

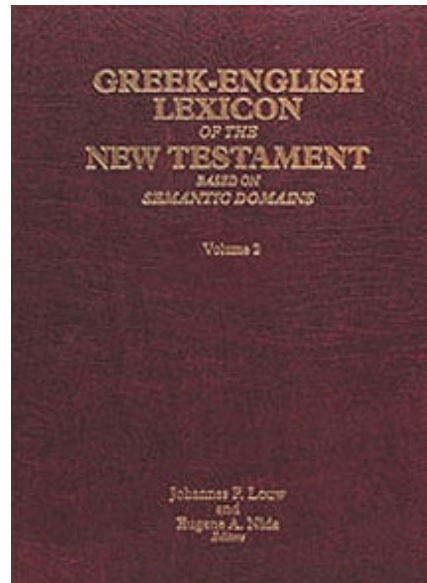
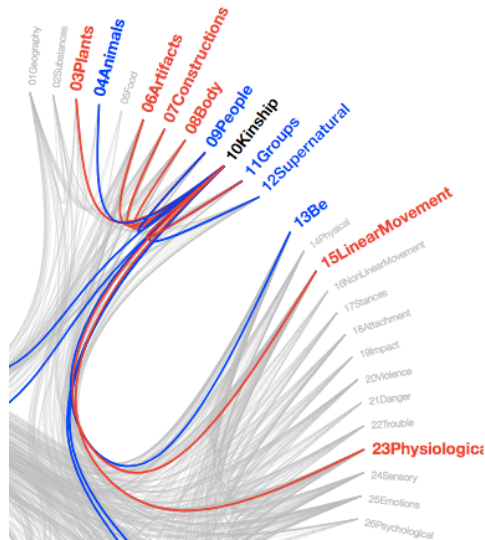
Cross-domain mappings in the Louw-Nida lexicon

Joost Zwarts, Utrecht University

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An experiment addressing two questions

1. How can we visualize metaphors in the New Testament?
2. How can we use information from the Louw-Nida lexicon for that purpose?



The ultimate goal

- an overview ('map') of the metaphors in the Bible (or the Greek New Testament to start with)
 - e.g., *tent* for 'body', 2 Cor 5:4 (Tappenden 2016, p.125)
- searchable by metaphor, meaning, verse, literature
- organized in domains ('constructions', 'life and death')
- with visual interfaces
- like *Mapping Metaphor with the Historical Thesaurus* (2015)
(<http://mappingmetaphor.arts.gla.ac.uk/>)

The background notion of metaphor

- a large-scale mapping from a source domain to a target domain
 - like CONSTRUCTION → BODY,
 - or BODY IS CONSTRUCTION
- involving multiple individual (lexical) correspondences
 - like 'body' is *tent* and 'death' is *dismantling (of tent)*
- following the Conceptual Metaphor Theory of Lakoff & Johnson (1980)
 - which is extensively applied in biblical metaphor studies (see Lanier 2014, Sherman 2014 for two fairly recent bibliographies)

Where the Louw-Nida lexicon of New Testament Greek comes in

- organization based on semantic domains
- four levels
 - entities (events, abstracts)
 - 7 Constructions (93 in total) ['macro']
 - 7B Buildings (7.2-7.25) (666 in total) ['meso']
 - ... 7.8 Dwelling ... 7.11 Inn ... 7.24 Prison ... ['micro']
- each (contextual) word sense ~ exactly one semantic domain
- polysemes (and homonyms) have multiple domains (1500 entries out of 5609)
 - for example, οἰκία (a) house 7.3 (b) family 10.8 (c) property 57.21
 - or σκήνωμα (a) dwelling 7.8 (b) dwelling place 85.77 (c) body 8.5

How to extract cross-domain mappings (incl. metaphors)

- example:
 - σκήνωμα (a) dwelling 7.8 (b) dwelling place 85.77 (c) body 8.5
 - yields the (micro) mappings $7.8 \rightarrow 85.77$ and $7.8 \rightarrow 8.5$
- aggregated to meso mappings
 - 7B (Buildings) \rightarrow 85E (Dwell, Reside)
 - 7B (Buildings) \rightarrow 8A (Body)
- aggregated to macro mappings
 - 7 (Constructions) \rightarrow 85 (Existence in Space)
 - 7 (Constructions) \rightarrow 8 (Body, Body Parts, Body Products)

Visualizing these mappings

- circular visualization
 - domains (nodes) at the perimeter of a circle
 - mappings (edges) as curves within the circle
- promising way of visualizing this type of data (Lima 2017)
- also used in Mapping Metaphor with the Historical Thesaurus (2015)
- choice for Hierarchical Edge Bundling
 - in the implementation of Mike Bostock (<https://bl.ocks.org/mbostock/7607999>)
 - allows for grouping of domains, interactive access, attractive output
- quantitative aspects not represented

Results at the macro level

- http://www.let.uu.nl/users/Joost.Zwarts/personal/l&n_index.html
- 93 macro domains at the perimeter
- hovering over a domain gives:
 - blue lines and nodes: mappings *to* other domains
 - red lines and nodes: mappings *from* other domains
- some domains stand out, e.g.,
 - **08 Body** almost exclusively source domain
 - **41 Behavior** almost exclusively target domain

Body as source domain (selection)

body (σῶμα), tongue (γλῶσσα), knee (γόνυ), face (πρόσωπον), flesh (σάρξ), hand (χείρ)	09 PEOPLE
flesh (σάρξ)	10 KINSHIP
body (σῶμα)	11 GROUPS
blood (αἷμα), sting (κέντρον)	20 VIOLENCE
belly (γαστήρ), blood (αἷμα), flesh (σάρξ)	23 PHYSIOLOGICAL
eye (ὄφθαλμός), face (πρόσωπον), ear (οὖς), sting (κέντρον)	24 SENSORY
tongue (γλῶσσα), mouth (στόμα), scar (στίγμα)	33 COMMUNICATION
finger (δάκτυλος), right hand (δεξιὰ), horn (κέρας), hand (χείρ)	76 POWER, FORCE
face (πρόσωπον)	83 SPATIAL POSITIONS
head (κεφαλή), body (σῶμα)	87 STATUS

Results at the meso level

- zooming in on one macro domain, e.g. [12 Supernatural](#)
- only domains are shown with connectivity with the selected domain
- http://www.let.uu.nl/users/Joost.Zwarts/personal/l&n_index.html
- (labels around the perimeter still need to be improved)

Supernatural beings (12A) as target domain

01B REGIONS ABOVE THE EARTH: in the sky (ἐπουράνιος)	from God
01B: REGIONS ABOVE THE EARTH: sky (οὐρανός)	God
01B: REGIONS ABOVE THE EARTH: world above (ὑψιστος)	the Most High
04A ANIMALS: animal (ζῷον)	living being
06M IMAGES AND IDOLS: idol (εἶδωλον)	false god
10B KINSHIP RELATIONS INVOLVING SUCCESSIVE GENERATIONS: father (πατήρ)	Father (title for God)
33O INFORM, ANNOUNCE: messenger (ἄγγελος)	angel
38A PUNISH: punishment (δίκη)	the goddess Justice
87C HIGH STATUS: prominence (μεγαλωσύνη)	Majesty

Supernatural beings (12A) as source domain (selection)

Holy Spirit (πνεῦμα)	14B WIND: wind; 30A: THOUGHT: way of thinking; 34J BREATHE: breathe; 26 PSYCHOLOGICAL FACULTIES: inner being
from the Spirit (πνευματικός/ῶς)	26 PSYCHOLOGICAL FACULTIES: spiritual; 33C DISCOURSE TYPES: figuratively; 41C PATTERNS OF BEHAVIOR: of spiritual conduct; 79A PHYSICAL/SPIRITUAL: not physical; 79B HUMAN/SPIRITUAL: supernatural
Devil (διάβολος)	33P INSULT, SLANDER: slanderer; 88O BAD: wicked person
the Helper (παράκλητος)	35A HELP: helper
Lord (κύριος)	37D RULE, GOVERN: ruler; 57A POSSESS: owner; 87C HIGH STATUS: sir
Satan (title) (Σατανᾶς)	93A NAMES OF PERSONS: Satan (name)

Optimistic conclusions about visualizing cross-domain mappings

- a circular visualization of cross-domain mappings could give insight in biblical metaphors and metonyms
- and a visual interface with something like the Louw-Nida lexicon
- if we could interactively zoom in from the macro level to the meso and micro level
- and allow the lexical data to 'pop up' in a useful way

Concerns about data and domains (in Louw & Nida)

- 'primary' sense not always (a) sense (e.g., with κύριος and πνεῦμα)
- (a) sense not always present (e.g., with καρδιά 'heart'), because it does not occur in the NT
- domains for metaphor sometimes split over different L&N domains
 - 'pastoral' source domain split between 44 Animal husbandry (for the shepherd) and 4 Animals (for the sheep)
 - no connection between 'sin' (88L) is 'stumbling' (15C) mapping and 'way of life' (41A) is 'road' (1P) mapping, which are part of the same LIFE IS JOURNEY conceptual metaphor
 - no distinction between mappings (metaphors and metonyms) and other polysemies and among different types of mappings
 - not clear what is left out (e.g. metaphors for 'church') without an independent criterion

Two different potential directions from here

- work out visual explorations of the 'pure' Louw-Nida lexicon
 - without solutions of the deeper semantic problems
 - in collaboration with interested L&N stakeholders
- restructure the domains and polysemies of the Louw-Nida lexicon
 - with domains relevant for metaphors (like a pastoral domain that includes shepherds, sheep, flocks and herding)
 - with polysemies relevant for metaphors (from more concrete to more abstract domains)

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