



Constructing The Constructicon Empirically: Experiments with Dutch Causatives

Natalia Levshina

Dirk Geeraerts

Dirk Speelman



University of Leuven

RU Quantitative Lexicology and Variational Linguistics

Aims

- develop a new usage-based method of mapping constructional form and meaning at different levels of schematicity
- construct a construction of Dutch analytic causatives with *doen* and *laten*

Outline

- Different ways of modelling relationships between Cx
- Dutch causative constructions
- Data and method
- A model of Dutch causative construction
- Discussion

Constructions

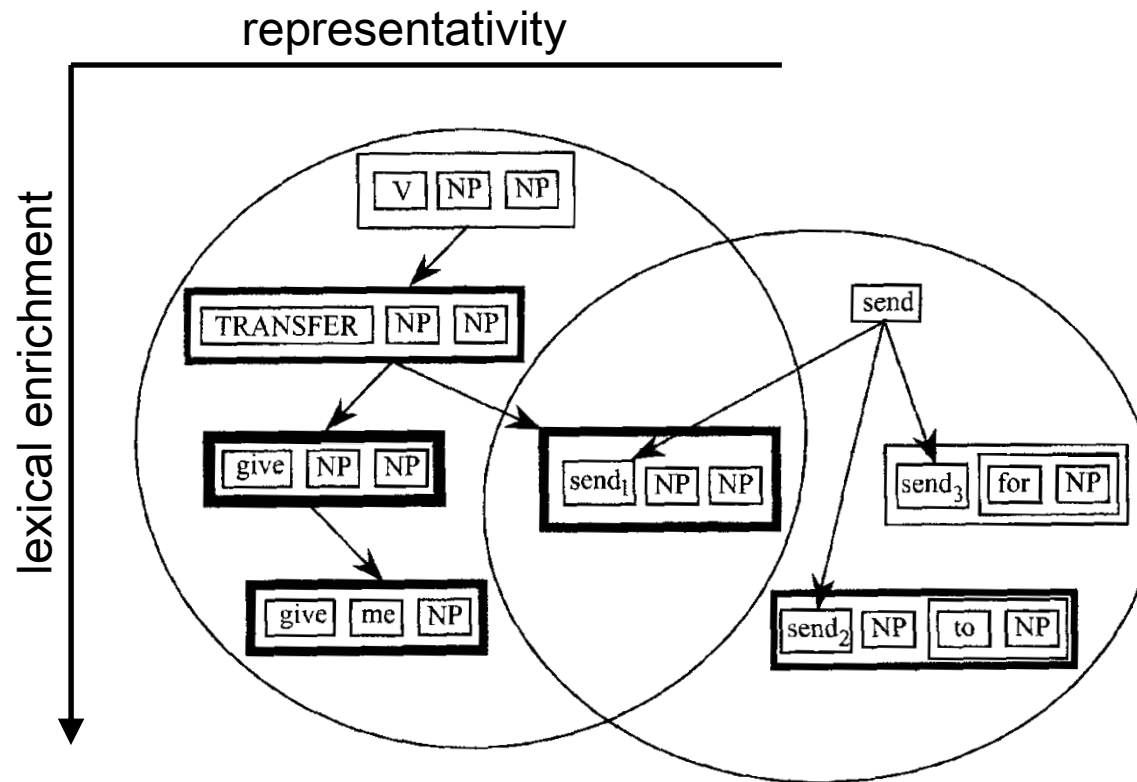
conventionalized form-meaning pairings of different degrees of schematicity, constituting a lexico-syntactic continuum (e.g. Goldberg 1995, 2006; Langacker 2005)

Constructicons

- taxonomies of formally related constructions (Goldberg 1995, Croft & Cruse 2004)
- relationships “parents” \rightleftharpoons “children”
- focus on inheritance (semantic motivation)
- few detailed usage-based quantitative models of construction networks, in spite of the proclaimed usage-based approach

Constructicon: Example

English ditransitive construction (Langacker 2005)



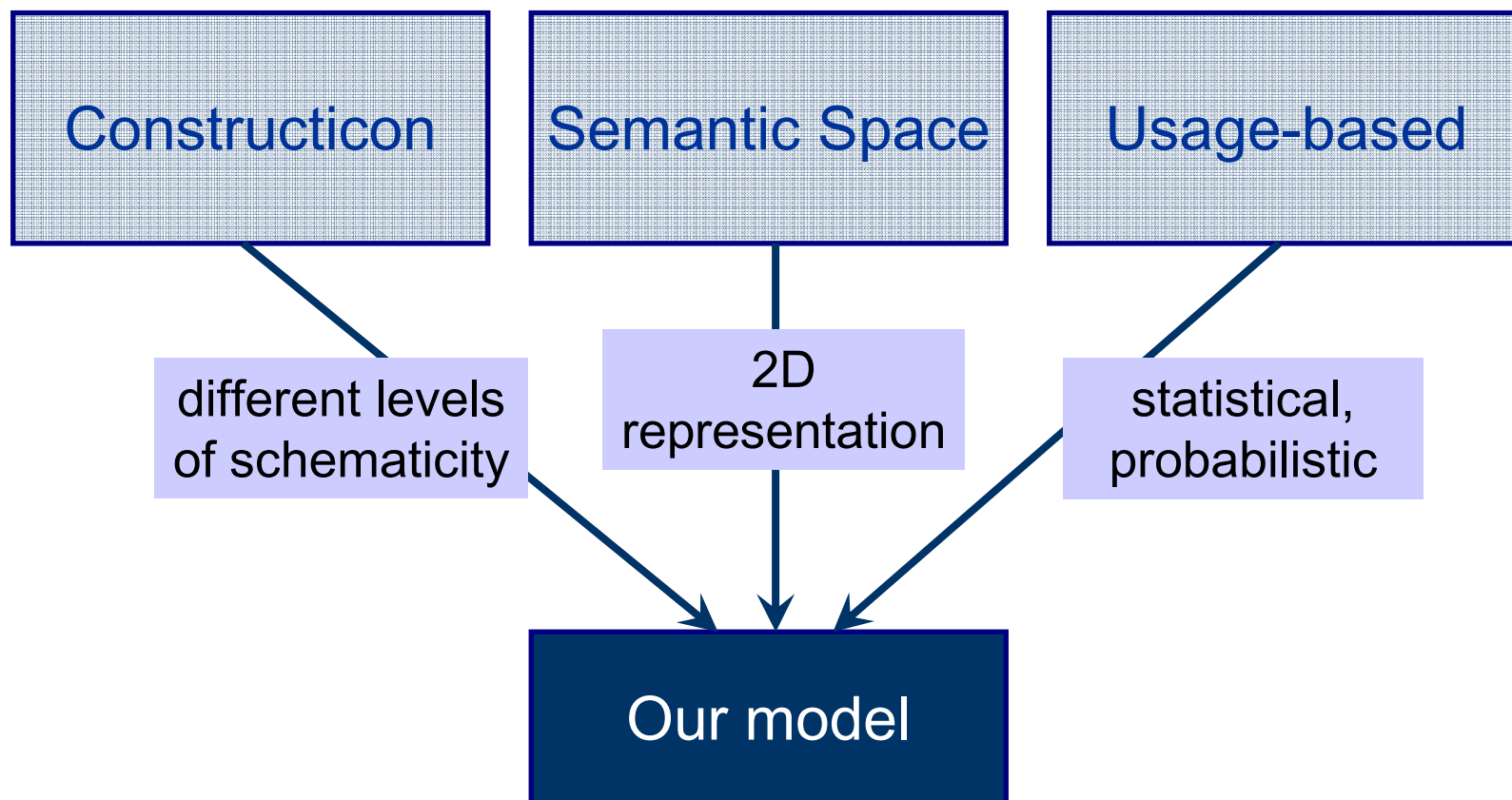
Semantic Spaces

- conceptual space with constructions/forms superimposed
- cf. lexical field studies
- cf. 'semantic maps' in typological studies, e.g. Croft 2001, Haspelmath 2003, Croft & Poole 2008

Usage-based, methodologically

- bottom-up, based on usage events (corpus), and hence quantitative
- e.g. studies of constructional near-synonyms: Grondelaers & Speelman 2002, Gries 2003, Heylen 2005, de Sutter 2005, Tummers 2005, Speelman & Geeraerts 2009
- consequences:
 - 1° probabilistic, non-categorical
 - 2° includes geographic and social variation

Our Model



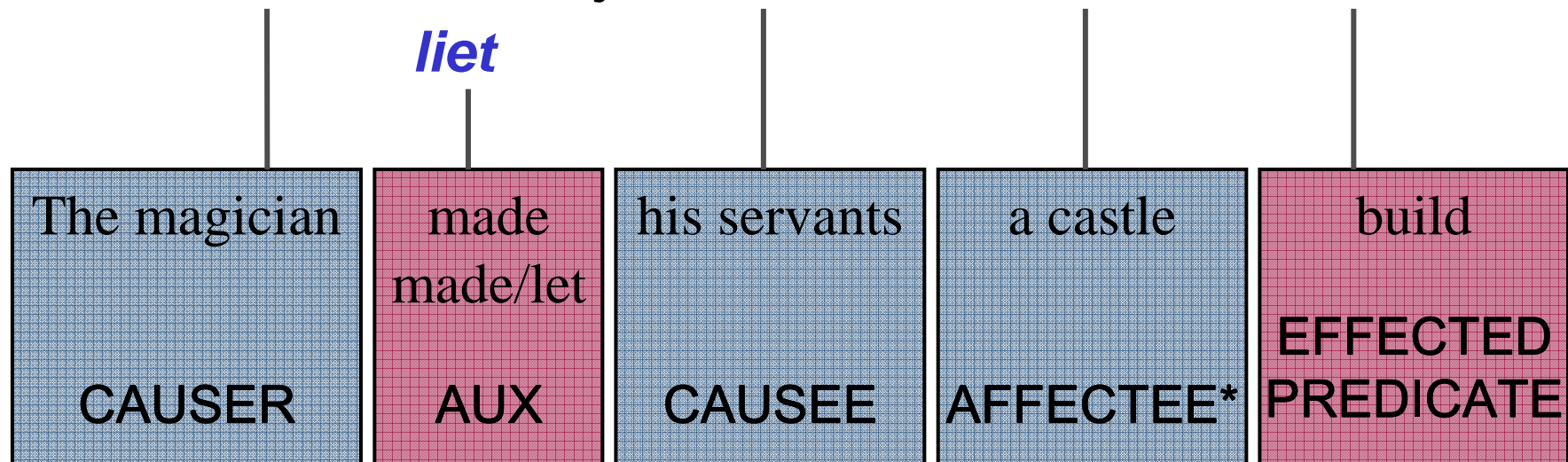
Outline

- Different ways of modelling relationships between Cx
- **Dutch causative constructions**
- Data and method
- A model of Dutch causative construction
- Discussion

Dutch Causative Constructions

*De tovenaar **deed** zijn dienaars een kasteel bouwen.*

liet



(slot names: Kemmer & Verhagen 1994)

Formal Variation

- *doen* vs. *laten*
- syntactic expression of Causee
- transitive or intransitive Effected Predicate

e.g. Kemmer & Verhagen 1994, Verhagen & Kemmer 1997,
Loewenthal 2003, Stukker 2005

doen vs. laten

Verhagen & Kemmer 1997

<i>DOEN</i>	<i>LATEN</i>
Direct causation	Indirect causation
«The initiator produces the effected event directly; there is no intervening energy source 'downstream'»	«Some other force besides the initiator is the most immediate source of energy in the effected event»

Syntactic expression of Causee

- Causee = NP
- Causee = *door* + NP (only *laten*)
- Causee = *aan* + NP (only *laten*)
- Causee = Impl

Hij liet *zijn studenten*
het gedicht lezen.
“He let/had his students
read the poem”

Syntactic expression of Causee

- Causee = NP
- Causee = *door* + NP (only *laten*)
- Causee = *aan* + NP (only *laten*)
- Causee = Impl

Hij liet het gedicht *door zijn studenten* lezen.

“He had the poem read by his students”

Syntactic expression of Causee

- Causee = NP
- Causee = *door* + NP (only *laten*)
- Causee = *aan* + NP (only *laten*)
- Causee = Impl

Hij liet het gedicht *aan zijn studenten* lezen.

“He let/had his students read the poem”

Syntactic expression of Causee


- Causee = NP
- Causee = *door* + NP (only *laten*)
- Causee = *aan* + NP (only *laten*)
- Causee = Impl

Hij liet het gedicht
lezen.

“He let/had [someone]
read the poem”

Syntactic expression of Causee

- Causee = NP
- Causee = *door* + NP (only *laten*)
- Causee = *aan* + NP (only *laten*)
- Causee = Impl



peripherality
autonomy
indirectness
(Kemmer & Verhagen
1994)

Syntactic expression of Causee

- Causee = NP
- Causee = *door* + NP (only *laten*)
- Causee = *aan* + NP (only *laten*)
- Causee = Impl
- Causee = Clause

Hij liet doorschemeren
dat alles in orde was.
“He implied that
everything was in order”

Transitivity of Effected Predicate

- Effected Pred. = Transitive
- Effected Pred. = Intransitive

Hij deed mij dat
geloven.

“He made me believe
that”

Transitivity of Effected Predicate

- Effected Pred. = Transitive
- Effected Pred. = Intransitive

Hij deed mij de hele
nacht **drinken**.

“He made me drink all
night”

Transitivity of Effected Predicate

- Effected Pred. = Transitive = indirectness
- Effected Pred. = Intransitive = directness

(Kemmer & Verhagen 1994)

Outline

- Different ways of modelling relationships between Cx
- Dutch causative constructions
- **Data and method**
- A model of Dutch causative construction
- Discussion

Data

- 8 mln word newspaper corpus (from TwNC & LeNC)
- two national varieties: Dutch in the Netherlands and Belgium (Flanders)
- 6855 observations with causative constructions
1170 with *doen*, 5685 with *laten*
- manually (!) coded for 5 semantic features, mostly related to cx slots, as evidence of constructional semantics (see e.g. Stefanowitsch and Gries 2003)

Semantic Features

Label	Description	Values
<i>Cr</i>	semantic class of Causer	Anim, Inanim
<i>Ce</i>	semantic class of Causee	Anim, Inanim
<i>CdEv</i>	semantic class of Caused Event	Ment, Phys, Soc
<i>Control</i>	coreferentiality and possession relations between Causer and other participants	Yes, No
<i>Neg</i>	negation	Yes, No

Semantic Features

Label	Description	Values
<i>Cr</i>	semantic class of Causer	Anim , Inanim
<i>Ce</i>	semantic class of Causee	Anim, Inanim
<i>CdEv</i>	semantic class of Caused Event	Ment, Phys , Soc
<i>Control</i>	coreferentiality and possession relations between Cr and other participants	Yes, No
<i>Neg</i>	negation	Yes, No

De politie liet de auto stoppen. “The police made the car stop”

Semantic Features

Label	Description	Values
<i>Cr</i>	semantic class of Causer	Anim , Inanim
<i>Ce</i>	semantic class of Causee	Anim , Inanim
<i>CdEv</i>	semantic class of Caused Event	Ment , Phys, Soc
<i>Control</i>	coreferentiality and possession relations between Cr and other participants	Yes , No
<i>Neg</i>	negation	Yes , No

Ik liet me niet intimideren door hem. “I didn’t let him intimidate me”

Formal Patterns

- 1 formal feature (maximally schematic):

doen/laten

- 2 formal features (medium schematic):

doen/laten + synt. Causee

- 3 formal features (specific):

doen/laten + synt. Causee + trans. Effected Pred.



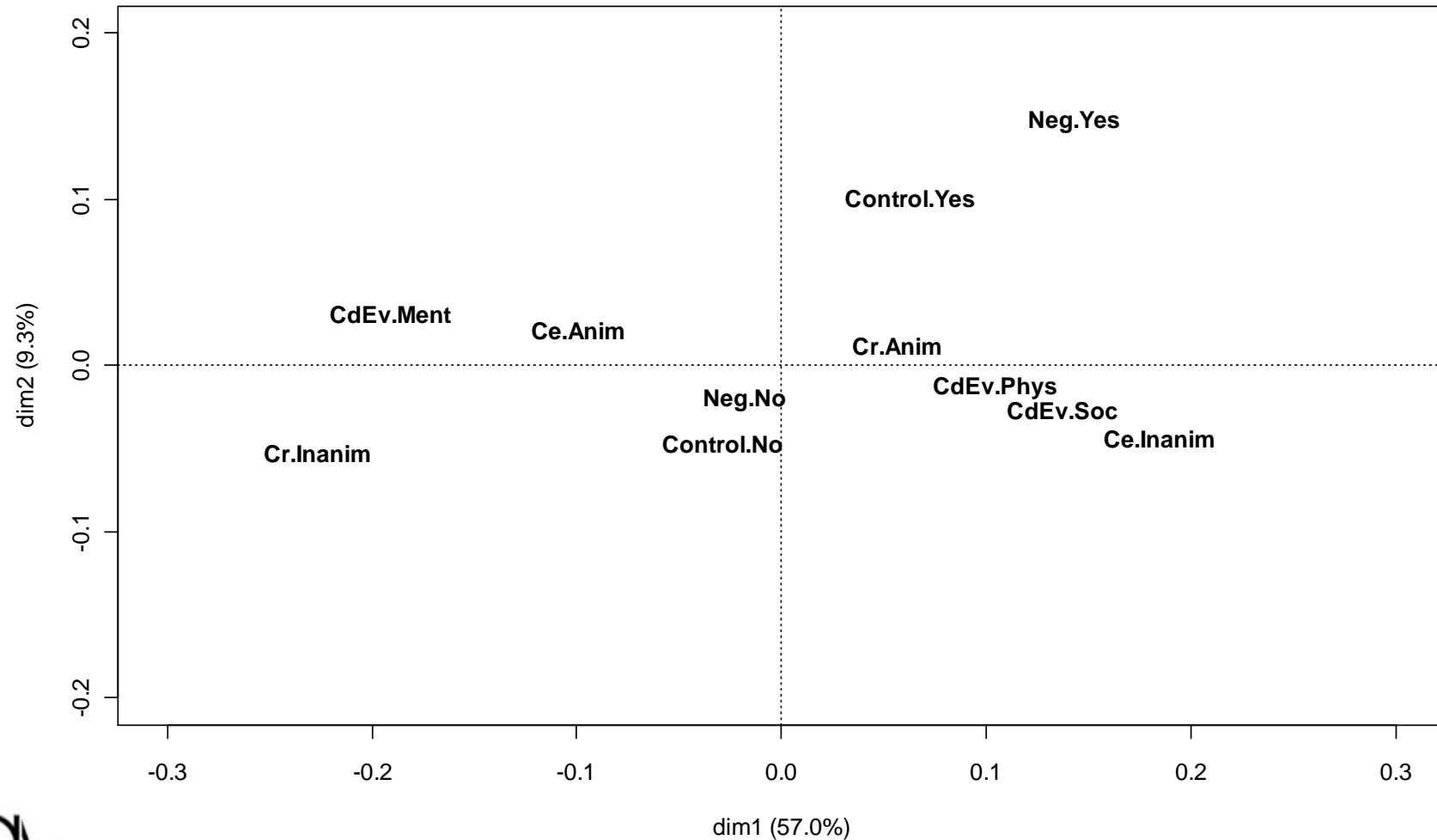
Method

- Multiple correspondence analysis: a multivariate technique for visualization of data structure
- Step 1: constructing the semantic space based on co-occurrence of the semantic features
- Step 2: plotting the formal patterns as supplementary points and studying the correspondences
- Stability tests: partial bootstrap and 95% confidence regions

Outline

- Different ways of modelling relationships between Cx
- Dutch causative constructions
- Data and method
- **A model of Dutch causative construction**
- Discussion

Semantic space of Dutch CCx



Conceptual interpretation of dim 1

mental Caused Event
inanimate Causer
animate Causee

Het doet me denken aan de 1960's
“It makes me think of the 1960s.”

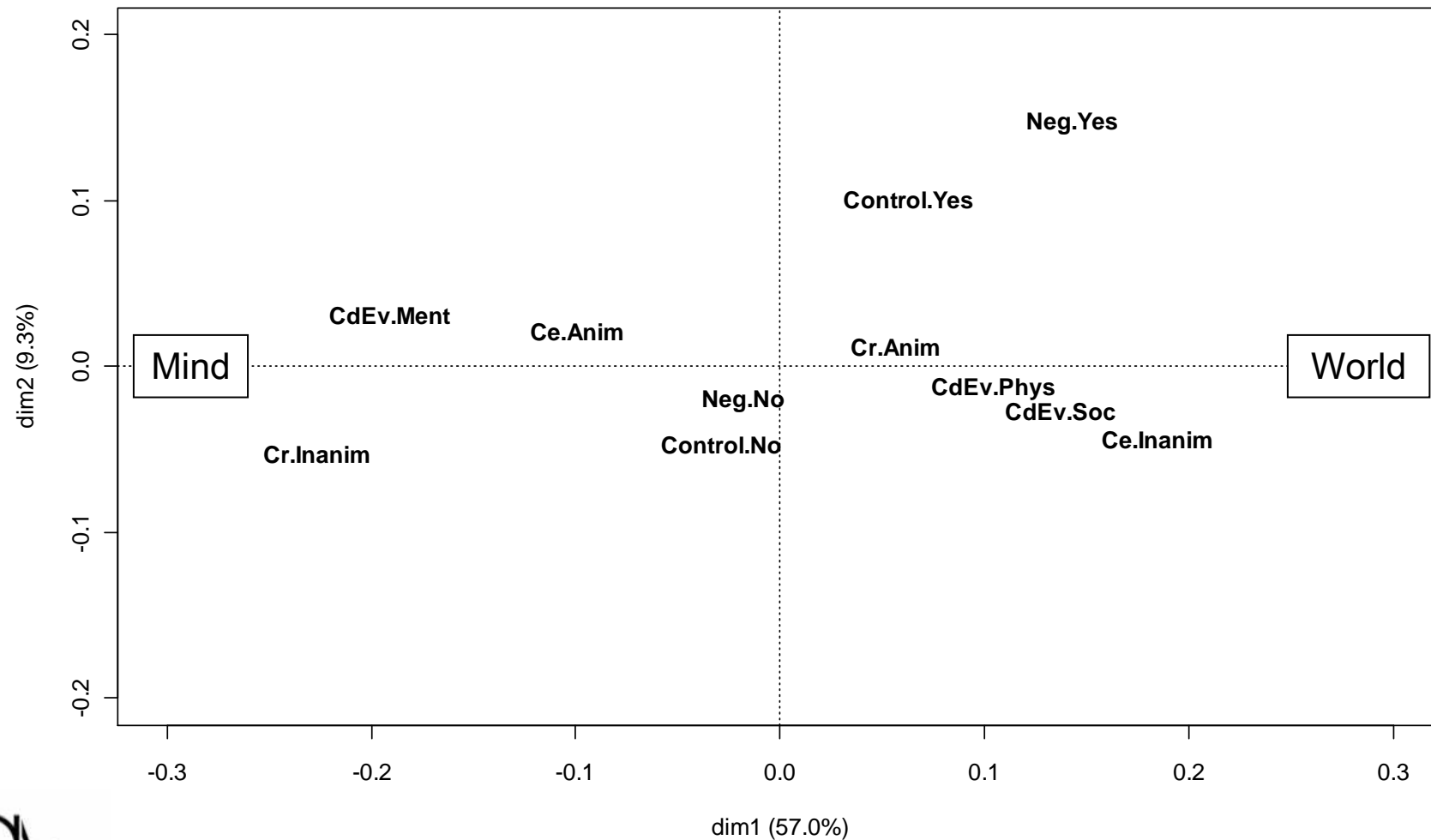
affecting
a mind

inanimate Causee
physical or social
Caused Event

De crisis deed de prijzen dalen.
“The crisis made the prices go down.”

changing
the world

Dimensions of semantic space



Conceptual interpretation of dim 2

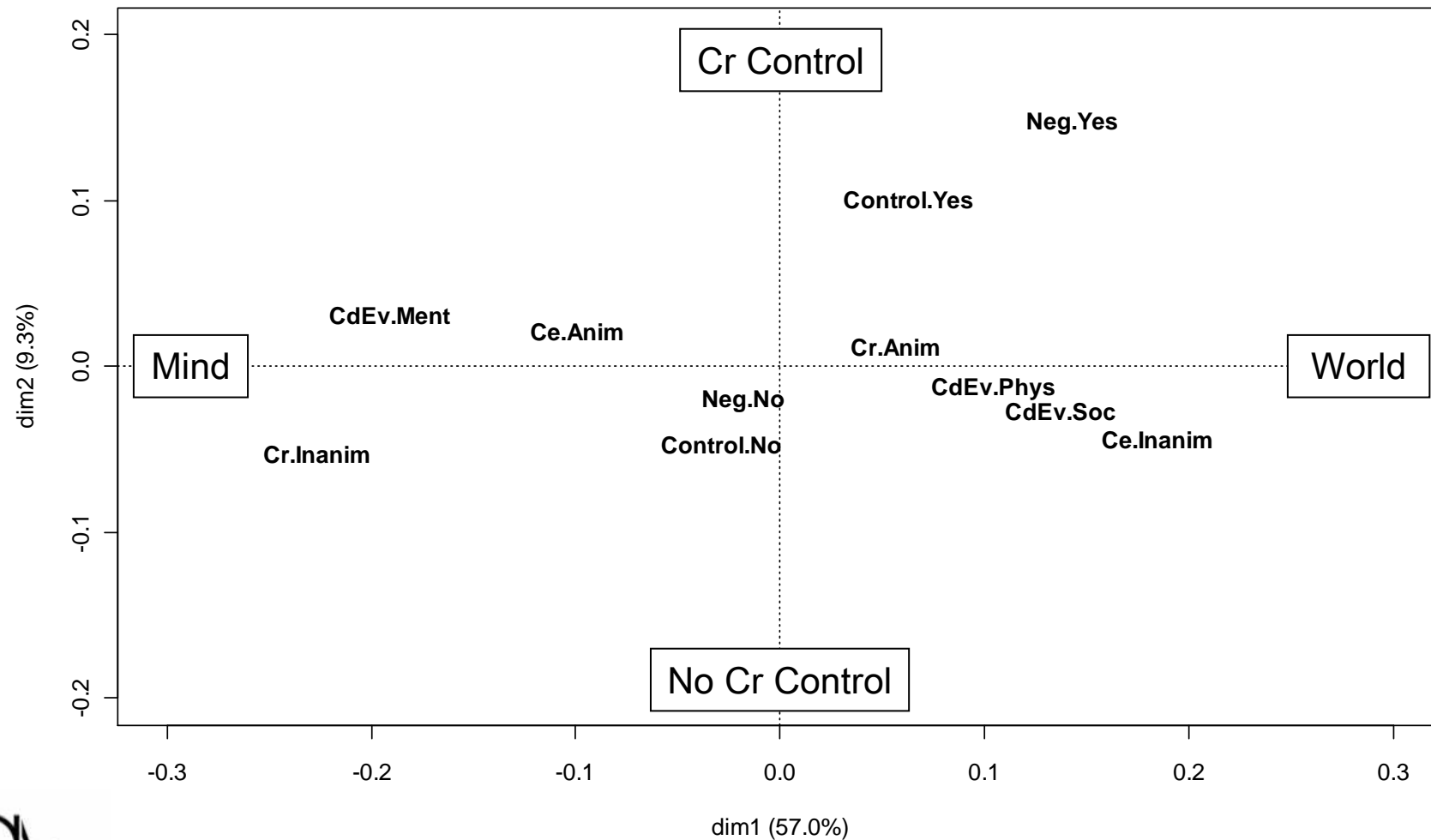
Causer's Control
Negation

Ik liet me (niet) intimideren door hem.
“I didn't let him intimidate me”

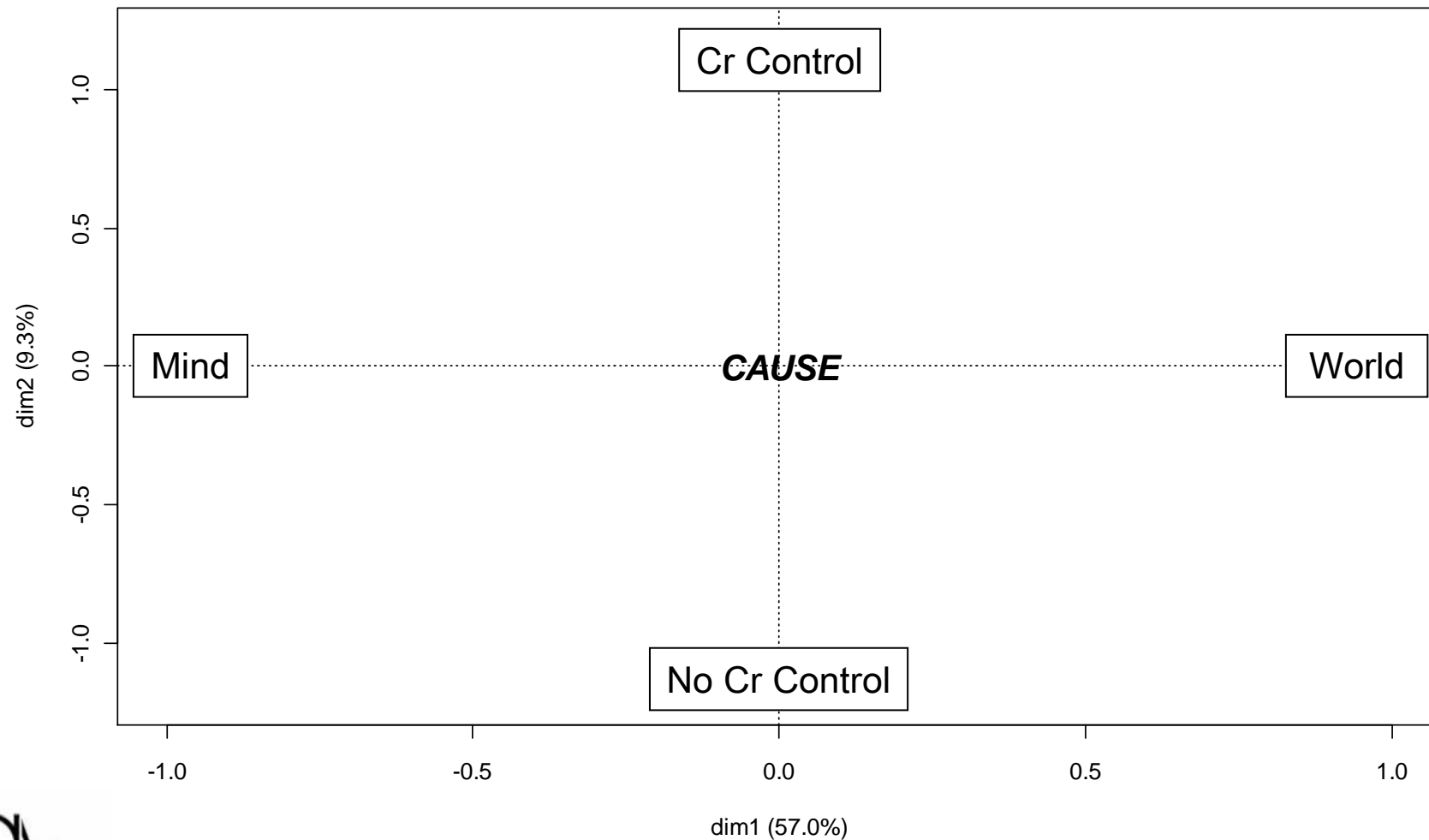
cf. indirect causation (Kemmer & Verhagen 1994)

No Causer's control

Dimensions of semantic space



Mapping Cxs: Average Cx



Formal Patterns

- 1 formal feature (maximally schematic):

doen/laten

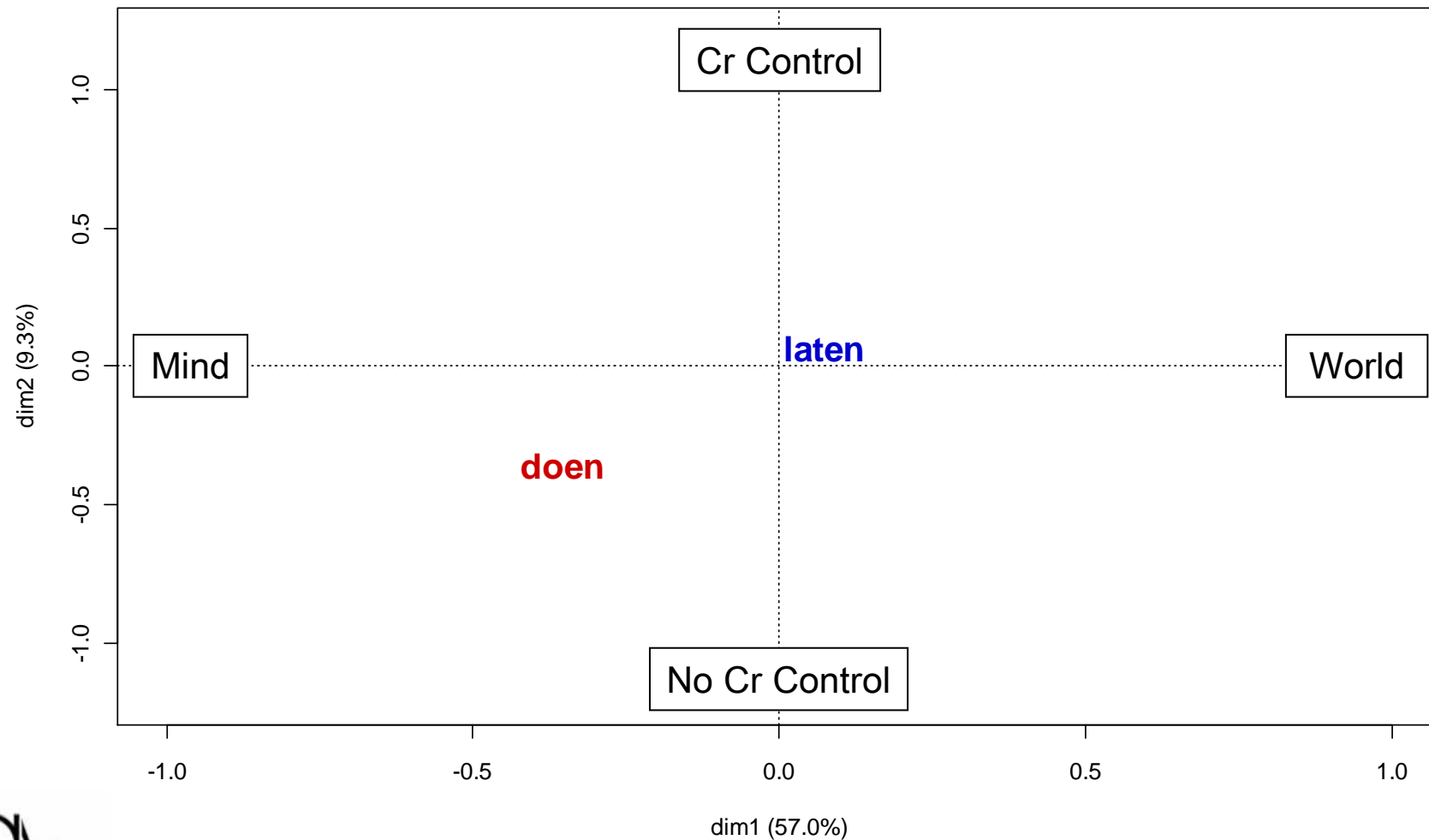
- 2 formal features (medium schematic):

doen/laten + synt. Causee

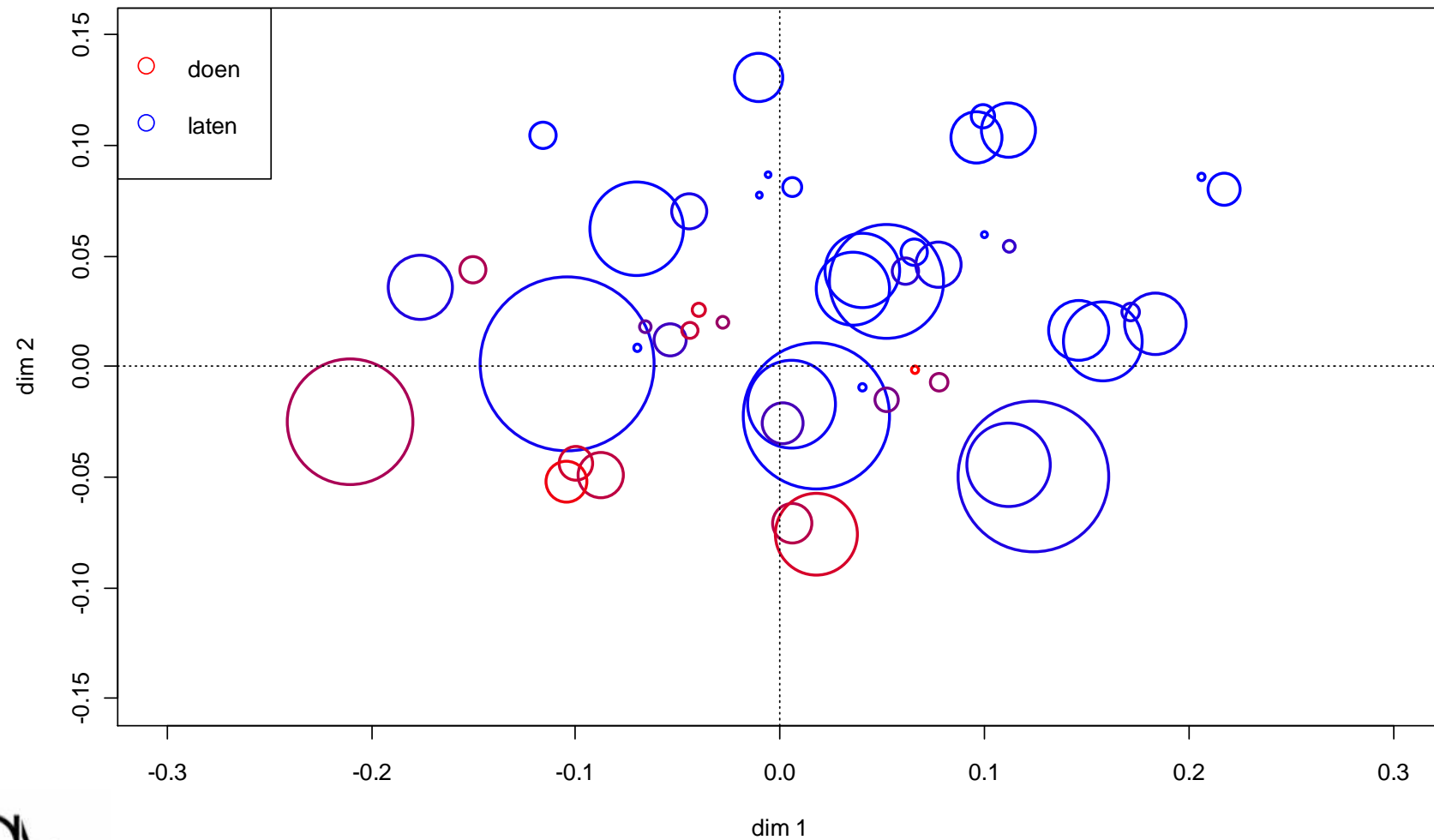
- 3 formal features (specific):

doen/laten + synt. Causee + trans. Effected Pred.

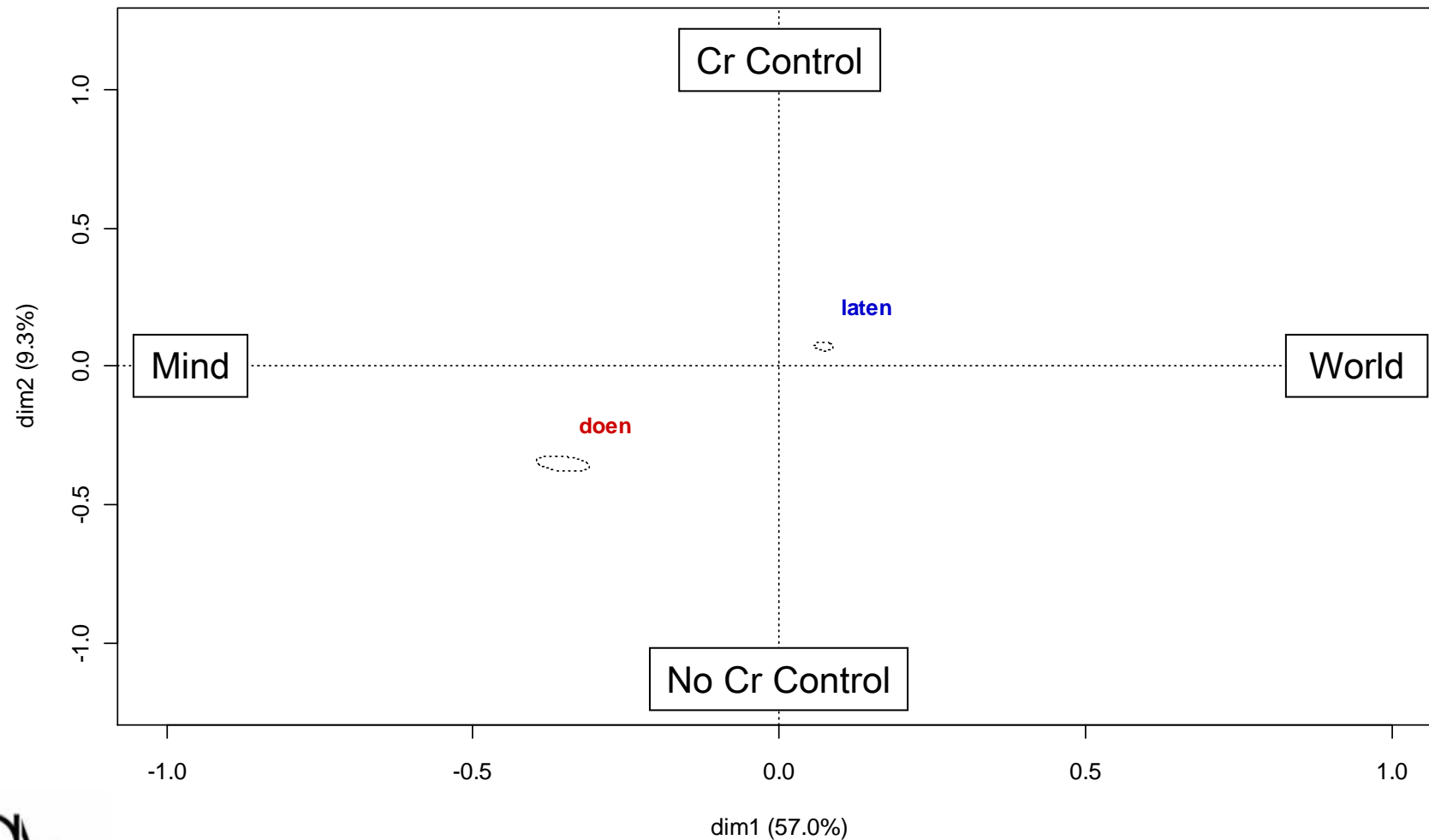
Mapping Cxs: doen/laten



Distribution of obs. with doen & laten



doen/laten: Confidence Regions



Formal Patterns

- 1 formal feature (maximally schematic):

doen/laten

- 2 formal features (medium schematic):

doen/laten + synt. Causee

- 3 formal features (specific):

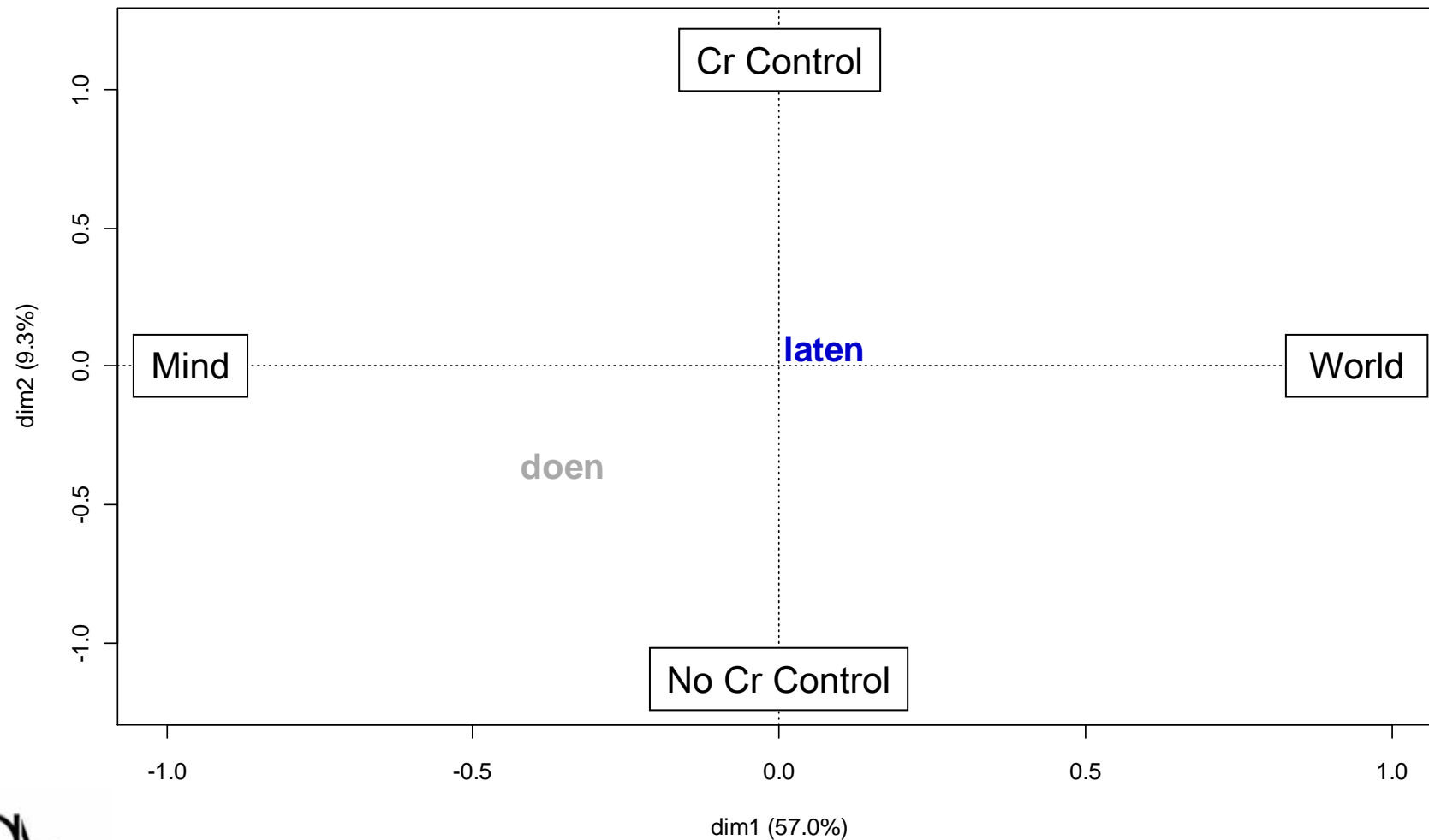
doen/laten + synt. Causee + trans. Effected Pred.



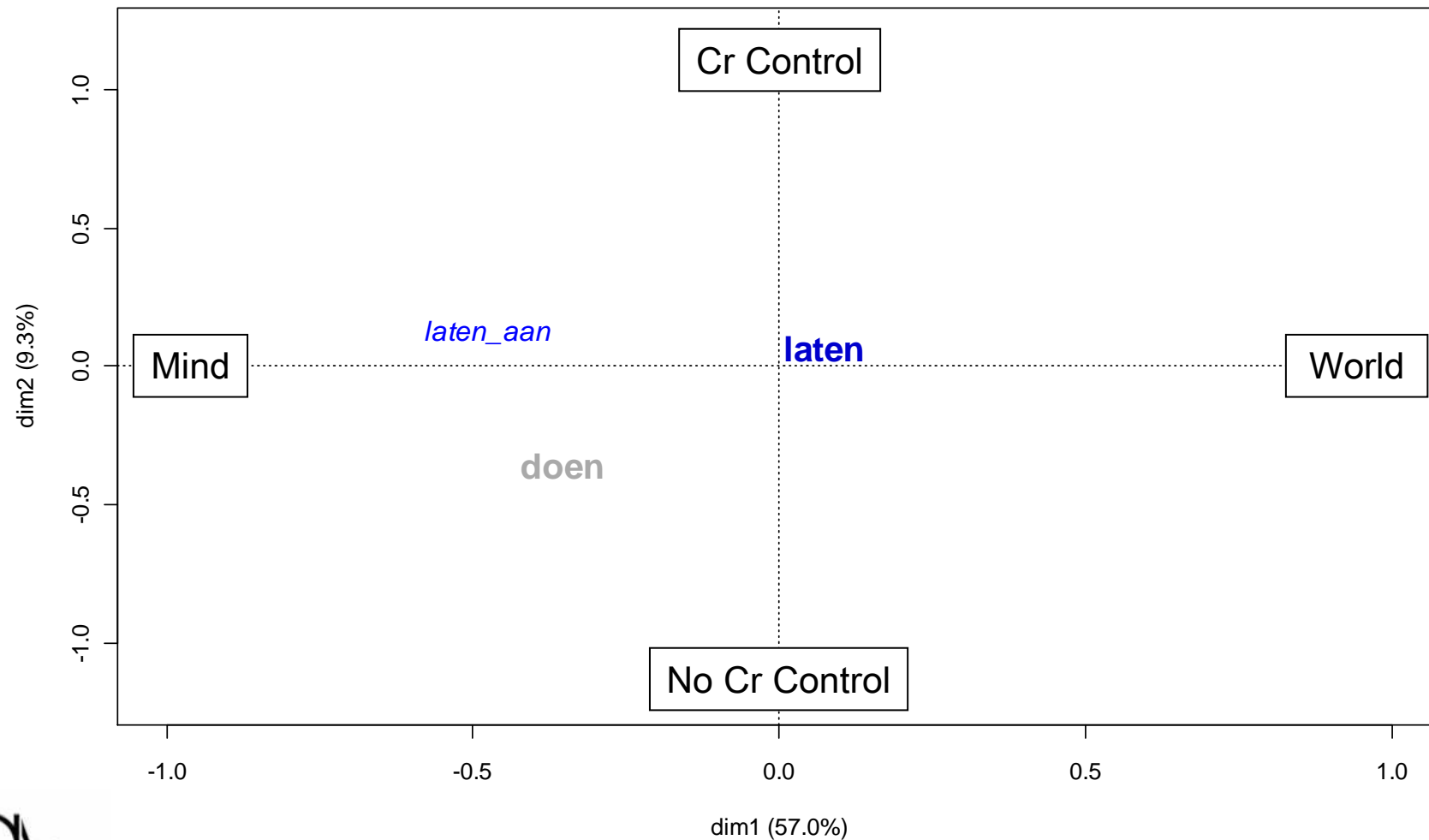
Principle of interpretation

- if the position of the siblings (more specific entities) differs significantly from the position of the parents (more schematic entities), we find constructional effects

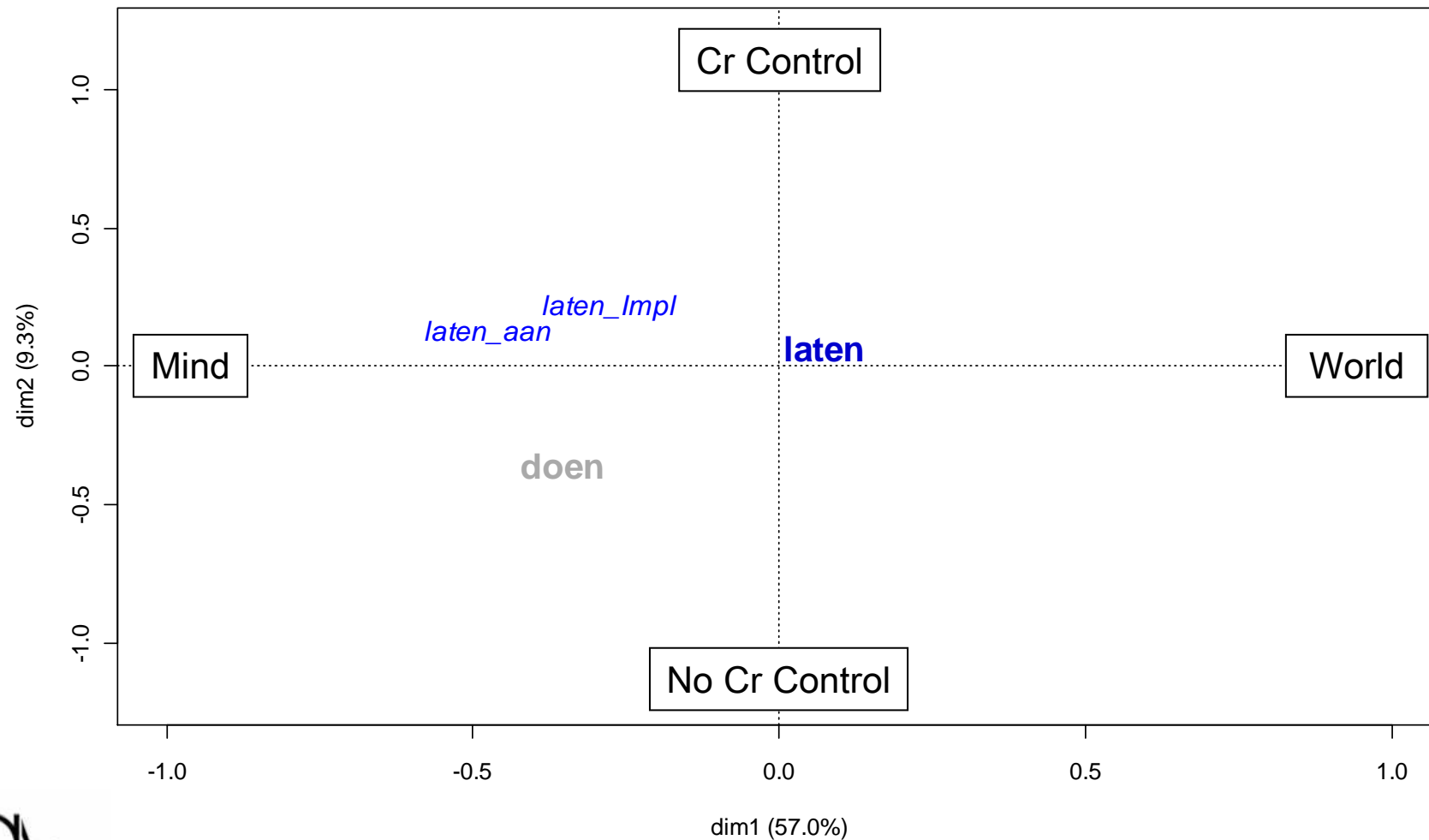
Mapping Cxs: laten + Ce



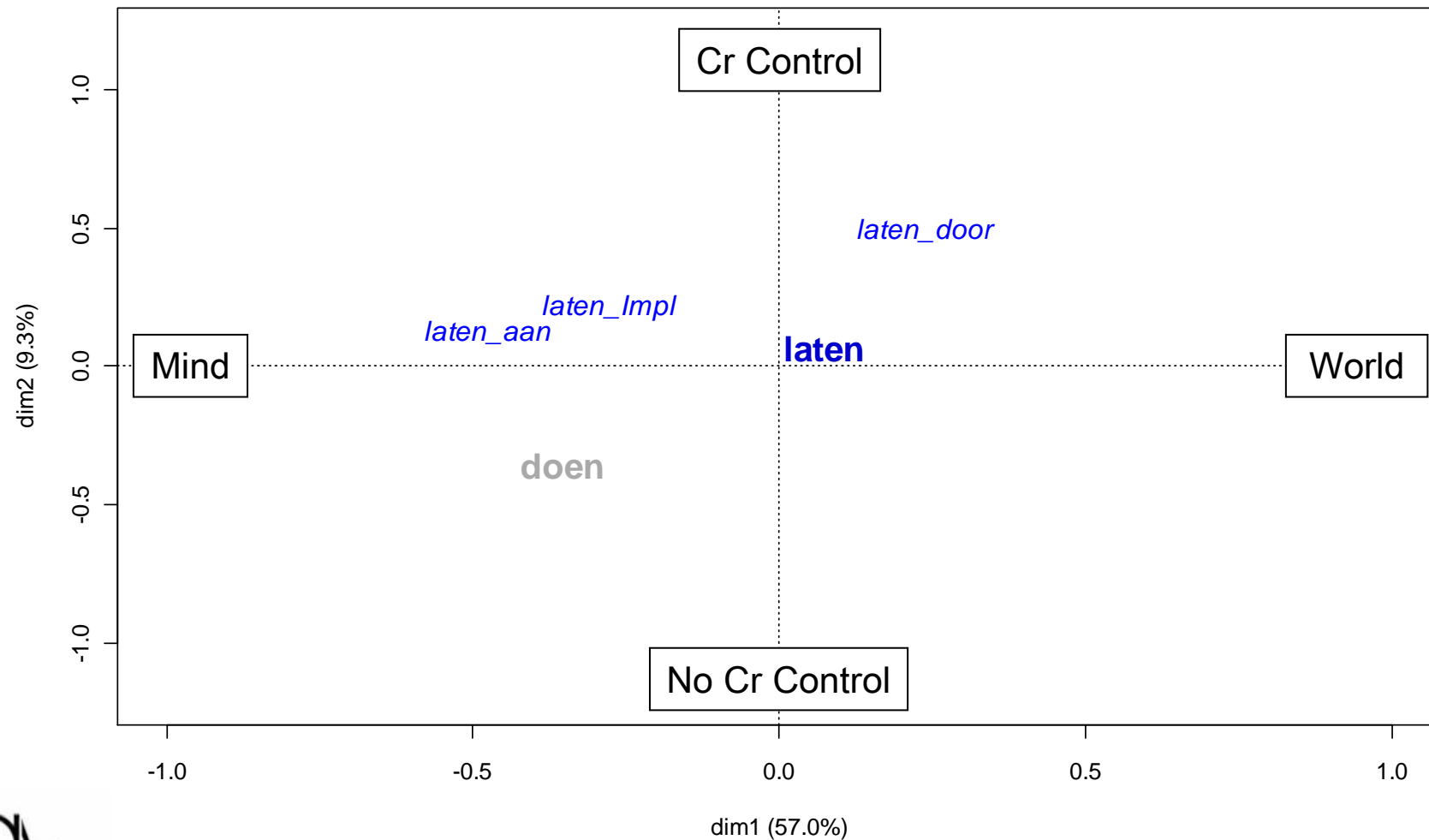
Mapping Cxs: laten + Ce



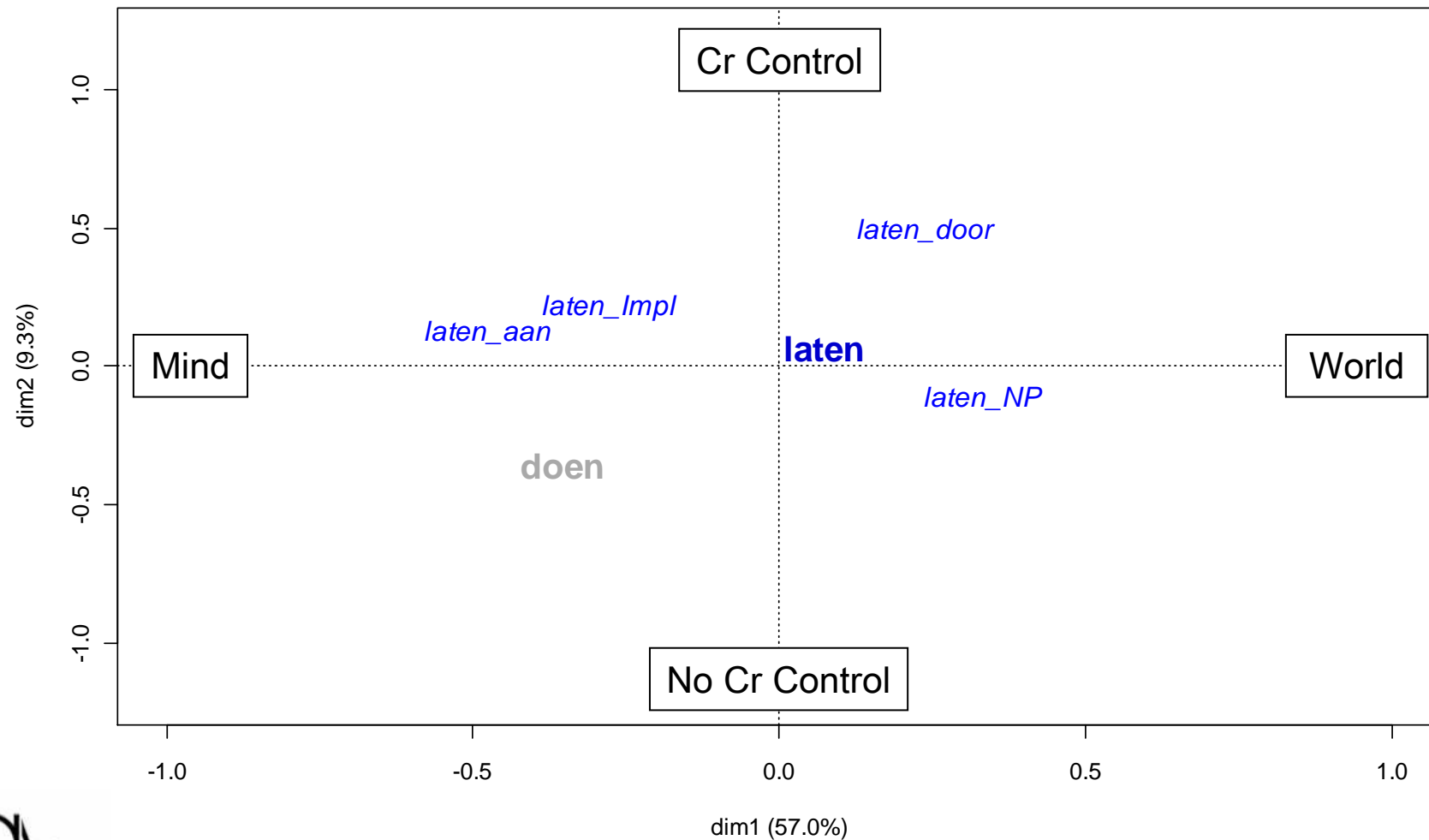
Mapping Cxs: laten + Ce



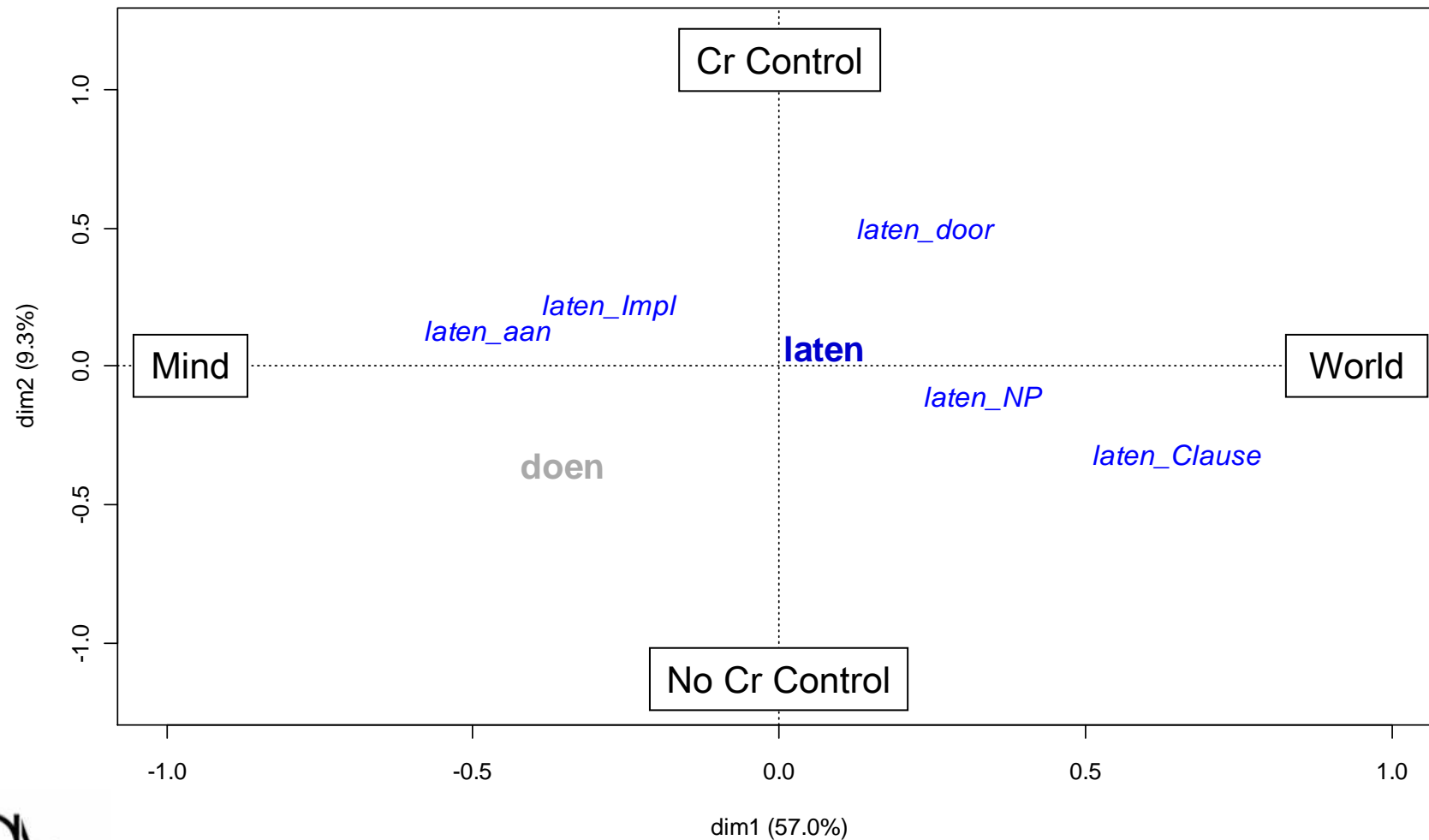
Mapping Cxs: laten + Ce



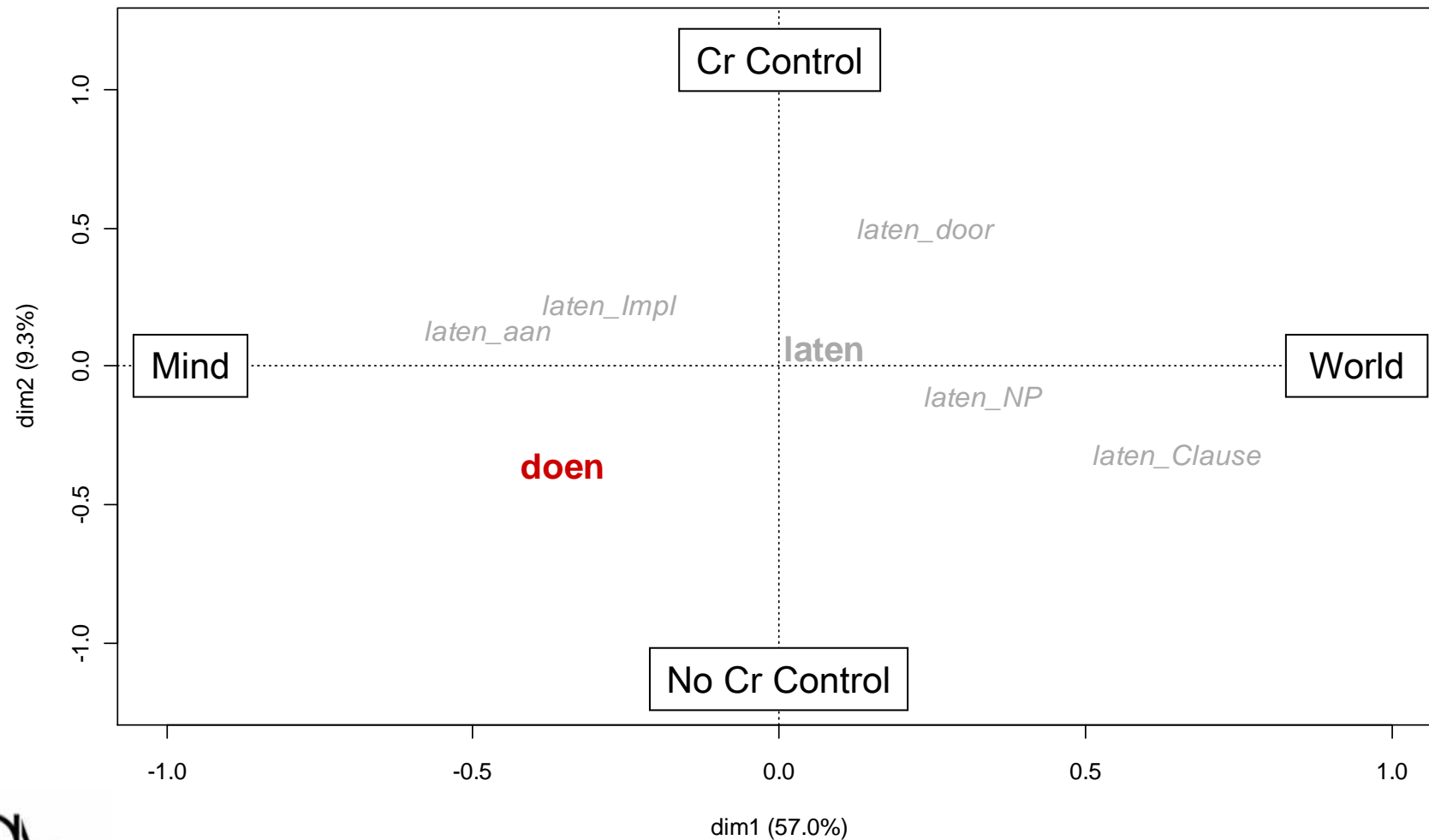
Mapping Cxs: laten + Ce



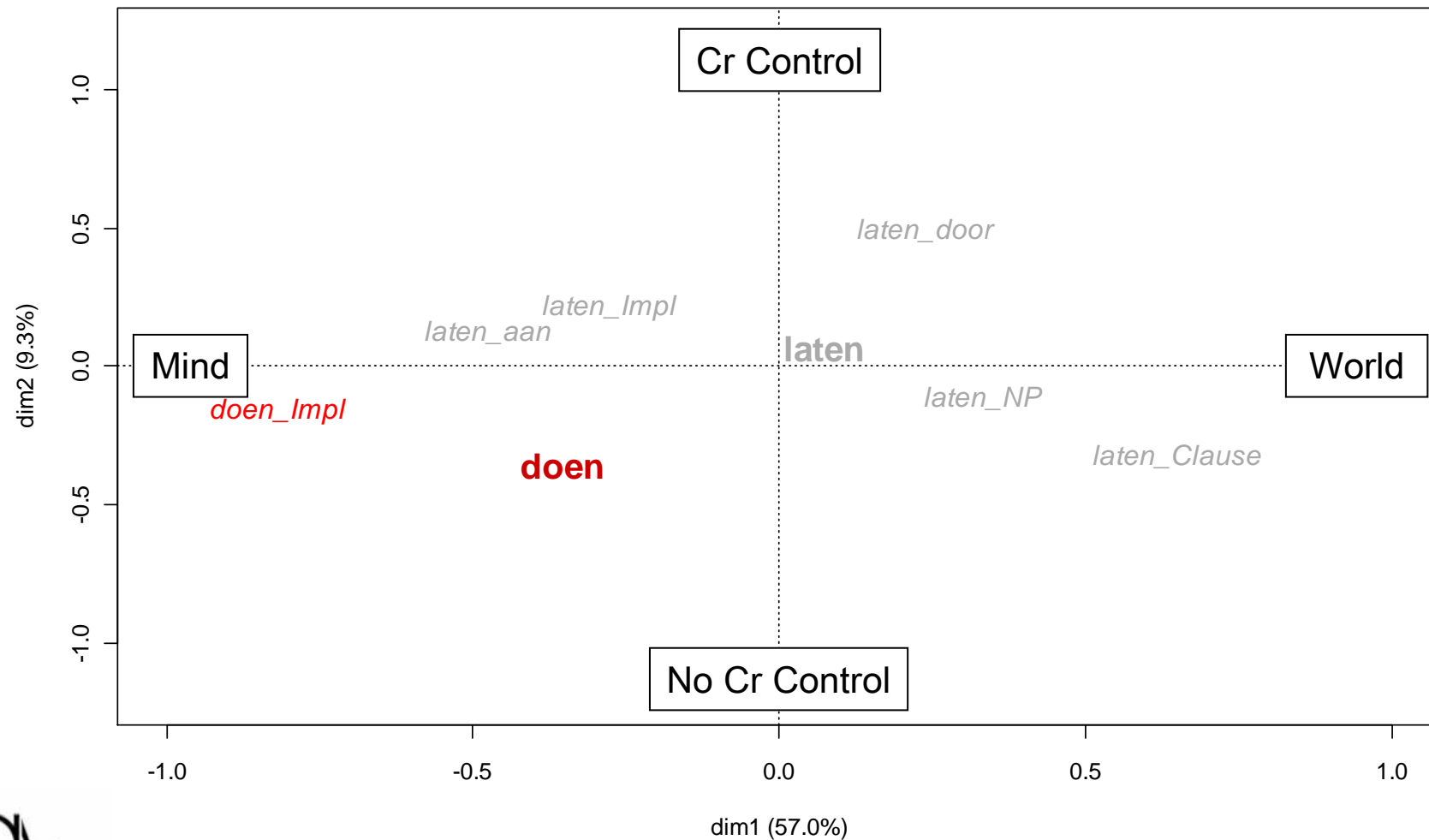
Mapping Cxs: laten + Ce



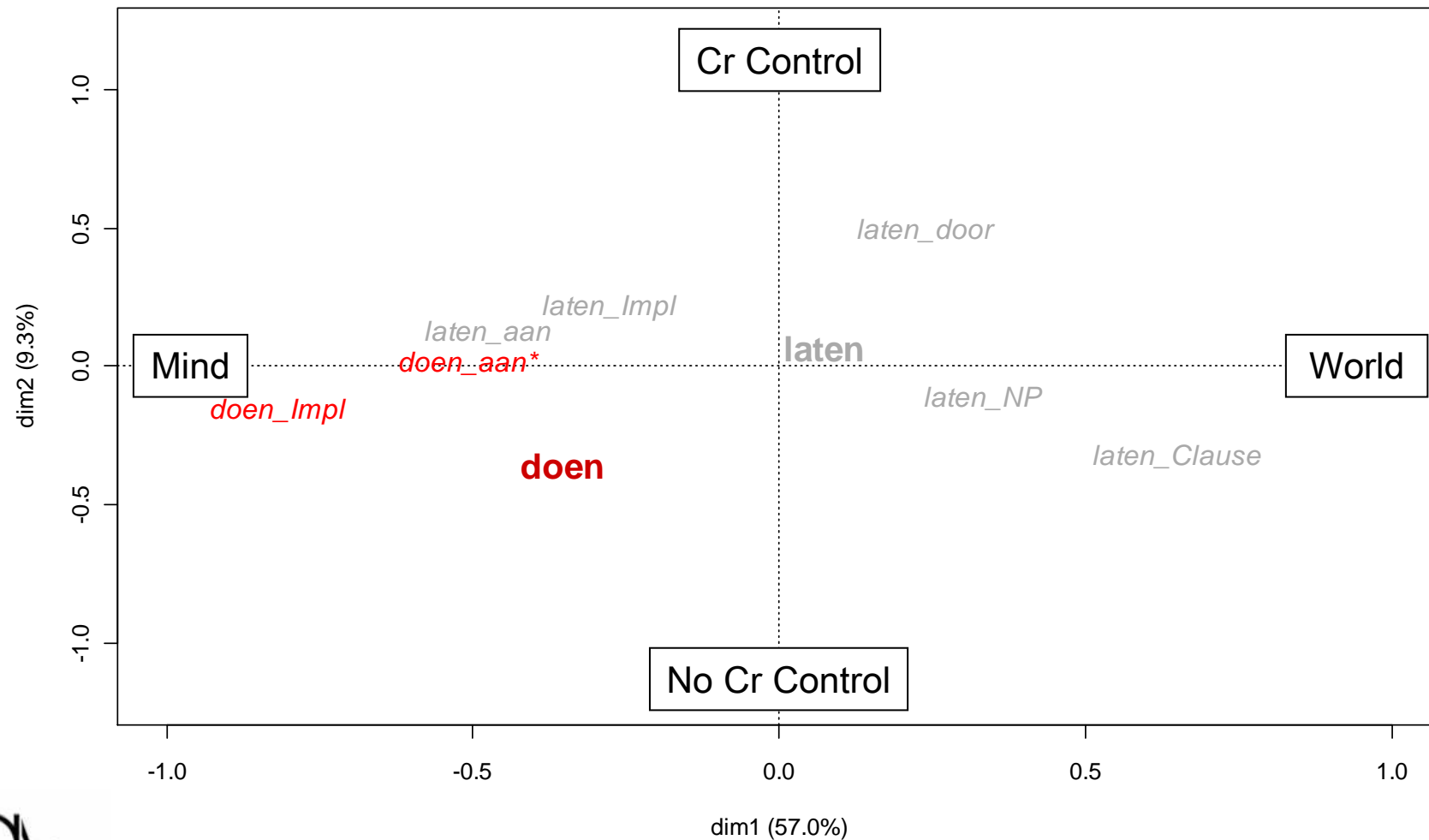
Mapping Cxs: doen + Causee



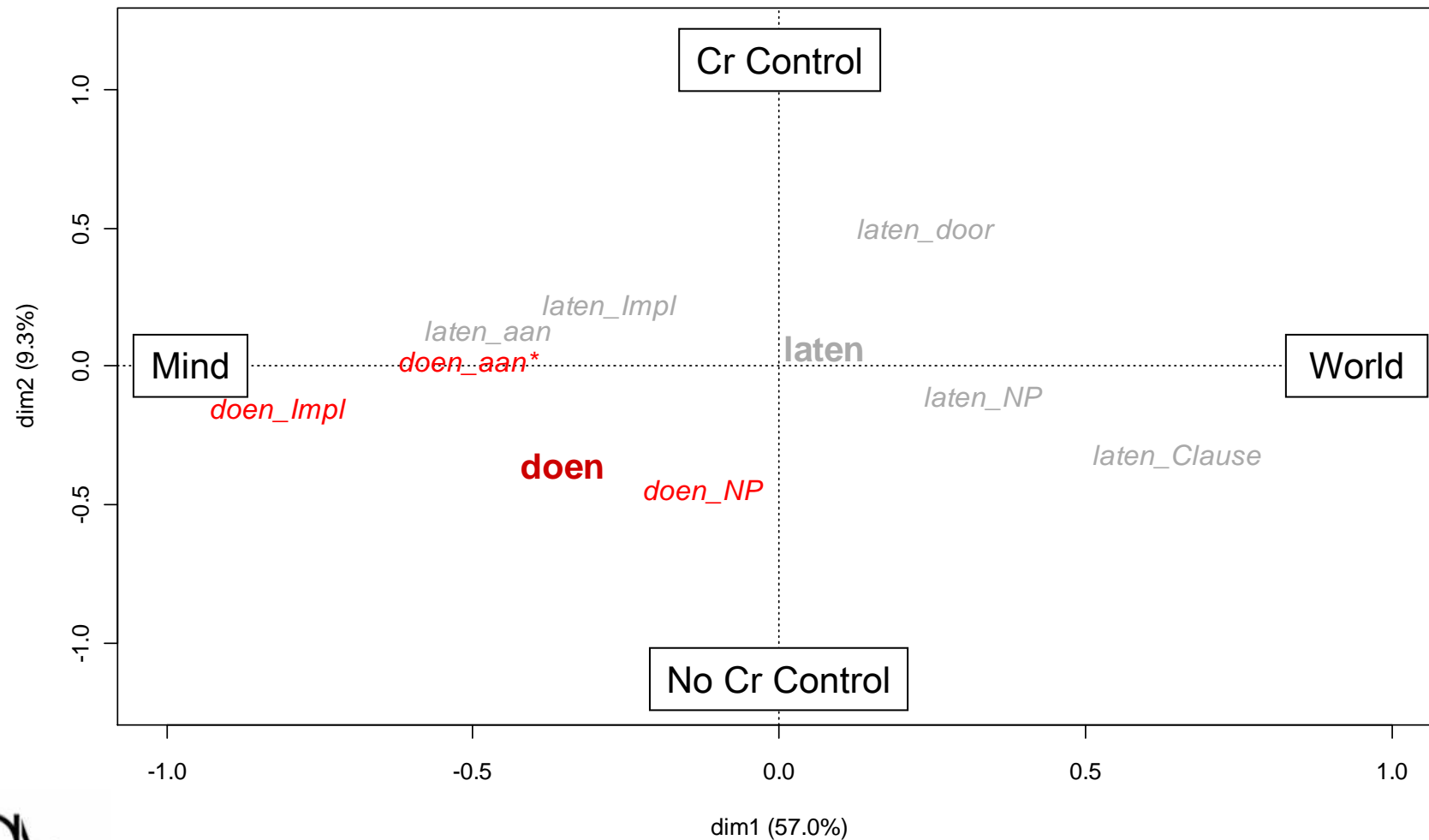
Mapping Cxs: doen + Causee



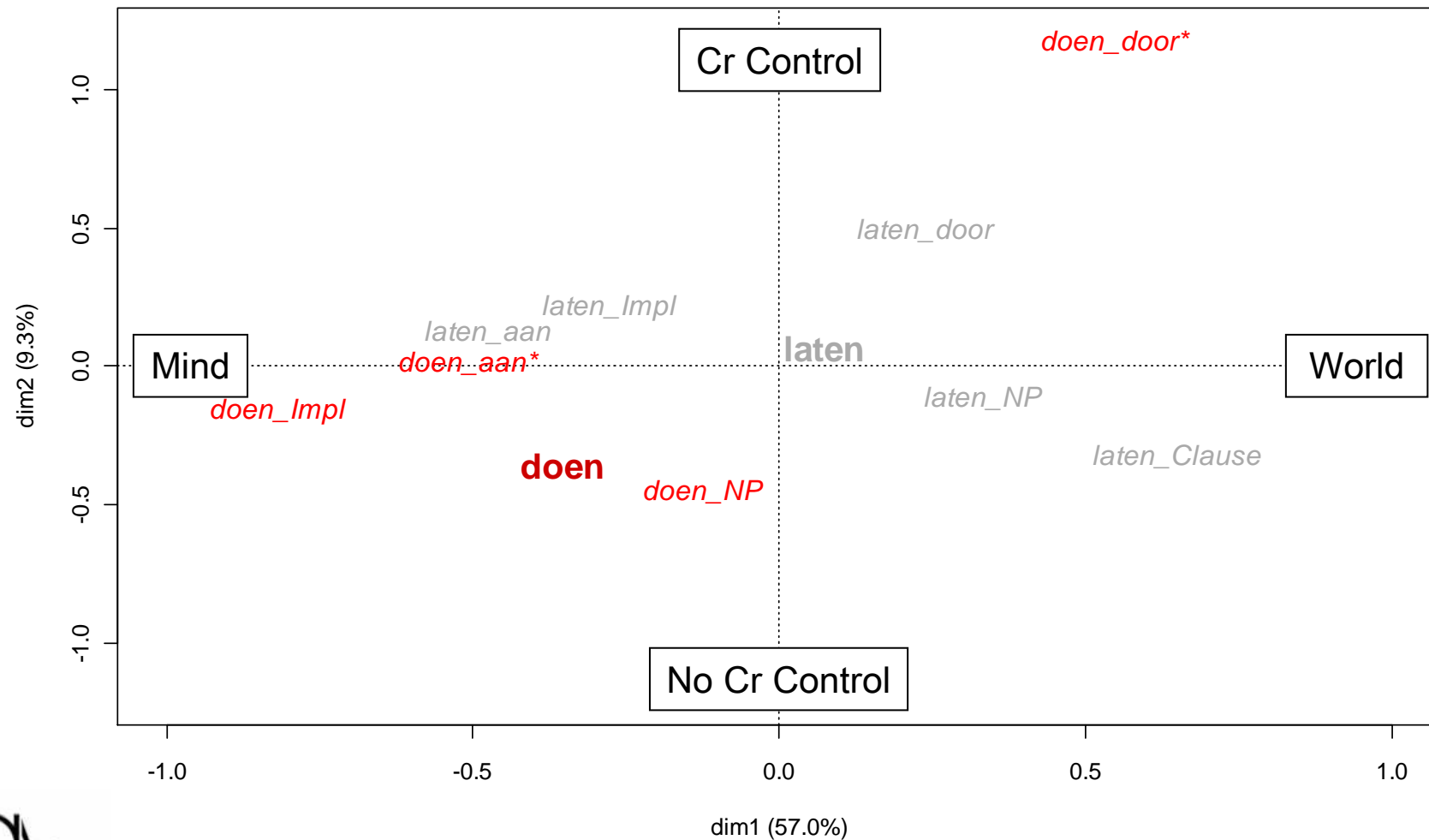
Mapping Cxs: doen + Causee



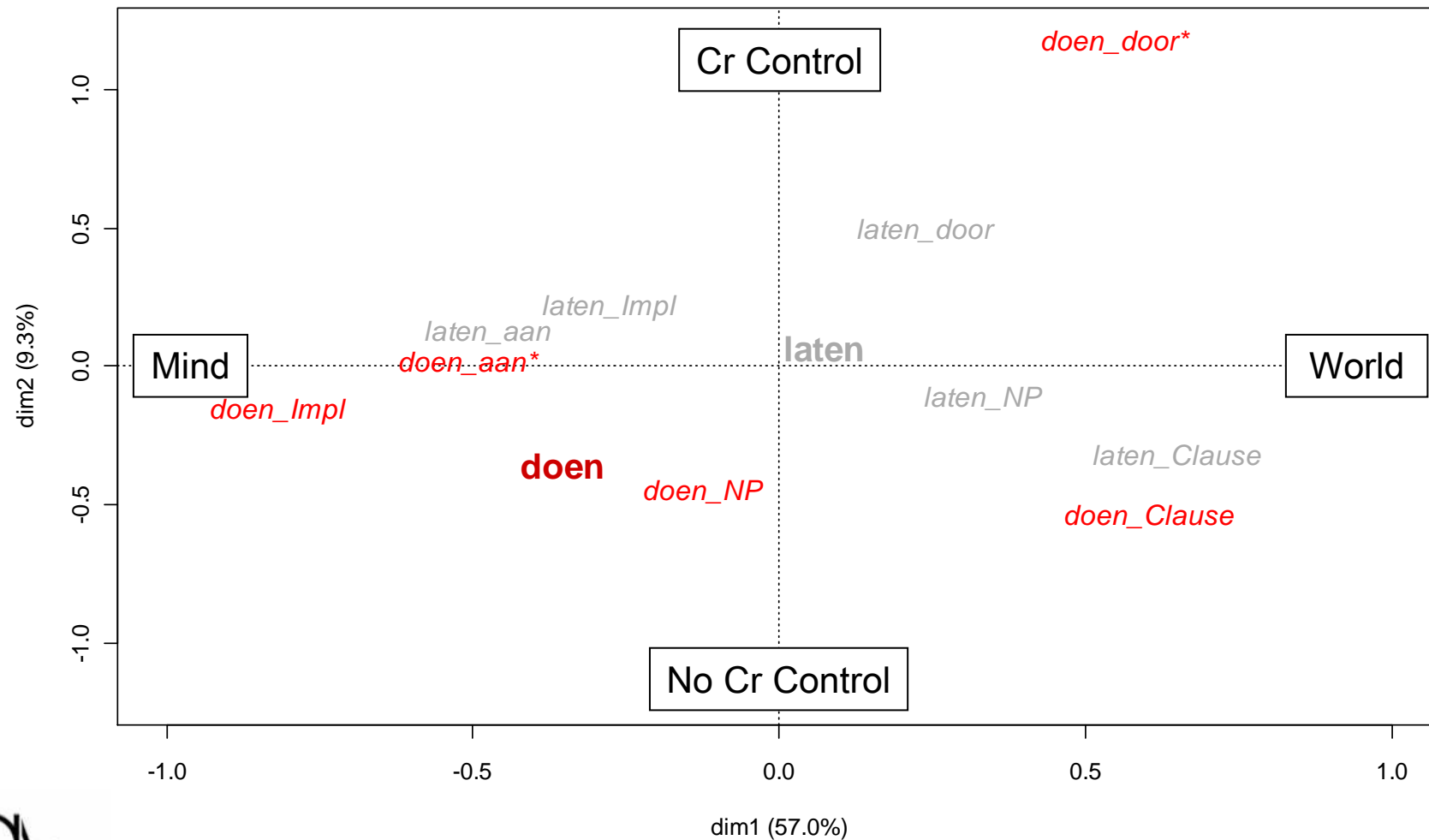
Mapping Cxs: doen + Causee



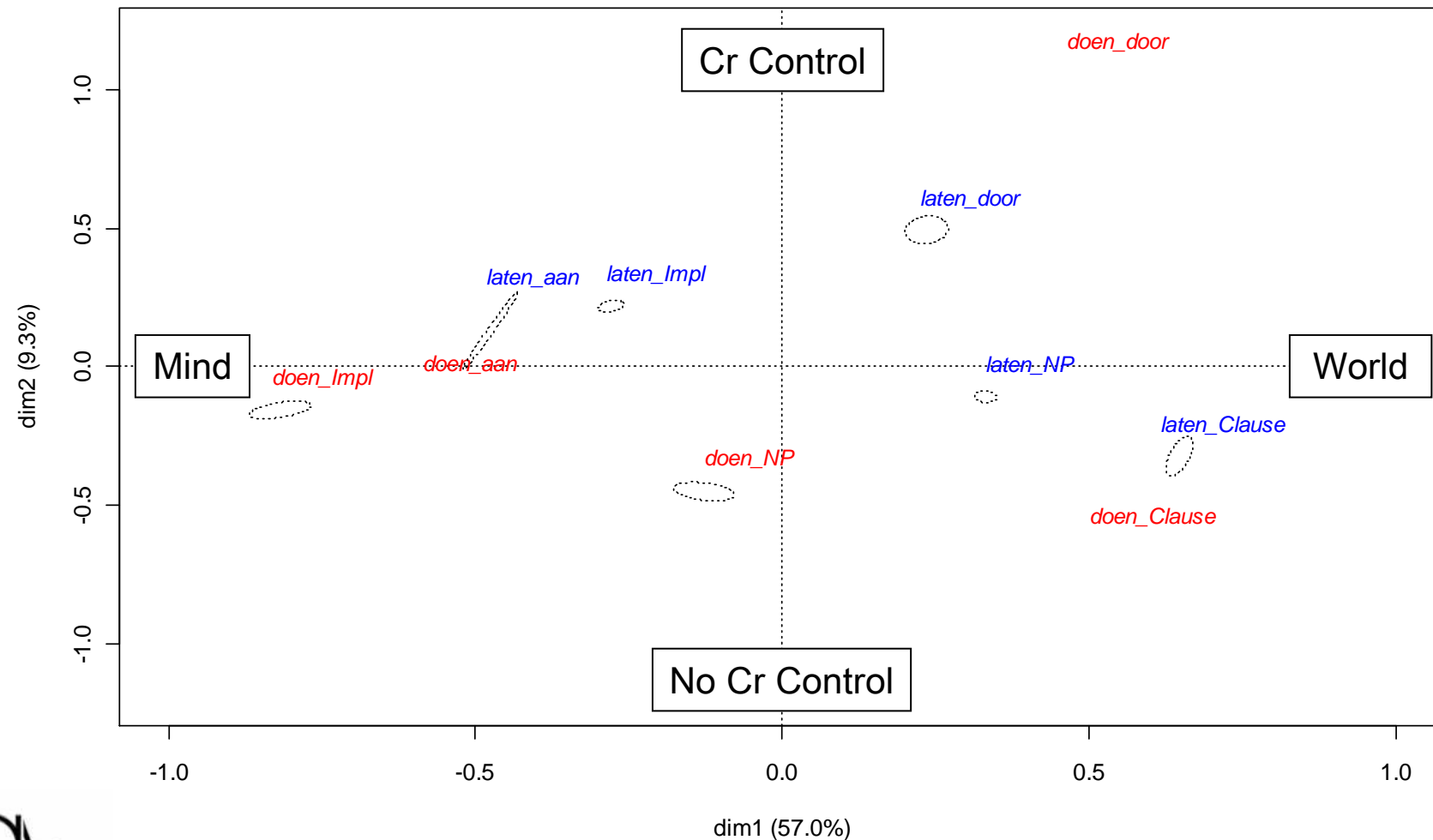
Mapping Cxs: doen + Causee



Mapping Cxs: doen + Causee



doen/laten + Ce: Confidence regions



doen/laten + Ce: Summary

- distinct semantics
- contiguous positions (cf. Croft's Semantic Map Connectivity Hypothesis) of *doen/laten* and different syntactic types of the Causee
- the most representative siblings have unmarked NPs

Formal Patterns

- 1 formal feature (maximally schematic):

doen/laten

- 2 formal features (medium schematic):

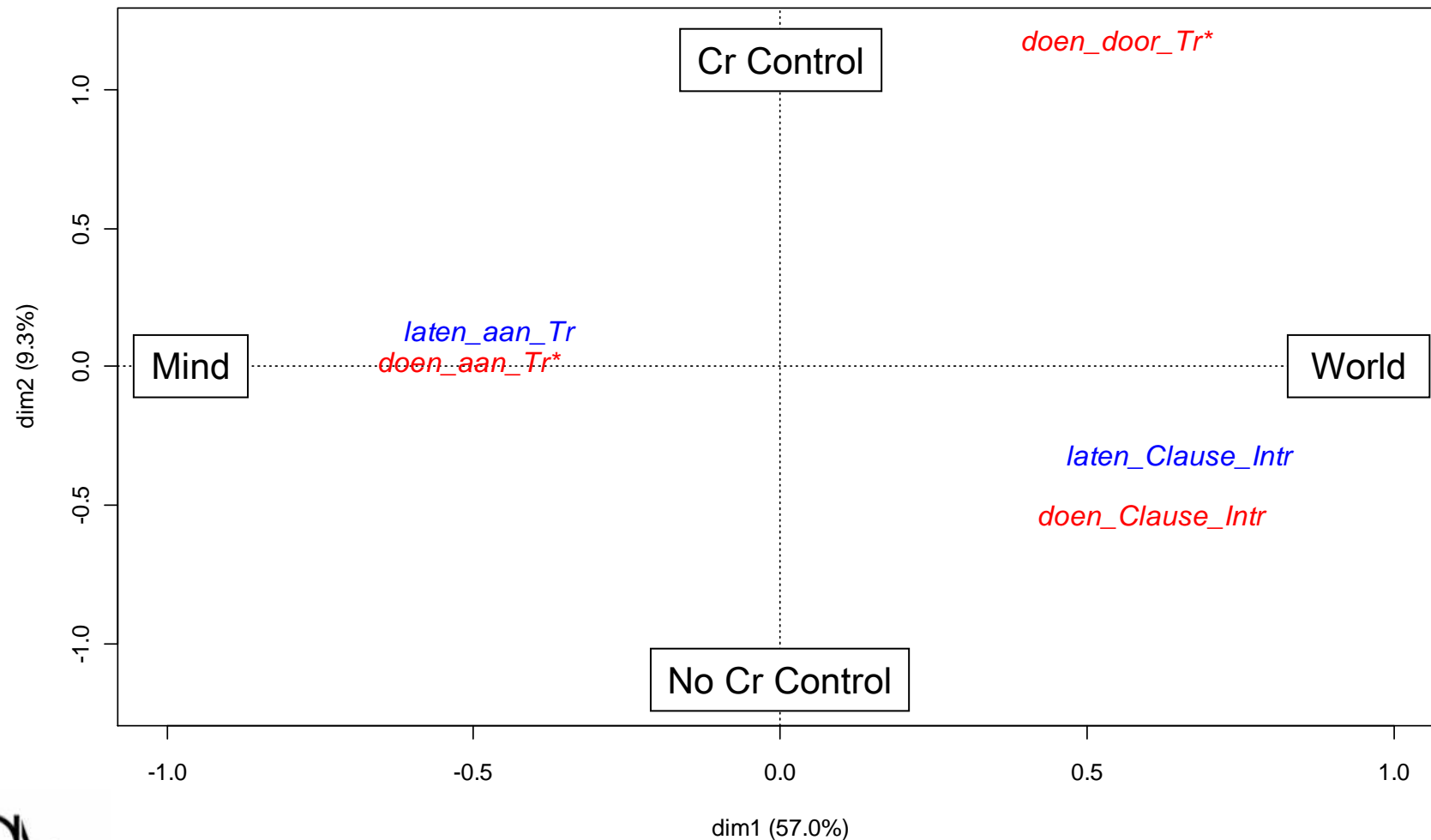
doen/laten + synt. Causee

- 3 formal features (specific):

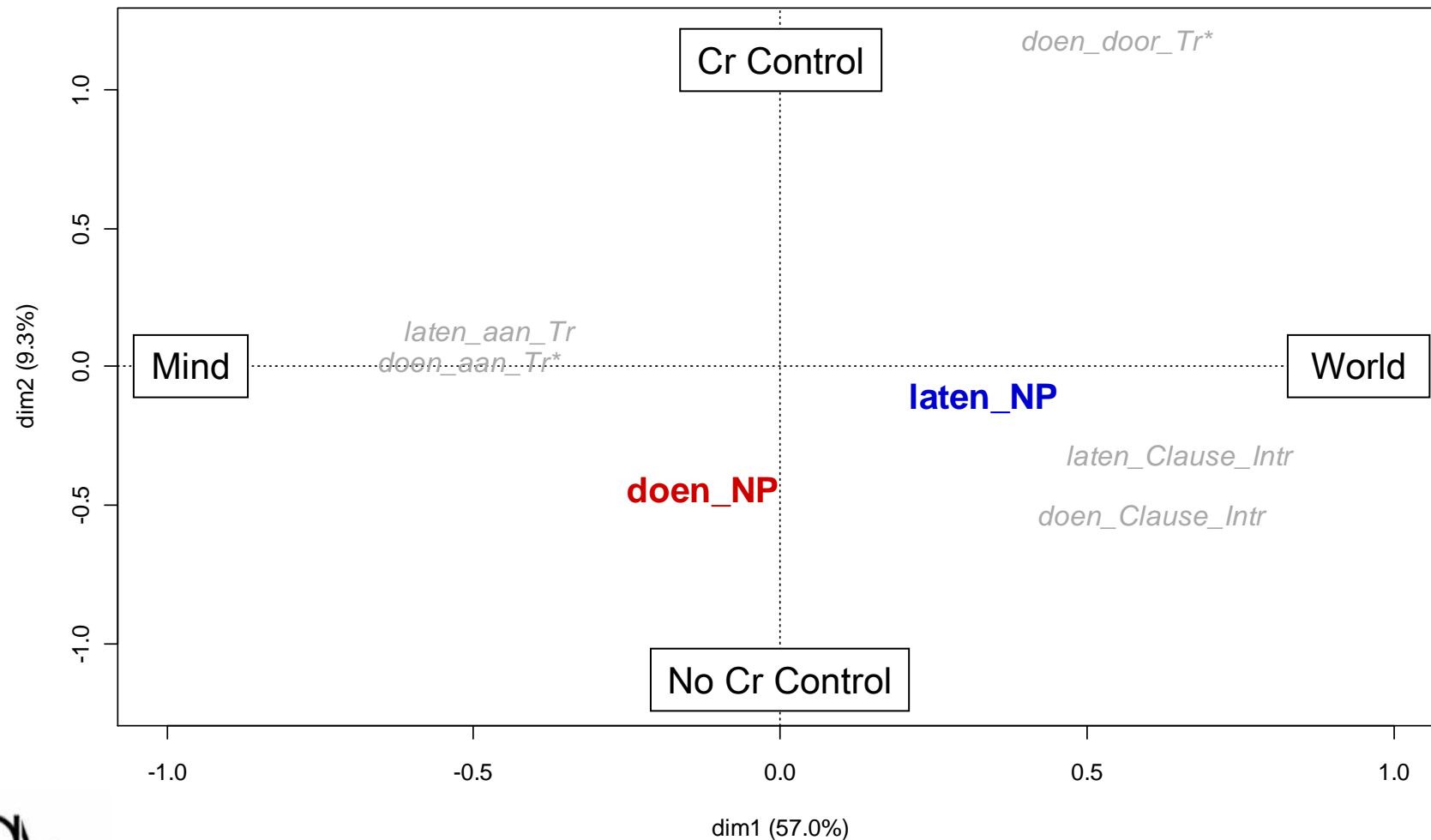
doen/laten + synt. Causee + trans. Effected Pred.



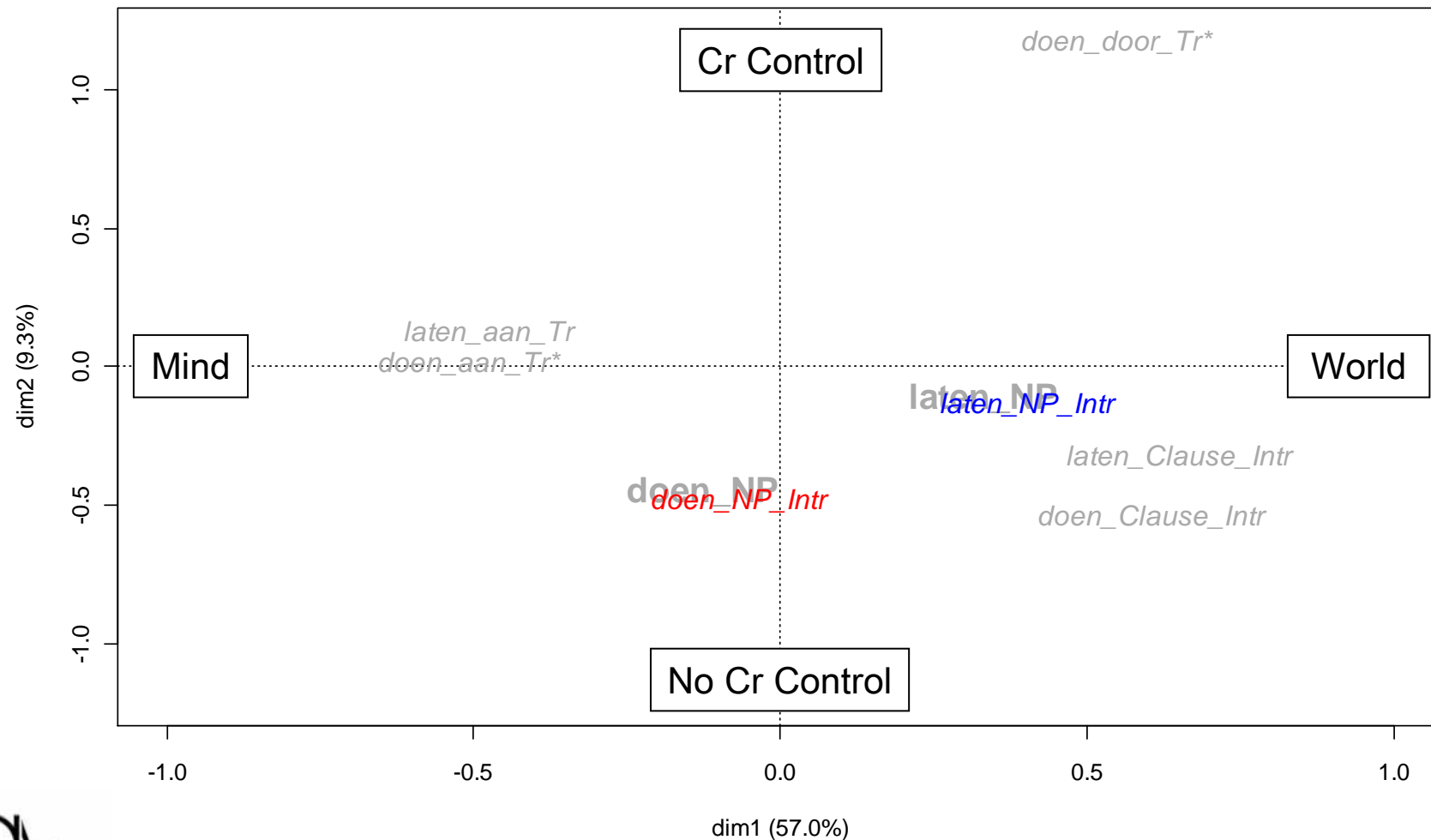
Mapping Cxs: doen/laten + Ce + Tr



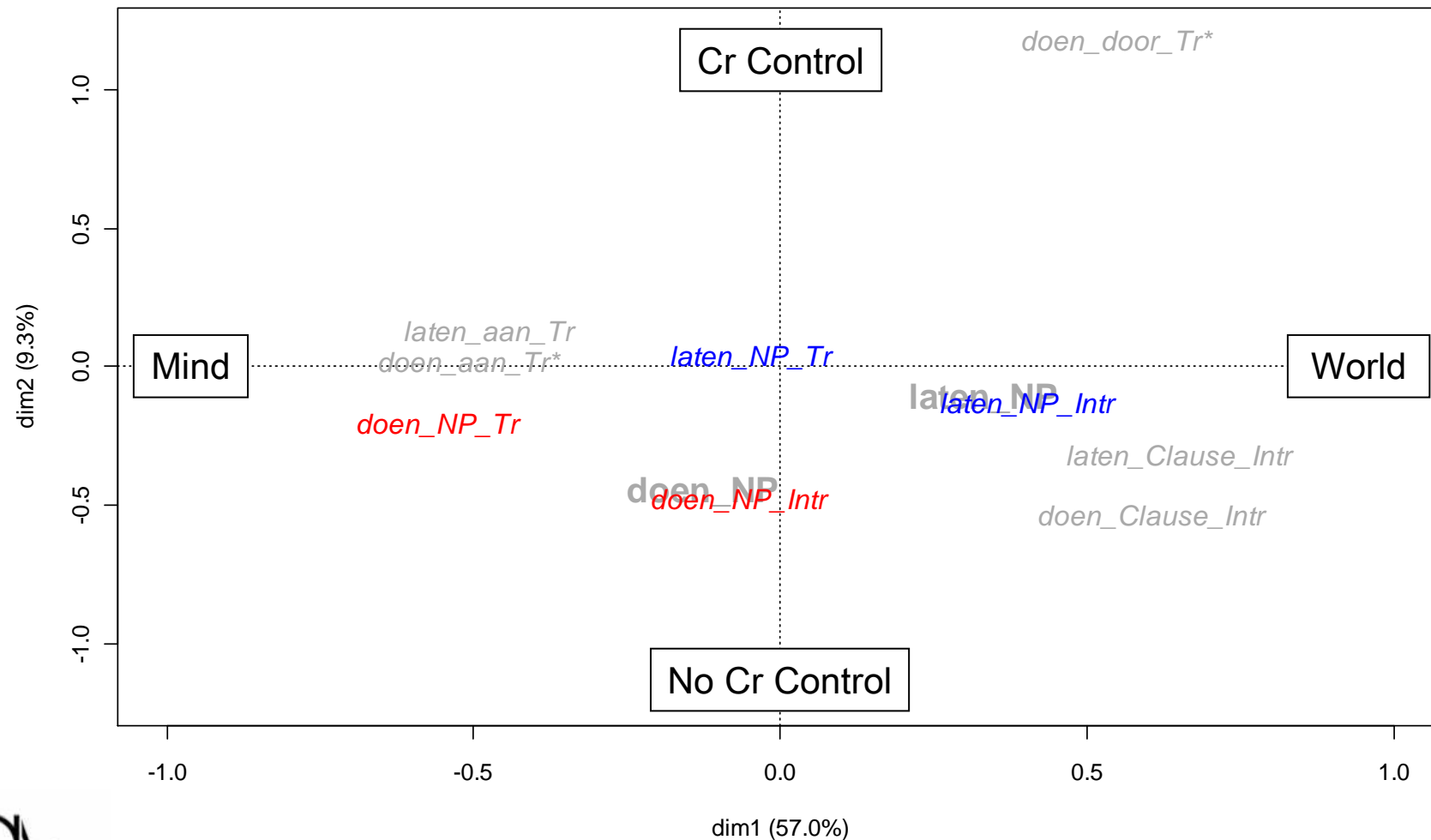
Mapping Cxs: doen/laten + Ce + Tr



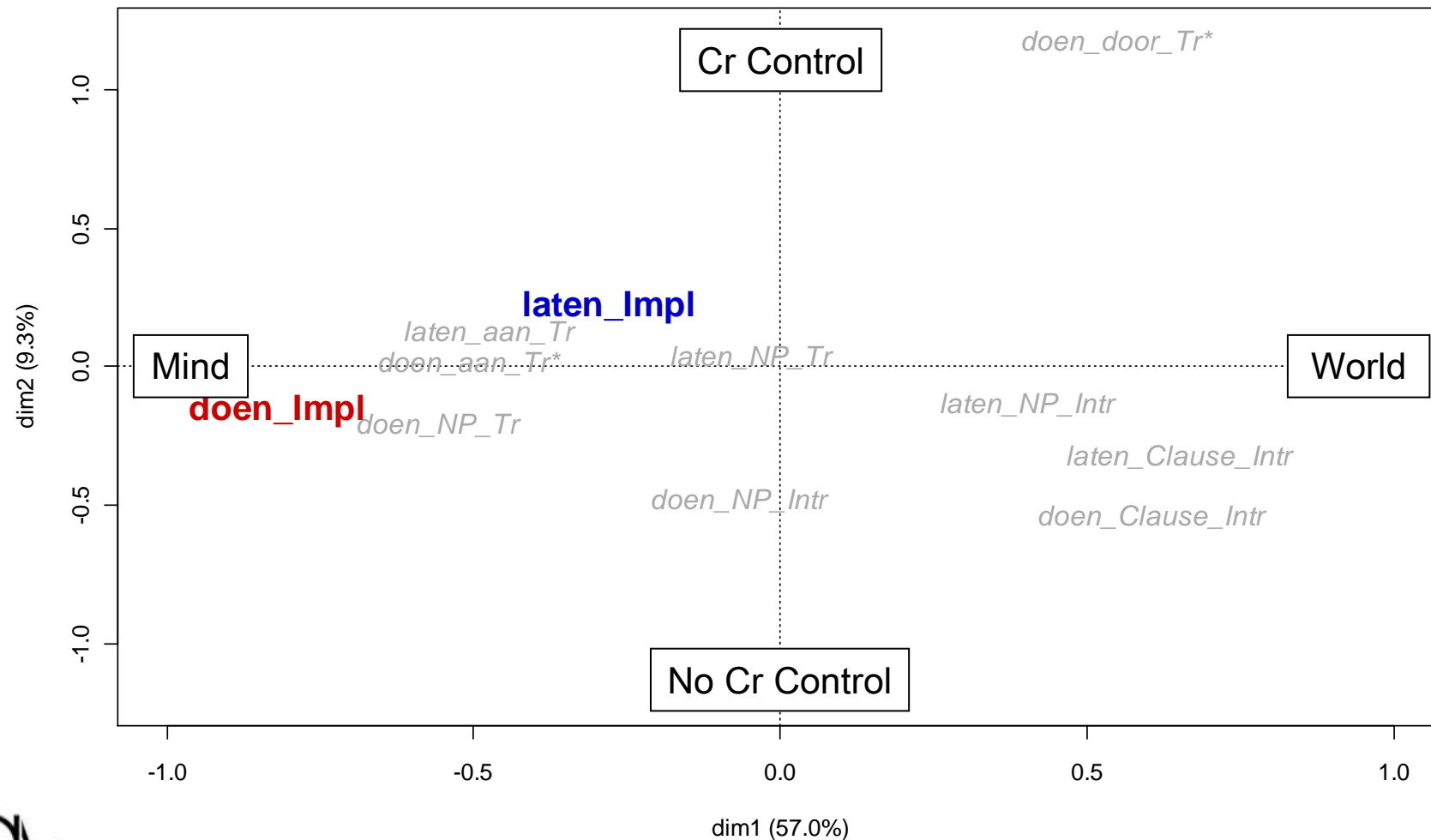
Mapping Cxs: doen/laten + Ce + Tr



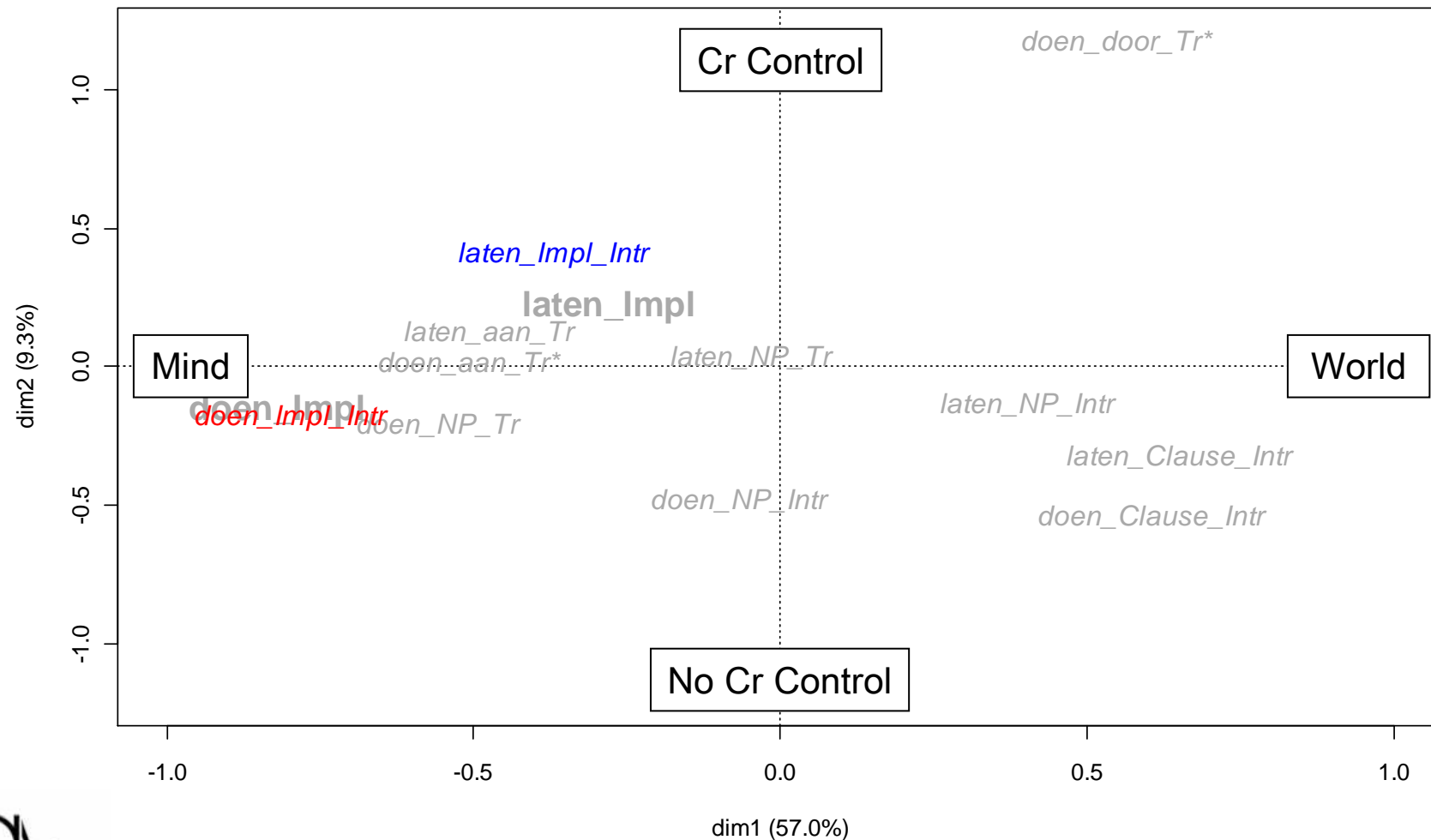
Mapping Cxs: doen/laten + Ce + Tr



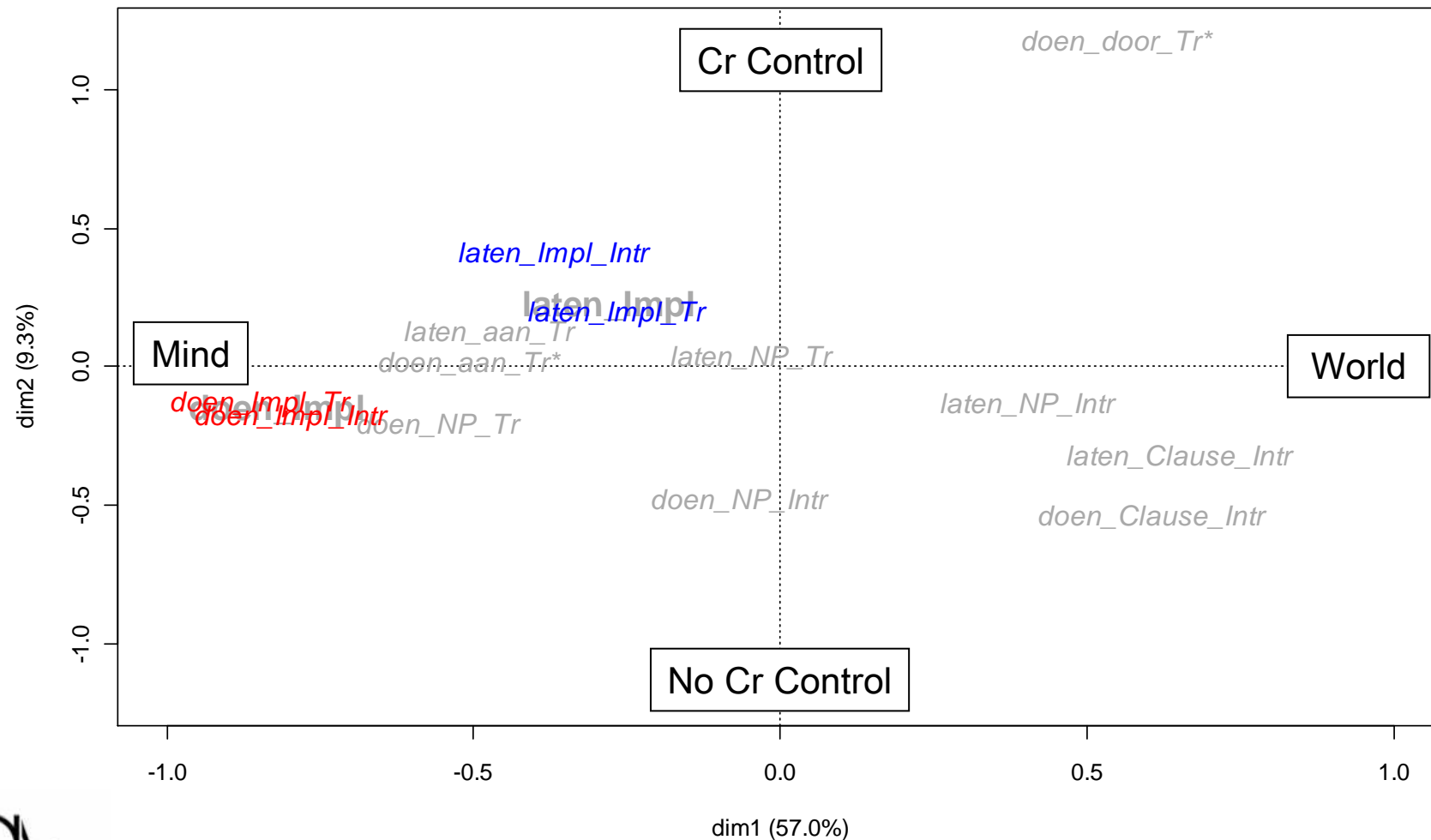
Mapping Cxs: doen/laten + Ce + Tr



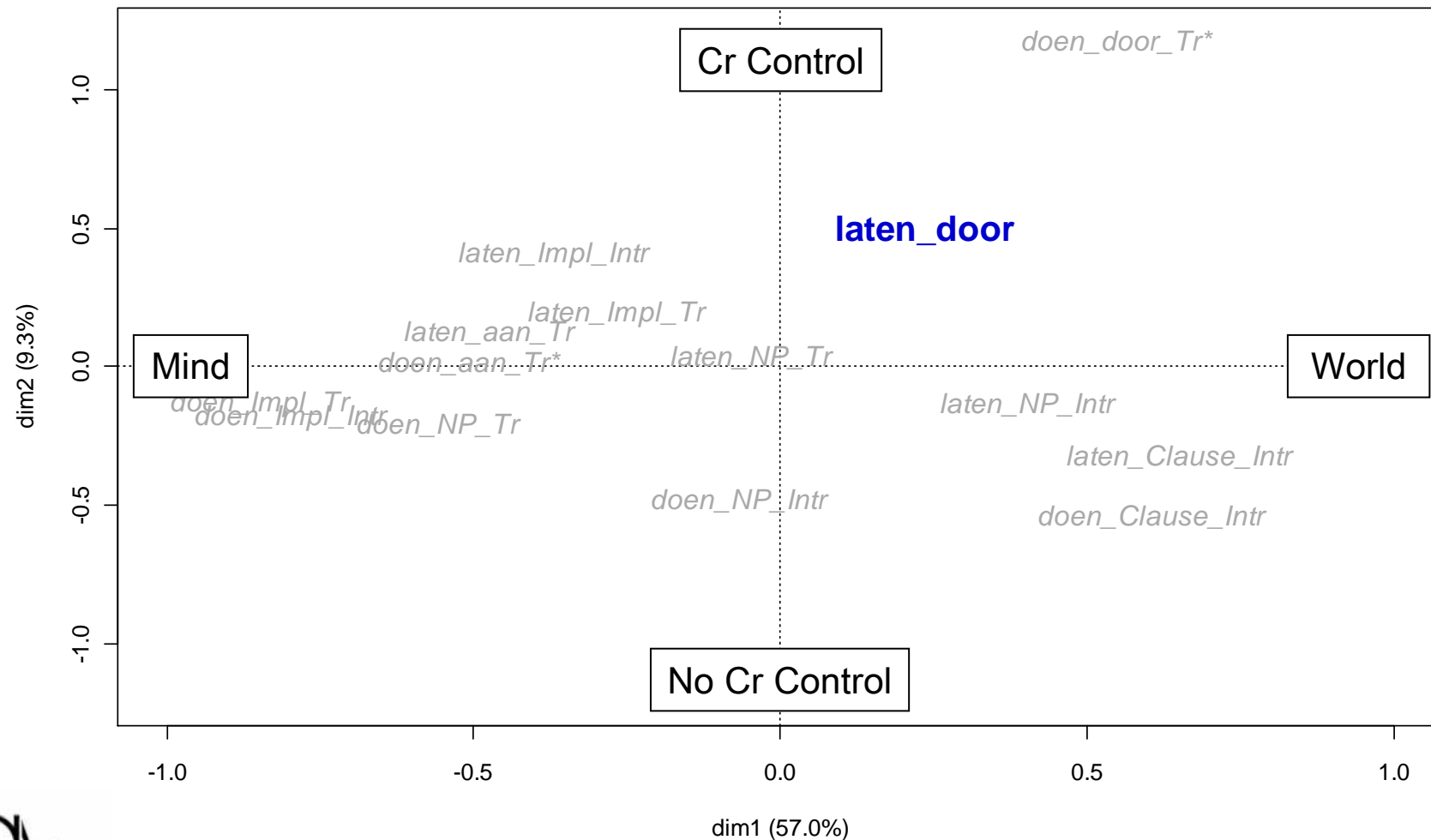
Mapping Cxs: doen/laten + Ce + Tr



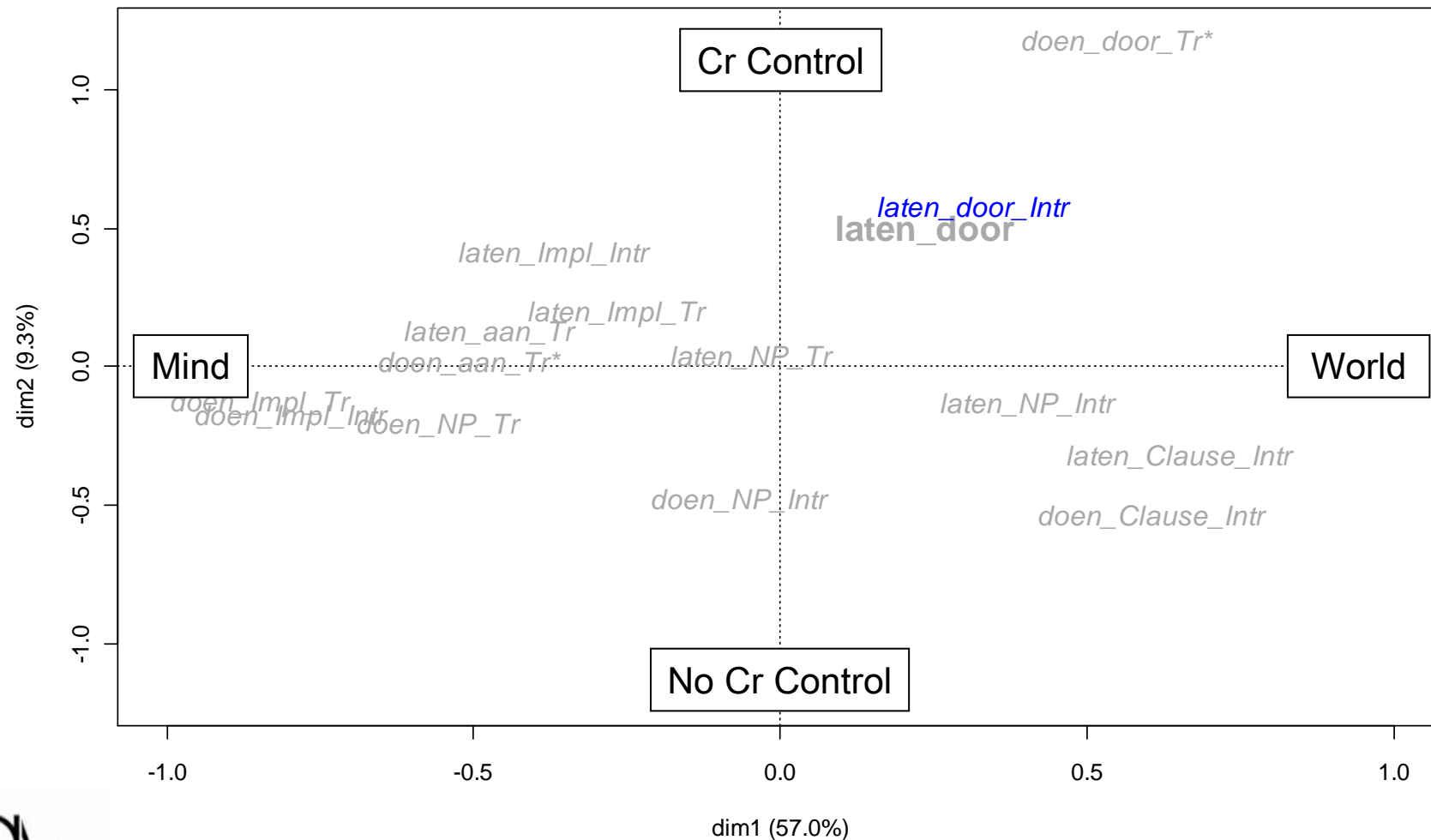
Mapping Cxs: doen/laten + Ce + Tr



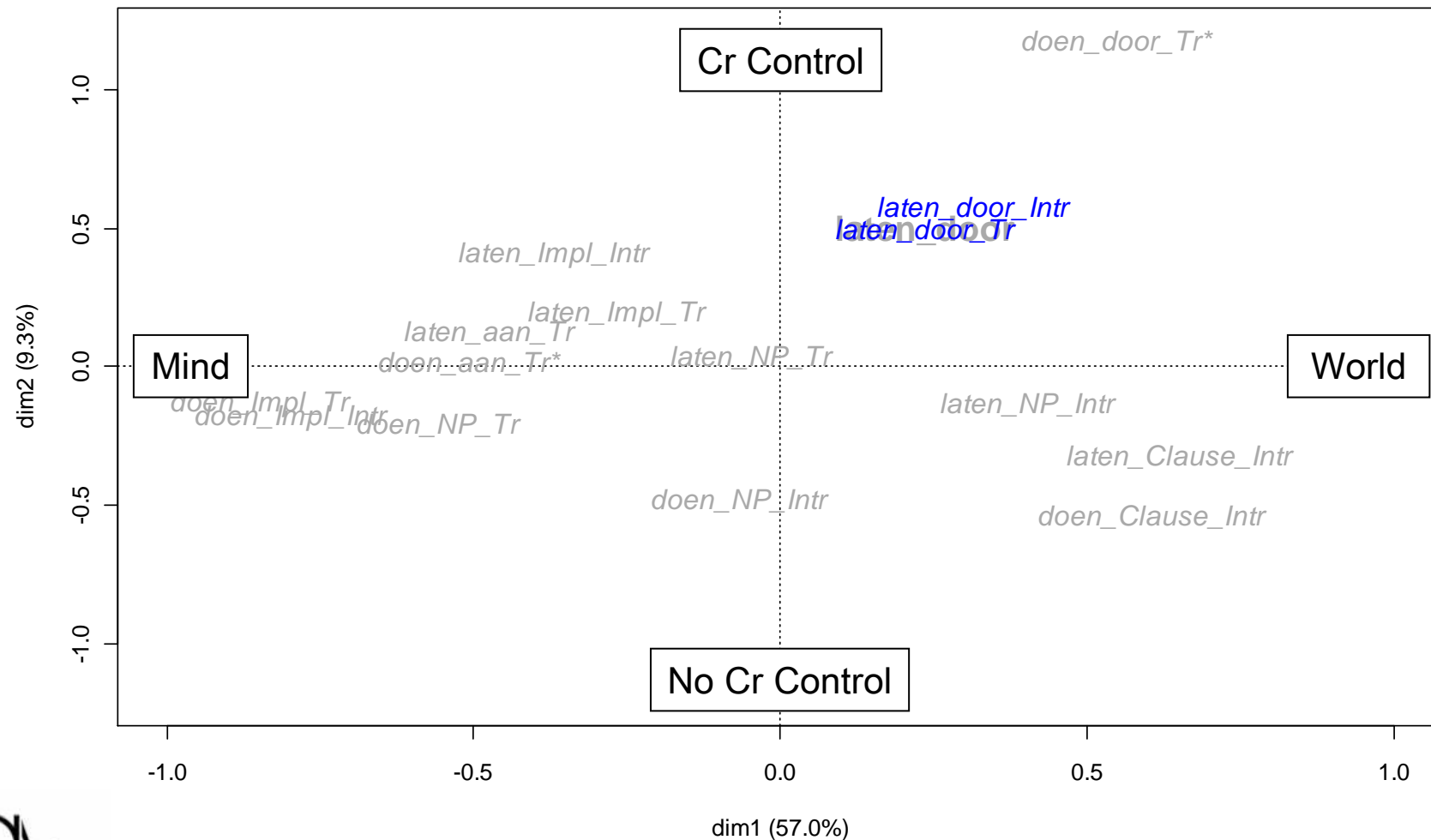
Mapping Cxs: doen/laten + Ce + Tr



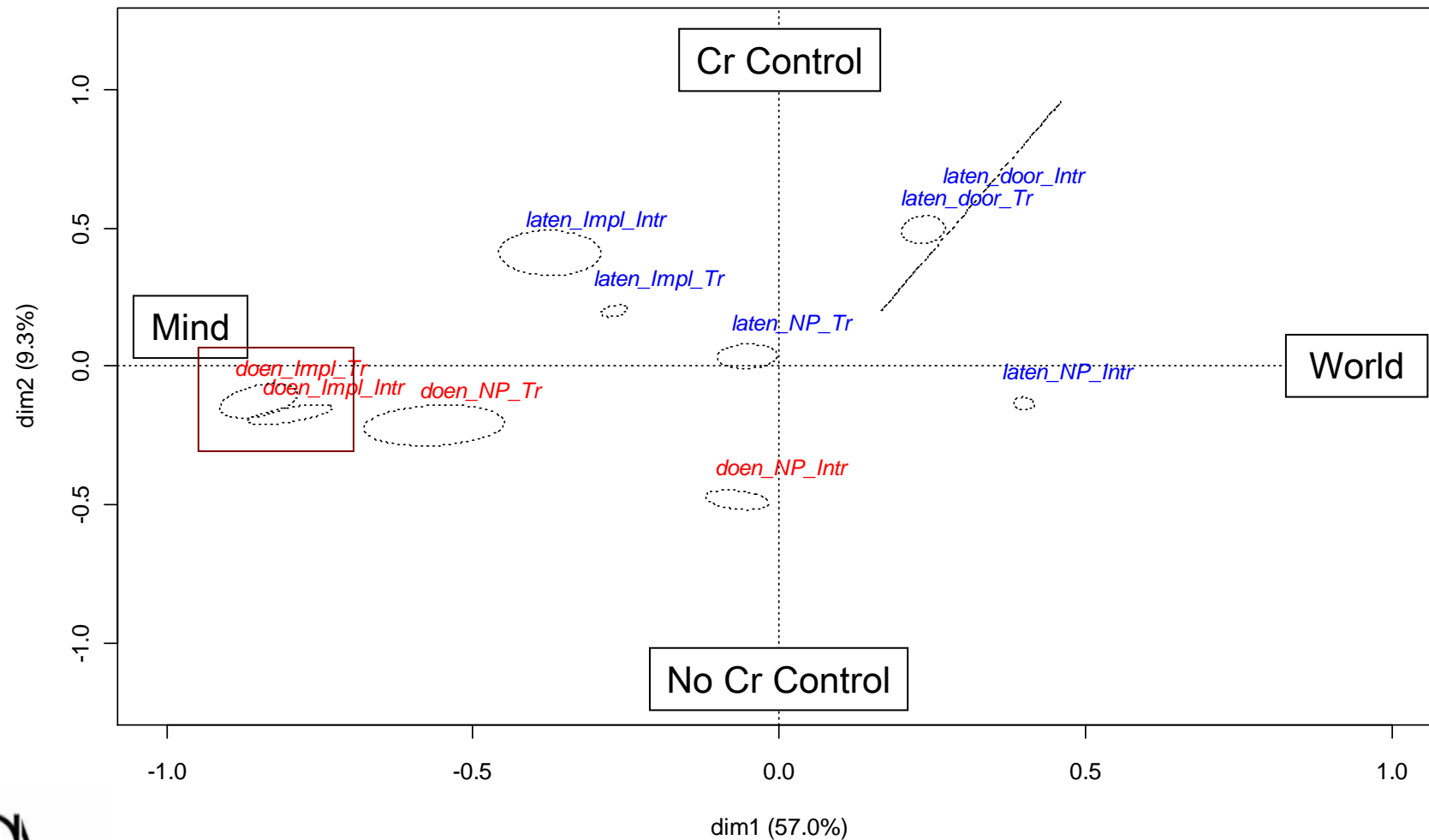
Mapping Cxs: doen/laten + Ce + Tr



Mapping Cxs: doen/laten + Ce + Tr



doen/laten + Ce + Tr: Confidence regions



doen/laten + Ce + Tr: Summary

- distinctive semantics except *doen_Impl_Tr* and *doen_Impl_Intr*; distinctiveness decreases with ‘mentality’ (non-prototypical transitivity)
- contiguity of positions of transitives and intransitives is not observed for mental events
- The best representatives for less mental Ce=NP are intransitives

Cf: a simple clause can have only two focal participants
(Langacker 1991: 410)

Outline

- Different ways of modelling relationships between Cx
- Dutch causative constructions
- Data and method
- A model of Dutch causative construction
- Discussion

Discussion: Our Method

- abstracts semantic patterns and their correspondences with formal patterns from usage events, bottom-up
- indicates important semantic dimensions
- captures hierarchical and horizontal relationships
- evaluates semantic distinctiveness with the help of confidence regions

Discussion: Semantic Space

- semantic space is formed mainly by semantic class of Caused Events and, to a lesser extent, by relationships between Causer and other participants
- dim 2 (“Cr’s control”) is more visible for non-mental events

Discussion: Form-Meaning Mapping

- maximally schematic level:
too schematic for description
- medium schematic level:
highly relevant for the identification of constructional effects
- specific level:
only partially relevant

Future Research

- from specific to maximally specific:
what if we get down to the actual lexical patterns ?



for further information:

<http://wwwling.arts.kuleuven.be/qlvl>

natalia.levshina@arts.kuleuven.be

dirk.geeraerts@arts.kuleuven.be

dirk.speelman@arts.kuleuven.be