Agency and lexical decomposition of Biblical Hebrew verbs

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AGENCY AND LEXICAL DECOMPOSITION OF BIBLICAL HEBREW VERBS

Intuition is a basic requirement, e.g. (Van Valin 2005, 36):

a. *The window shattered vigorously

b. The house is shaking vigorously

A PROPOSAL OF APPLYING QUANTITATIVE METHODS

How can we decompose verbs in ancient, "dead" languages?

➢ Applying statistical methods to distinguish active and stative verbs

➢ Applying additional qualitative criteria to distinguish causative and non-causative verbs

1. CLASSIFYING ACTIVE/STATIVE VERBS: A QUANTITATIVE APPROACH

- **Applied method**: "covarying collexeme analysis" (Gries and Stefanowitsch 2004; Stefanowitsch and Gries 2005)

- **Purpose**: To compute how strongly a verb is associated to a certain adverb

Four construction types:
Verb + **adverbial**
Verb + any other adverbial
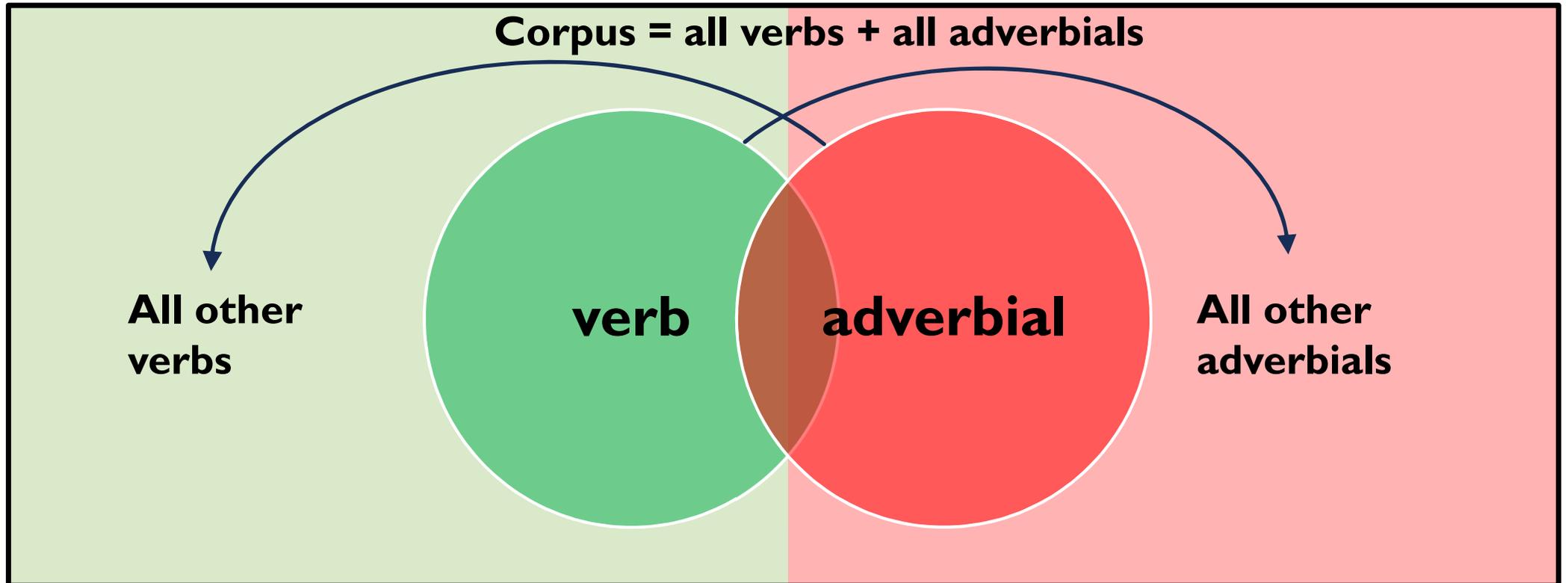Any other verb + **adverbial**
Any other verb + any other adverbial

Corpus = all verbs + all adverbials

All other verbs

verb

adverbial

All other adverbials

COVARYING COLLEXEME ANALYSIS

Selection of four complement forms

| Complement form	Hebrew	Presumed function
Preposition "in" + substantive	ב	Locational
Prep. "on" + subs.	על	Locational
Prep "to" + subs.	אל	Directional
Subs. + morphological suffix	ה-	Directional

A rough disambiguation of complements: excluding substantives likely to be used as instruments (e.g. "rock", "stick" and body parts)

RESULTS
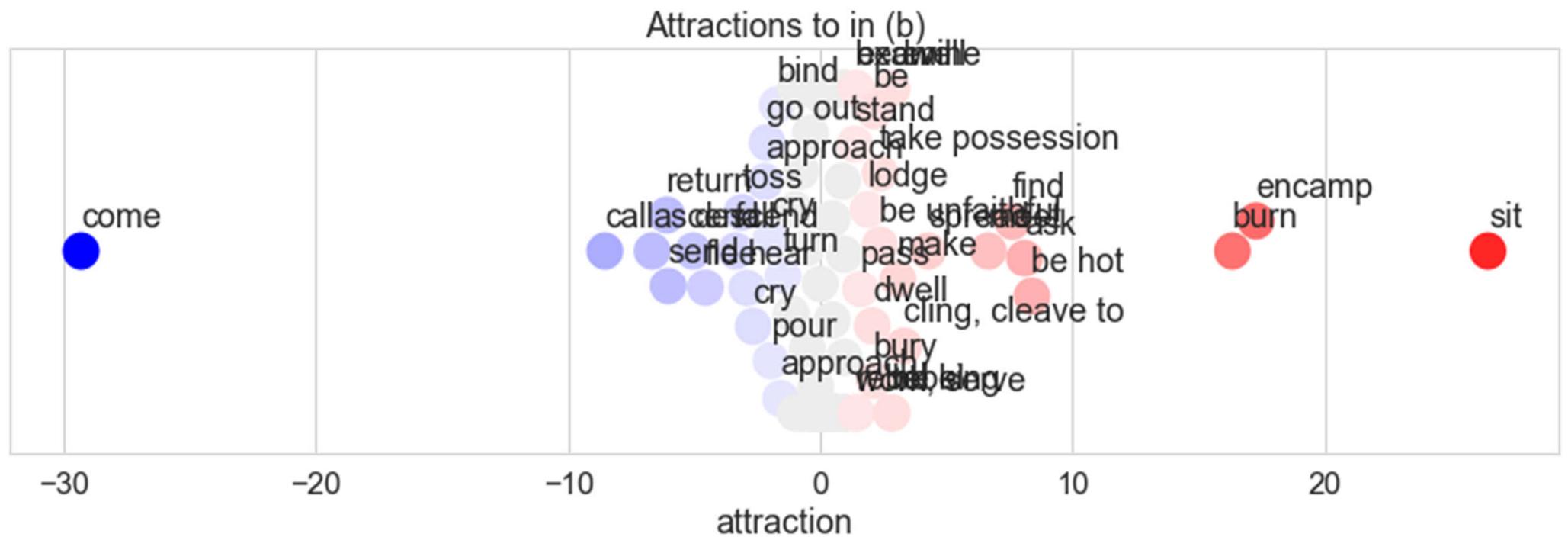
The layout of the plot is adapted from Cody Kingham (github.com/CambridgeSemiticsLab/BH_time_collocations)
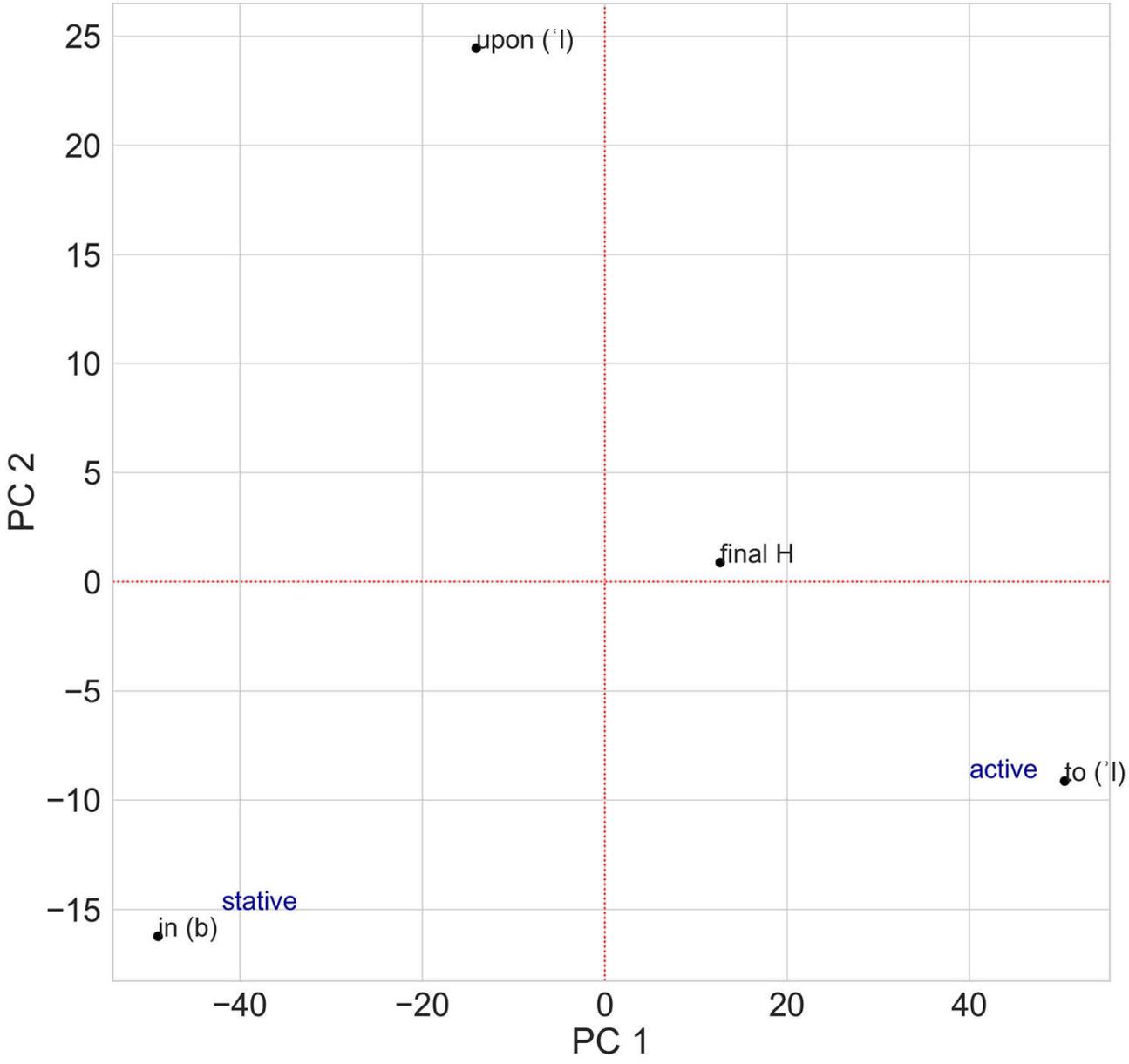
RESULTS
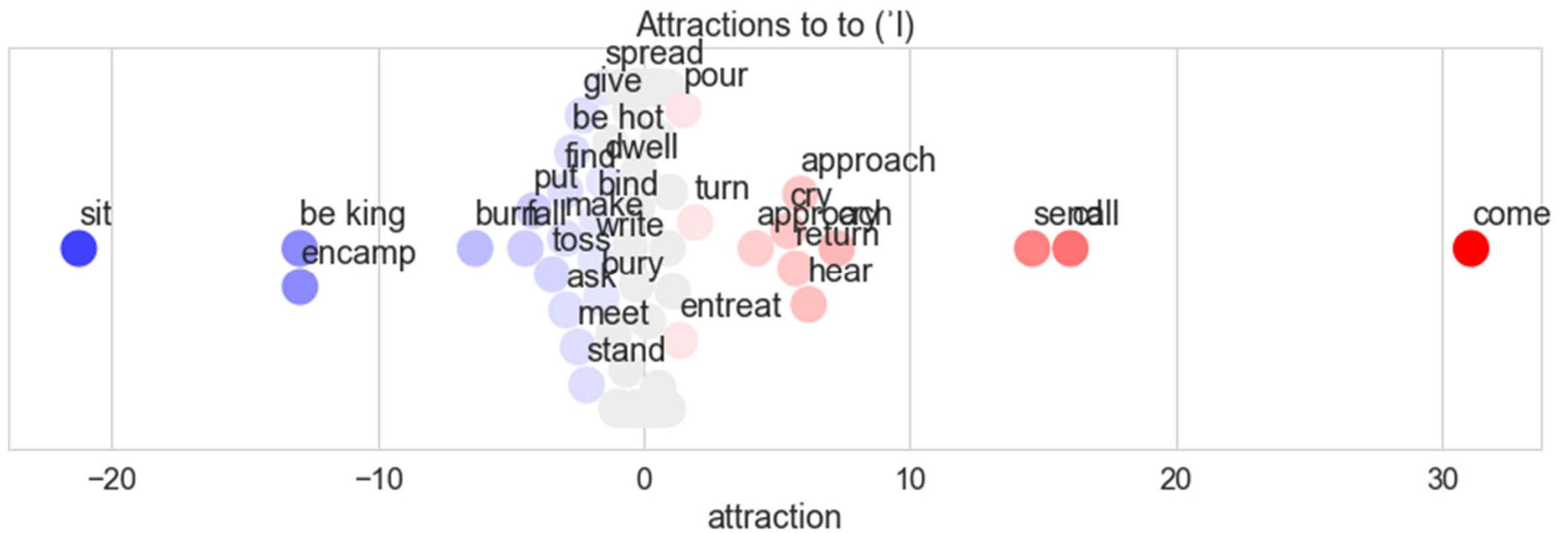
MOVING ON: PRINCIPAL COMPONENT ANALYSIS

- **Purpose**: To explore a number of independent, quantitative variables and reduce the variation caused by the variables to the lowest number of dimensions ("principal components") possible.

PCA of collexemes

PCA of collexemes

upon ('l)

toss

be king
fall
give
bind

put#2

extend
write
hang#2 ascend
descend
passion
stagger final H
burn
mdly
call
cleave to
spread

meet
find
ask
be hot walk send

encamp

sit come
burn#2
to ('l)

in (b)

PC 1

PC 2

PCA of collexemes

PCA of collexemes
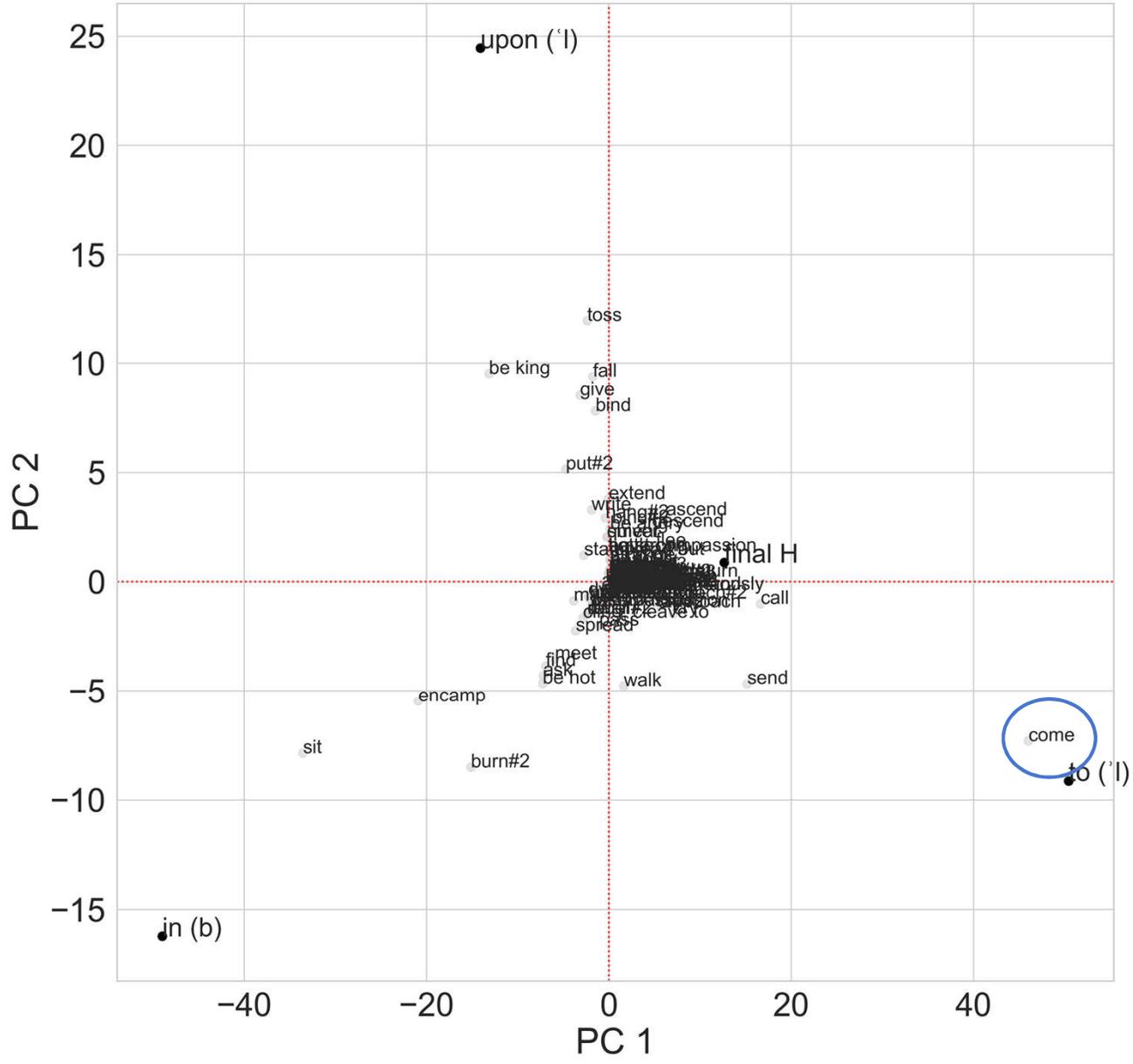
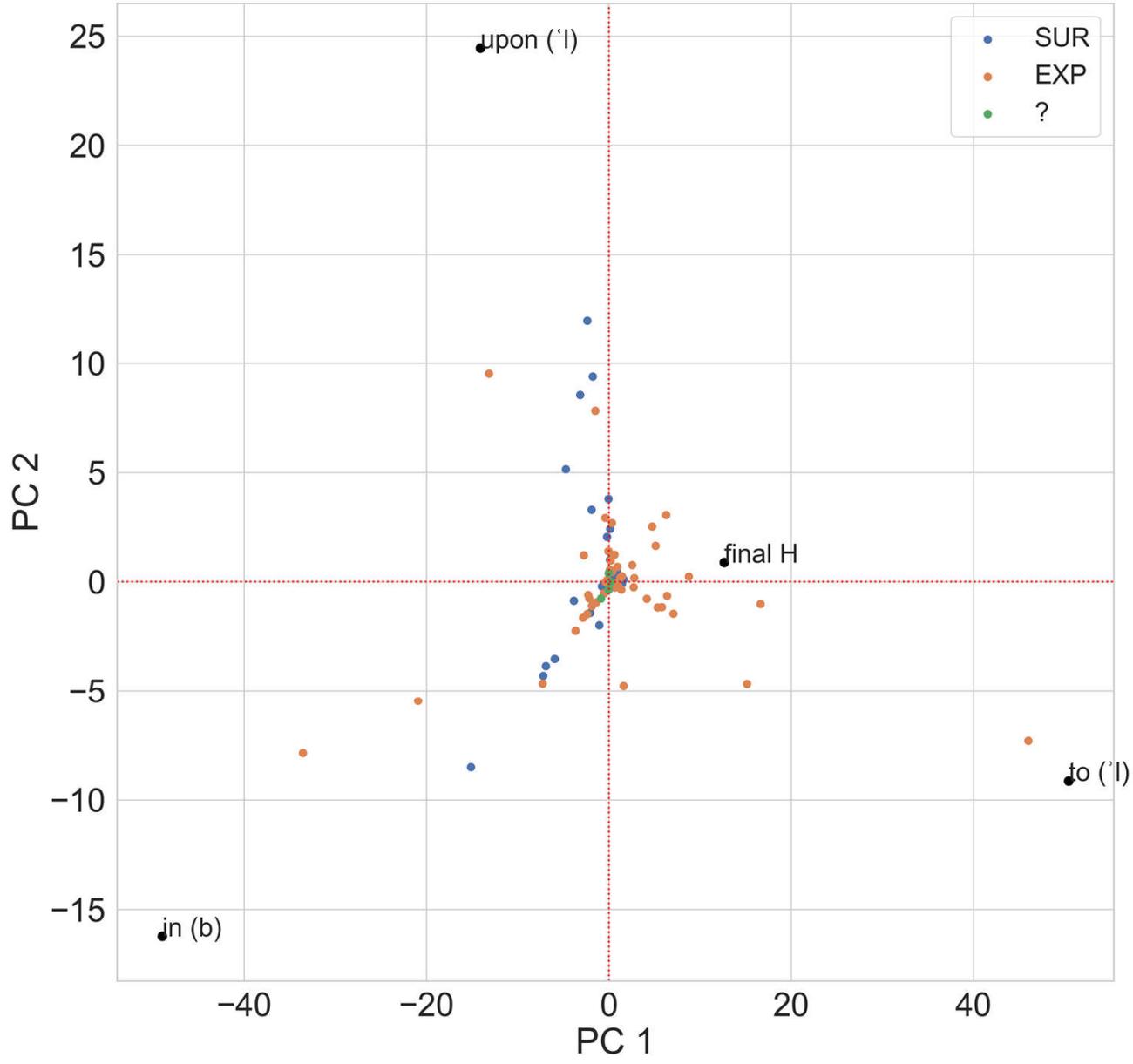PCA of collexemes

PCA of collexemes

PCA of collexemes
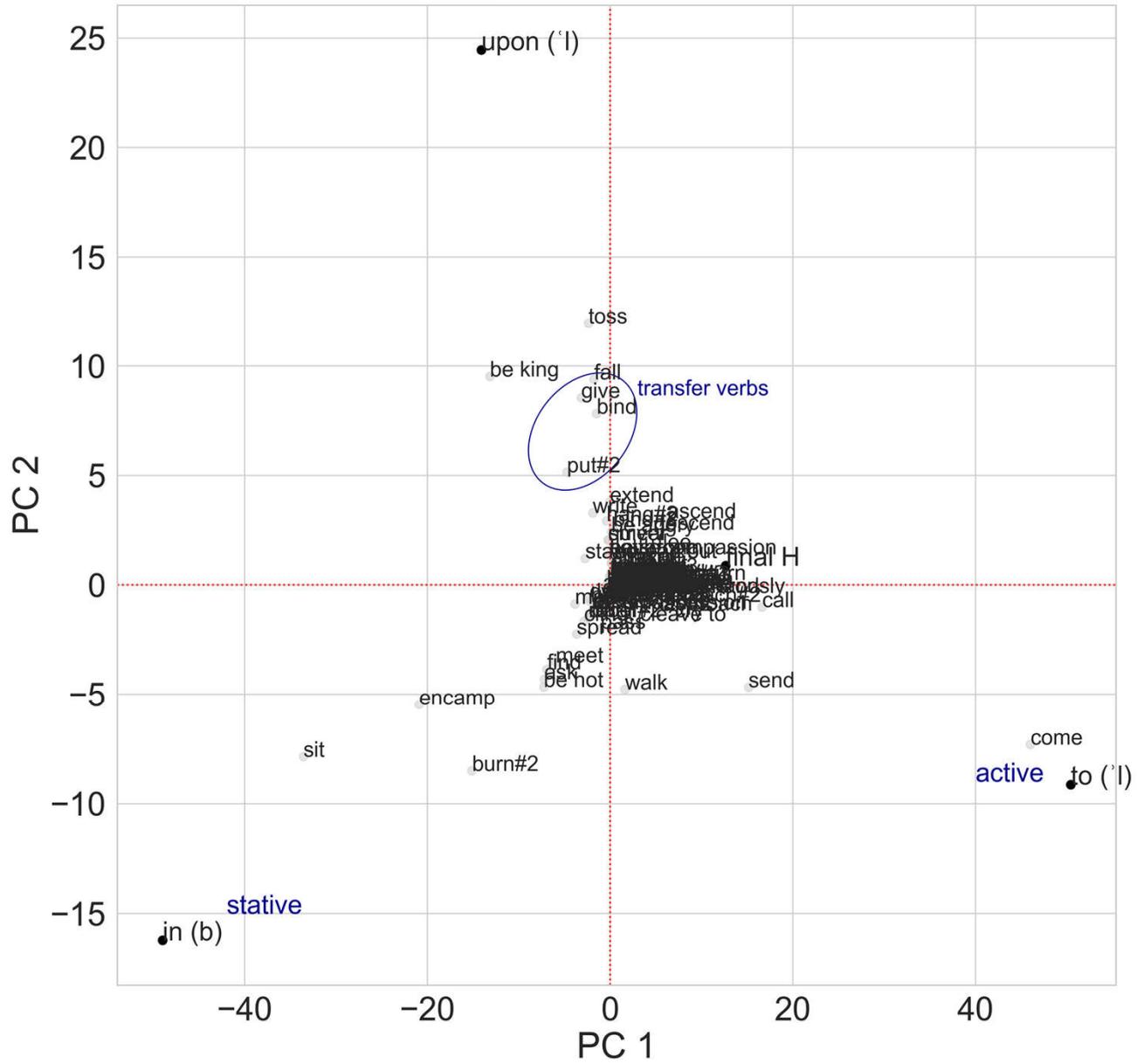
TRANSFER VERBS

Give, cf. Van Valin (2005, 61):

```
[do' (Pat, Ø) CAUSE [BECOME have' (Chris, book)]
```
Pat gave the book to Chris

2. BROADENING THE SCOPE: CAUSATIVES

Causative test (cf. Van Valin 2005, 38):

The dog frightens the boy →The dog **caused** to the boy **to fear**

SEMANTIC TRANSITIVITY

Hopper and Thompson (1980, 264)

"… causatives are highly Transitive constructions: they must involve at least two participants, one of which is an initiator, and the other of which is totally affected and highly individuated."

SEMANTIC TRANSITIVITY

Prototypical transitivity, cf. Åshild Næss (2007)

	Agent	Patient
Volitionality	+	−
Instigation	+	−
Affectedness	−	+

AFFECTEDNESS AND CAUSATION

Emotion verbs

ʔîš   ʔim   -mô   wə   ʔāv -îw   tîrā   -ʔû

man   mother-PRS.M.3SG   CON   father-PRS.M.3SG fear.IMPF-M.2PL

Everyone shall fear his father and mother (Leviticus 19:3)

RRG: `fear'` (man, his father and mother)

Næss:

	Actor	Undergoer
Volitionality	+	–
Instigation	–	–
Affectedness	+	–

AFFECTEDNESS AND CAUSATION

Consumption verbs

šivʕat   yām-îm   mas -ṣôt   tōʾxēl -û

seven   day -M.PL bread-F.PL   eat.IMPF-M.2PL

For seven days you shall eat unleavened bread (Leviticus 23:6)

RRG: `do' (you, [`**`eat'`**` (bread)])`

Næss:

	Actor	Undergoer
Volitionality	+	–
Instigation	+	–
Affectedness	+	+

AFFECTEDNESS AND CAUSATION

Construction verbs

û	nṭaʕ	-tem	kol ʕēṣ	maʔaxāl
CON	plant.PERF	-M.2PL	any tree	eat

… and you plant any fruit tree (Leviticus 19:23)

RRG: `do' (you, [plant' (any fruit tree)])`

Næss:

	Actor	Undergoer
Volitionality	+	–
Instigation	+	–
Affectedness	–	–

Existential verbs

wᵊ	lōʾ	tᵊ	-ḥallēl	ʔet	šēm	ʔᵉlōheʸ-xā
CON	NEG	M.2SG-defile.IMPF		OBJ	name	God	-PRS.M.2SG

and you may not defile the name of your God (Leviticus 18:21)

RRG: `[Do'` `(you, Ø)]` `CAUSE` `[BECOME` **`unclean'`** `(the name of your God)]`

Næss:

	Actor	Undergoer
Volitionality	+	–
Instigation	+	–
Affectedness	–	+

AFFECTEDNESS AND CAUSATION

Transfer verbs

hā	ʔāreṣ	ʔᵃšer	ʔᵃnî	nōtēn	lā -xem
DET	land	REL	I	give.PTC	to-PRS.M.2PL

the land which I am giving to you (Leviticus 25:2)

RRG: `[Do' (I, Ø)] CAUSE [BECOME have' (you, the land)]`

Næss:

	Actor	Undergoer
Volitionality	+	+
Instigation	+	−
Affectedness	−	+

IN CONCLUSION

a. Covarying collexeme analysis can be succesfully applied to an ancient corpus to distinguish active and stative verbs.

   ■ More fine-grained parameters will likely increase the accuracy (but reduce the number of relevant constructions…)

b. Affectedness serves as a useful category to distinguish causative and non-causative verbs.

All codes, datasets, and plots on
github.com/ch-jensen/semantic-roles

Thank you for your attention!

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