Abstraction in definition, or indefinition

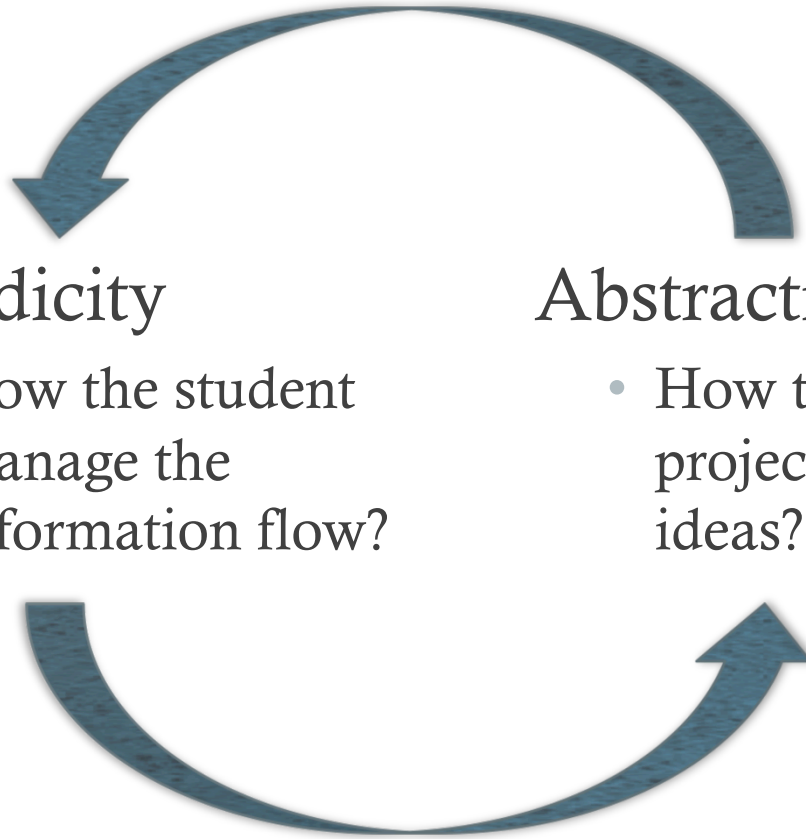
Cecilia Fung-kan PUN
co-tutelle PhD student
CityU, HK/ USYD

5th November, 2010
Friday Seminar

Where to start with…

- LCC/SLATE project
  - Joint-venture between CityU and USYD
  - Front-loading support & providing feedback in the commenting-and-drafting cycle(s)
  - Students' written assignments in various disciplines
  - Linguistics and Language Technology

Academic Discourse



Periodicity

- How the student manage the information flow?

Abstraction

- How the students project/express their ideas?

Abstraction

in action…

Abstraction

- Discussed in a non-specialized way
  - ~~Definition~~
- Halliday and Matthiessen (1999)
  - Conscious & Non-conscious (Material & Semiotic)
- Halliday (2005)
  - Material & Meaning
- Martin and Rose (2003/2007)
  - Concrete & Abstract & Metaphoric

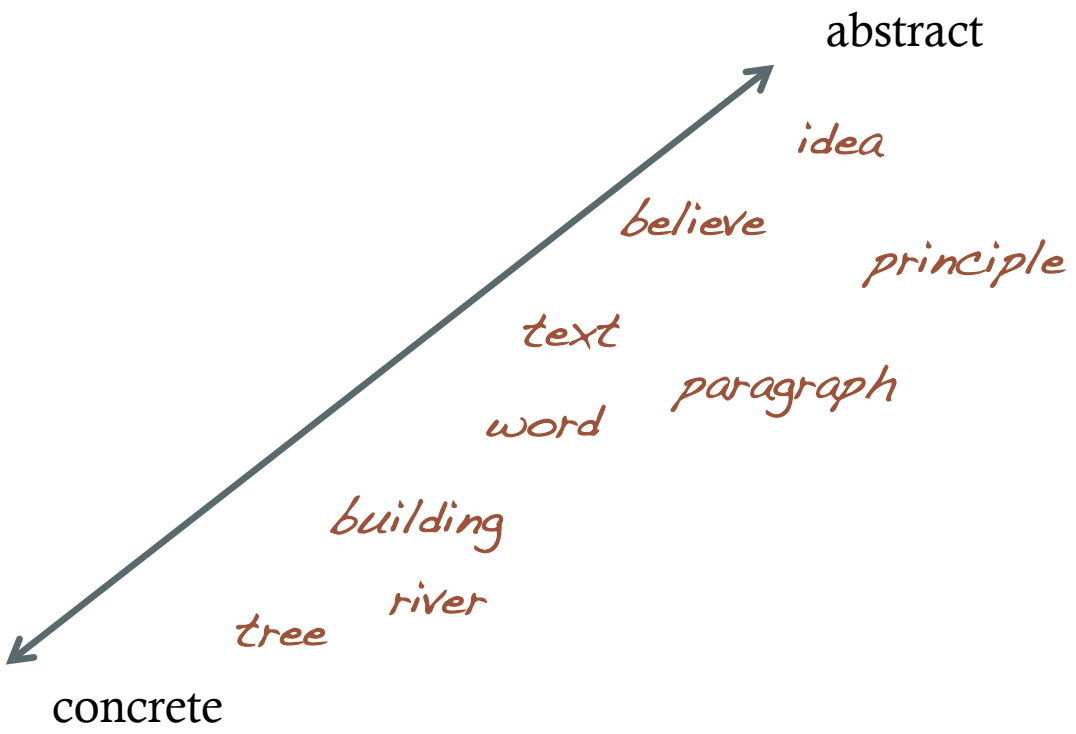
Abstraction

- THING
  - Nominal Group
    - Working unit
  - Possibility of transcategorization

- Attempt to define
  - Perception of the world
    - Existence (natural & artificial)
  - Language internal definition

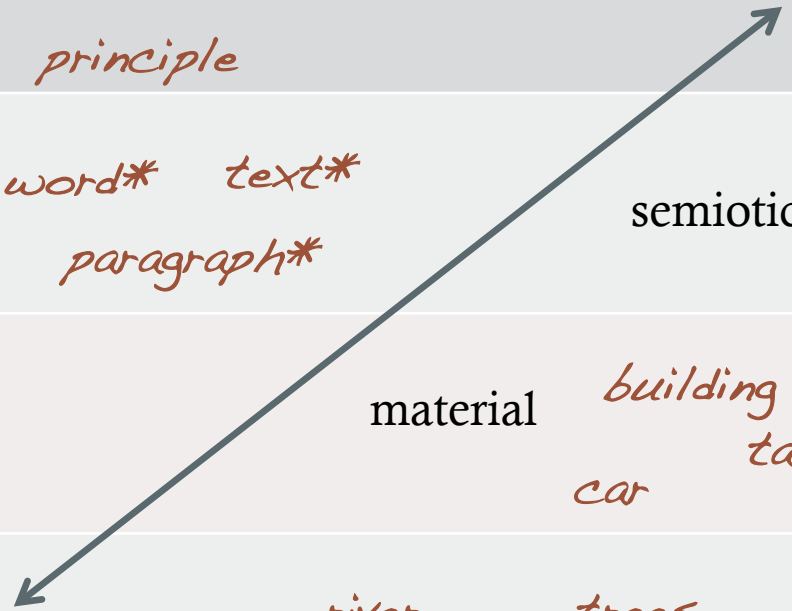
Cline of Entity

- Topological perspective (after Dreyfus & Jones 2008)

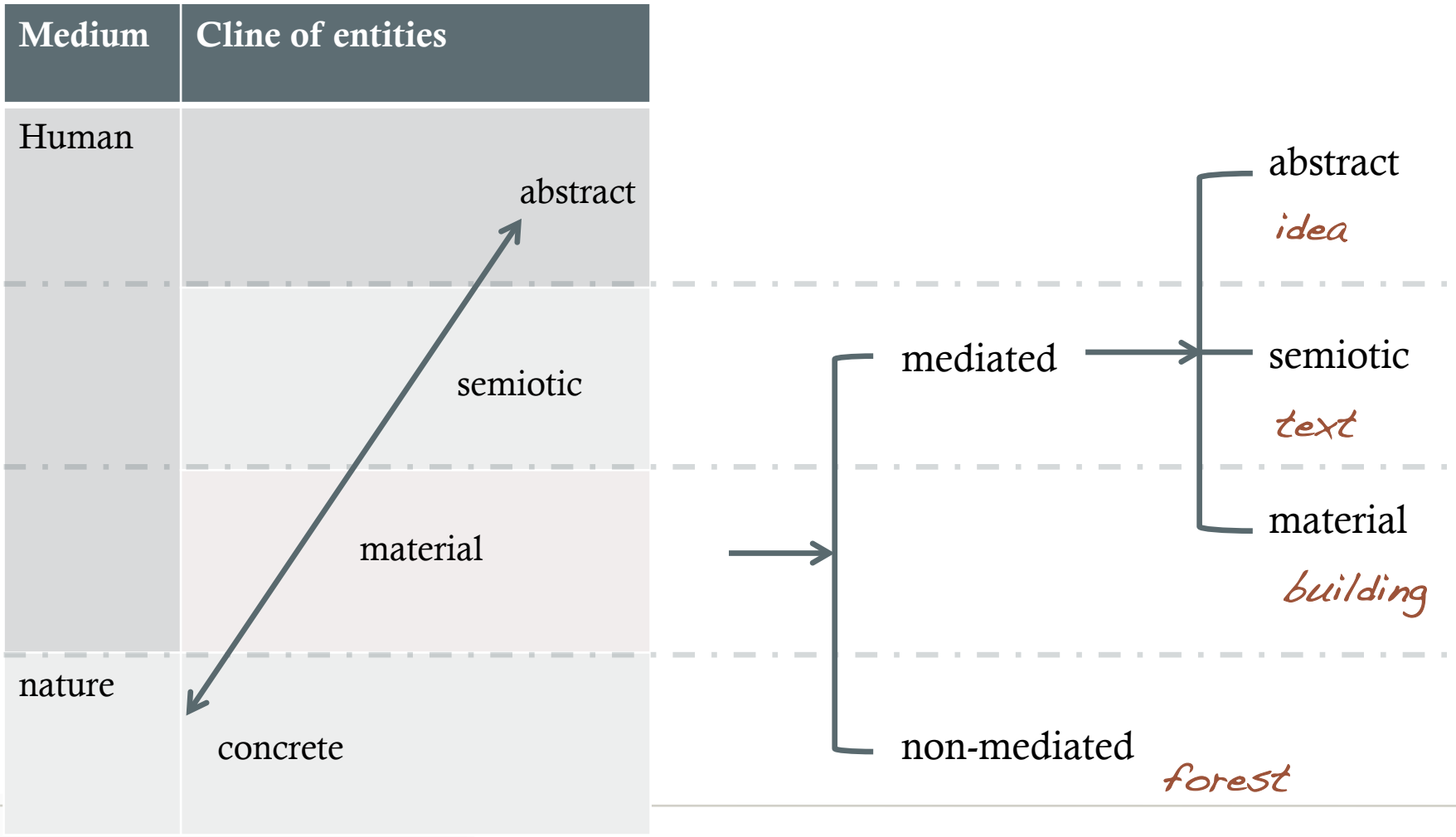


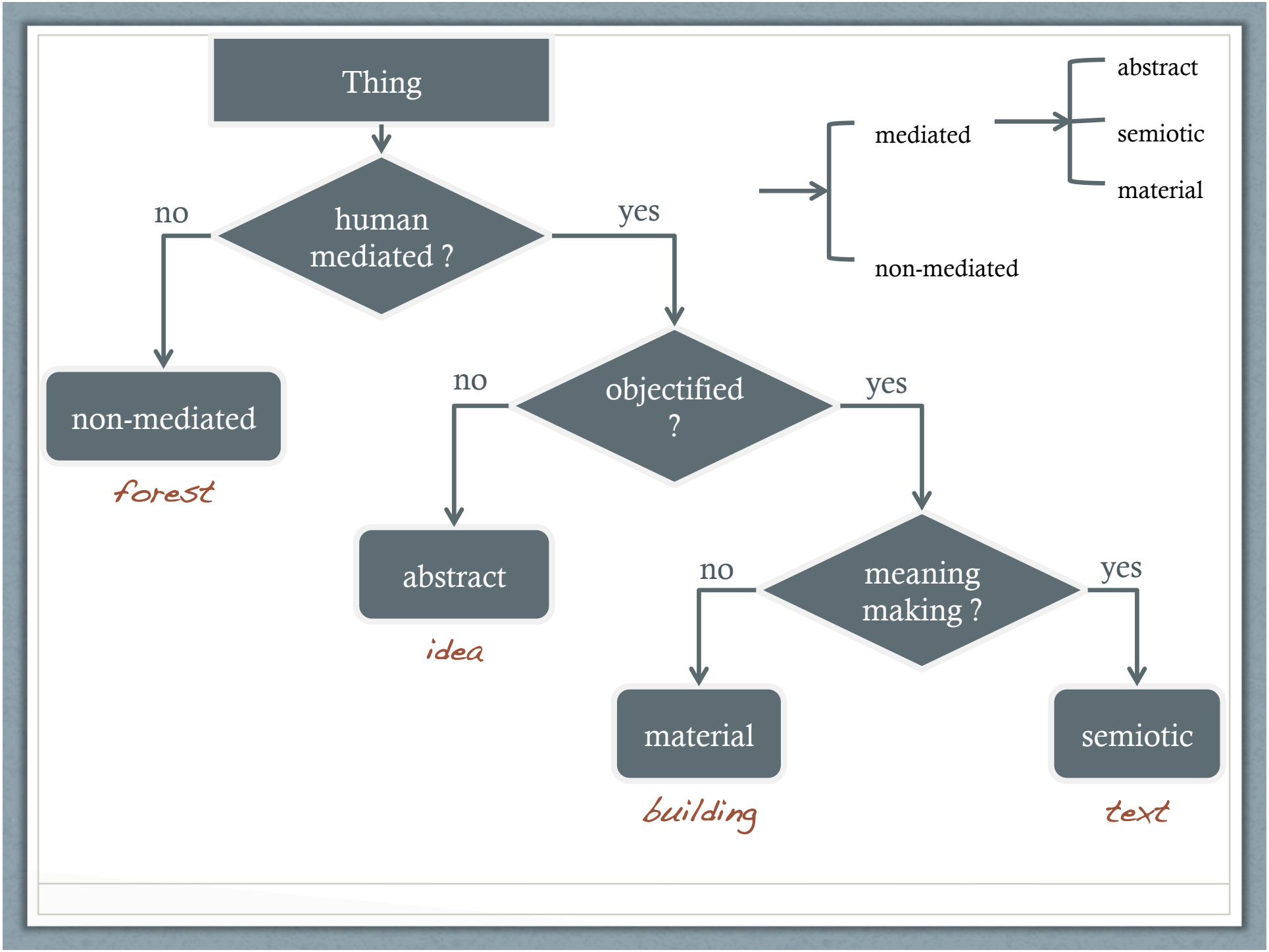
Cline of Entity

Medium	Cline of entities	Physical status
Human	idea, believe, principle — abstract	human's consciousness
	word*, text*, paragraph* — semiotic	space and mass
	material — building, table, car	
nature	concrete — river, trees, forest	



Taxonomic perspective




Thing
human mediated ?
no
yes
non-mediated
forest
objectified ?
no
yes
abstract
idea
meaning making ?
no
yes
material
building
semiotic
text
mediated
non-mediated
abstract
semiotic
material

Technicality

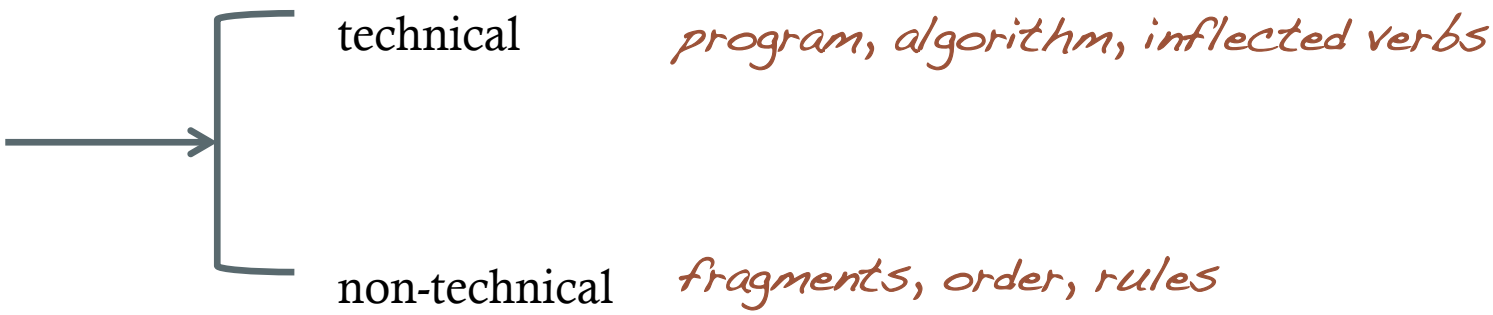
- Technical
  - Learned through institutional settings, especially in tertiary education
  - Building up the discipline-specific meaning

after Martin & Rose (2007)

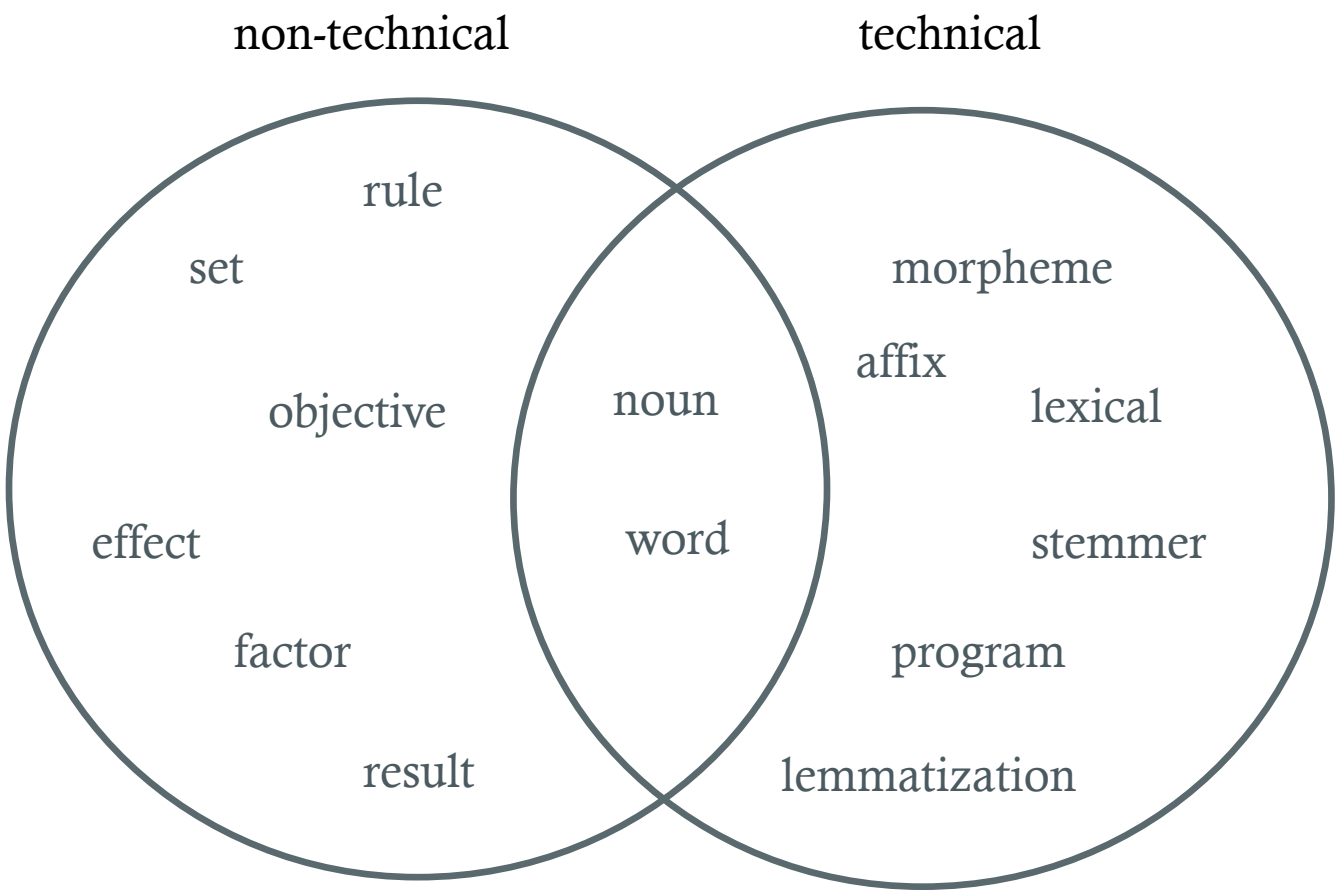
- Computational Linguistics
  - Computer Science *lemmatization, program, plain text, …*
  - Mathematics *algorithm*
  - Linguistics *noun, inflected verbs, …*

Technicality

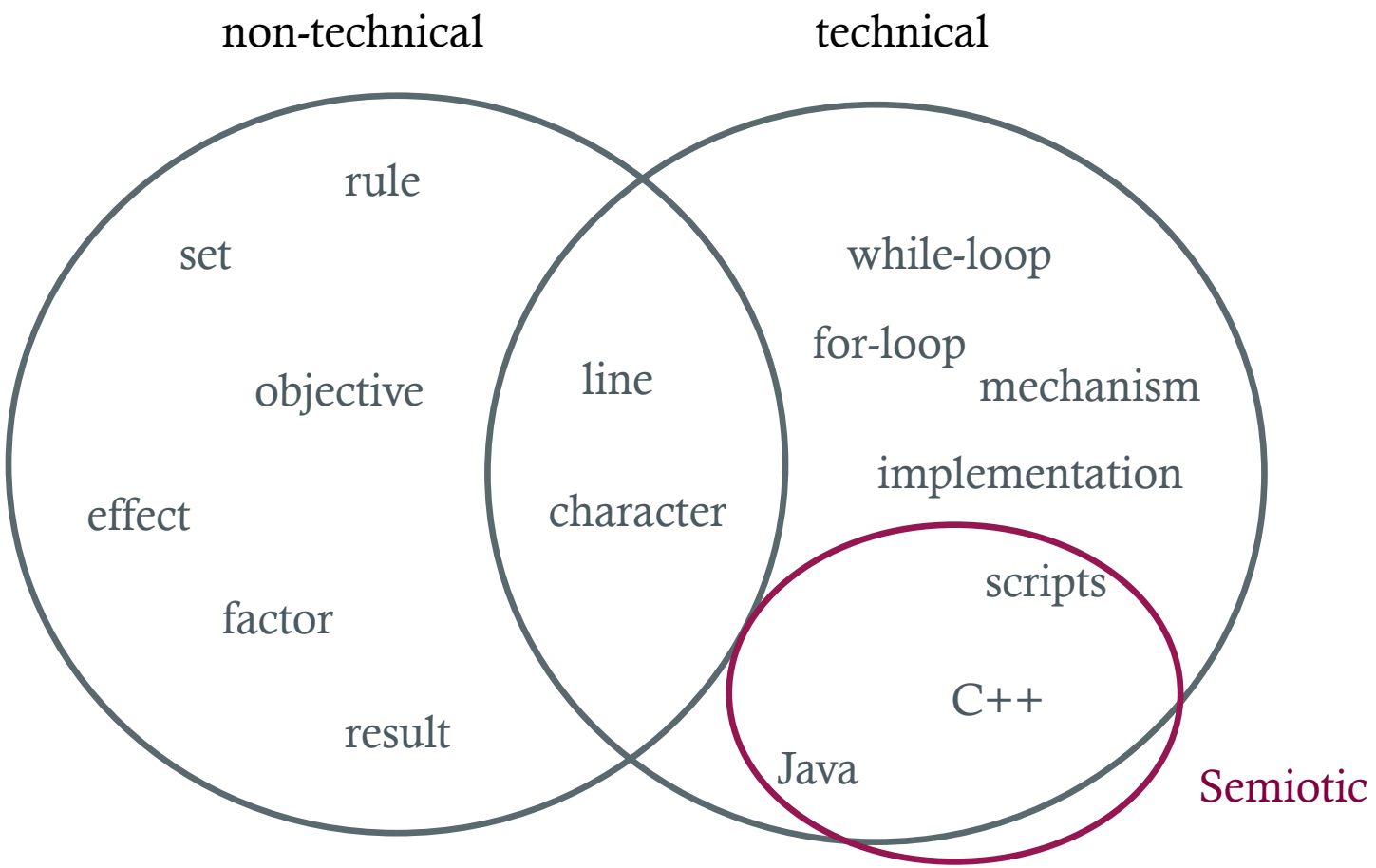
- Non-technical (generic)
  - Learned through everyday settings
  - Cross-disciplinary
  - *fragments, order, rules, factors, kinds, …*

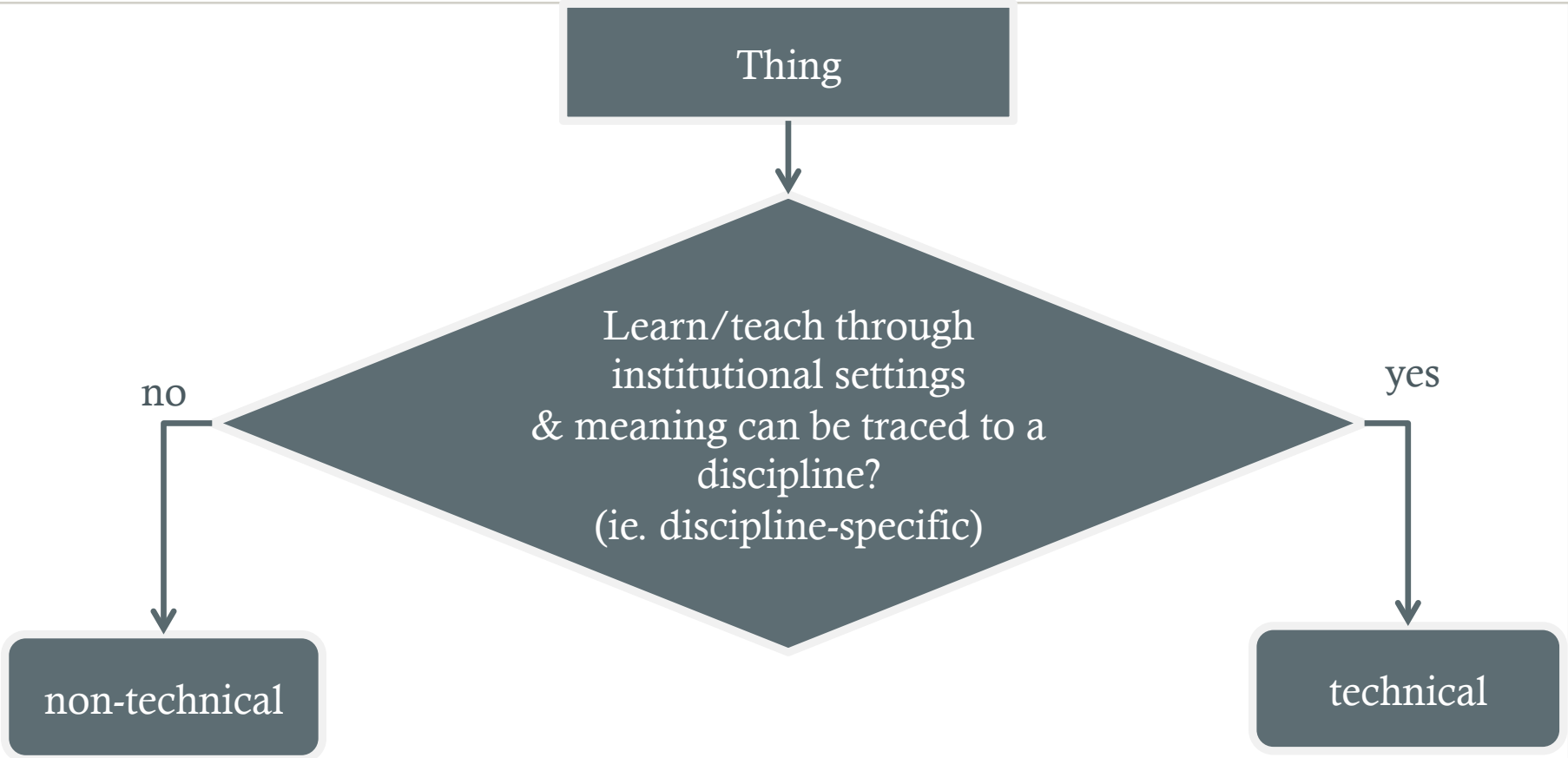


Discipline of Linguistics

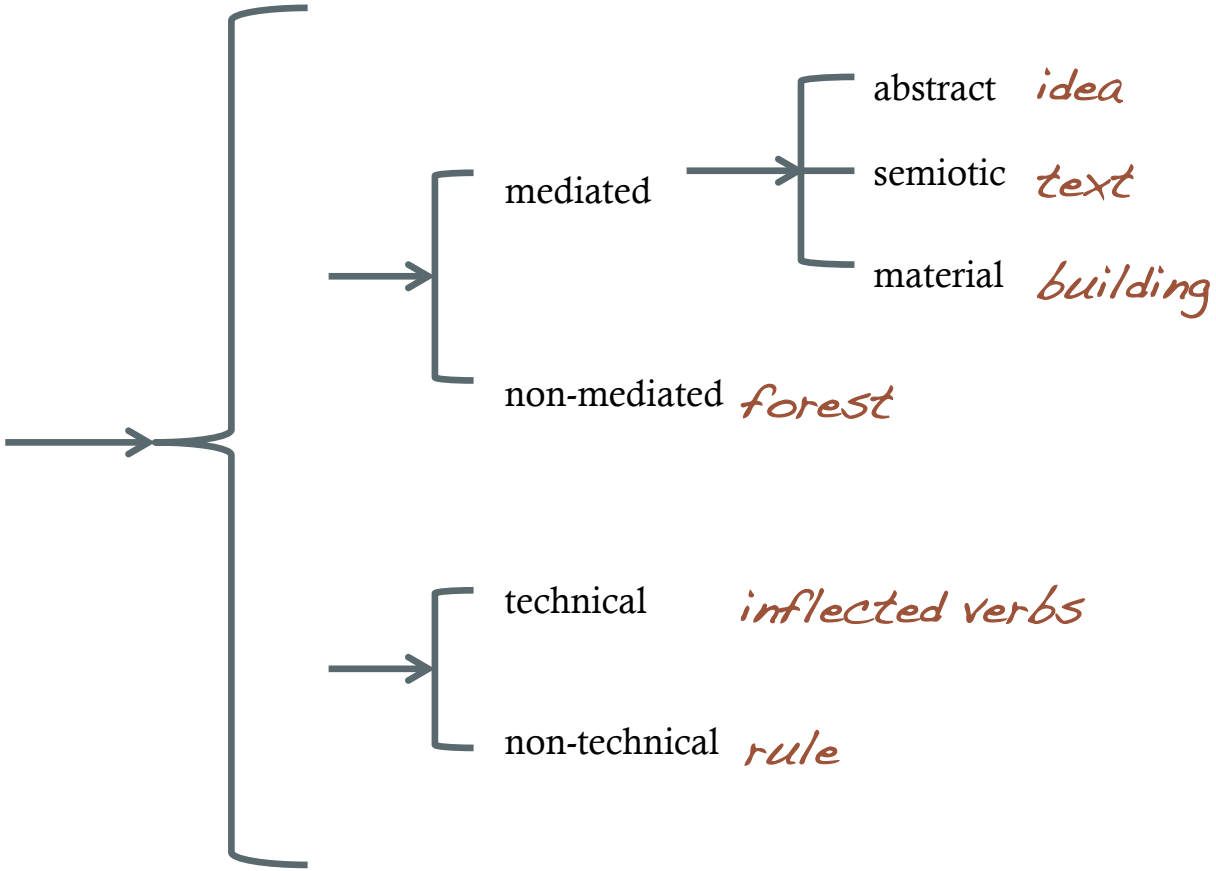


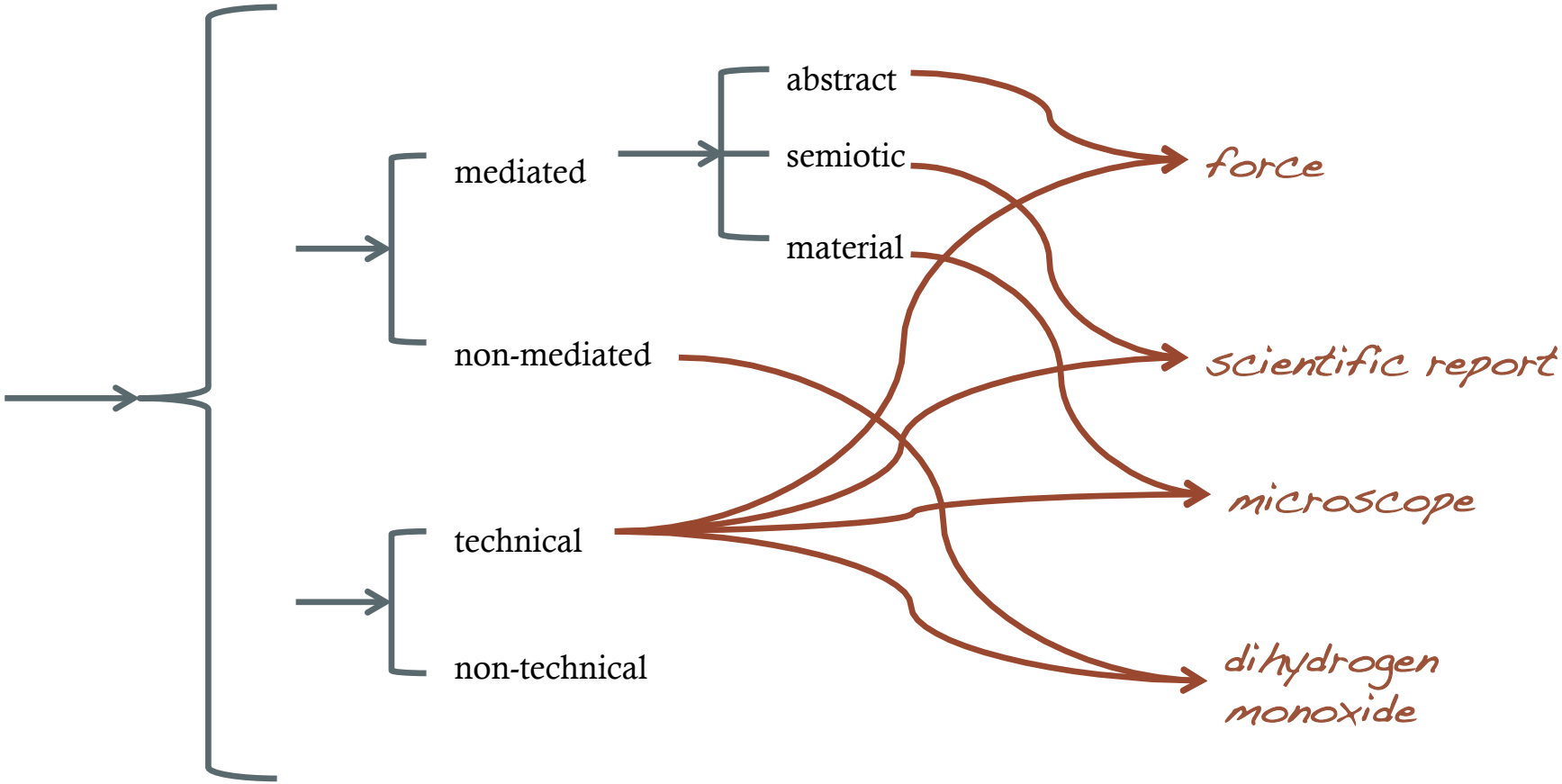
Discipline of Computer Science

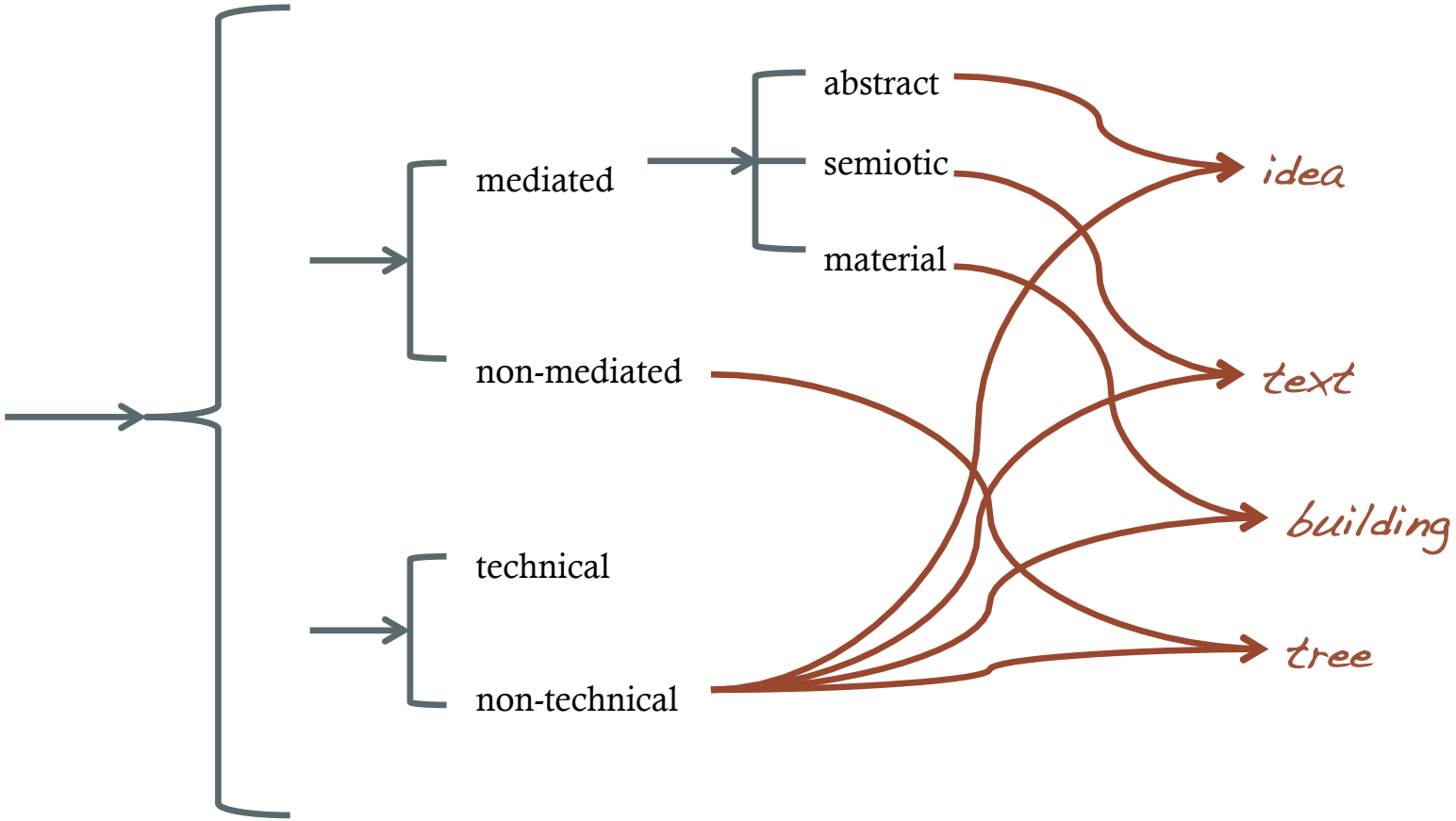




idea, principle, ...	Mediated: abstract	algorithm, force ...
text, language, ...	Mediated: semiotic	scientific report, JAVA, ...
car, building, ...	Mediated: material	test-tube, microscope...
tree, bird, ...	Non-mediated	dihydrogen monoxide, arbor...


abstract
idea
mediated
semiotic
text
material
building
non-mediated
forest
technical
inflected verbs
non-technical
rule

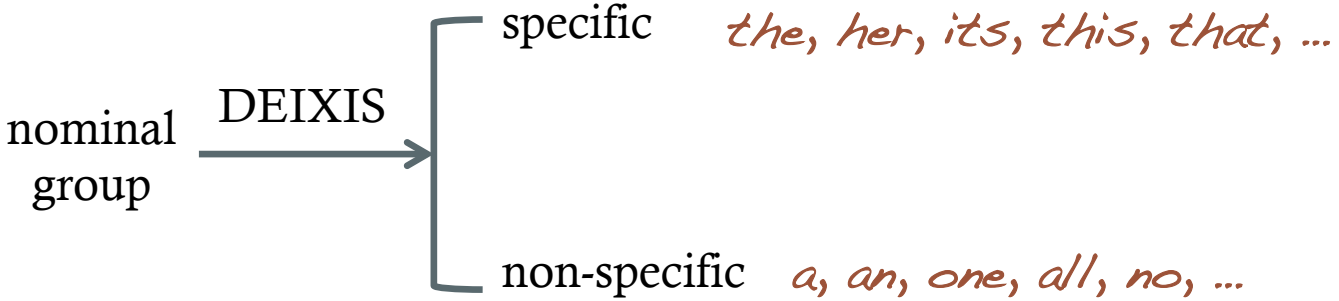

abstract
semiotic
material
mediated
non-mediated
technical
non-technical
force
scientific report
microscope
dihydrogen monoxide

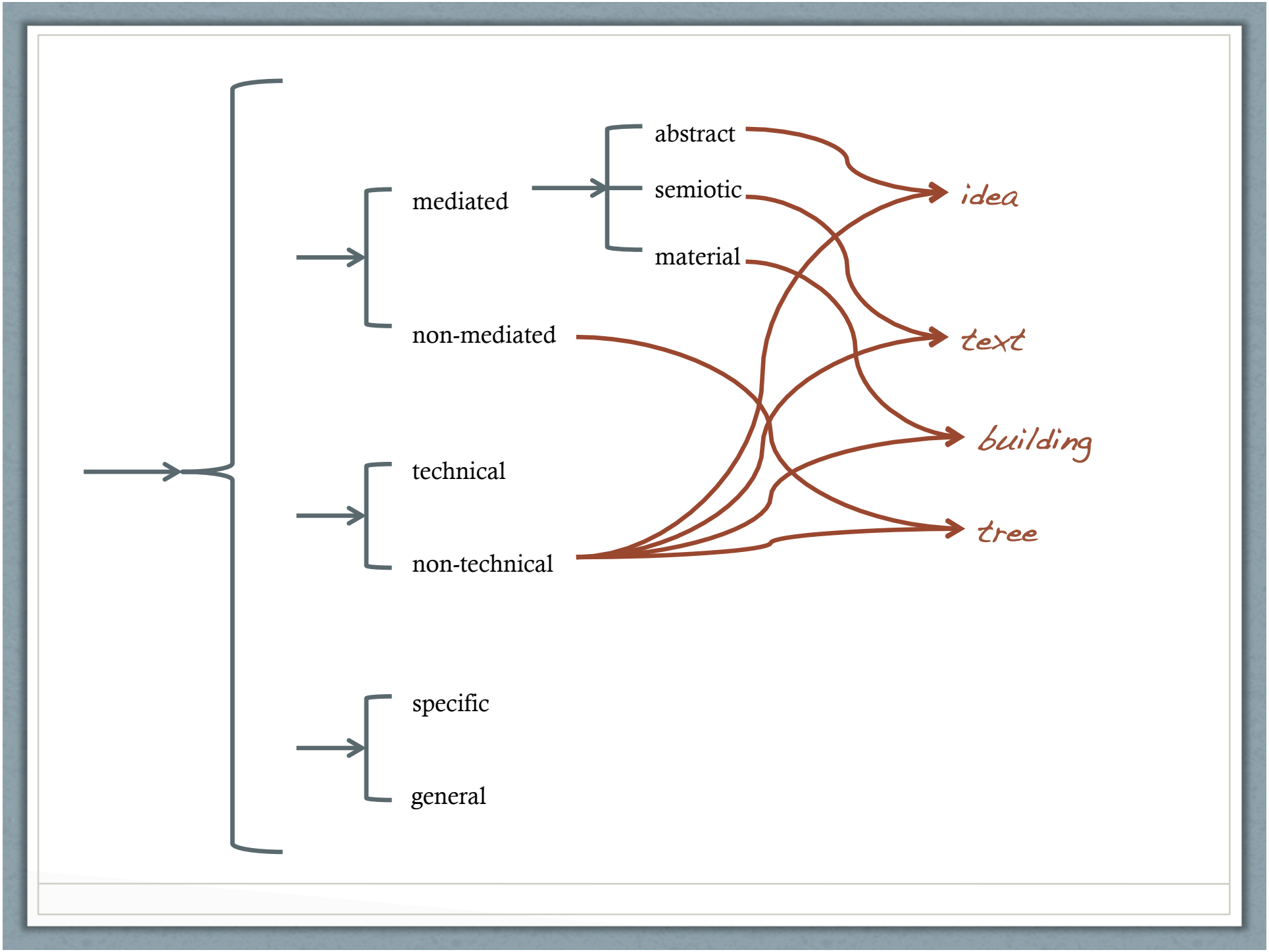

abstract
semiotic
material
mediated
non-mediated
technical
non-technical
idea
text
building
tree

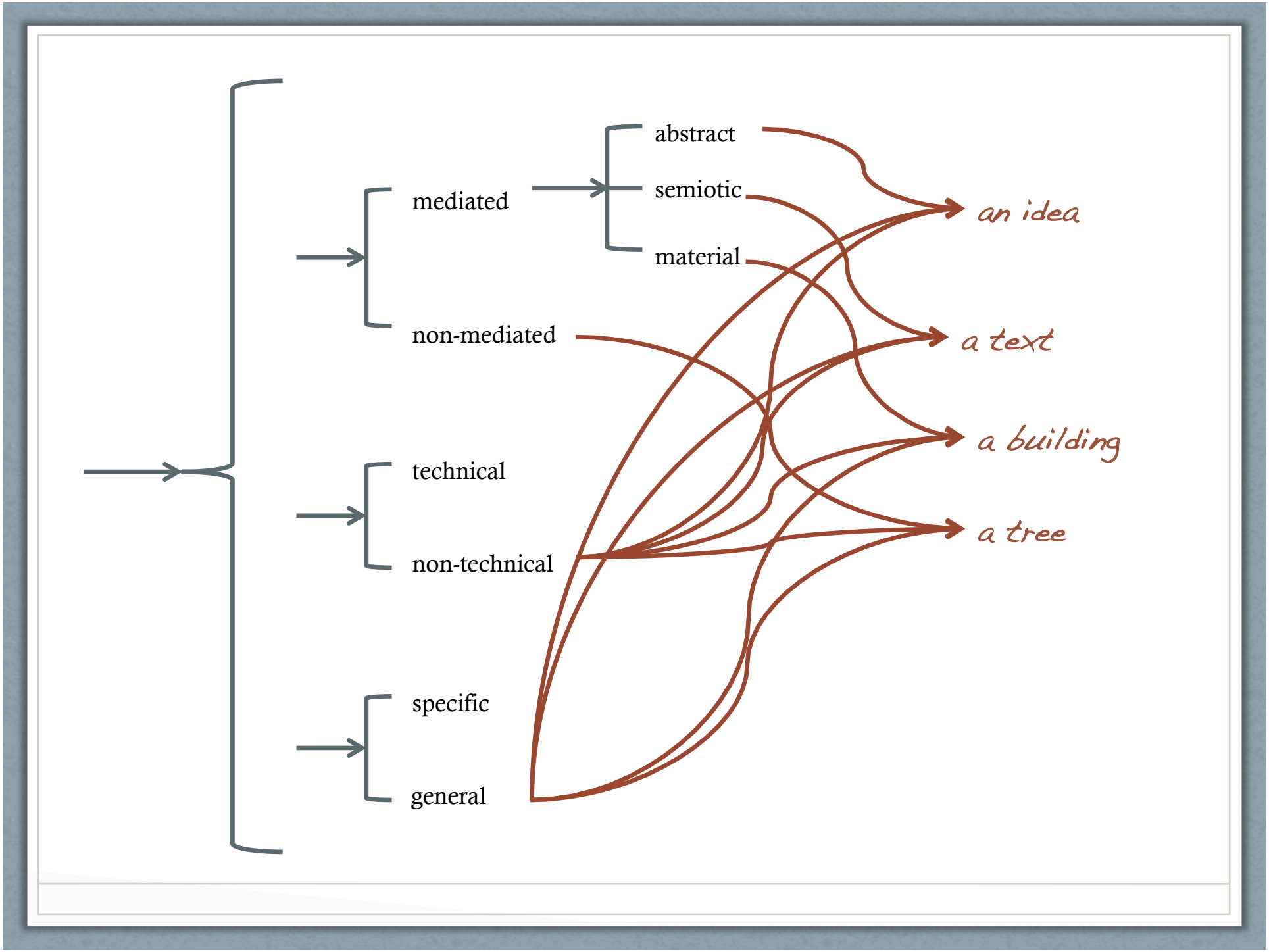
it’s not over yet…

Specificity

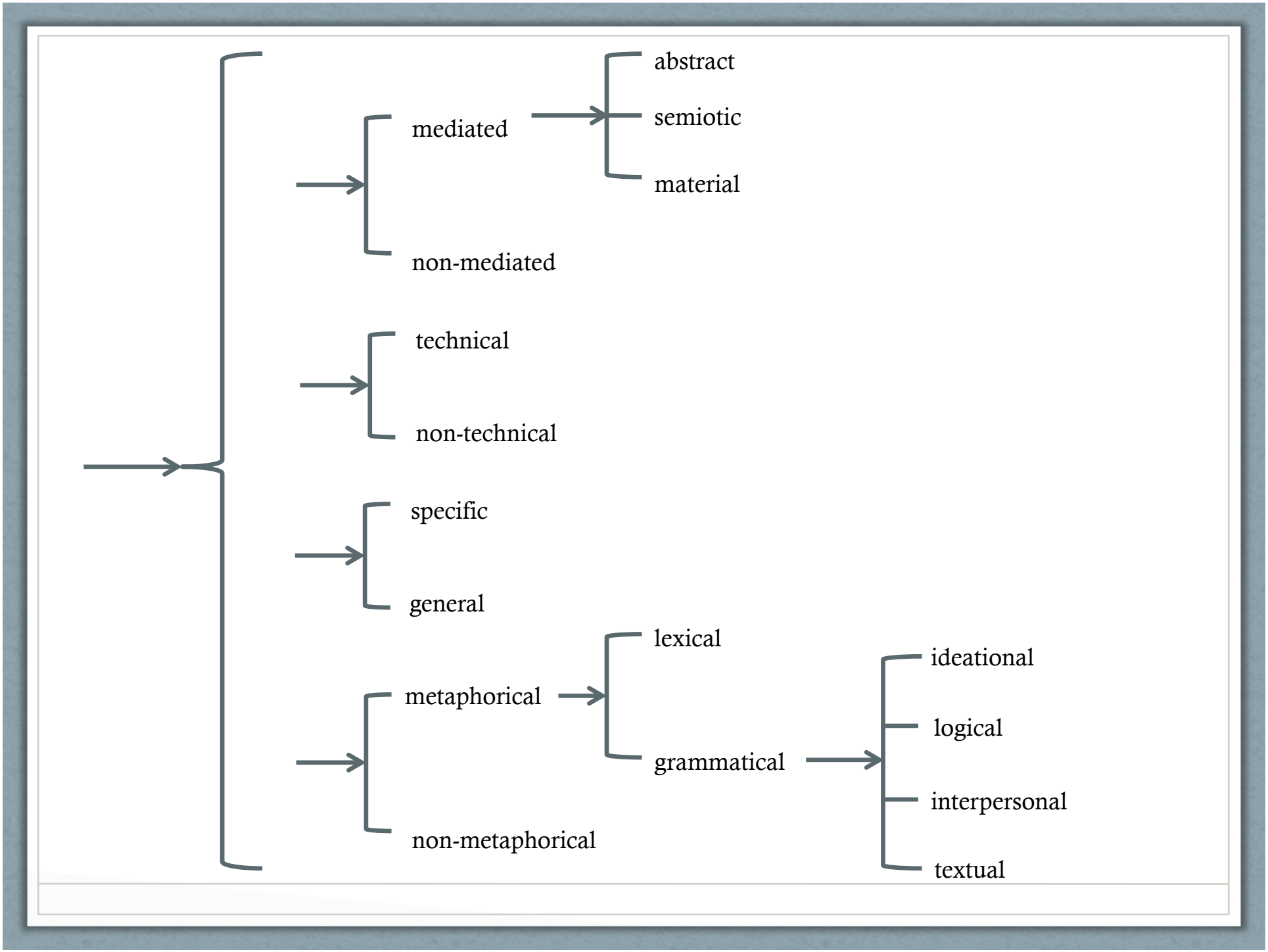
- General/non-specific or particular/specific
- Typically realized through Deictic
  - DETERMINATION (Halliday & Matthiessen 2004:313)

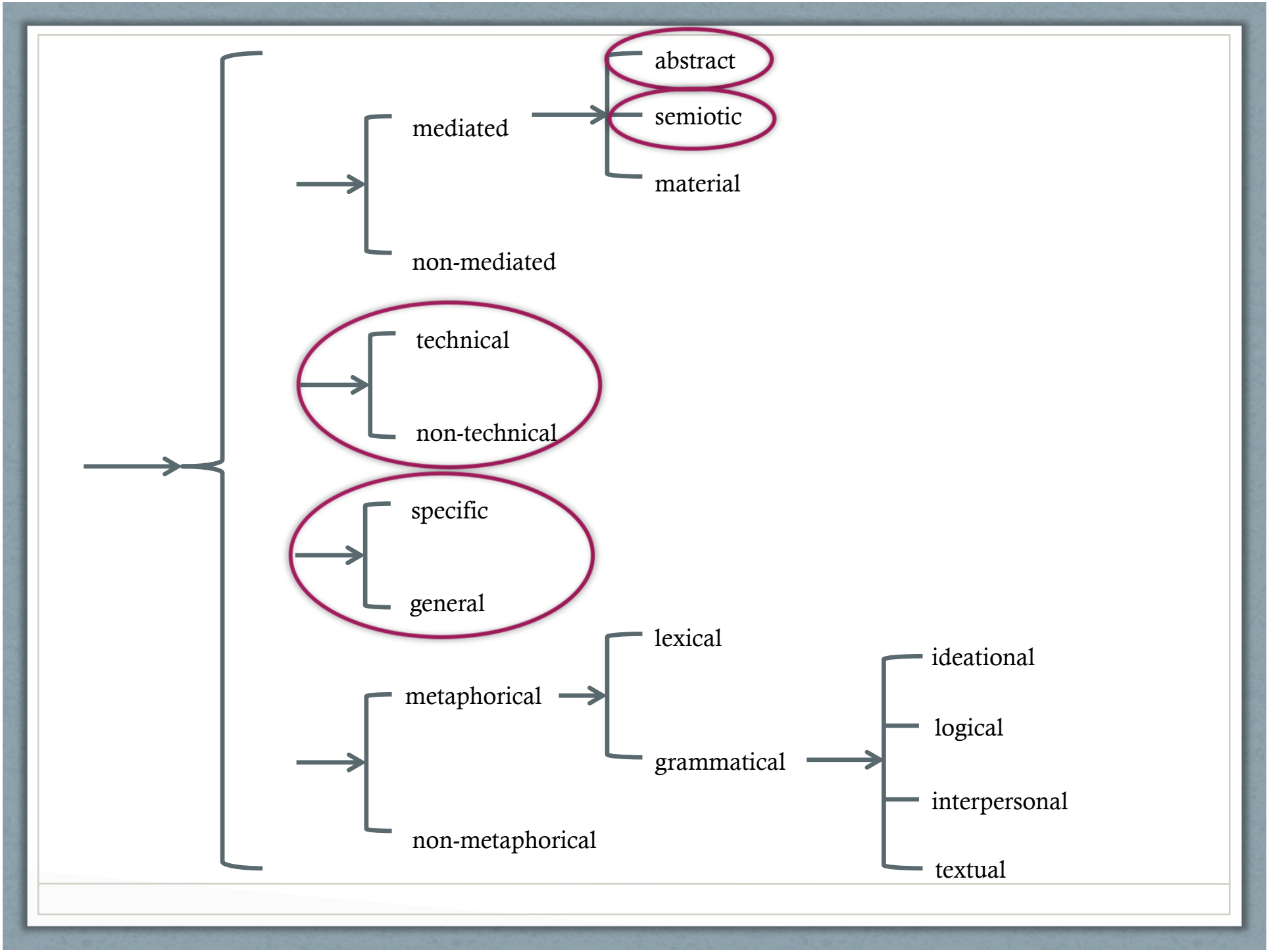



abstract
semiotic
material
mediated
non-mediated
technical
non-technical
specific
general
idea
text
building
tree


abstract
mediated
semiotic
material
non-mediated
an idea
a text
a building
technical
non-technical
a tree
specific
general

and…

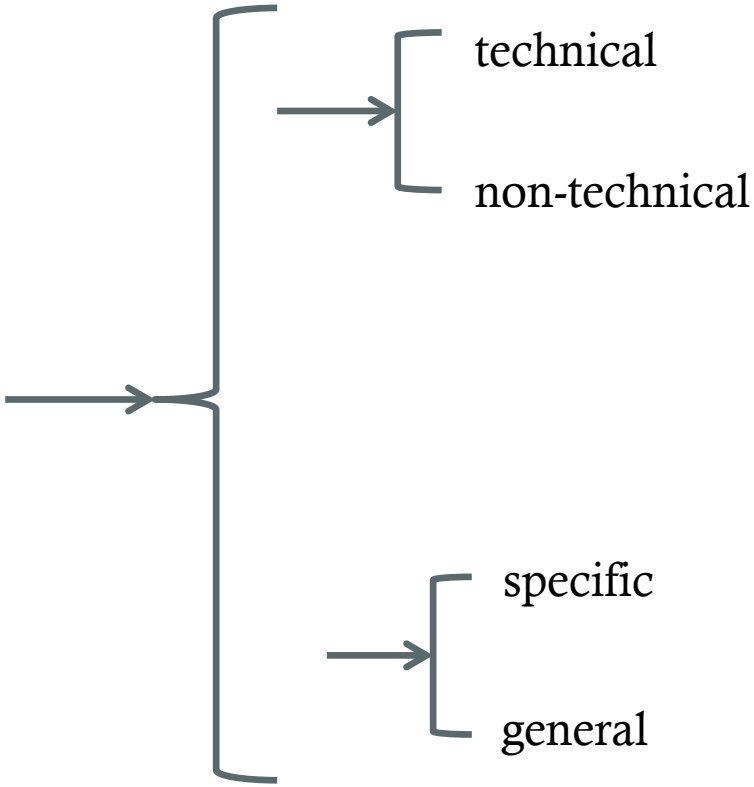

abstract
semiotic
material
mediated
non-mediated
technical
non-technical
specific
general
lexical
metaphorical
grammatical
ideational
logical
interpersonal
textual
non-metaphorical


abstract
semiotic
material
mediated
non-mediated
technical
non-technical
specific
general
lexical
metaphorical
grammatical
ideational
logical
interpersonal
textual
non-metaphorical

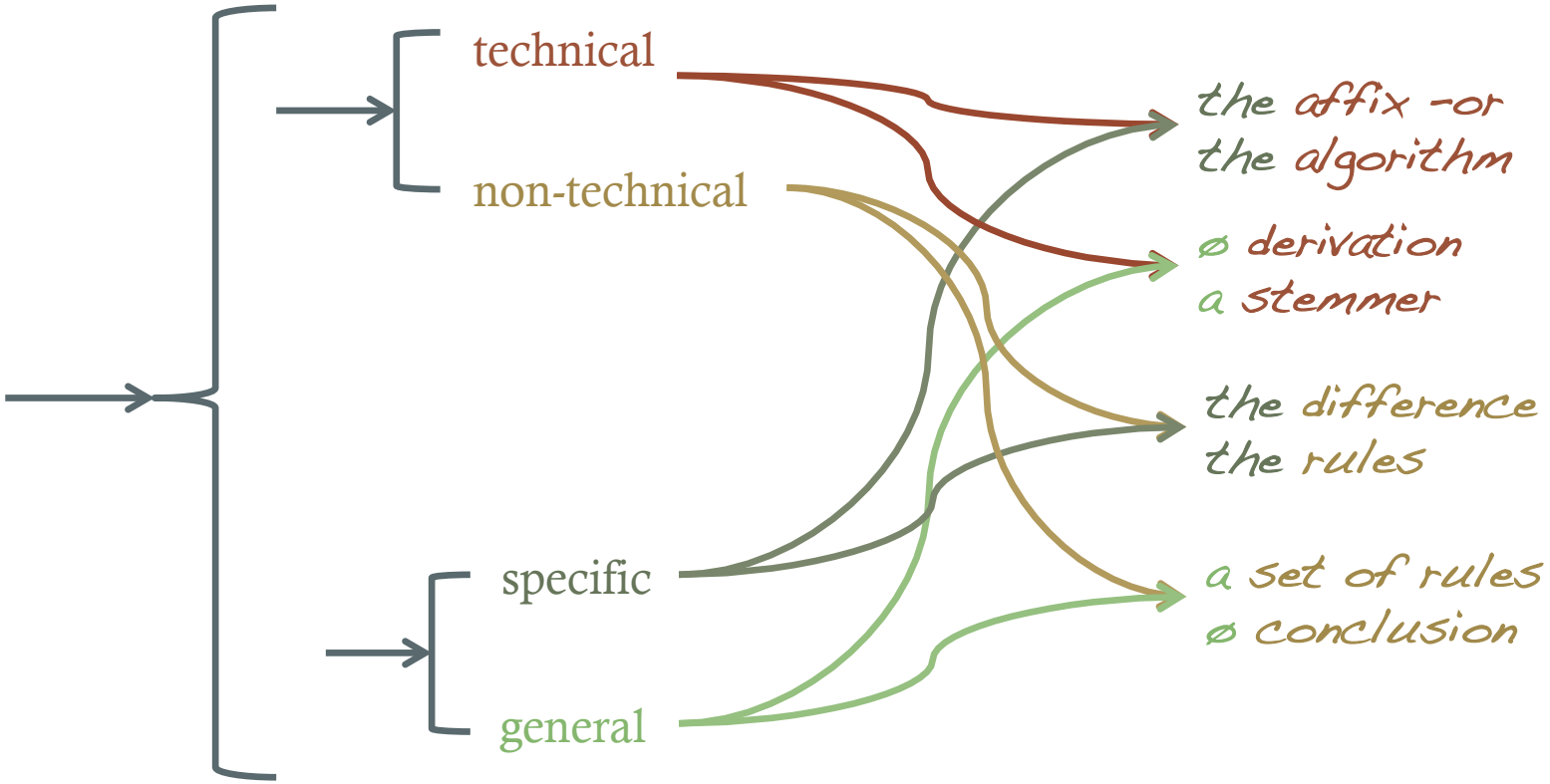
Abstract Entities

- Nominal Group
- Model texts from
  - Morphology
  - Computational Linguistics

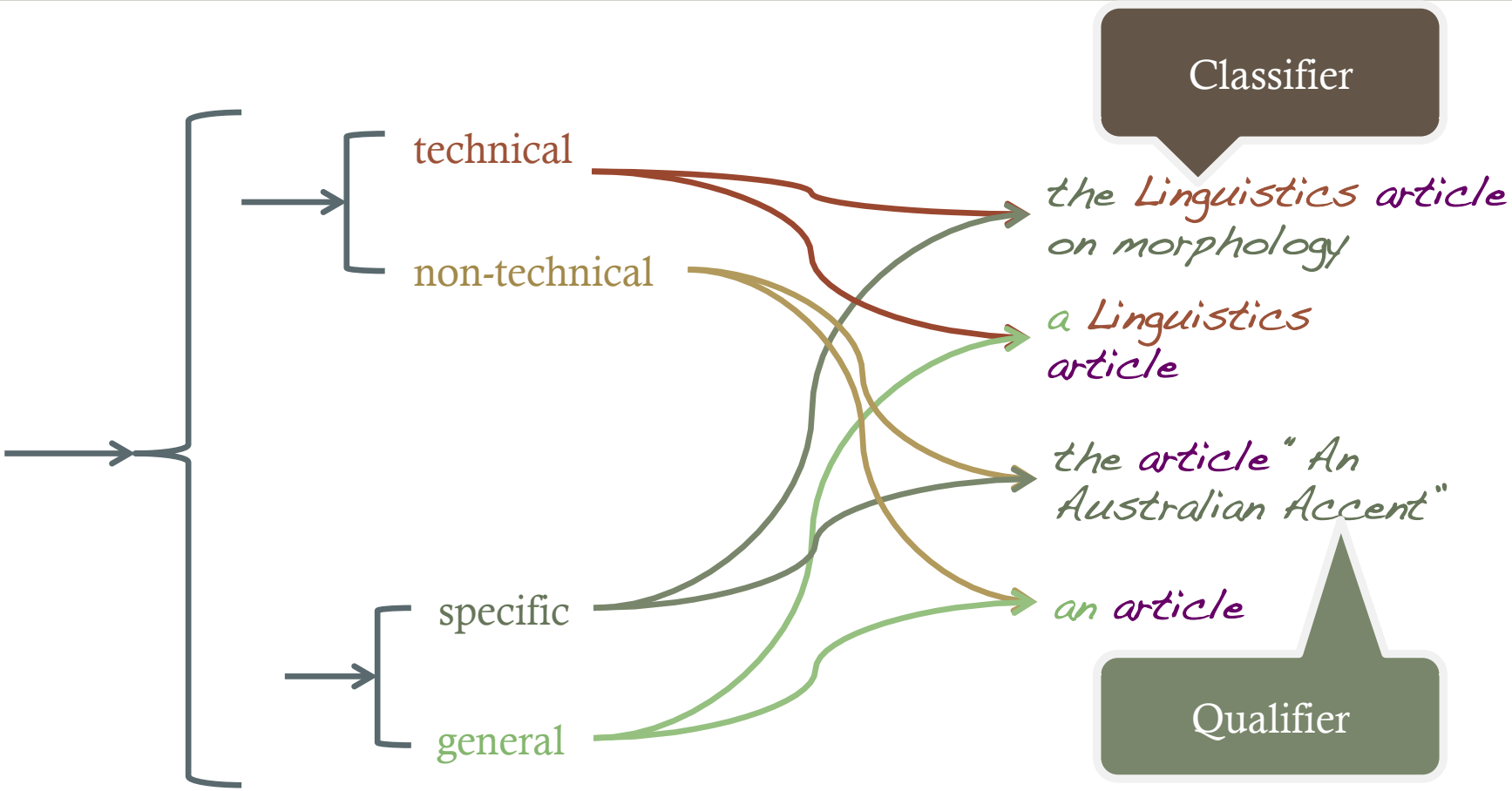
Abstract Entities



Abstract Entities



Semiotic Entities



and yet…

life is just not that simple…

(Abstract) Entities Analysis

- Nominal Group
  - Deictic
  - Post-deictic
  - Numerative (focus)
  - Epithet
  - Classifier
  - Thing
  - Qualifier

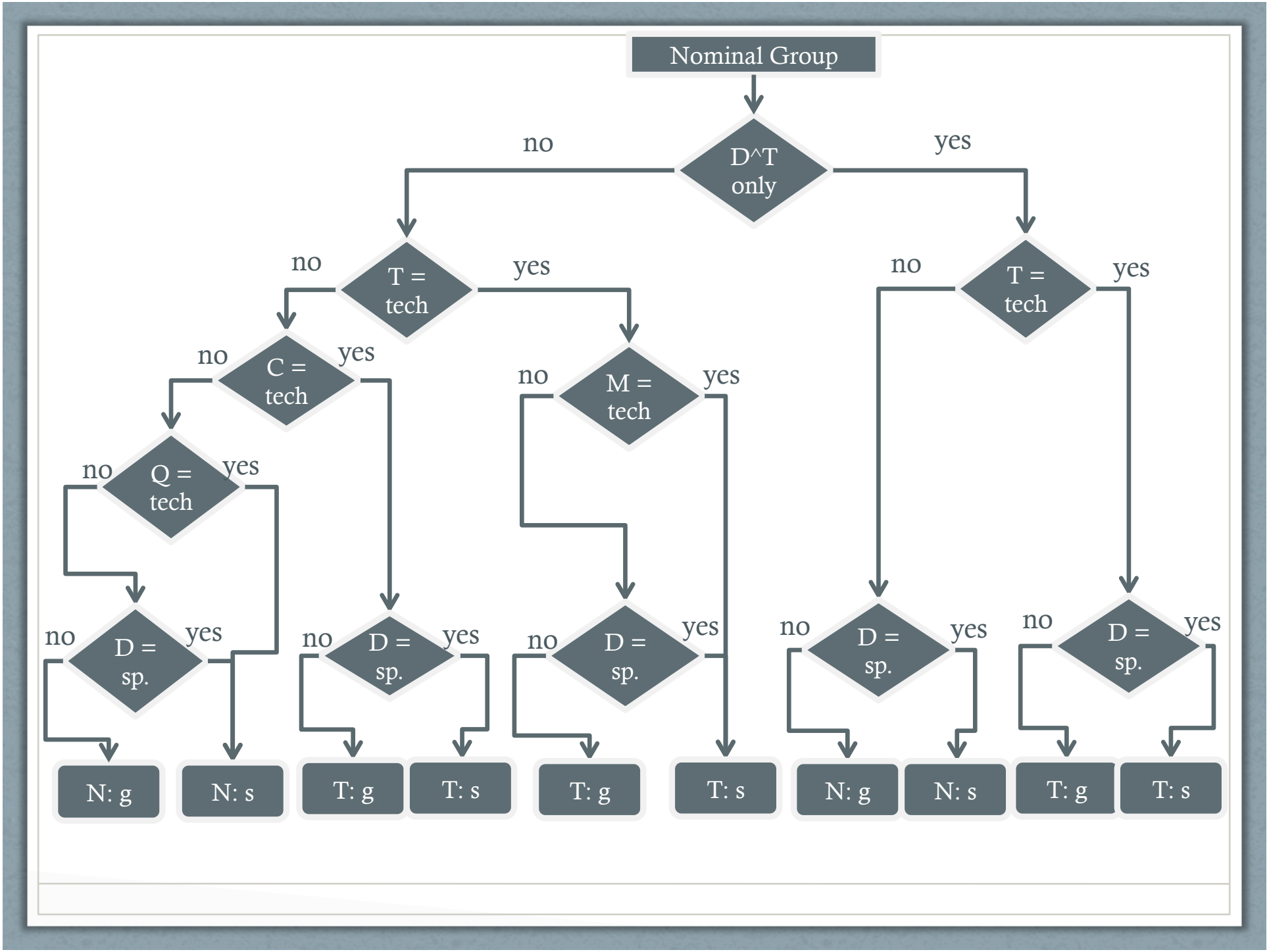
the	*result*
Deictic	Thing
(specific)	non-technical

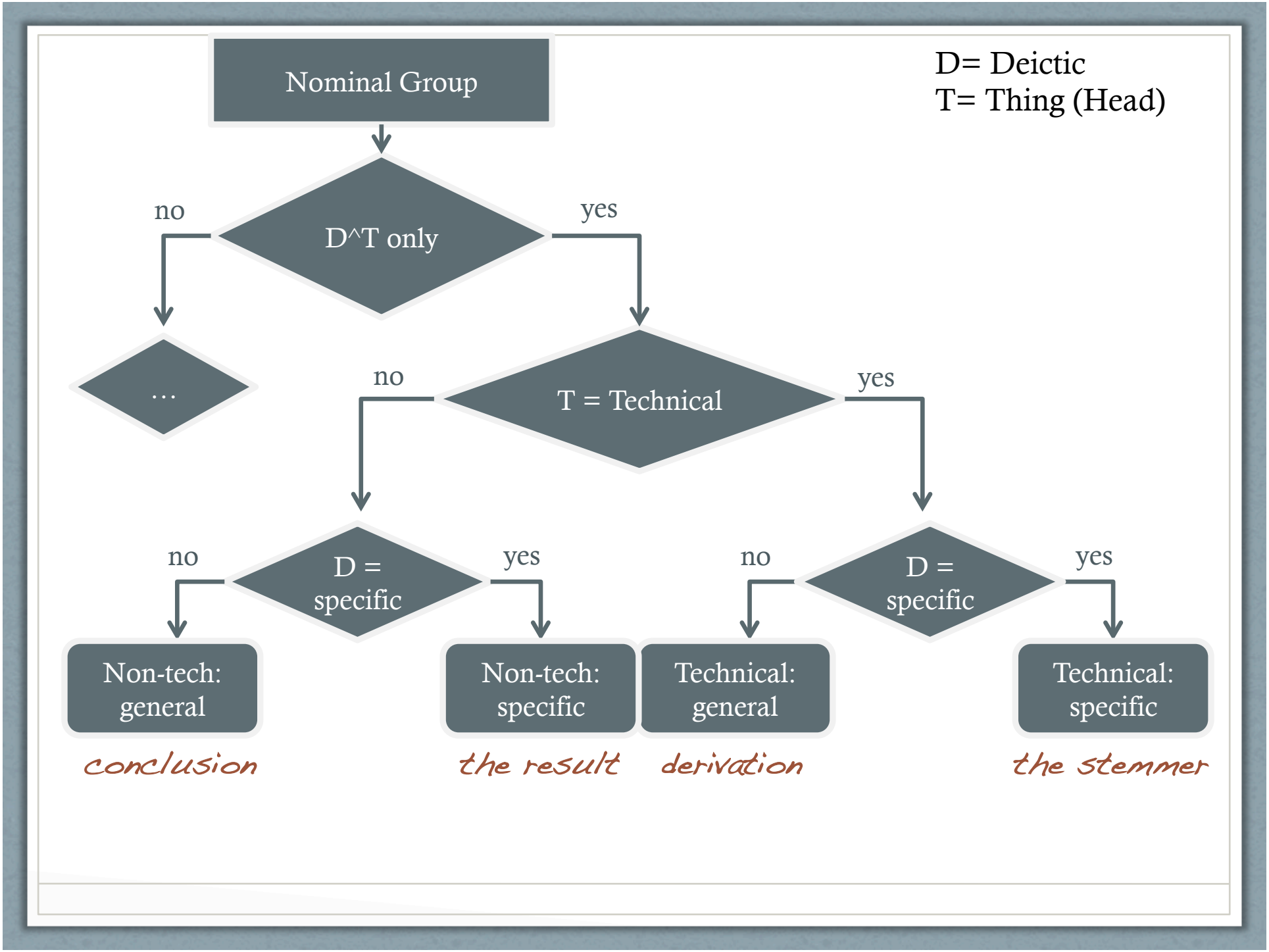
a	*stemmer*
Deictic	Thing
(non-specific)	technical

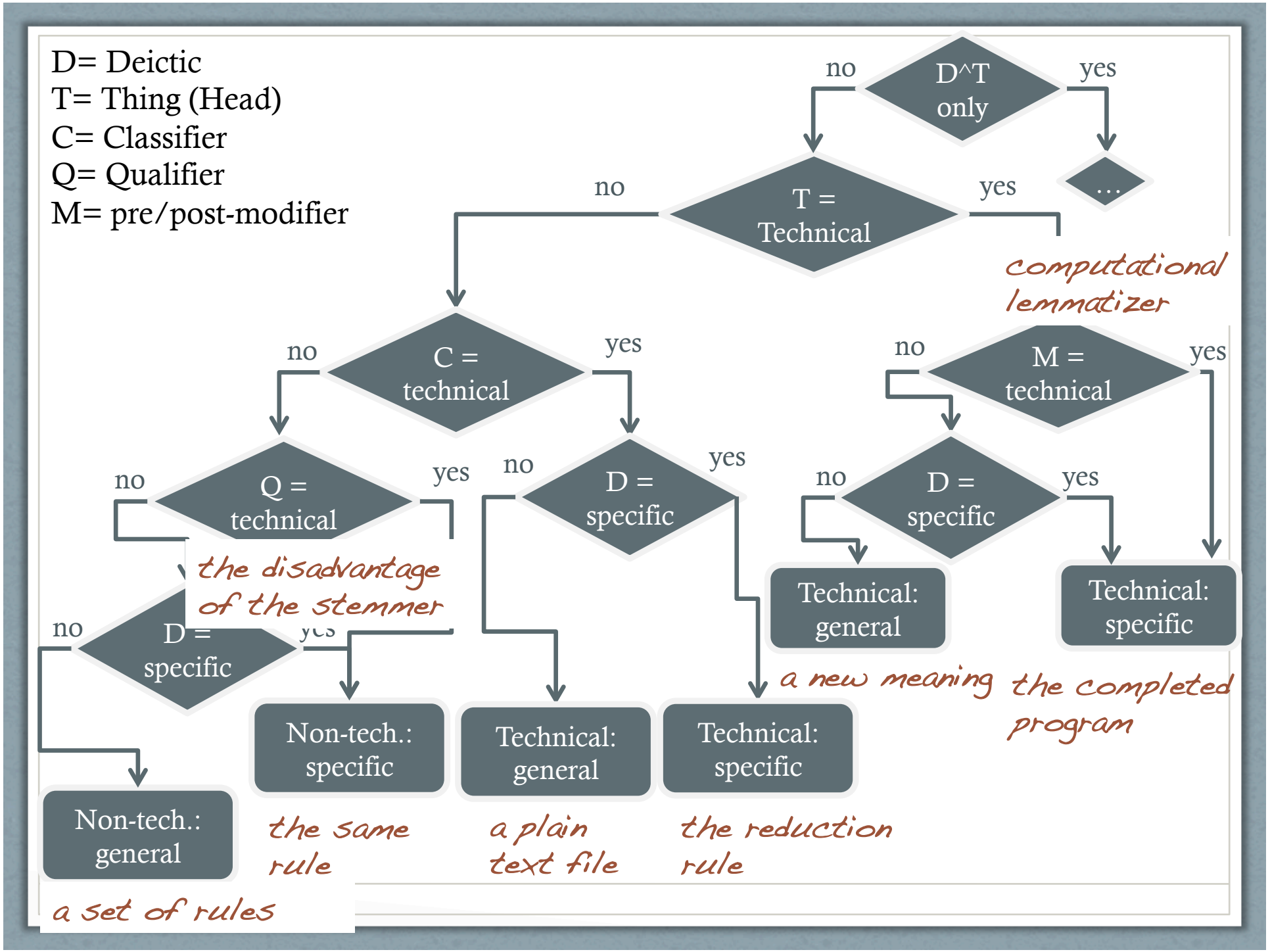
[(D), (P), (N), (E), (C), Thing, (Q)]

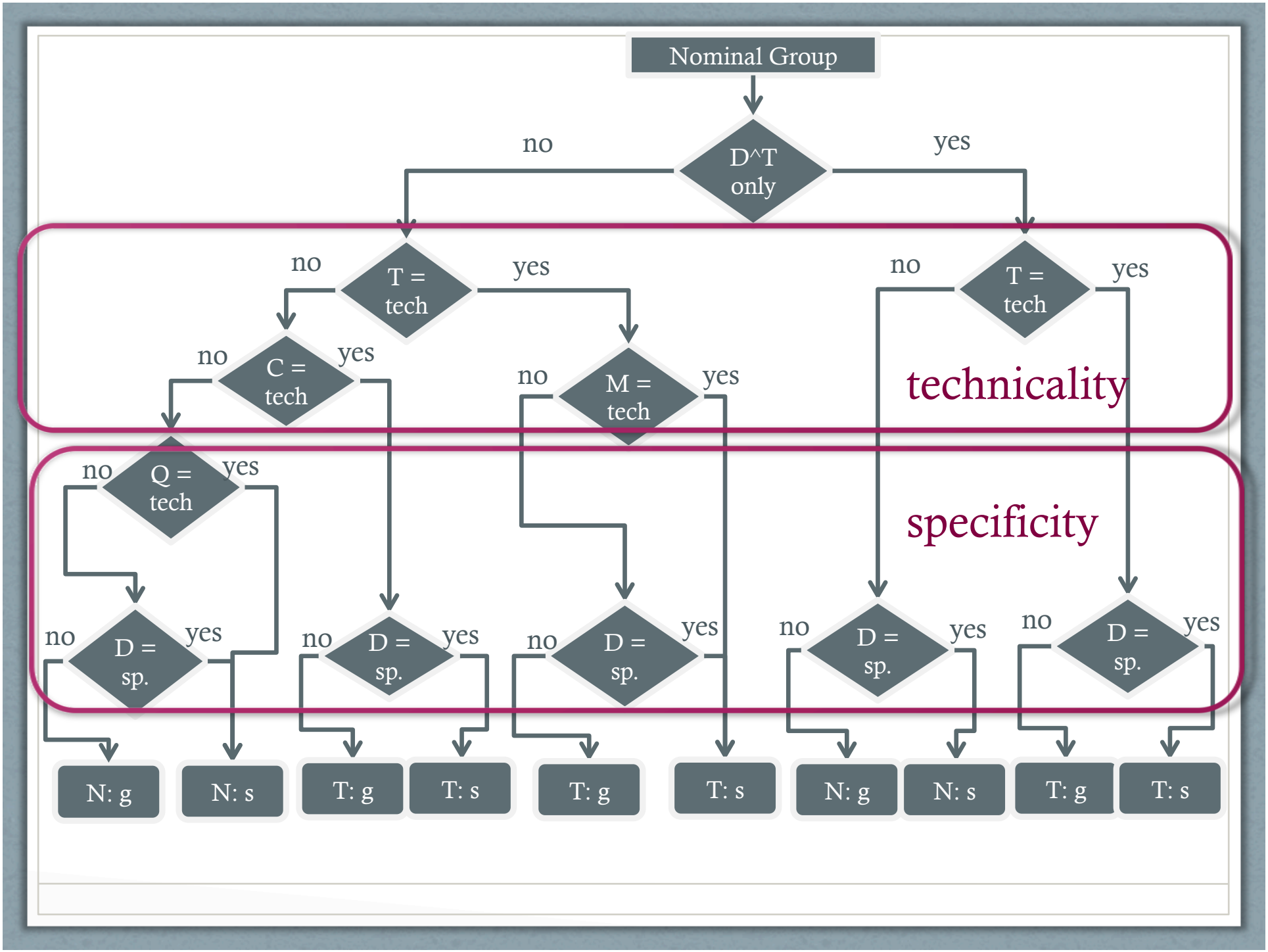
(Abstract) Entities Analysis

- Thing with pre-modifier and/or post-modifier
  - a real word
  - the order of the rules
  - the majority cases in English
  - the stemming result
  - a set of reduction rules with a dictionary
  - the string of characters resulting from stemming
  - .....

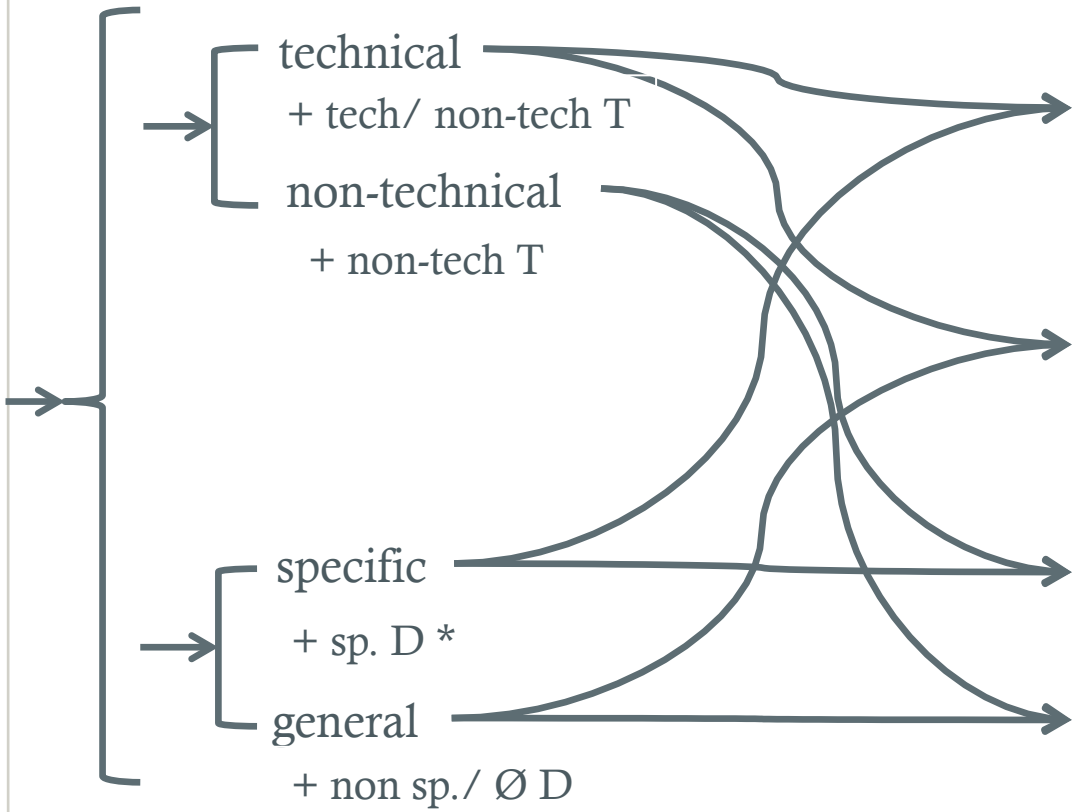

Nominal Group
D^T only
no
yes
T = tech
no
yes
T = tech
no
yes
C = tech
no
yes
M = tech
no
yes
Q = tech
no
yes
D = sp.
no
yes
D = sp.
no
yes
D = sp.
no
yes
D = sp.
no
yes
D = sp.
no
yes
N: g
N: s
T: g
T: s
T: g
T: s
N: g
N: s
T: g
T: s


D= Deictic
T= Thing (Head)
Nominal Group
D^T only
no
yes
...
T = Technical
no
yes
D = specific
no
yes
D = specific
no
yes
Non-tech: general
Non-tech: specific
Technical: general
Technical: specific
conclusion
the result
derivation
the stemmer


D= Deictic
T= Thing (Head)
C= Classifier
Q= Qualifier
M= pre/post-modifier
D^T only
no
yes
…
T = Technical
no
yes
computational lemmatizer
C = technical
no
yes
M = technical
no
yes
Q = technical
no
yes
D = specific
no
yes
D = specific
no
yes
the disadvantage of the stemmer
D = specific
no
yes
Technical: general
Technical: specific
a new meaning
the completed program
Non-tech.: specific
Technical: general
Technical: specific
Non-tech.: general
the same rule
a plain text file
the reduction rule
a set of rules


Nominal Group
D^T only
no
yes
T = tech
C = tech
M = tech
Q = tech
D = sp.
technicality
specificity
N: g
N: s
T: g
T: s

Abstract Entities



+ sp. D, tech T; D^ T
+ sp. D, tech C, non-tech T; D^C^T
+ tech M, tech T; (M)^T^(M)#
+ sp. D, non-tech M, tech T; D^(M)^T^(M) #

+ tech T; D^T
+ tech C, non-tech T; D^C^T
+ tech T, non-tech M; D^(M)^T^(M) #

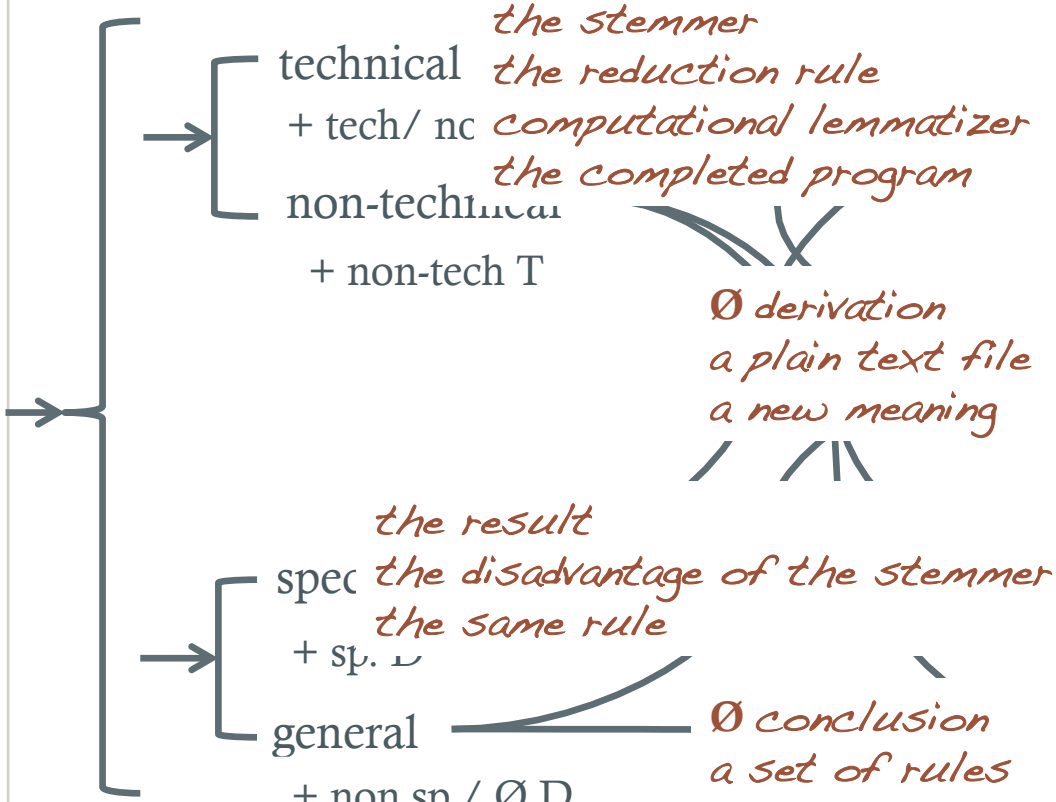
D ^ T
+ tech Q; T^Q
+ non-tech M; D^(M)^T^(M) #

D ^ T
+ non-tech M; (M)^T^(M) #

* except for tech T & tech Q

at least one

Abstract Entities



+ sp. D, tech T; D^ T
+ sp. D, tech C, non-tech T; D^C^T
+ tech M, tech T; (M)^T^(M)#
+ sp. D, non-tech M, tech T; D^(M)^T^(M) #

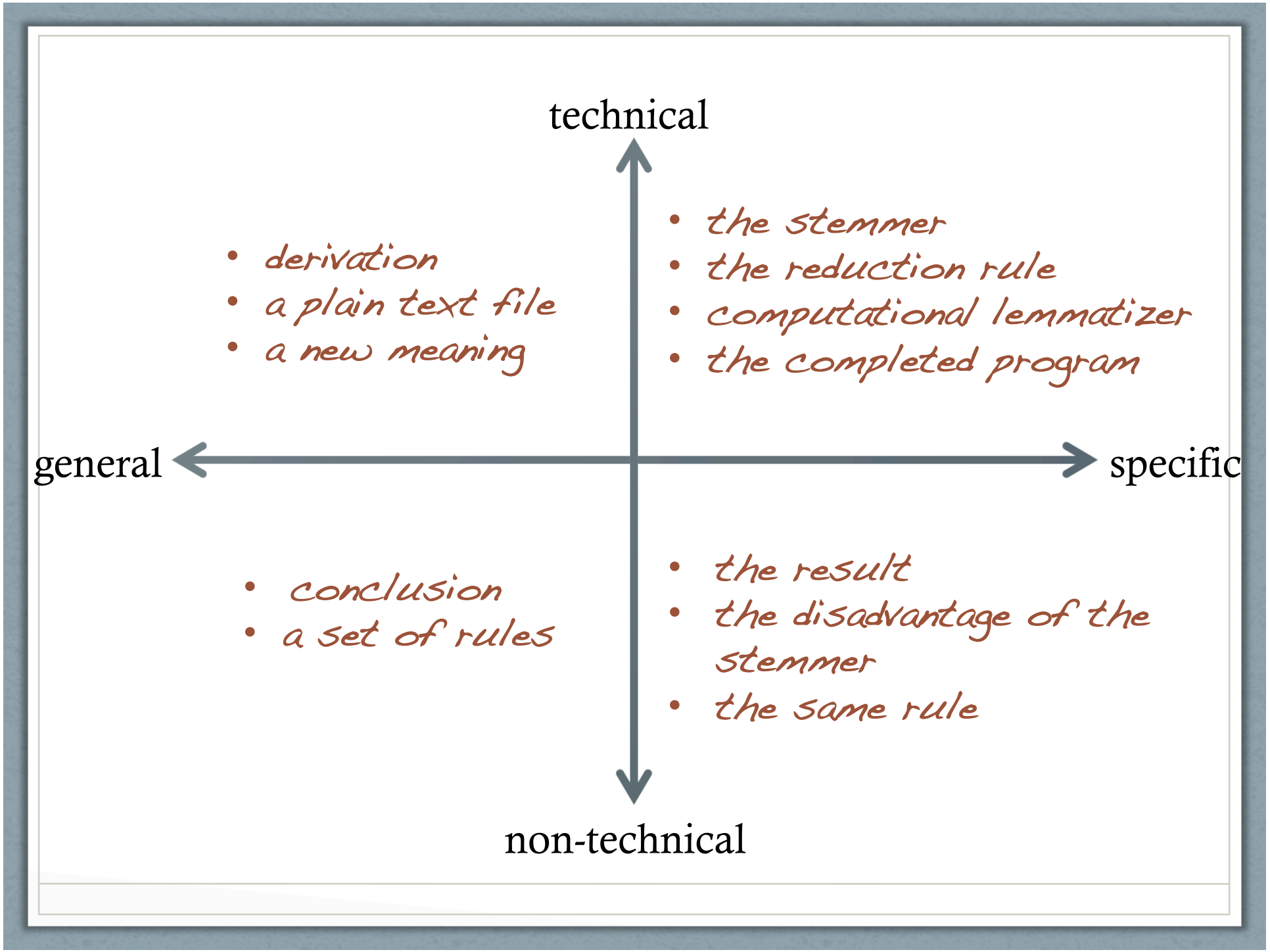
+ tech T; D^T
+ tech C, non-tech T; D^C^T
+ tech T, non-tech M; D^(M)^T^(M) #

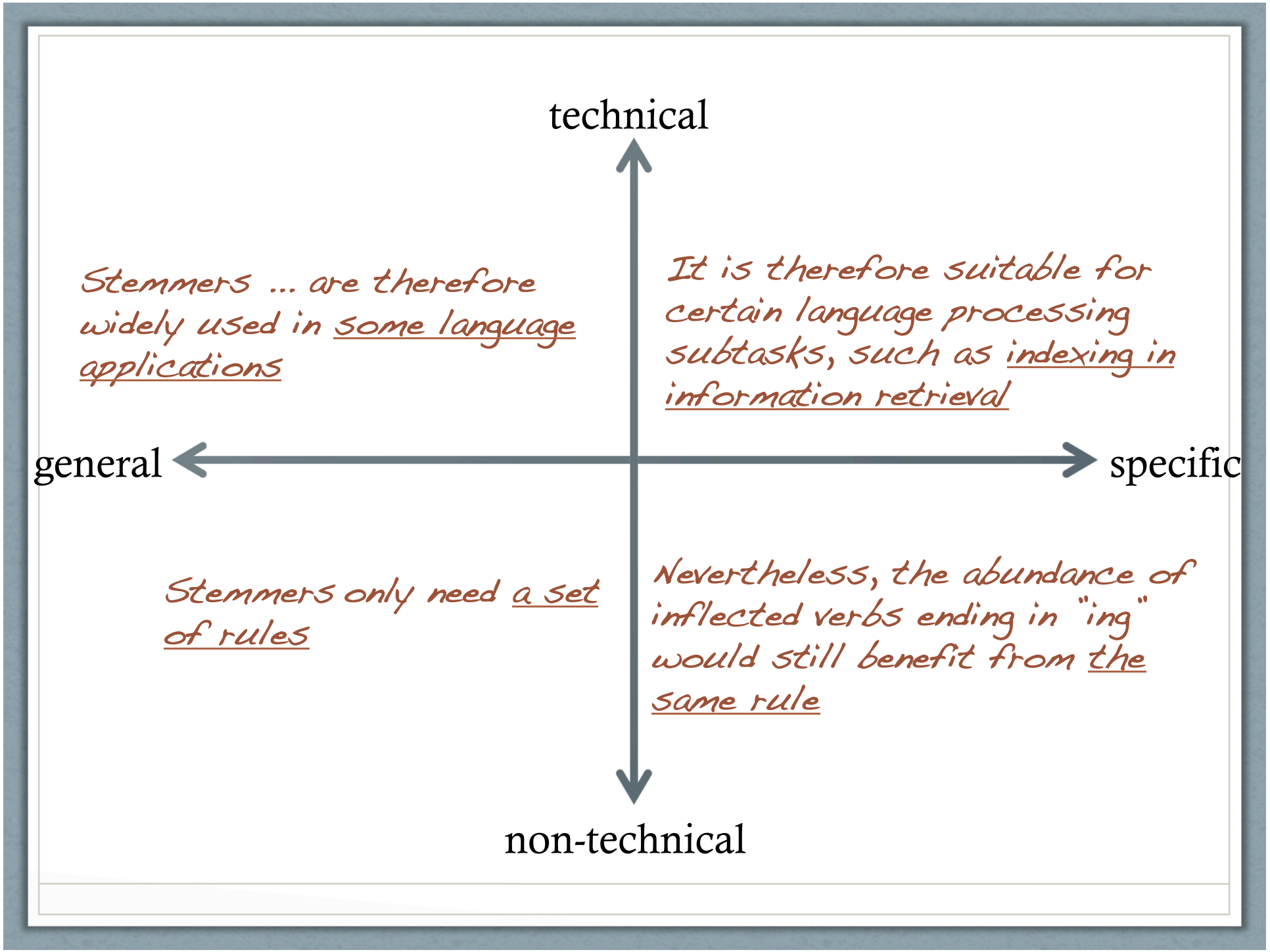
D ^ T
+ tech Q; T^Q
+ non-tech M; D^(M)^T^(M) #

D ^ T
+ non-tech M; (M)^T^(M) #

* except for tech T & tech Q

at least one


technical
general
specific
non-technical
• derivation
• a plain text file
• a new meaning
• the stemmer
• the reduction rule
• computational lemmatizer
• the completed program
• conclusion
• a set of rules
• the result
• the disadvantage of the stemmer
• the same rule


technical
general
specific
non-technical
Stemmers ... are therefore widely used in some language applications
It is therefore suitable for certain language processing subtasks, such as indexing in information retrieval
Stemmers only need a set of rules
Nevertheless, the abundance of inflected verbs ending in "ing" would still benefit from the same rule

Summary

- THING
  - Nominal Group
- Technicality
  - Thing
  - Classifier
  - (Qualifier)
- Specificity
  - Deictic
  - Qualifier
    - Semiotic entities

A long way to go…

Challenges

- Technicality
  - The article "The Australian Accent"
  - The base "propose"
  - The word "act"
  - The suffix -or

examples → instance ?

Challenges

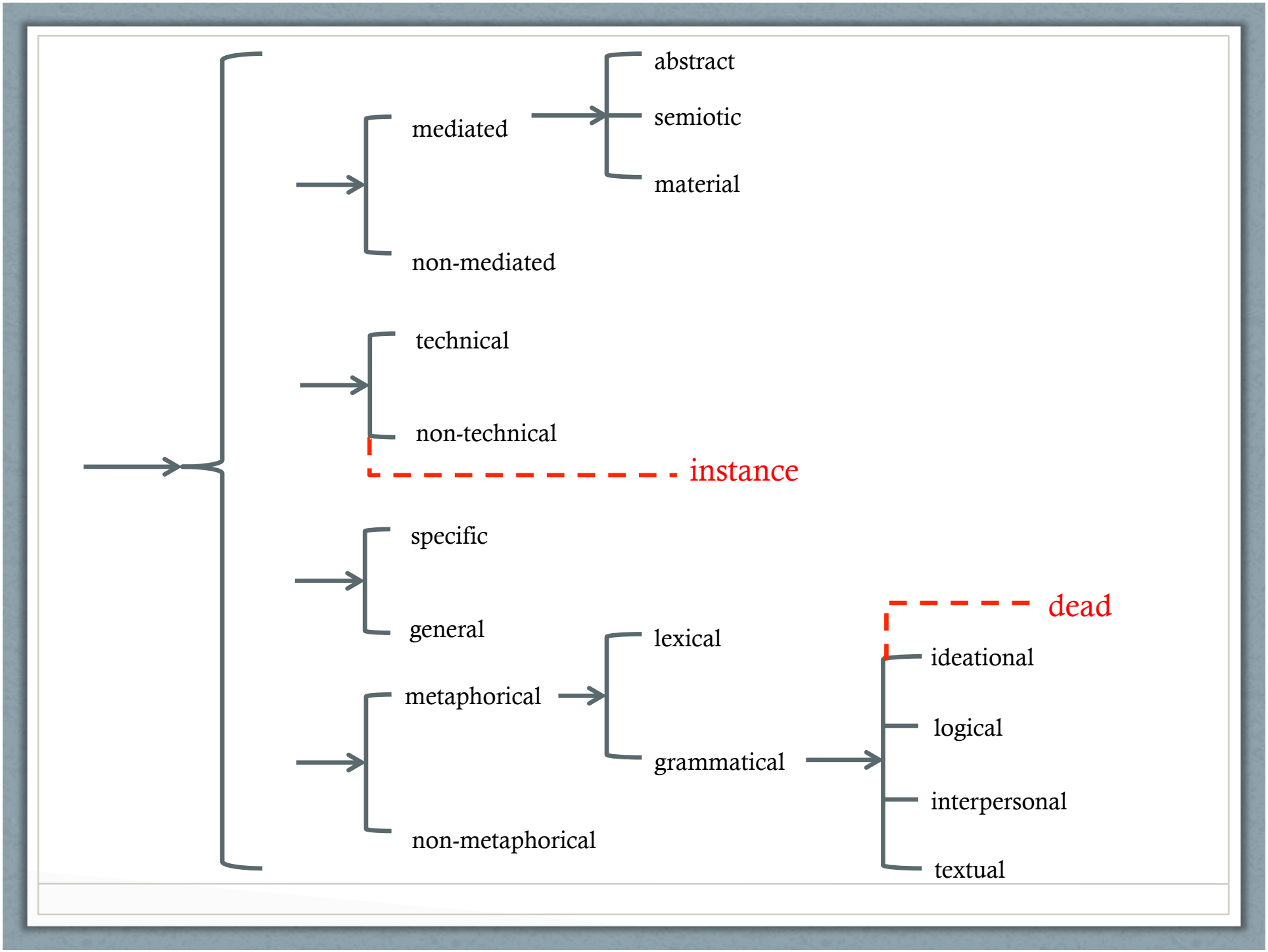
- (semantic) Environment
  - ...morphemes are added to words to signal grammatical relations
  - ...the word "proposed" is formed
  - Inflectional morpheme does not change the syntactic categories of the word.
  - One of the word is "motherland".
  - ...may not always form a real word, ...
  - ...try to match with the ending of the input word...

general

specific

Challenges

- Grammatical Metaphors
  - ...morphology is the study of word formation
  - ...the effect imposed on the formed words
  - Inflectional morphology serves grammatical functions
  - derivation
  - inflection


abstract
mediated
semiotic
material
non-mediated
technical
non-technical
instance
specific
general
dead
lexical
ideational
metaphorical
logical
grammatical
interpersonal
non-metaphorical
textual

Reference

- Dreyfus, S. and Jones, P. (2008). Mapping Sense of Place: Further descriptions of circumstance of location. In C. Wu, C.M.I.M. Matthiessen & M. Herke (eds). *Proceedings of ISFC 35: Voices around the world*. (p. 340-344)
- Halliday, M. (2005). On Matter and meaning: the two realms of human experience. *Linguistics of the Human Science ,1.1*, 59-82.
- Halliday, M. and J. Martin (1993). Writing Science: Literacy and discursive power. London: Falmer & Pittsburg: University of Piyysburg Press.
- Halliday, M. and Matthiessen C. (1999). *Construing Experience Through Meaning*. London & New York: Continuum.
- Halliday, M. and Matthiessen C. (2004). *An Introduction to Functional Grammar (Third Edition)*. London: Arnold.
- Martin, J. (1992). *English Text: system and structure*. Amsterdam: Benjamins. [reprinted Peking University Press. 2004]
- Martin, J. & Rose, D. (2003/2007). *Working with Discourse: Meaning beyond the clause (First/ Second Edition)*. London, New York: Continuum.
- Martin, J. & R. Veel (eds.). (1998). *Reading Science: Critical and functional perspectives on discourses of science*. London: Routledge.

Your turn

One more thing…

Let’s go get a drink!