (nlTenTen14), available on Sketch Engine

Selection based on literature (e.g. Hoeksema 2002), exploratory searches in the corpus (“*geen* N”) and searches based on frequent predicates

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2. General overview of the dataset

MINIMIZER

Type frequency	244
Hapax frequency	83

Combined with 641 different predicates

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2. General overview of the dataset

MINIMIZER

Type frequency	244
Hapax frequency	83

Combined with 641 different predicates

Entire dataset:

- 6224 tokens
- annotated a maximum of 100 tokens per minimizer, but a lot of them are less frequent

Focus of this talk:

- 4600 tokens
- the 46 minimizers with 100 tokens

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3. PRODUCTIVITY MEASURES

Productivity: a multi-faceted concept

- **Lexical scope**: “Productivity refers to the range of lexical items that may fill the slots of constructions” (Perek 2016: 66) TYPE FREQUENCY
- **Extensibility**: “the extensibility of a pattern to new types” (Barðdal 2008: 29) HAPAX FREQUENCY

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3. PRODUCTIVITY MEASURES

Productivity: a multi-faceted concept

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- **Extensibility**: “the extensibility of a pattern to new types” (Barðdal 2008: 29) HAPAX FREQUENCY
- “Syntactic productivity is multidimensional – different aspects of productivity are not necessarily correlated (though they often are)” (Zeldes 2012: 135)

3. PRODUCTIVITY MEASURES

PRODUCTIVITY MEASURES

1. Type token ratio

2. Hapax token ratio

3. Hapax type ratio

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3. PRODUCTIVITY MEASURES

PRODUCTIVITY MEASURES

1. Type token ratio
21/100 = 0,21

2. Hapax token ratio
10/100 = 0,10

3. Hapax type ratio
10/21 = 0,48

SNARS	
begrijpen	28
snappen	20
geloven	17
interesseren	5
uitmaken	5
weten	5
geven om	2
kloppen	2
te maken hebben	2
terechtkomen	2
veranderen	2
bakken van	1
deugen	1
hebben aan	1
helpen	1
opschieten	1
terugzien	1
uitvoeren	1
vertrouwen	1
vinden aan	1
zien	1
Types	21
Hapaxes	10

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3. PRODUCTIVITY MEASURES

"ANTI-PRODUCTIVITY" MEASURES

4. Frequency of the most frequent predicate

5. Mean frequency of the 3 most frequent predicates

6. Standard deviation of the 3 most frequent predicates

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3. PRODUCTIVITY MEASURES

These are “measures of conventionalization, which aim to capture different facets of the distribution of high token frequency types”.

Van Wettere 2021: 405

(Bybee 2007; Clausner & Croft 1997; Hilpert 2015)

“ANTI-PRODUCTIVITY” MEASURES

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Types	21
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"ANTI-PRODUCTIVITY" MEASURES

4. Frequency of the most frequent predicate
28

5. Mean frequency of the 3 most frequent predicates
(28+20+17)/3 = 21,7

6. Standard deviation of the 3 most frequent predicates
5,7

$$\text{Standard Deviation} = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{n-1}}$$

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3. PRODUCTIVITY MEASURES

7. ALPHA
= the slope of the regression line

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3. PRODUCTIVITY MEASURES

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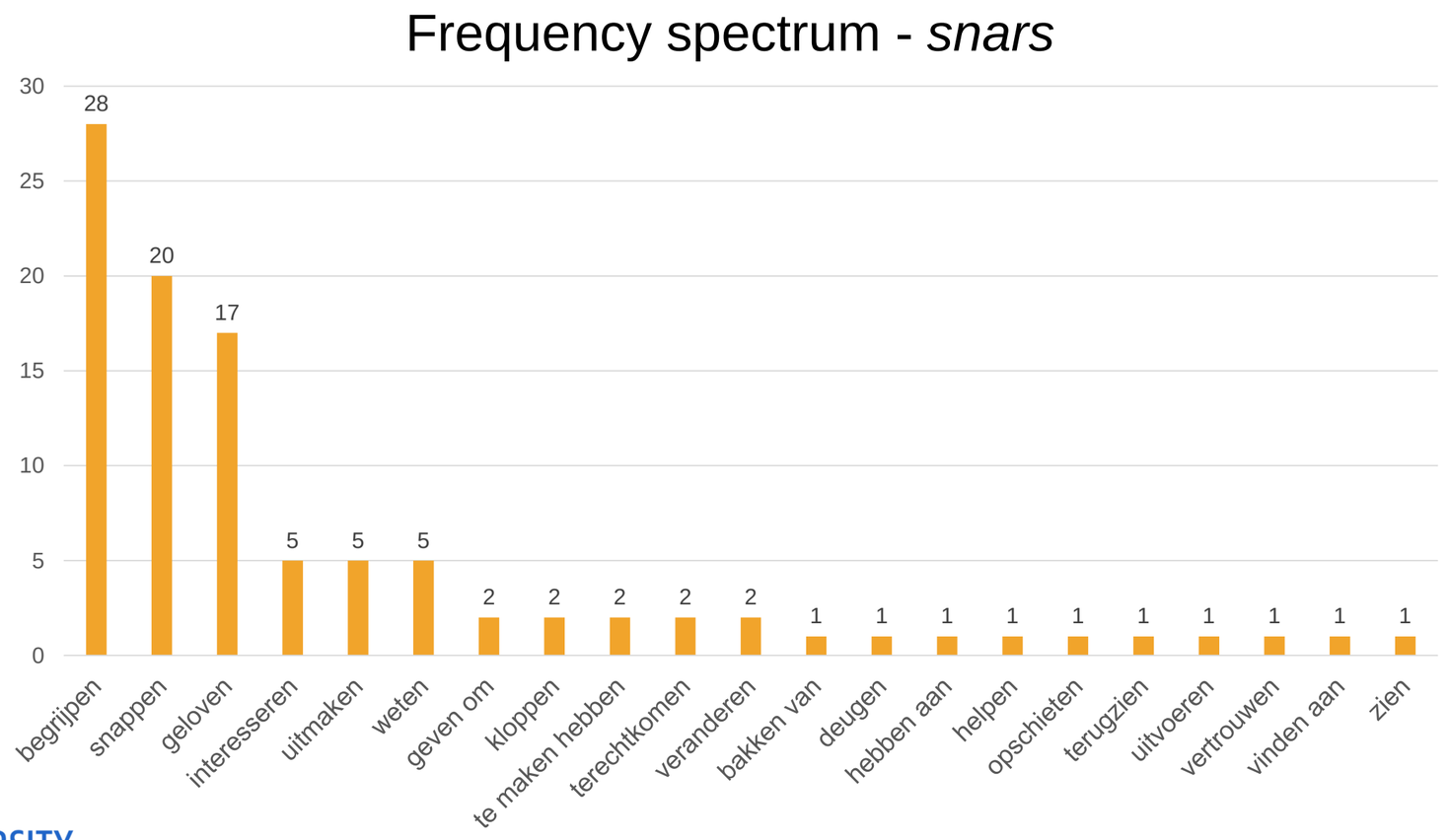
= the slope of the regression line



1) Frequency spectrum

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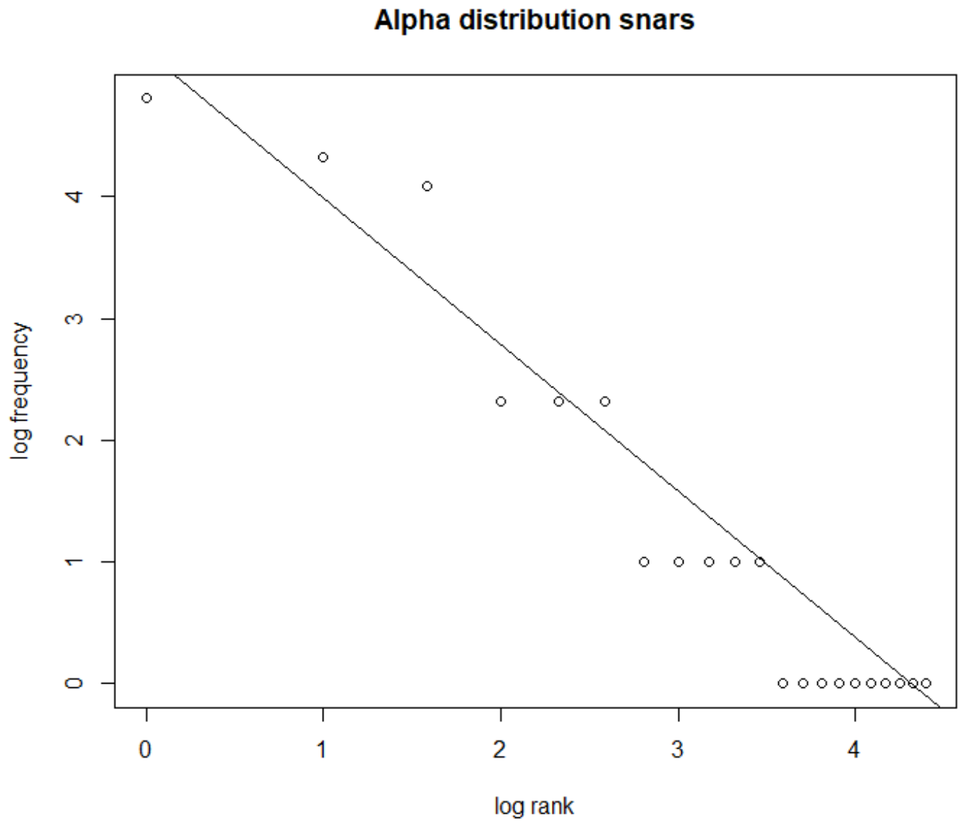
3. PRODUCTIVITY MEASURES

7. ALPHA
= the slope of the regression line



1) Frequency spectrum
2) Alpha distribution

(van Egmond 2013)

→ Alpha captures the relation between the logtransformed frequencies and the ranks of the Zipfian curve

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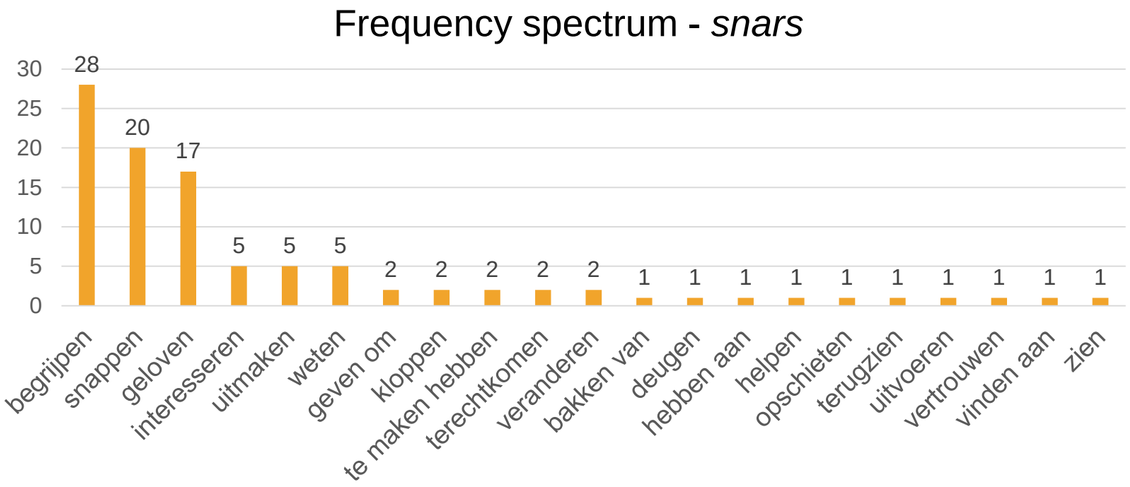
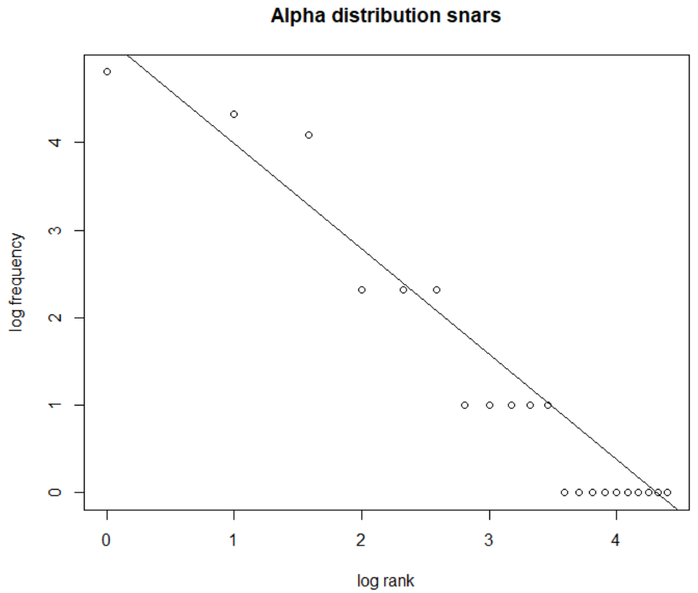
3. PRODUCTIVITY MEASURES





Alpha = 1,2

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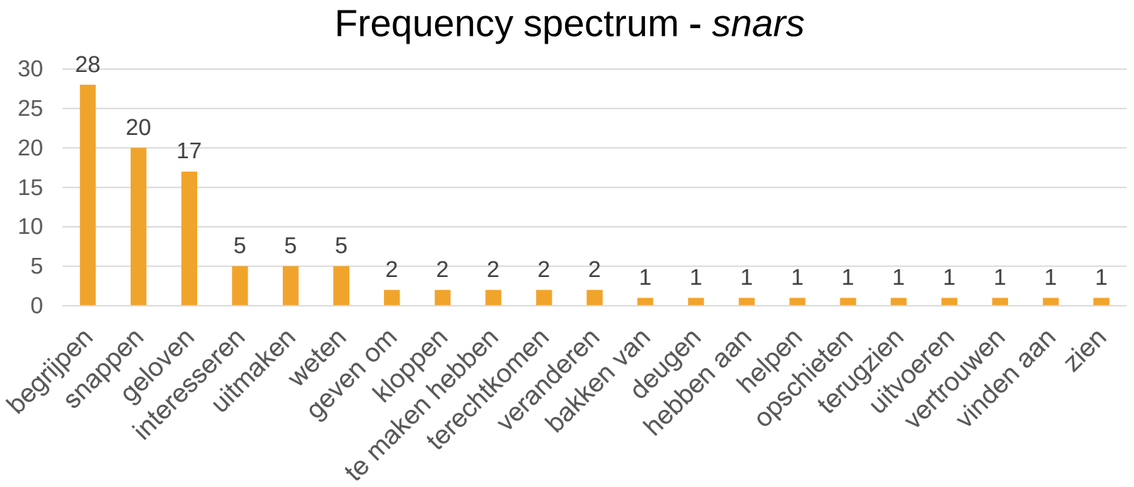
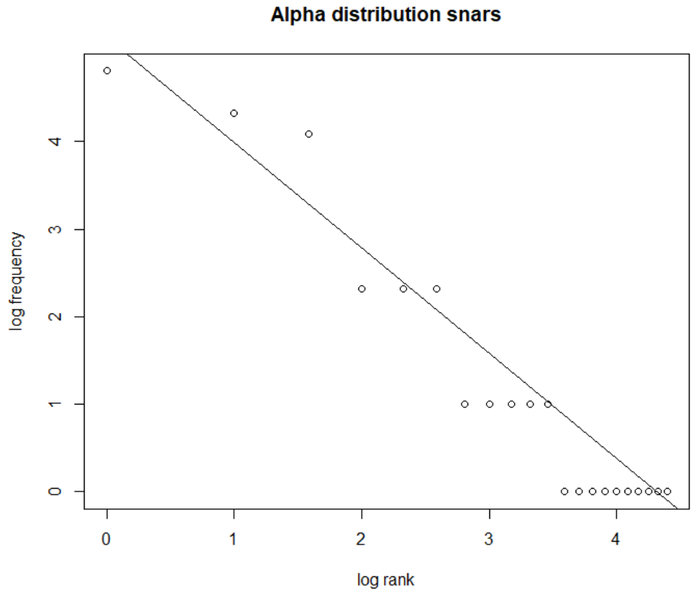
3. PRODUCTIVITY MEASURES





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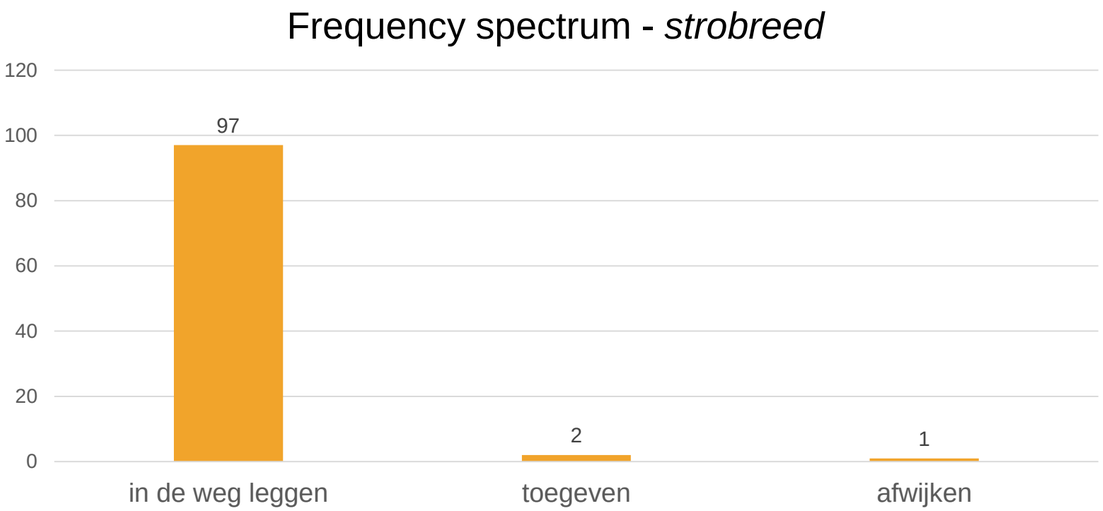

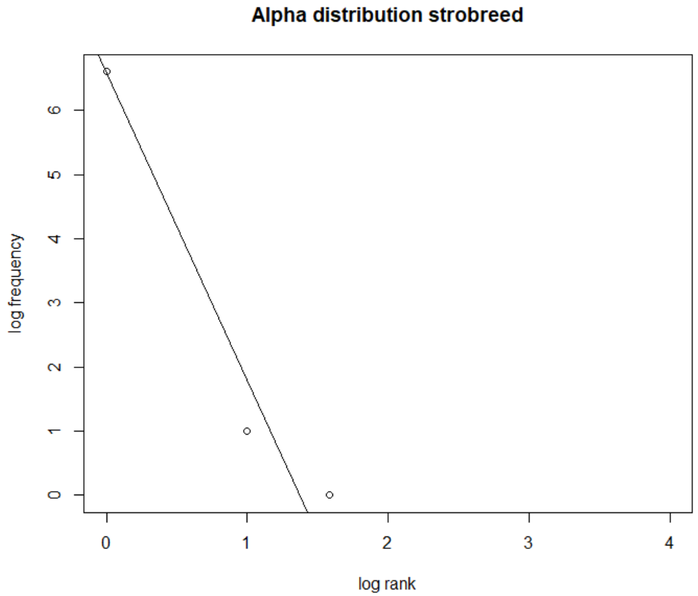

Alpha = 4,8

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3. PRODUCTIVITY MEASURES

Correlations between the productivity measures (Pearson correlation)

Positive correlation
No correlation
Negative correlation

	ZipfAlpha	MeanFrTop3	FrTop1	SDTop3	HapaxTypeRatio	TypeTokenRatio
HapaxTokenRatio	-0,5	-0,6	-0,53	-0,48	0,73	0,93
TypeTokenRatio	-0,69	-0,83	-0,77	-0,71	0,46	1
HapaxTypeRatio	-0,14	-0,06	-0,02	-0,01	1	0,46
SDTop3	0,93	0,93	0,98	1	-0,01	-0,71
FrTop1	0,88	0,94	1	0,98	-0,02	-0,77
MeanFrTop3	0,91	1	0,94	0,93	-0,06	-0,83

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R package: “corrplot”

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Positive correlation
No correlation
Negative correlation

"Anti-productivity" measures

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R package: "corrplot"

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4. Principal Components Analysis (PCA)

- a dimensionality reduction method, which allows to reorient the data so that the first few dimensions or principal components account for as much of the available information as possible

- it allows to detect and to have a more global view on the correlations between the productivity measures

4. Principal Components Analysis (PCA)

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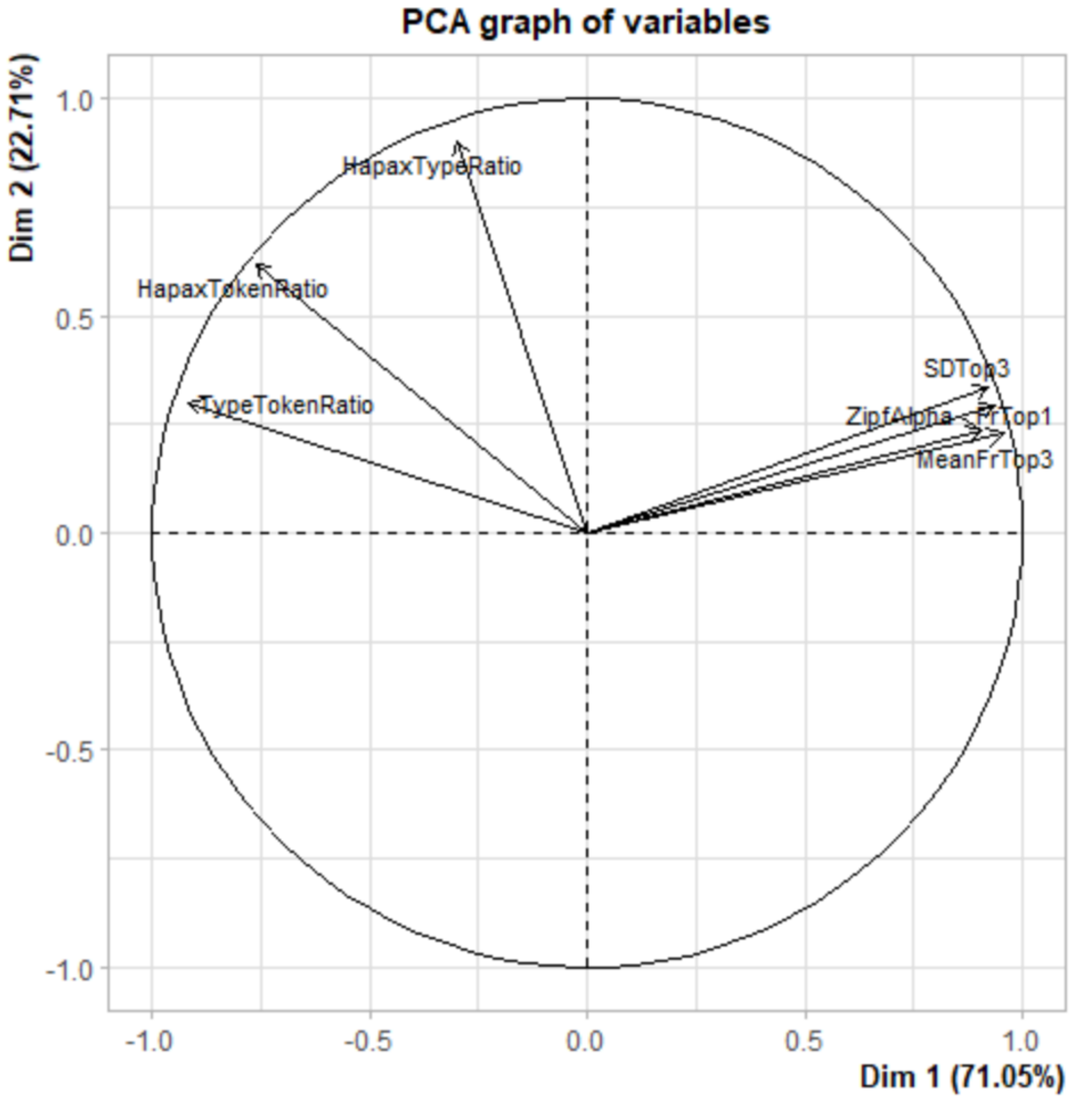
R Package: “FactoMineR”, “factoextra”

4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY



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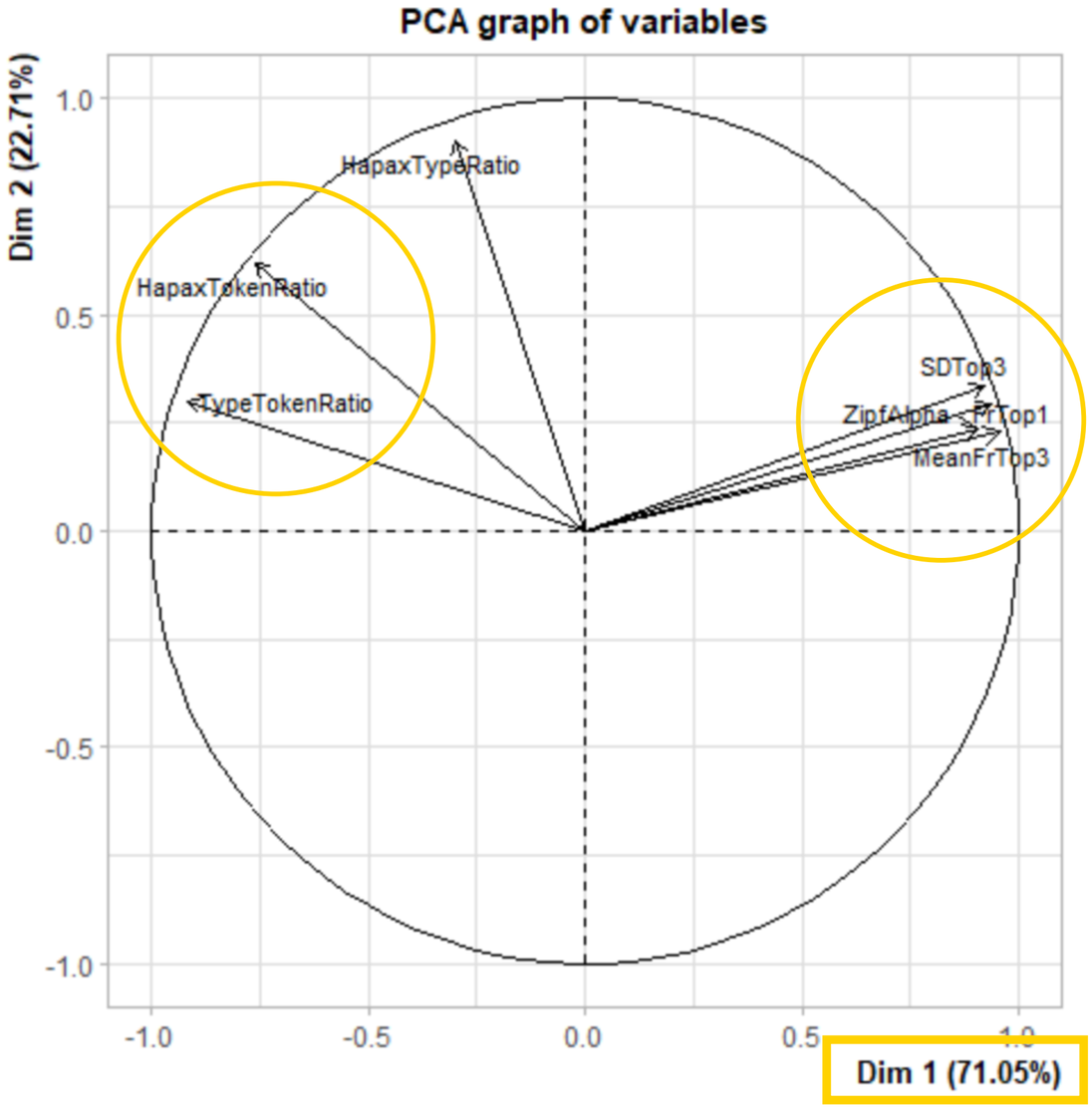

Dimension 1 correlations

MeanFrTop3	0,96
FrTop1	0,94
SDTop3	0,92
ZipfAlpha	0,91
VS.	
HapaxTokenRatio	-0.76
TypeTokenRatio	-0,92

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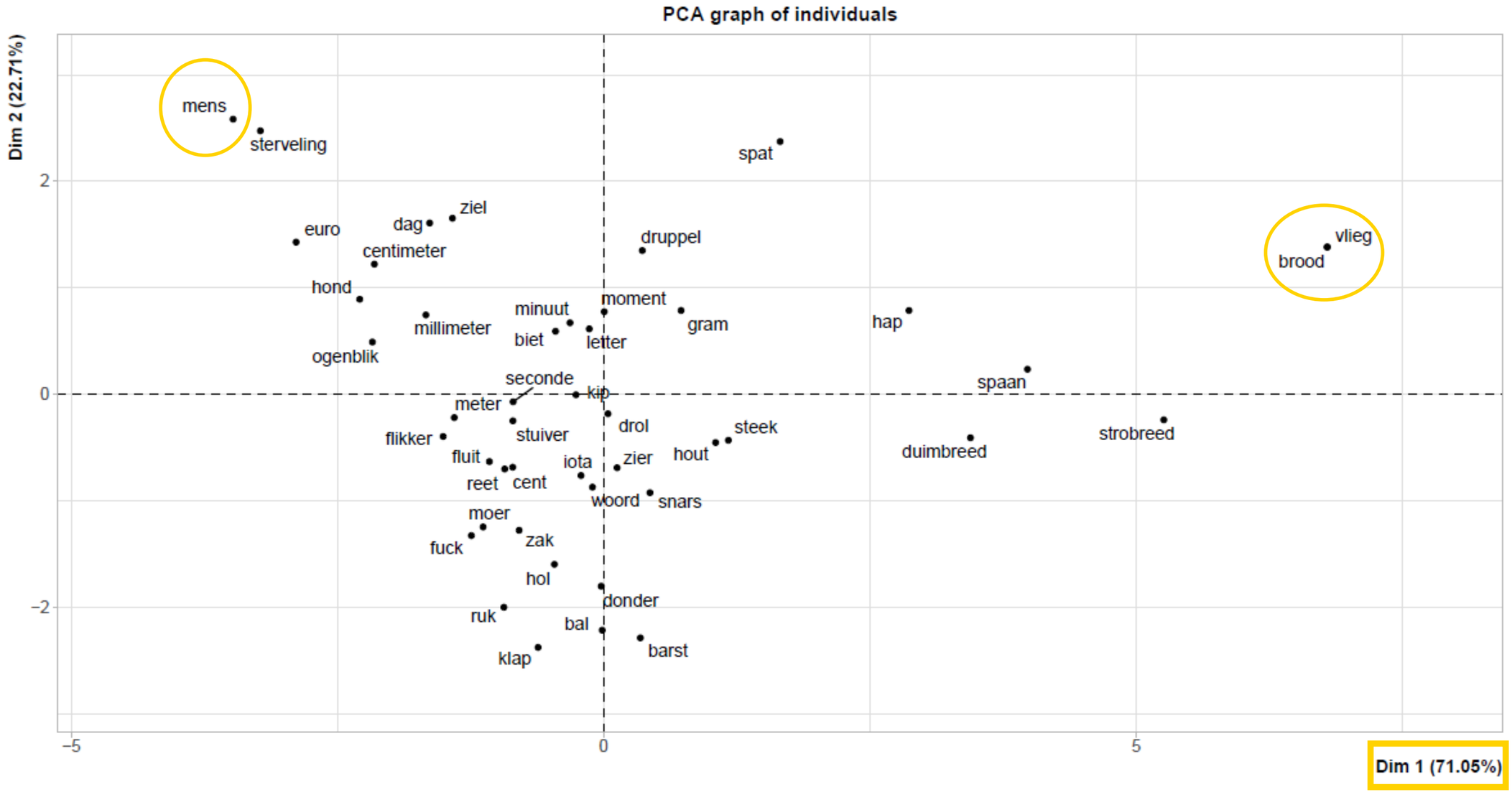
R Package: “FactoMineR”, “factoextra”

4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY



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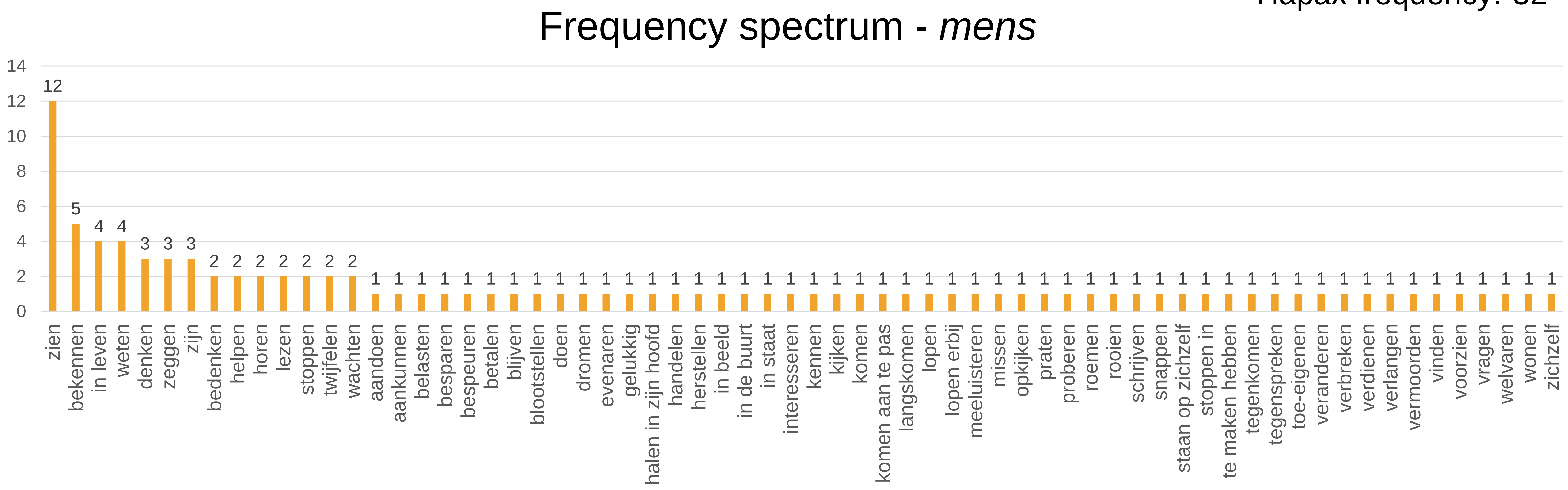
4.1 Two macro-dimensions of productivity

Type frequency: 66
Hapax frequency: 52



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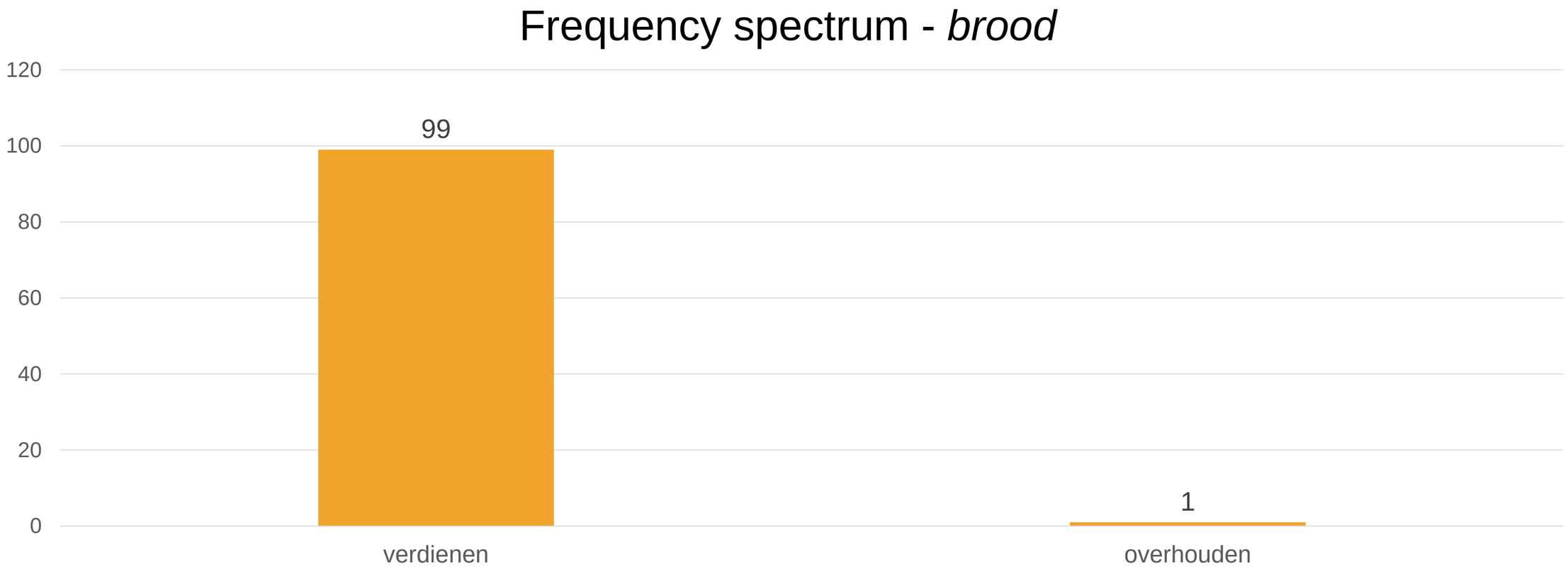
4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY

Type frequency: 2
Hapax frequency: 1



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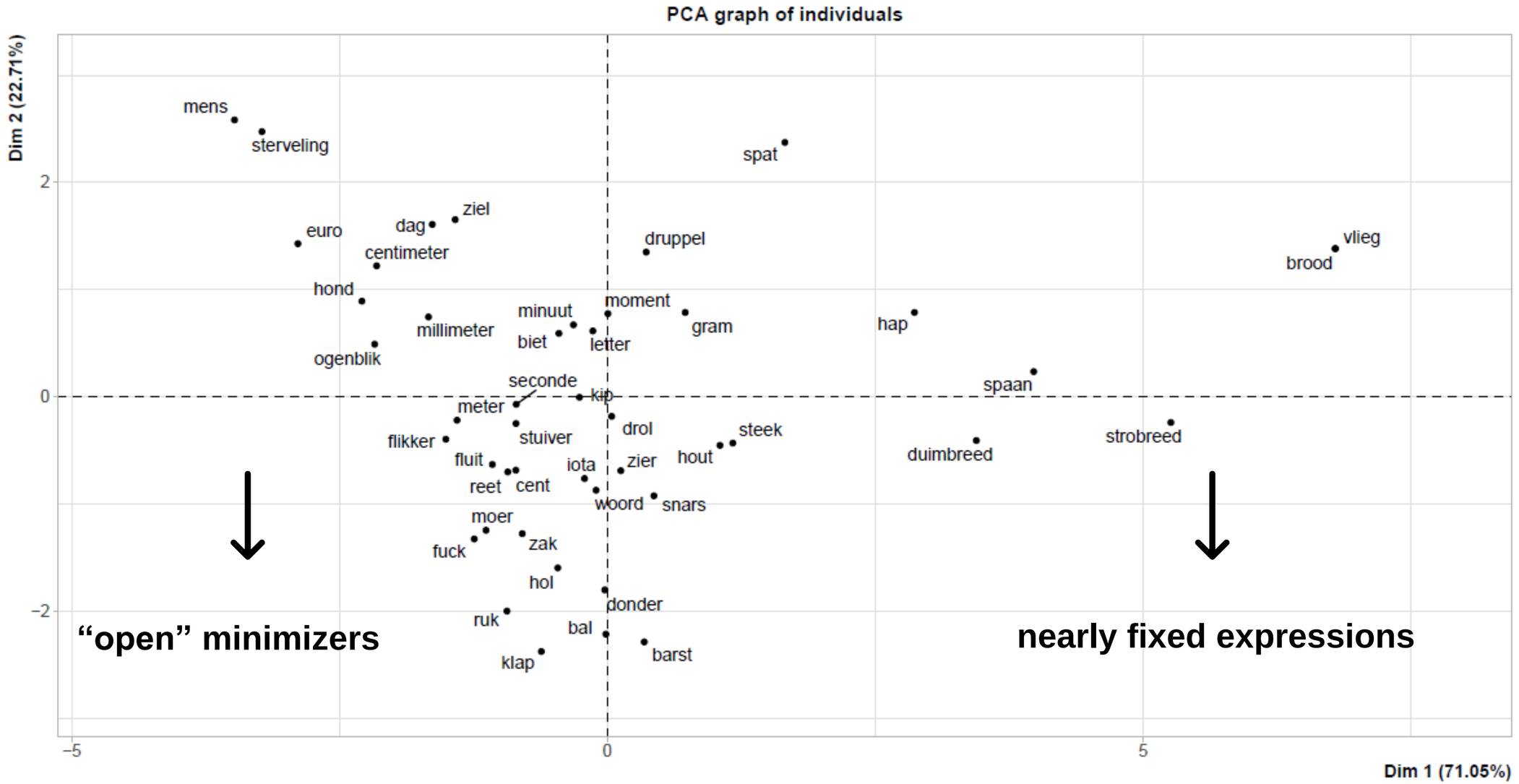
4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY



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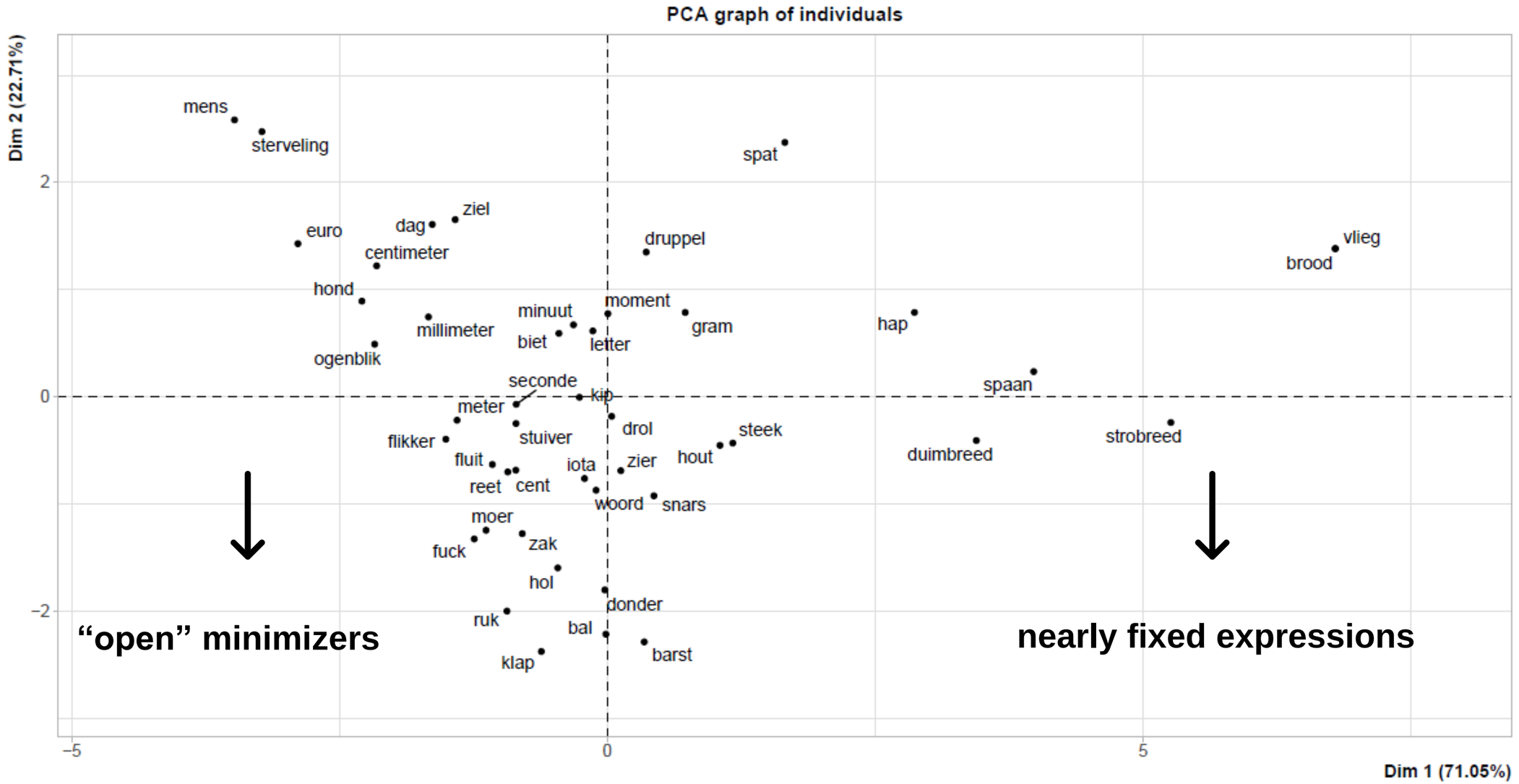
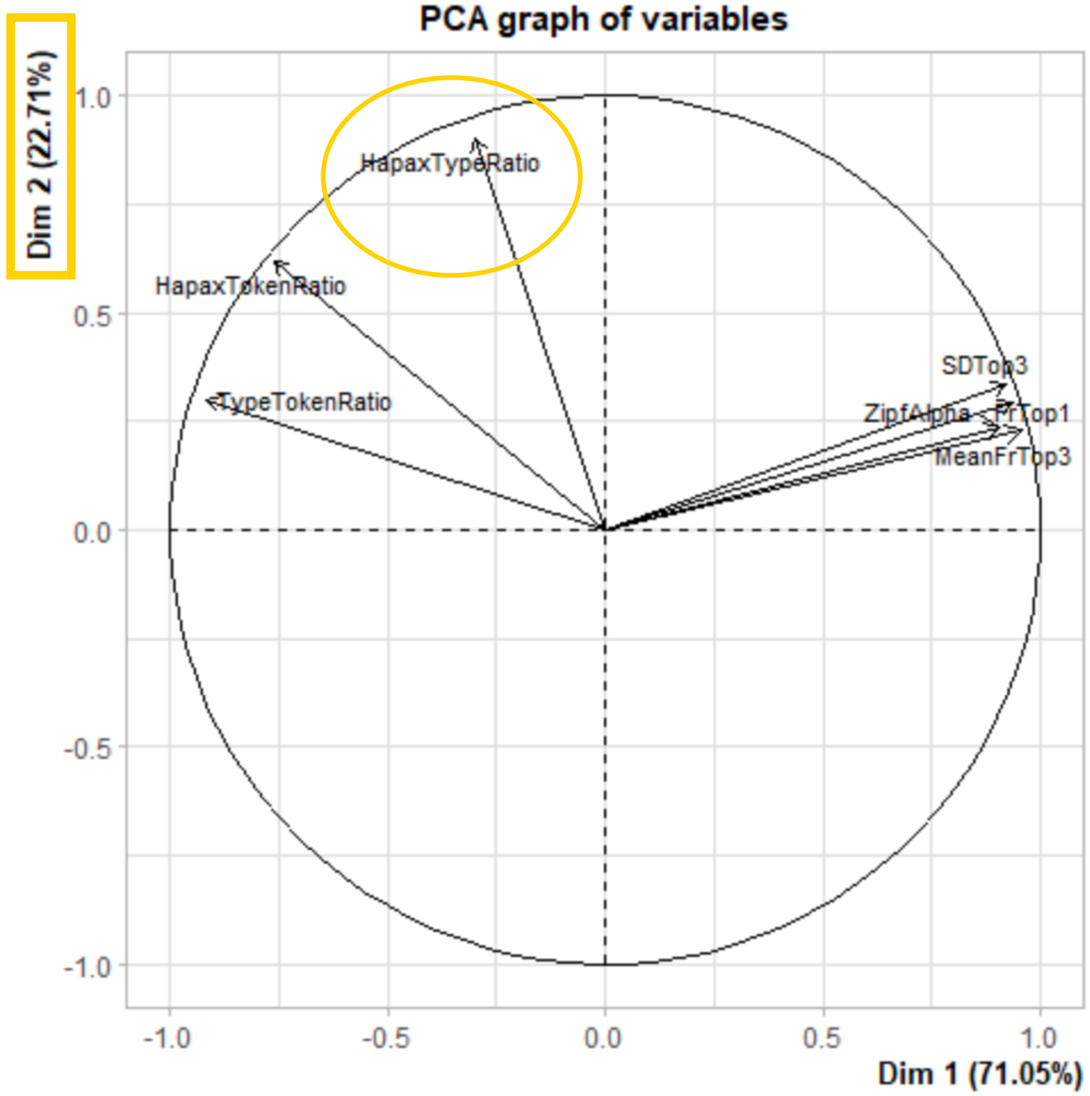
4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY



→ very token frequent predicates can detract from productivity

(Barðdal 2008: 49; Van Wettere 2018: 610; De Smet 2020)

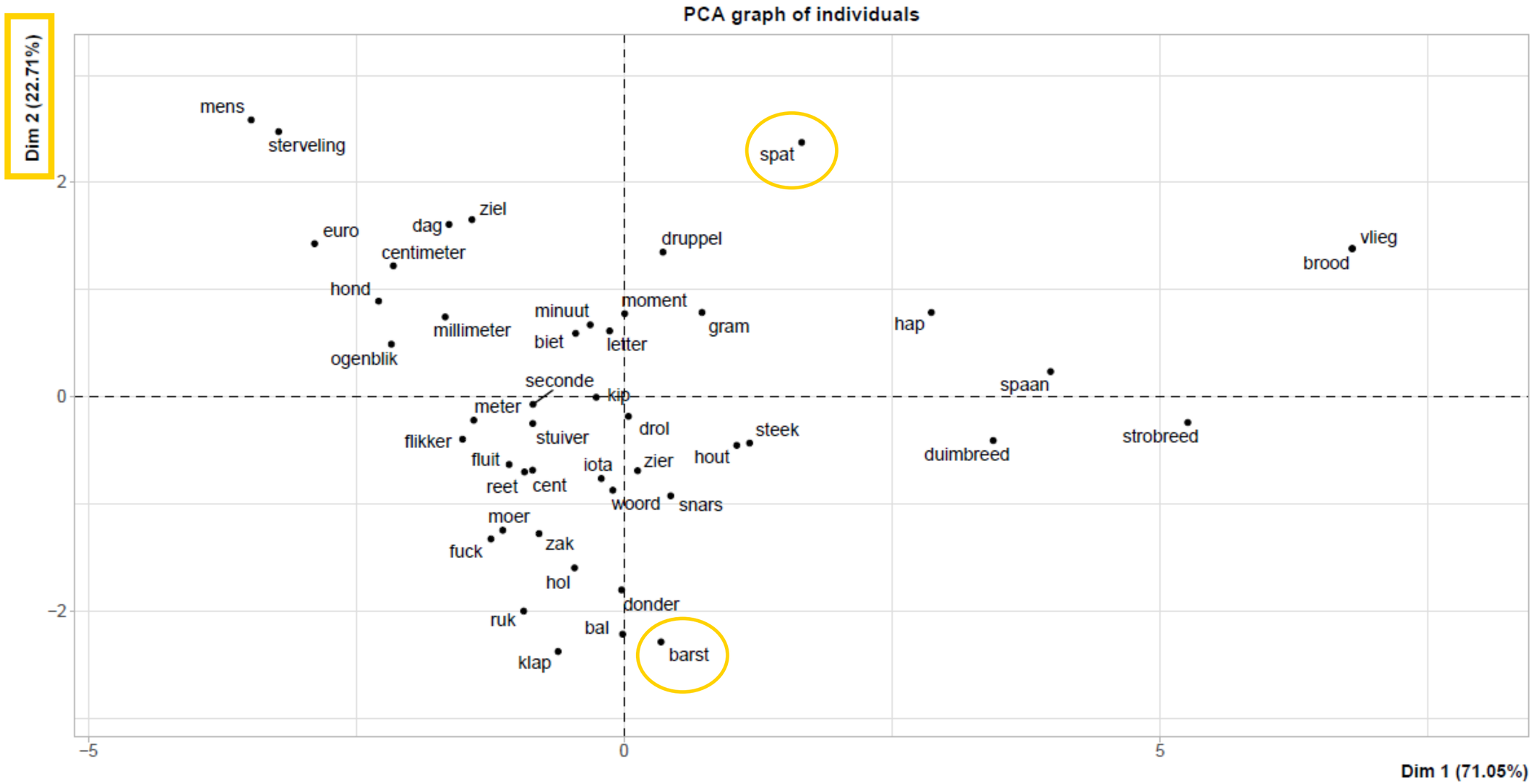
4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY



Dimension 2 correlations

HapaxTypeRatio	0,90

4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY



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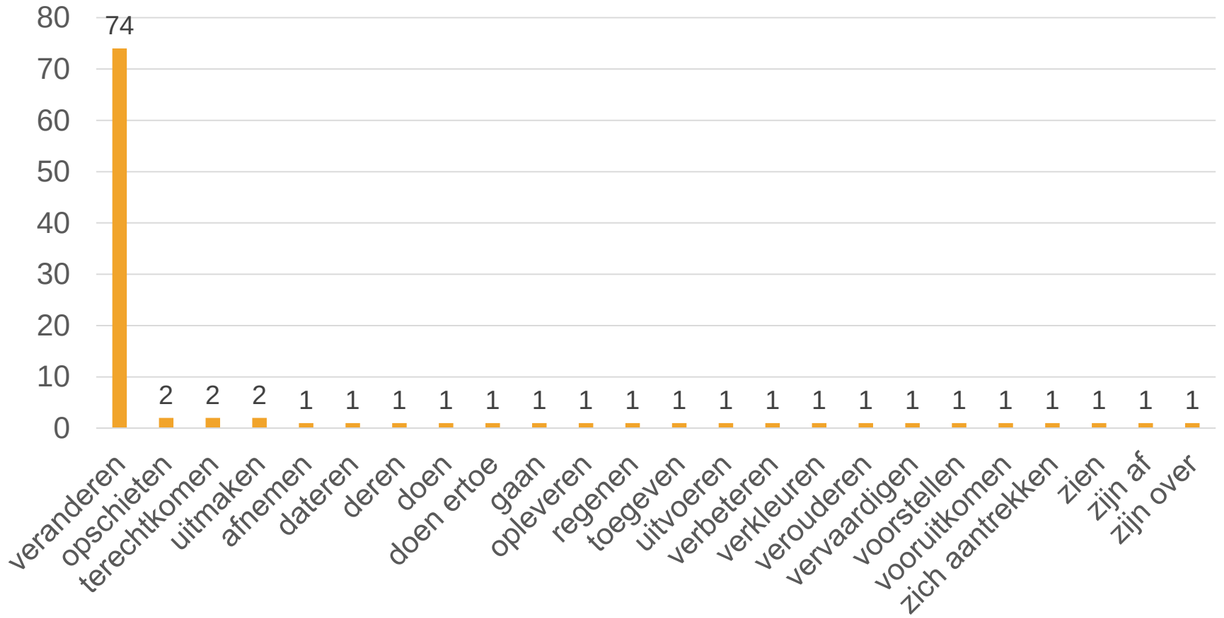
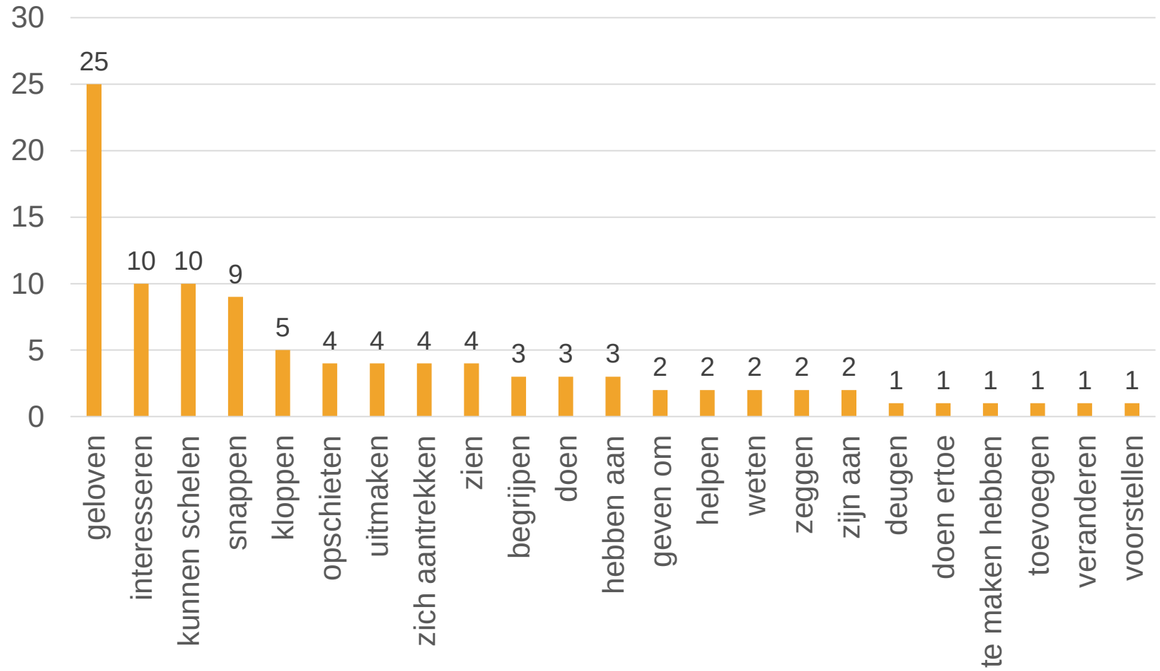
4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY

Frequency spectrum - *spat*



Type frequency:	24
Hapax frequency:	20
Hapax type ratio:	0,83

Frequency spectrum - *barst*



Type frequency:	23
Hapax frequency:	6
Hapax type ratio:	0,26

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4.1 Two macro-dimensions of productivity

"Since the hapax type ratio focalizes the dichotomy between hapax and non-hapax, this measure downplays the impact of high token frequencies among the non-hapax. In other words, whereas type frequency and hapax frequency […] are very negatively impacted by a couple of high token frequency types, the hapax type ratio is more capable of detecting productivity in certain subdomains in spite of a (limited) number of high token frequency types. Therefore it is less in direct opposition with the anti-productivity measures than type and hapax frequency."

(Van Wettere 2021: 410-411)

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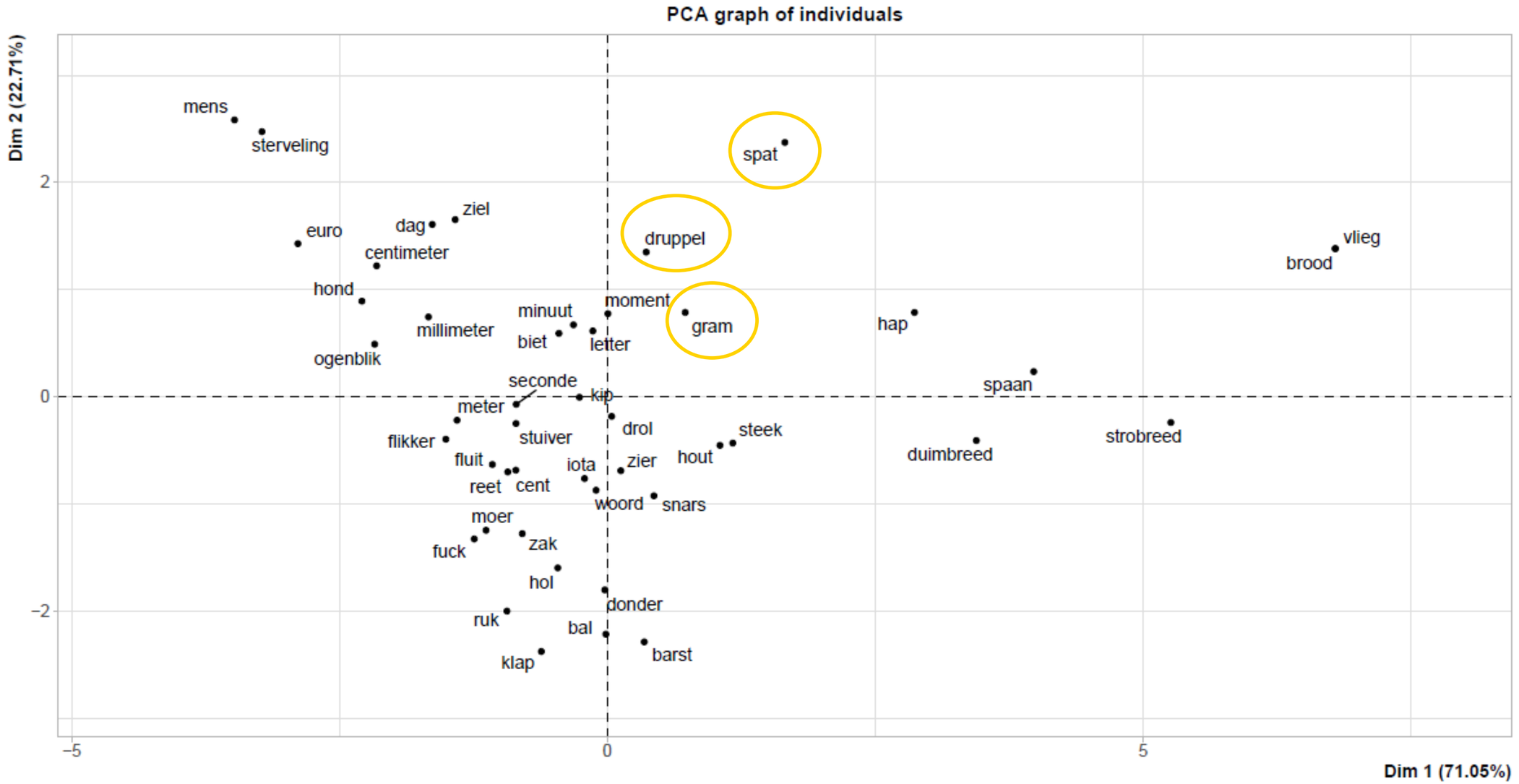
4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY



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4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY

Minimizer	**Hapax type ratio**	**Most frequent predicate(s)**	**Hapaxes belonging to the same semantic field**
geen spat 'not a splash'	0,83	*veranderen* 'to change' (frequency: 74/100)	*verbeteren* 'to improve' *verkleuren* 'to colour' *verouderen* 'to age'
geen druppel 'not a drop'	0,71	*drinken* 'to drink' (frequency: 49/100)	*innemen* 'to take' *inslikken* 'to swallow' *nuttigen* 'to consume' *ophebben* 'to have drunk' *proeven* 'to taste'
geen gram 'not a gram'	0,71	*aankomen* 'to gain weight' (frequency: 42/100) *afvallen* 'to lose weight' (frequency: 21/100)	*aankrijgen* *bijkrijgen* *erbij zijn* *afkrijgen* *kwijt zijn* *kwijtraken*

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4.1 TWO MACRO-DIMENSIONS OF PRODUCTIVITY

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→ It is not always the case that token frequent predicates detract from productivity → They can function as attractors, but more detailed semantic analysis is needed!

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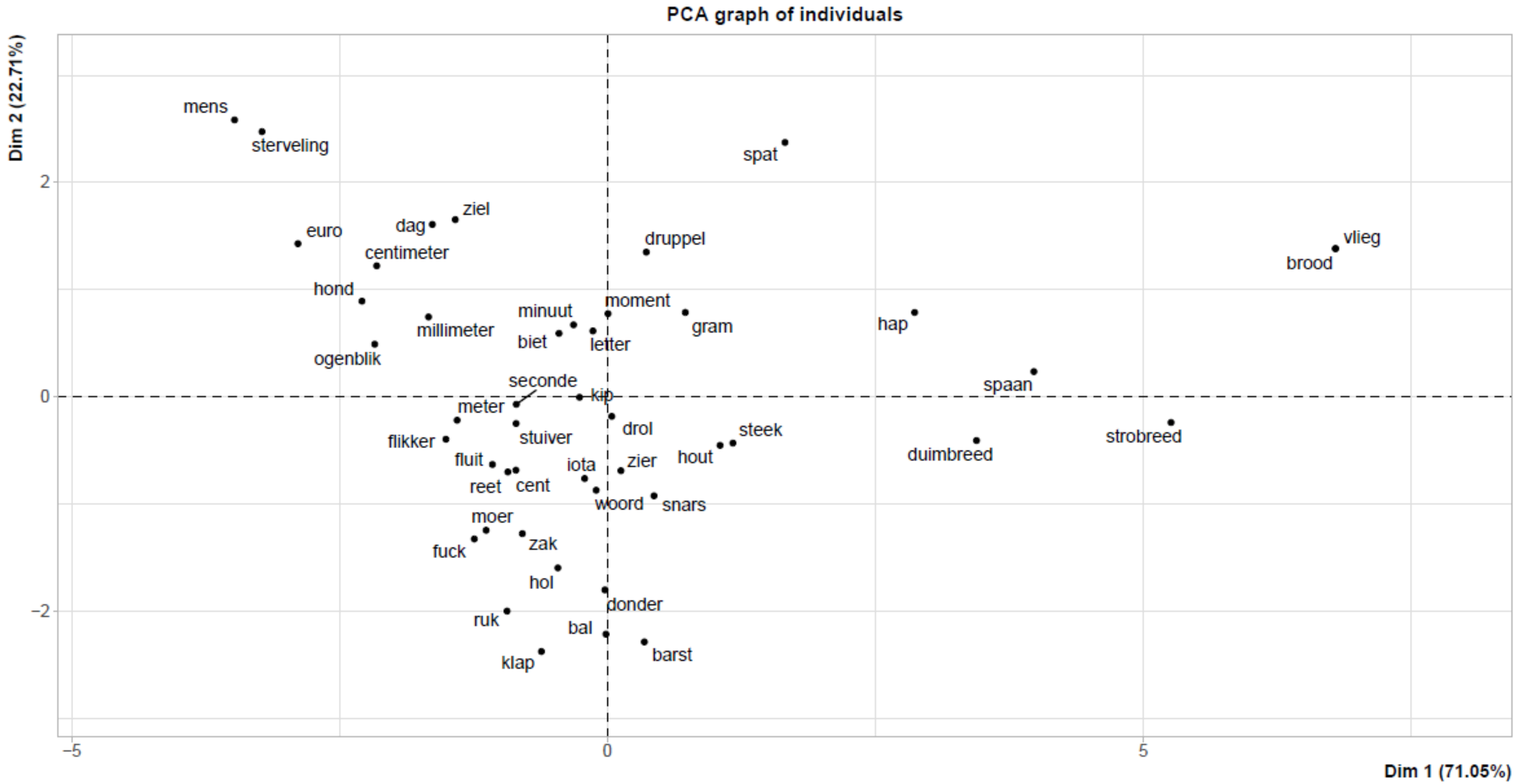
4.2 PRODUCTIVITY AND SEMANTICS



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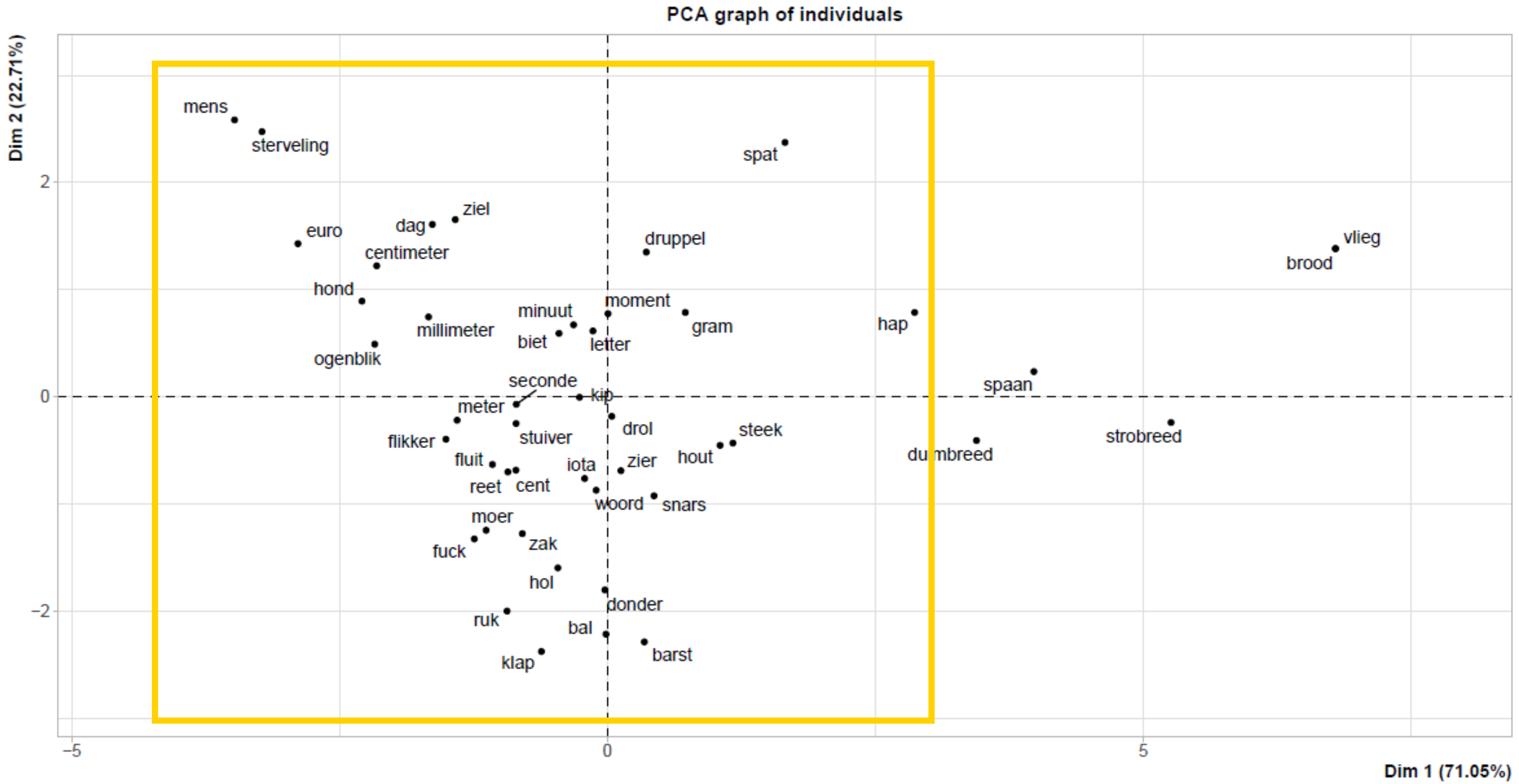
4.2 PRODUCTIVITY AND SEMANTICS



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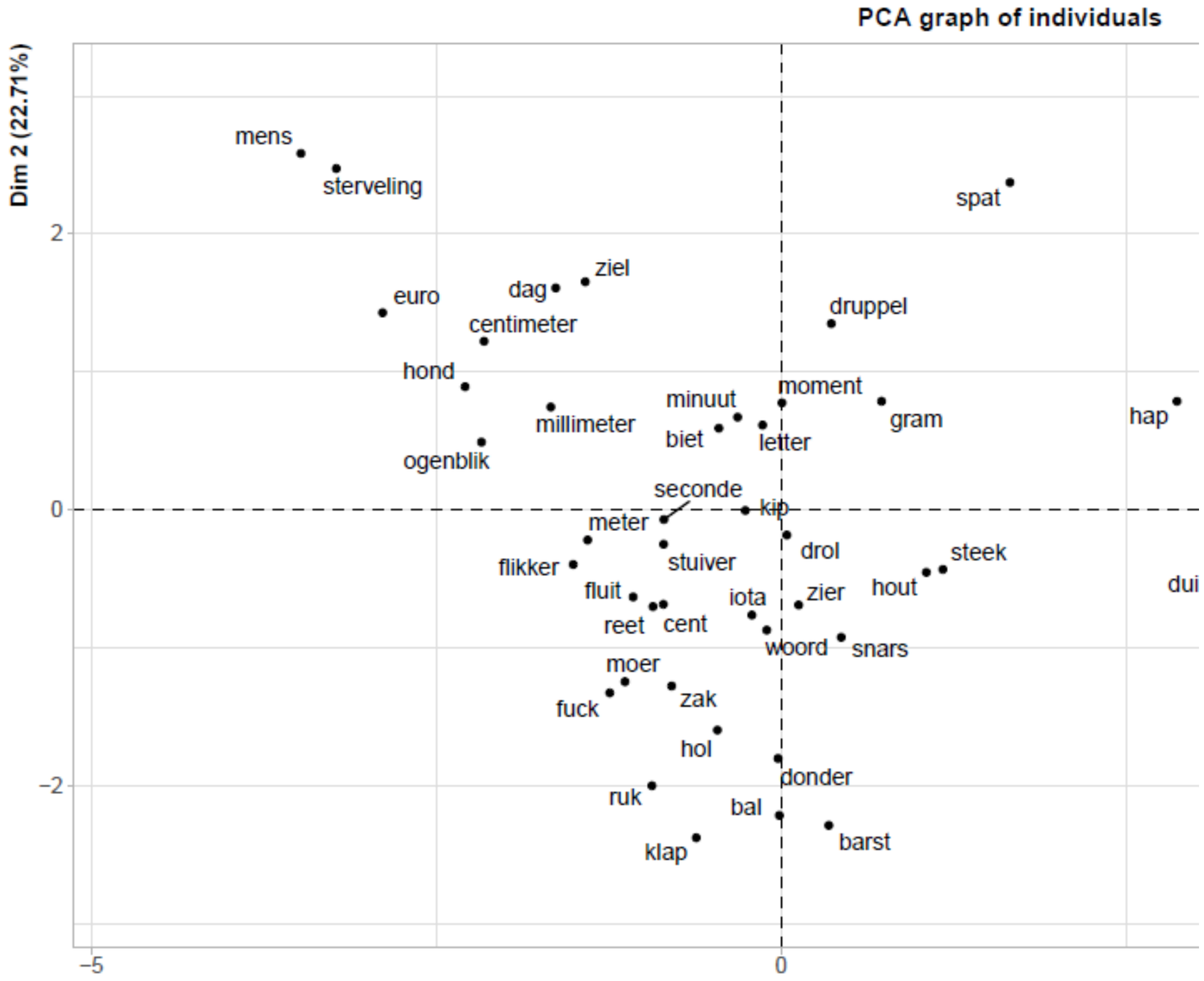
4.2 PRODUCTIVITY AND SEMANTICS



4 semantic clusters

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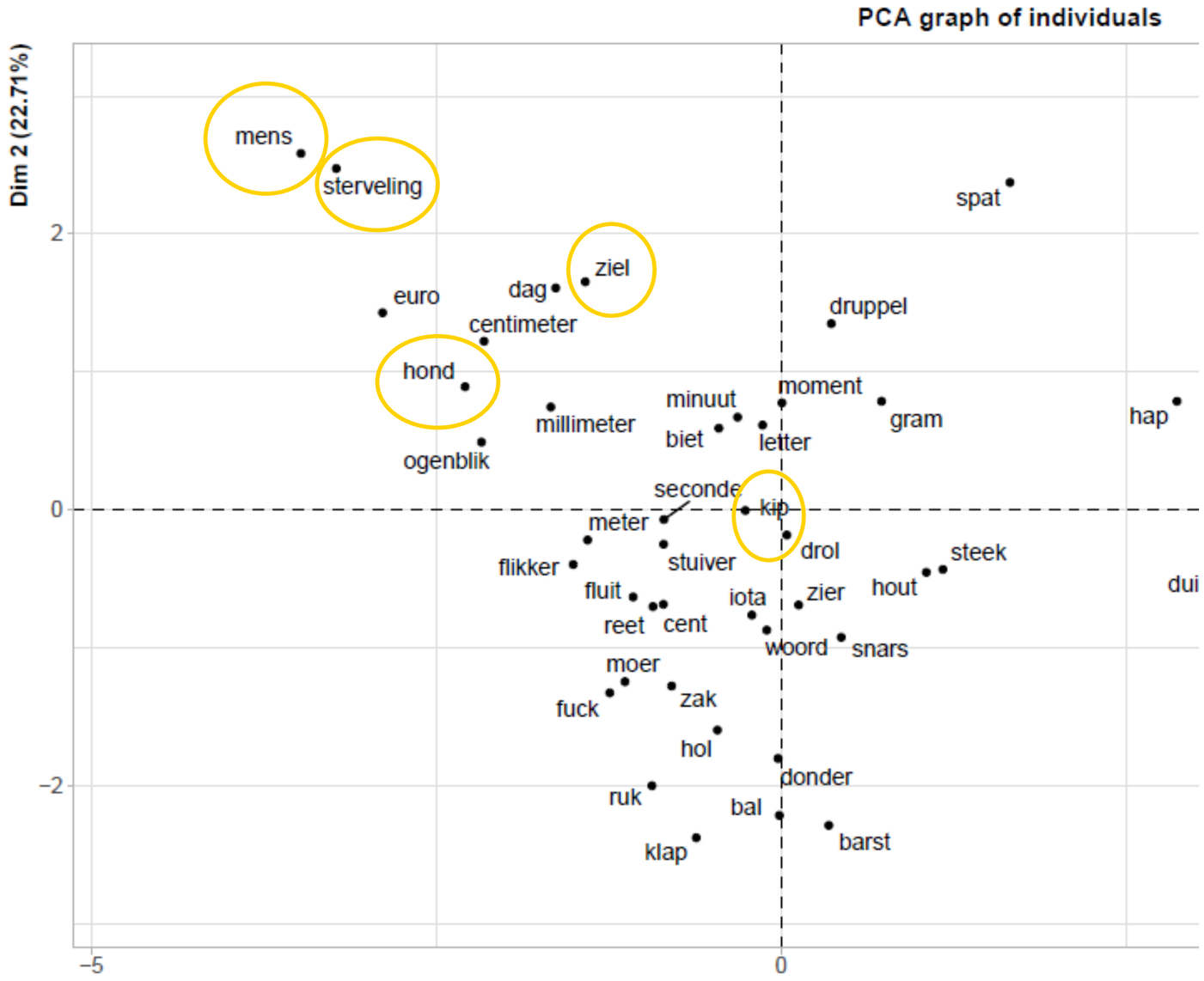
4.2 PRODUCTIVITY AND SEMANTICS



1. Minimizers referring to **people and animals**

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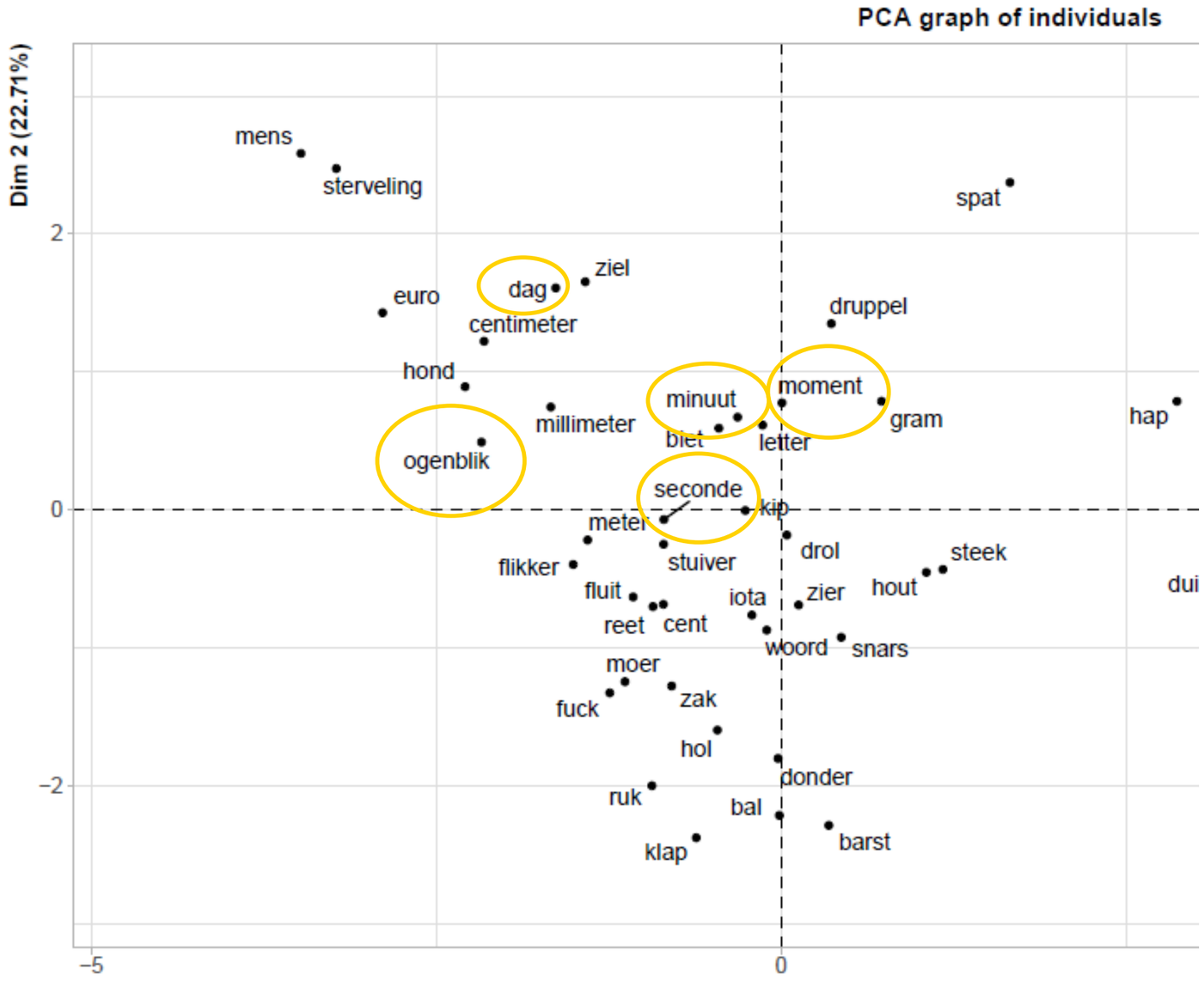
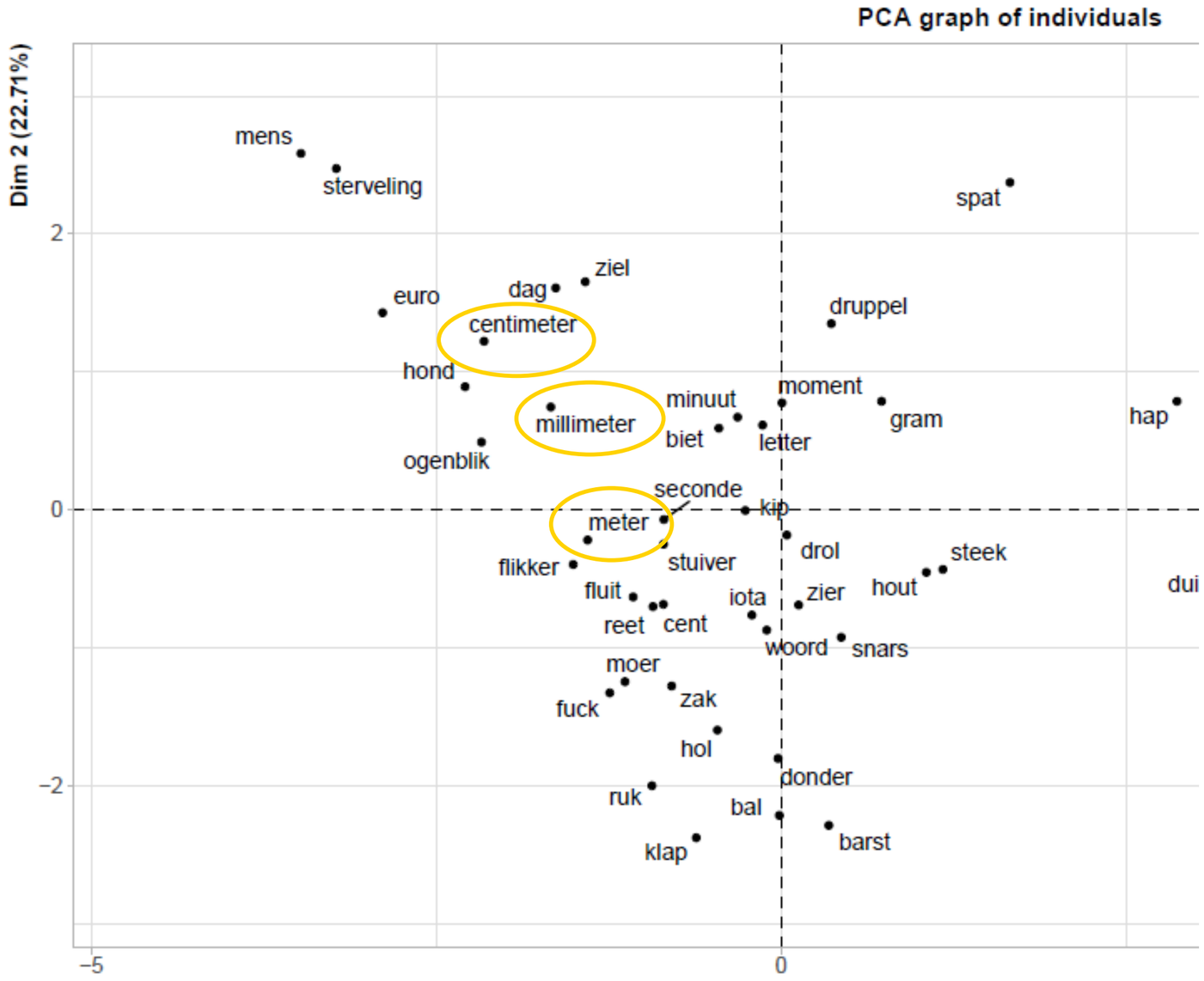
4.2 PRODUCTIVITY AND SEMANTICS



2. Minimizers referring to **time**

4.2 PRODUCTIVITY AND SEMANTICS



3. Minimizers referring to **distance**

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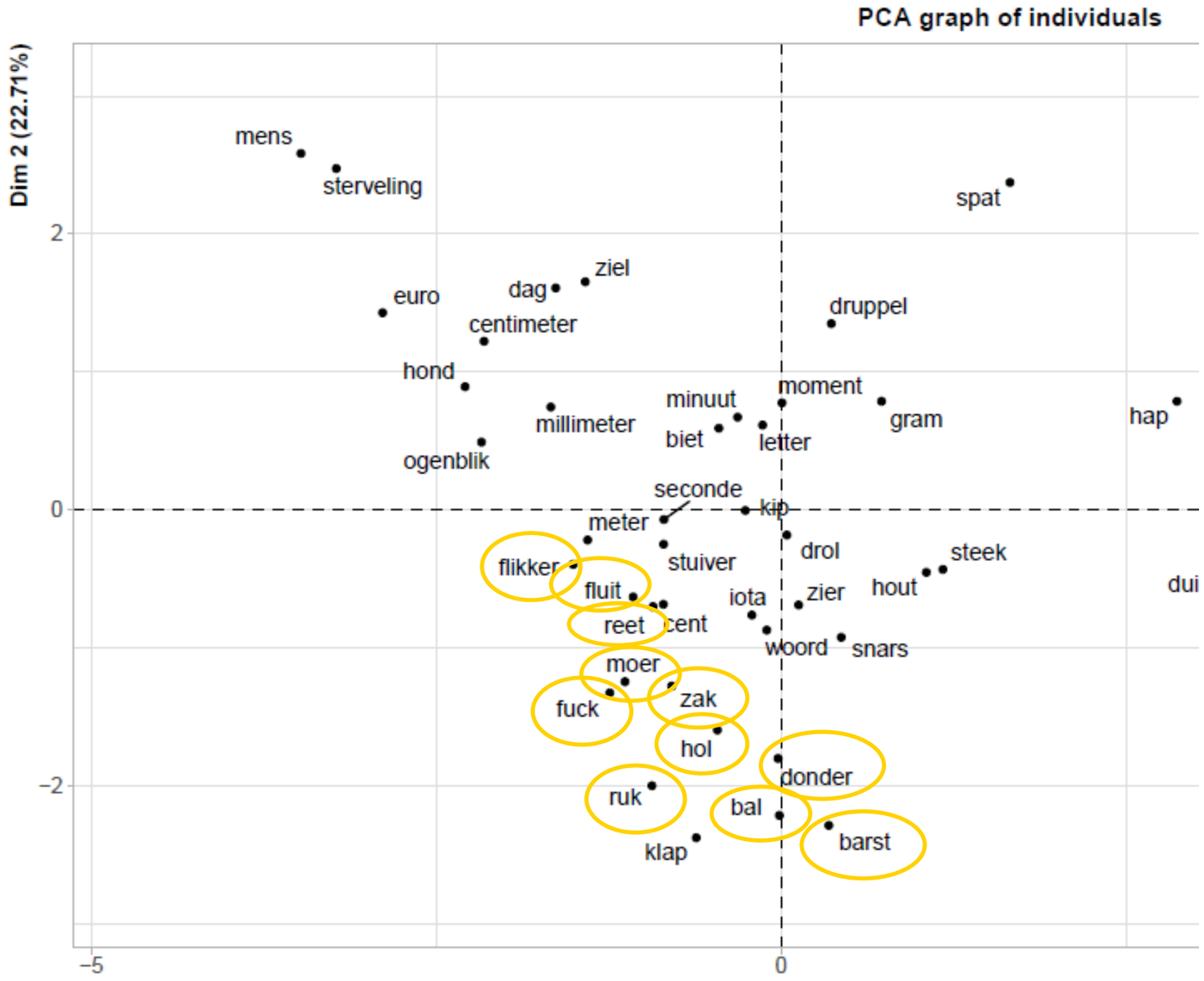
4.2 PRODUCTIVITY AND SEMANTICS



4.
Taboo
minimizers

#*!

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4.2 PRODUCTIVITY AND SEMANTICS

Semantic category	Mean type frequency	Mean hapax frequency	Mean hapax type ratio
People and animals 5 minimizers 	50,6	37	0,71
Distance 3 minimizers 	42	27,7	0,65
Time 5 minimizers 	37,8	24,8	0,65
Taboo 11 minimizers 	31,8	13,6	0,42

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4.2 PRODUCTIVITY AND SEMANTICS

Semantic category	Number of different predicates	Average number of predicates	Shared predicates
People and animals 5 minimizers 	169	33,8	5 (used in 29% of the tokens)
Distance 3 minimizers 	97	32,3	5 (used in 24,3% of the tokens)
Time 5 minimizers 	122	24,4	5 (used in 32,4% of the tokens)
Taboo 11 minimizers 	86	7,8	9 (used in 49,6% of the tokens)

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4.2 PRODUCTIVITY AND SEMANTICS

geen

bal
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begrijpen
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geloven
hebben aan
interesseren
snappen
te maken hebben met
uitmaken
zijn aan

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5. CONCLUSION

- productivity in general & productivity of the minimizing constructions

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→ two facets of productivity, corresponding to the macro-dimensions of the PCA

(a) dimension 1: openness vs. conventionalization
high type and hapax frequency (no token frequent predicates)

(b) dimension 2: lower-level local productivity
high hapax type ratio (the slot is extensible, despite the presence of high token frequent predicates)

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→ importance of semantics: analogical attraction

(a) high token frequent predicates (such as *geen spat veranderen*)

(b) among taboo minimizers

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FACULTY OF ARTS AND PHILOSOPHY

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Thank you for your attention!

Part of the GOA project (BOF UGent)
Language Productivity at Work
https://www.languageproductivity.ugent.be/

Supervisors: P. Lauwers (PI), J. Barðdal, R. Enghels, T. Colleman, R. Hartsuiker, M. Taverniers, L. De Cuypere, A. Ghyselen

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