
The Meaning of Ancient Words for ‘Earth’: An Exercise in Visualizing Colexification on a Semantic Map
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This paper aims at investigating the polysemic patterns associated with the notion ‘soil/earth’ by using the semantic map model as a methodological tool. Our goal is to visualize the semantic spaces of twenty ‘soil/earth’ words in nine different languages (mainly ancient). The open empirical questions are whether the semantic spaces covered by the investigated lexemes are different from one another and to what extent some commonalities can be detected. Interestingly, the construction of semantic maps on the basis of the data collected from the various sources of the object languages reveals that the semantic spaces covered by the investigated lexemes are often quite different from one another, although common patterns can also be detected. Our study highlights some shortcomings and methodological problems of previous analyses suggesting that a possible solution to these problems is the control of the data in the existing sources of the object languages. Finally, drawing upon the cognitive linguistics literature on the various types of semantic change, we show that some of the senses of the individual lexemes are the result of the function of such mechanisms as metaphor, metonymy, and generalization.

Semantic map; polysemy; lexicography; earth; space; metonymy; metaphor.

1 Introduction

This paper aims at investigating the polysemic patterns associated with the notion ‘soil/earth,’ a notion that is itself not spatial but has many spatial concepts as part of its polysemy. By using the semantic map model as a methodological tool, our goal is to visualize the semantic spaces of twenty ‘soil/earth’ words in nine different languages (mainly ancient). The open empirical questions are whether the semantic spaces covered by the investigated lexemes are different from one another and to what extent some commonalities can be detected. Interestingly, the construction of semantic maps on the basis of the data collected...
lected, allows to check certain semantic hypotheses. In particular, the possible semantic connections between senses and the processes linked to these connections are discussed, highlighting the role of certain mechanisms in meaning extension. Since the relevant literature has mainly focused on the grammatical domain, the choice to test the applicability of the model to the lexical domain appears to be challenging and important. Finally, this paper may also foster a necessary awareness of the fallacies of polysemy and homonymy, not only in the case of ancient and modern lexemes in everyday life, but also in the scientific vocabulary (‘language’) of various academic disciplines.

The structure of the paper is as follows. In Section 2, we begin by situating our work relative to the monosemy vs. polysemy debate. We also present the basic principles of the semantic map model. Section 3 focuses on the colexification method, which is specifically designed for lexical semantic maps, and discusses some problems that arise using it. Section 4 gives information about the languages that constitute the empirical basis of this study. Section 5 introduces the notion of ‘earth,’ presents some methodological notes (e.g., the use of linguistic glossing) and describes step by step the process of generating a semantic map. In Section 6, we propose specific sources and targets of meaning extension and relate them to similar developments that have been acknowledged in the relevant literature. The final section summarizes the results and offers some concluding comments.

2 Monosemy, polysemy, and semantic maps

2.1 Monosemy and polysemy

The nature of word meanings is an intriguing subject that has been the center of long-standing debates in both the linguistic and philosophical traditions. Our primary focus is on two of the major approaches to the topic, the monosemist position and the polysemist position. Both accounts provide solutions that are satisfactory for some problems and inadequate for others. Crucially, when monosemists and polysemists focus on the comparison between languages, the conflicting analyses by the advocates of each approach will often lead to a dead end. Recent literature has tried to overcome this problem by employing the semantic map tool, which, according to its supporters, is neutral with respect to this distinction between monosemy and polysemy.1 Decisions concerning whether the different meanings of a word are stored as distinct semantic entities, or whether these meanings can be explained in terms of a single general sense, are irrelevant for this method. The semantic map tool is not interested in whether, for example, the different meanings of English to are different conventional senses or only different uses (see Section 2.2, below).

This methodological principle constitutes one of its comparative advantages over other methods, since it facilitates the cross-linguistic comparison.

2.2 Semantic maps

In this subsection, we give a brief overview of the basic principles of the semantic map method and of its further advantages. Semantic maps are a methodological tool for visually representing the multiple senses of a linguistic unit and are particularly useful for cross-linguistic and diachronic studies.2 Consider Fig. 1, the textbook example taken from Haspelmath’s (2003) influential article, which exemplifies how the model works.

Fig. 1 presents the dative functions typically found in the languages of the world, according to Haspelmath. These functions are selected on the basis of cross-linguistic

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1 See, e.g., Haspelmath 2003
2 See Haspelmath 2003
comparison and arranged geometrically in such a way that reflects the (dis)similarity of functions. In the semantic map model, similarity is not an arbitrary notion, but rather depends on the frequency of two functions co-occurring in (the respective samples of) the languages. On a second level, closeness is determined on the basis of the ontological properties of the various functions.\(^3\) For example, it is more probable that functions like direction and purpose will be grouped together in a language, taking into account that both involve motion, (see Ex. 1 and 2 below), whereas functions like direction and judicantis will be kept apart, since the ‘literal-movement’ property is absent in judicantis (see Ex. 3).

(Ex. 1) Mary is going to the airport.

(Ex. 2) The lifeguard ran to the rescue of the child.

(Ex. 3) Mir ist schlecht (me.dat is.3sg bad ‘I feel queasy’).

Closeness of functions is conventionally shown by spatial adjacency. The more similar the functions are, the closer they appear in representational space. Ideally, connecting lines indicate more clearly which functions are closely related and can serve as starting points for the establishment of possible pathways of diachronic meaning change. The curved closed lines around a set of connected functions indicate the boundaries of a grammatical morpheme in semantic space. For example, the English preposition to is confined within the area that includes the functions purpose, direction, recipient, and experiencer. All the other functions fall out of its scope and therefore are not encircled in the curved closed line (Fig. 1). The iconic clustering of the various functions in contiguous areas of the map and the representational conventions which indicate how different words across different languages cut semantic space, are few of the many advantages of the method. Our choice to rely on this method is further justified by the following five reasons:\(^4\)

1. **Semantic:** The method is neutral with respect to the monosemy–polysemy distinction. Decisions concerning whether the different meanings of a word are stored as distinct semantic entities, or whether these meanings can be explained in terms of a single general sense, are irrelevant for this method.

2. **Typological:** This method efficiently serves the purpose of cross-linguistic comparability. Each map may posit various implicational universals.

3. **Diachronic:** The map may indicate possible directions of semantic change.\(^5\)

4. **Synchronic:** The semantic map can provide evidence as to which meanings speakers perceive as closer or more distant.

\(^3\) See also François 2008, 178–179.

\(^4\) See Haspelmath 2003 for an overview.

\(^5\) See Narrog 2010.
5. **Scientific accuracy**: The validity of a map can be challenged in light of further data; this ensures the falsifiability of the hypotheses made within this approach.

3 **Colexification: the method and some problems**

The semantic map model was initially created in order to describe the polysemic patterns of grammatical morphemes. The literature has tended to neglect the lexical domain, primarily because content words are generally considered less interesting in linguistic theory than function words. Not until very recently, however, have efforts been made to extend the model to include lexical semantics as well. This paper aims to help fill this gap by focusing on the applicability of the model to the lexicon. In doing so, we build upon the model of lexical typology developed by François that follows the methodological steps identified by Haspelmath.

A fundamental concept in the model is that of the pivot sense. A pivot is the specific sense taken as the object of the study. In our case study, the pivot sense is the sense ‘soil/earth’, which is understood here as the substance in which plants grow, its form/shape being irrelevant (cf. Section 5.1). A caveat should be kept in mind, however: the pivot sense of the described method should not be confused with the prototypical meaning of a lexical unit. It could be prototypical, but not necessarily. As François puts it:

> [T]he definition of a prototypical meaning [...] constitutes an interpretative claim about this word that may be challenged or falsified. On the contrary, the selection of a given notion as the pivot of a (universal) lexical map entails no claim at all: it is simply an arbitrary choice, the starting point before any lexical map may even begin to be drawn.

For a lexical unit to be inserted in our database, it is a necessary condition that this lexical unit include the pivot sense – in our case ‘soil/earth’ – as part of its polysemy. Once the words fulfilling this criterion are collected, the next step is to list all the other senses of these (and only these) words. François’s method is dictionary-based in this respect, meaning that the analyst should rely on the knowledge that the lexicographer records. This approach has both advantages and disadvantages. On the one hand, it ensures that all the data is gathered using the same method. In addition, it makes possible the study of a larger set of languages, since an intimate knowledge of a particular language is not a prerequisite for this language to be included in the sample. On the other hand, one possible disadvantage is that not all dictionaries are designed according to the same criteria. For example, they may not apply the same rules on how to distinguish among the various senses of a word; the lexicographer chooses which nuances to include in the dictionary and which of these deserve separate treatment. Some differences between senses may not be considered important enough to be recorded. It is obvious that such an approach to

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7 See François [2008], Wälchli and Cysouw [2012].

8 François [2008], Haspelmath [2003].

9 François [2008], 181–182.

10 Furthermore, some dictionaries have already become quite old and do not include any new attestations, findings, or understandings of the sense(s) of certain words. For Akkadian, for example, the earliest volumes of *The Assyrian Dictionary of the Oriental Institute of the University of Chicago* (Chicago Oriental Institute [1956–2010]) were published in 1956 (Volume 5 G, and Volume 6 H), whereas the last volume was published in 2010 (Volume 20 U/W). Another problem, especially for Hittite, is the fact that some dictionaries are not (yet) complete. The *Hittite Dictionary of the Oriental Institute of the University of Chicago* (Chicago Oriental Institute [1980–2005]) has currently published volumes only for the letters L, M, N,
listing senses could seriously affect the resulting map, since one lexicographer working on a language might make more fine-grained distinctions than another. Enabling more detailed distinctions could give a different picture than an approach that treats senses that appear to be close as having one meaning. The problem is obvious and grave: if a sense is not recorded in the dictionary, this does not mean that the sense does not exist.

In trying to resolve this thorny problem, we chose to use not only dictionaries, but other existing sources of the object languages as well. The researcher who was responsible for ancient Egyptian, for example, classified the senses of all the text examples for the respective lexemes recorded in the digital text database *Thesaurus Linguae Aegyptiae*.

One or two convincing text examples of each of the senses for each language were chosen to be fully glossed for publication in a separate data appendix (PID: 21.111101/0000-0001-AE7C-1). This procedure often revealed a set of senses that were not listed in the respective dictionaries. Expanding the list was not an arbitrary choice made by the analyst, however, but one based on a very specific methodological criterion. We considered a sense as distinct on the basis of cross-linguistic comparison. Assuming that in a language $L_1$ a lexical element $LE_{1a}$ has the senses $S_1$ (the pivot), $S_2$, and $S_3$, but in a language $L_2$ a lexical element $LE_{2a}$ has the senses $S_1$ (the pivot) and $S_2$ but not $S_3$ (which is expressed by another lexical element $LE_{2b}$), this would suffice to justify the choice of distinguishing between $S_2$ and $S_3$. To put it in more concrete terms, the fact that ancient Greek $gê$ lexifies ‘soil/earth’ with ‘ground’ but not with ‘floor’, as opposed to the German *Boden* (‘ground’), which has all three senses, is sufficient reason to treat ‘ground’ and ‘floor’ as distinct senses.

A second fundamental concept in François’s model is that of colexification. He calls “colexification” what is generally known as “polysemy,” namely the use of words with a number of related meanings. We prefer the term colexification over polysemy, because the former does not imply any claim about which meanings of a word are stored as distinct senses in memory. Colexification is divided into two subcategories: “strict colexification” and “loose colexification.” In the present paper, we consider only cases of strict colexification: polysemic patterns of the very same word in synchrony. In case of ancient Greek, for example, we picked the form *khthṓn* and identified its various senses, e.g., ‘soil’ and ‘country.’ The colexification of ‘soil’ and ‘country’ can be thought of as strict colexification because both are senses of the same form, i.e., $khthṓn$ and inflected variants. Senses that form part of the colexification of a related but different form, e.g., the derivational form $khthónios$ (with the sense ‘under-the-earth’), are not taken into consideration. Note that the addition of loose colexification would lead to a slightly different semantic map. We generally chose not to include it in our analysis. This eventually raised serious problems in some of the languages of our sample, however. In classical Arabic, for example, which is characterized by a root–and–pattern morphology system, it was difficult to always draw

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11 *TLA* 2014.
12 See Haspelmath 2003; François 2008.
13 See Lakoff 1987; Taylor 1995, among many others.
14 In a similar vein, Haspelmath uses the term *multifunctionality* to avoid the problem of distinguishing between monosemy and polysemy.
15 For example, *khthónios theoi* are ‘the gods of the netherworld.’ Note that the sense ‘underworld’ is attested in Akkadian, Classical Hebrew, and Hitite in our language sample. This means that if we had considered loose colexification as well, the change of the boundaries would have indicated a shared polysemy between all these languages.
a clear line between strict colexification and loose colexification, since some variations resemble inflection but others resemble derivation. Another tricky issue was the question of how far fixed collocations and/or compounds (e.g., in German) should be taken into account: we generally tried to disregard these.

<table>
<thead>
<tr>
<th>Language</th>
<th>Language Family</th>
<th>Period</th>
<th>Researcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akkadian</td>
<td>East Semitic (Afro-Asiatic)</td>
<td>26th c. BCE – 1st c. CE</td>
<td>T. Kitazumi; L.E. van de Peut</td>
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<tr>
<td>Classical Arabic</td>
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<td>7th – 12th c. CE</td>
<td>A. Sundermeyer</td>
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<tr>
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<td>(Central) Semitic (Afro-Asiatic)</td>
<td>12th(?!) c. BCE – 2nd c. CE</td>
<td>J. Hartlieb</td>
</tr>
<tr>
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<td>Afro-Asiatic</td>
<td>23rd – 4th c. BCE</td>
<td>D.A. Werning</td>
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<tr>
<td>Hittite</td>
<td>Anatolian (Indo-European)</td>
<td>17th – 12th c. BCE</td>
<td>T. Kitazumi; L.E. van de Peut</td>
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<td>8th – 4th c. BCE</td>
<td>Th. Georgakopoulos</td>
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<tr>
<td>English</td>
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<tr>
<td>French</td>
<td>Romance (Indo-European)</td>
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<td>G. Chantrain</td>
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Tab. 1 | List of languages studied.

4 Language corpus

Our corpus consists of twenty words in nine languages. See Tab. 1 lists the languages that constitute the empirical basis of the present study and provides information about the language family for each language, the relevant time span examined in each language, and the researcher who collected and analyzed the data. As can easily be seen, the sample has a Mediterranean bias because it consists of languages belonging to the Indo-European and Afro-Asiatic language families. These choices were necessary in order to overcome the problems arising from the dictionary method: such pragmatic problems, discussed in

16 Although the data for some languages in our sample covers different periods of the language, it should be underlined that our study is by no means diachronic. Our analysis can be described as involving data from various synchronies. A diachronic investigation is definitely called for, especially since the semantic map method is particularly suitable for the inclusion of diachronic information (see Narrog[2010] which shows how information on paths of semantic change of grammatical morphemes is integrated into the map). Future research could identify probable (and improbable) directionalities of meaning extension, but this aspect is beyond the scope of this paper.
Section [3] could only be overridden if the researchers involved had good knowledge of the languages under investigation. In short, we sacrificed having a representative sample in favor of more precise analysis. After all, our study does not claim to have any universal validity, but can be a good starting point in this direction.

5 Collaborative research on the semantic map for ‘soil/earth’

5.1 The pivot sense

In accordance with the overall research topics of the Excellence Cluster Topoi, we wanted to use a semantic map to visualize the different senses of a word related to either space or knowledge. These senses would function as a pivot to show the similarities and differences between languages.

After a preliminary exploration of four promising possible pivot senses, namely ‘place,’ ‘earth,’ ‘face,’ and ‘to know,’ we chose to focus on the specific notion of ‘earth,’ more precisely the sense ‘soil/earth’ (as a substance). This was mainly a pragmatic choice: the collected colexified senses for ‘soil/earth’ were generally more concrete than the ones collected for the other three senses, and therefore more intersubjective agreement could be reached as to the definition of the collected senses. What’s more, the semantic space covered by the lexemes studied promised to shed some light on the set of metonymical and metaphorical relations that motivate the colexification of spatial senses such as ‘planet Earth,’ ‘terrestrial body,’ ‘ground,’ and ‘country,’ as well as less or even nonspatial senses like ‘world,’ ‘homeland,’ and ‘soil/earth’ in certain lexemes. As mentioned above, we defined the pivot sense ‘soil/earth’ as ‘the earth material in general, irrespective of its form/shape, potentially focused on fertility.’

5.2 Linguistic glossing

In order to help future readers as well as our fellow researchers to verify the senses attributed to the lexemes in different languages, we decided to present as many language examples with linguistic glosses as was feasible.\[17\] It must be mentioned, however, that the method of glossing used allows for a considerable number of glossing ‘variants,’ and we did not try to force all contributors to use one specific glossing variant. Consequently, the analyses represented here are each the responsibility of their own individual researcher.

The difference between the prototypical sense of a word and its other senses in specific contexts highlighted a methodological problem with glossing in general: whether one should use the prototypical sense or the contextual sense of a word to gloss it in a given context. The practical solution that we adopted was to recommend glossing at least those lexemes that we studied in this investigation with their prototypical sense (or, if there was no obvious prototypical sense, the first sense listed in the dictionary). This emphasized the difference between the prototypical meaning mentioned in the gloss and the sense of the lexeme conveyed by the translation of the text example.

5.3 Collecting and evaluating senses

During the distributed research, we collected the attested senses in a common table (see Table [5] in the appendix). The table was updated and repeatedly discussed. The researchers

\[17\] The reader is also referred to collaborative online wiki Glossing Ancient Languages (Werning \[2012\]–) (See also Kutscher and Werning \[2014\] x-xi, xxx–xxvii).
were asked to mark attested senses for their respective lexemes, as well as those that were almost certainly not colexified by the lexeme. There were animated discussions concerning the descriptions of the observed functions/(contextual) senses. Table 2 in the appendix lists the recognized senses by an (almost random) number and includes a conventional label, the common English words and German translations for the sense, and some additional comments and cross-references.

It is worth mentioning that, for various reasons, in the end we had to merge some senses that we had initially distinguished. For example, for the present paper we gave up on distinguishing between ‘soil/earth’ and more specifically ‘clay’ and ‘sediments’, between ‘natural ground’ and ‘surface of the earth’ (large-scale perspective), between ‘world of the living’ and ‘whole world’ (including underworld and heaven), and between ‘terrestrial body’ (not necessarily spherical) and ‘planet Earth’ (sphere).

5.4 Generating the map

The first step towards a semantic map around the pivot sense ‘soil/earth’ was to collect the attested senses for the relevant lexemes of all languages in a table (see the latest version in Table 2 in the appendix). To get to a first preliminary layout of the semantic map, we exported the full list of attested pairs of sense||lexeme. This list was imported as a list of “edges” (the positive attestation of a sense) between two “nodes” (sense and lexeme) into the open-source graph program Gephi. A preliminary arrangement of sense nodes and lexeme nodes was computed by applying the Yifan Hu algorithm that is implemented in the program. Afterwards, however, we repeatedly rearranged this and subsequent map versions in order to be able to neatly encircle contingent areas for all individual lexemes. Where possible (i.e., while still maintaining contingent areas for all lexemes), we also tried to group (intuitively) related senses close to each other. Repeated rearrangements were necessary, since the data from the individual languages changed continually during the research process. For the final map (see Fig. 17 in the appendix) all the edges between the sense nodes and the lexeme nodes were deleted, and the lexeme nodes were replaced by lines encircling the attested sense nodes for each individual lexeme (Venn diagram areas).

6 Observations

First of all, we can see that the semantic spaces covered by the investigated lexemes are often quite different from one another (see Fig. 17 in the appendix). The senses colexified by individual lexemes include some metonymies and metaphors. On top of this, we also find downward shifts in the taxonomy, namely specialization of senses, or, conversely, upward shifts in the taxonomy, namely generalization of senses. Some of the more interesting observations are discussed below, with the caveat that the proposed sources and targets of the meaning expansions are always interpretations based on a) the closeness of the senses in the diagram and b) the judgments of the researcher.

6.1 Metonymies

In our data, metonymy is one way that a lexeme gains semantic properties. Among the metonymies observed is the conceptual metonymy place for inhabitants, as exemplified by the extension from (very probably) ‘world’ to ‘humankind’ and from ‘country’ to ‘inhabitants (of a country)’ in Egyptian:

https://gephi.github.io/vc.8.2b (visited on 06/06/2016).
'How happy are the (inhabitants of) this country that he became to rule.'

Here a connection is established between two conceptual entities that belong to the same conceptual domain; this is why the relation between place and inhabitants is classified as metonymic.\(^\text{19}\) That places may be understood as containers that contain people has been widely acknowledged in the literature dealing with metaphors and metonymies.\(^\text{20}\) Note that this metonymy is not unidirectional, but that the opposite directionality is also possible, as is the case with many metonymies.\(^\text{21}\)

Another evident instance of conceptual metonymy connects a substance and an object (consisting of that substance), as exemplified by the colexification of ‘soil/earth’ (substance) and ‘(natural) ground’/‘terrestrial body’ (object) in nearly every lexeme investigated here, e.g., in the English earth, German Erde, and French terre.

Another case of conceptual metonymy is object for an inner space of that object, as exemplified by the sense ‘underworld,’ e.g., in the following example from Hittite:

‘The Storm-god and Šuwaliyatt went down to the dark netherworld.’

6.2 Functional extensions

We often find that one sense has an additional functional component as opposed to another sense. Compare, e.g., the relation between ‘(natural) ground’ and ‘plot of land’ to that of ‘homeland/native land,’ the latter of which adds the sense ‘ownership.’ Note the following examples from Akkadian and French:

‘As (the equivalent of) fifteen shekels of silver, he gave his plots of land, which (are) behind the house, to the Anatolian.’
‘He spent all his income buying land; [...]’

In addition, the relation of ‘ground’ or ‘terrestrial body’ to ‘world’ (exemplified in the Akkadian qaqqaru(m)) adds the nuance of a ‘habitat,’ as does the extension to ‘city’ (in ancient Greek gê).

(Ex. 8: The Epic of Gilgamesh, Gilg. VII iii 44 and VIII 3, see CAD Q 123b)

\[
\text{malkû} \quad \text{sa} \quad \text{qaqqari} \quad \text{uñašaqu} \quad \text{šepê=ka}
\]

The rulers of the earth/world kiss your feet.

(Ex. 9: Euripides, The Trojan Women 867–868; 5th BCE)

\[
\text{κεῖνος μὲν οὖν δέδωκε σὺν θεοῖς δίκην}
\]

\[
\text{αὐτός τε καὶ γῆ δορὶ}
\]

\[
\text{πεσοῦσ᾽ Ἑλληνικῷ}
\]

‘But he, by the gods’ will, has paid the penalty, ruined, and his city too, by the spear of Hellas.’

The extension from ‘soil’ to ‘mortar/grout’ and/or ‘plaster’ adds a specific function to ‘soil/earth,’ or rather more specifically ‘clay.’

(Ex. 10: Book of the Dead, spell no. 151, col. 393, pKairo CG 51189 = pJuja; 14th c. BCE; from TLA 2014)

\[
jr(j) \quad n=f \quad bb.w \quad hr \quad st.wt \quad jmnt.(i)t \quad hr=f
\]

\[
r= \quad jblt.(i)t \quad jr(i) \quad dbi \quad hr=f \quad m \quad t\i
\]

\[
\text{r= eastern:F} \quad \text{to=advz} \quad \text{clothie=IMP-3SG.M} \quad \text{face=M-3SG.M} \quad \text{with= land/earth(m)}
\]

‘Make a hole for it in the western wall, facing its eastern (wall) and cover its front with clay/plaster.’

Similarly, a path that leads from ‘soil’ to ‘agricultural land’ (and then metonymically to agriculture) is detected. This is exemplified in Ex. 11:

(Ex. 11: 2 Chronicles 26:10)

“[King Uzziah of Judah] built [watch-]towers in the steppe and dug many wells, because he had a large live stock [there], also in the Shephelah-lowland and the Mishor-plateau,
and field farmers and wine farmers in the mountains and in the fruitful land. For he was loving [cultivating the] *agricultural land* (*ʔdɔmɔ*).

Finally, we find the extension of (very probably) ‘natural ground’ to ‘pastureland’ (see Ex. 12) and/or ‘farmland’ (see Ex. 13).

(Ex. 12: Genesis 13:2.5f)

“Abram was very rich in flocks [...] but also Lot, who traveled with Abram, had sheep, cattle and tents. But the *pastureland* (*ʔɛrɛ*. didn’t supply them for living together, because their property was [so] large, [that] they couldn’t live together.”

(Ex. 13: Exodus 23:10f)

“For six years you (Israel) may sow your *farmland* (*ʔɛrɛ* ‘land’) and gather its income, but in the seventh year you shall leave it fallow and unused.”

### 6.3 Metaphors

In some attestations, we observed that a connection was established between conceptual entities belonging to different domains or frames. We therefore classified these as metaphorical. Such a connection can be identified between the concept of ‘(in the) dust’/‘(in the) dirt’ and the concept of ‘humiliation/abasement’ in Classical Hebrew.

(Ex. 14: 1 Samuel 2:7f)

“Yahweh makes poor and makes rich, humiliates and also exalts. He raises the nobody out of the *dirt* (*ʕɔp̄ɔr* ‘dust’), out of the dunghill he lifts up the poor.”

We can presume that our understanding and experience of humiliation is akin to lying in the dirt, the bare ground. This metaphor is consistent with other orientational metaphors present in many languages, including the metaphorical concepts *sad is down*, being subject to control or power is down, and *less is down*. German exemplifies another case of a spatial metaphor, very likely extending the sense ‘(natural) ground’/‘floor’ as a kind of support for the inhabitants of the world to the sense ‘shelf board’; the support for items to be stocked on a shelf. Note, e.g., the description of IKEA’s shelf “Ivar”:

(Ex. 15: Description of a shelf, ikea.com 2014)

*Mit versetzbarer* Böden; *der Abstand dazwischen kann dem Bedarf angepasst werden.*

‘With transferable [shelf boards]; the distance between them can be adapted to one’s needs.’

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22 See, e.g., Werning 2014, §1.
23 See Lakoff and Johnson 1980; Lakoff and Johnson 1999.
24 See http://www.ikea.com/de/de/catalog/products/S29896362/, “IVAR,” “Produktinformationen” [06.06.16].
An old collocation in Classical Hebrew testifies to a structural metaphor that extends the sense ‘dust’ to the ‘innumerable’ amount of its basic particles. Note the following example:

(Ex. 16: Genesis 13:16)

“(To Abraham:) I will make your offspring very high in number (literally like the dust [ʕɔp̄ɔr] of the terrestrial body [ʔɛrɛs]), so that [only] if someone could count the dust of the earth could he count your descendants, too.”

We also find another interesting metaphor based on ‘dust’ in classical Arabic. Here ‘dust’ may be used in the sense ‘nothing (valuable):’

(Ex. 17: Lane 1997 [1863], vol. 1, 301/2)

لا حب التراب

la-hu at-turāb

for-3sg.m def-dust

‘May he have nothing!’

6.4 Generalizations

We can observe that some senses extend to more general senses. The mechanism involved in this kind of extension is ‘generalization,’ which refers to the semantic relationship between a more general sense and a more specific one. A representative example from Akkadian is the extension of a sense denoting a limited terrestrial area (like ‘territory’) to an ‘area’ in general (‘area,’ ‘area in the sky,’ ‘open/free/black space’).

(Ex. 18: A letter, ABL 744 r.1, see CAD Q 121 a; Neo-Assyrian)

ينا قاقار برع سيمانيانا أتيمار

ina qaqqar MUL.SIPA.ZI.AN.NA ittamar

in ground.stc (constellation) see 3sg.prf.pass

‘(Jupiter) became visible in the area/region of Orion.’

(Ex. 19: ABL 17:8, see CAD Q 122b)

كبت قاقرر ان ا لأناقش

kittu qaqquru ana sadāri ēs

reality.nom.sg ground.nom.sg.m for place_in_order.inf.gen few

‘As a matter of fact, there is little room for maneuvering.’

Another case is the (very probable) extension of ‘(natural) ground’/‘floor’ to any ‘bottom/base’ of a container in the German Boden and to any ‘lower part’ in classical Arabic. This metaphorical extension seems to presuppose a conception of the habitat ‘world’ as a container and the ‘ground’ as the ‘bottom/base’ of it.

The linkage between the specific and the more generalized sense can be accounted for via such mechanisms as metaphor and metonymy (see above).

25 See Geeraerts 2010.
26 DWB 1854–1971, 2, 210: “2) boden ist uns noch heute wesentlich der grund eines fasses, glases, bechers, sackes, beutels” (“boden is basically still the bottom of a barrel, glass, mug, sack, [or] pouch for us today”);

See Lane 1997 [1863].
6.5 Indirect evidence of connections

Some of the collected lexemes that colexify ‘soil/earth’ demonstrate the contextual sense ‘humankind.’ Compare the following examples from Egyptian and Hebrew:

(Ex. 20: Great Hymn to the Sun, Amarna, Col. 5; 14th c. BCE; from TLA 2014)

`tꜢ Ꜣr-f jr(j)=sn kꜢ t=sn
f-3pl work:

land/earth(M) whole-3sg.m do:IPPV-3PL work:3-3PL

‘(The population of) the whole world: they do their work.’

(Ex. 21: Genesis 9:19)

“These three were the sons of Noah and from these all humankind (ʔɛrɛs) spread.”

It is most likely no coincidence that the word meaning ‘soil/earth’ has the additional sense ‘humankind.’ The linkage between the two senses is also evidenced by the fact that in some language families, the lexicon referring to earth underlies the many formations for designating humans. As a matter of fact, in Indo-European,\(^{28}\) we have the form \(\ast dh\text{-}gh\text{-}m\text{-}on\) with the meaning ‘human being,’ which derives from \(\ast dh\text{-}gh\text{-}om\text{-} ‘earth’ (cf. Lat. *humus ‘earth’ vs. *homo ‘human being’).\(^{29}\) In our case, however, the pathway seems to be an extension from the sense ‘world’ to its inhabitants ‘humankind’ (for the conceptual metonymy case for these inhabitants, see Ex. 4, above), suggesting an indirect connection between the sense ‘soil/earth’ and the sense ‘humankind.’

7 Concluding remarks

The goal of this paper was to investigate the polysemic patterns associated with the notion ‘soil/earth’ by using the semantic map model as developed in Haspelmath and François.\(^{30}\) Most of past research on polysemy focused on the analysis of grammatical morphemes, while simultaneously the lexical domain was neglected. This paper helped fill this gap by focusing on the applicability of the semantic map model to the lexicon. It also highlighted some shortcomings and methodological problems of previous analyses suggesting that a possible solution to these problems is the control of the data in the existing sources of the object languages. The most concise result of our research is a diagrammatic visualization of the semantic spaces of twenty words in nine different languages (Fig. 17 in the appendix). However, already the research process was influenced by the repeated creation and evaluations of hypotheses in the form of preliminary semantic maps. These preliminary maps allowed to check semantic hypotheses and to identify potentially problematic input data. The research practice was, therefore, also a practical exercise in ‘diagrammatic reasoning.’ The common semantic map for the various languages revealed that the semantic spaces covered by the researched lexemes are often quite different from one another, although common patterns can also be detected. Finally, drawing upon the cognitive linguistics literature on the various types of semantic change, this study showed that some of the senses of the individual lexemes are the result of the function of such mechanisms as metaphor, metonymy, and generalization.

\(^{28}\) Especially in the branch termed “North-West Indo-European” (see Mallory and Adams 2006, 74, 109).

\(^{29}\) Mallory and Adams 2006, 74, 120–121.

\(^{30}\) Haspelmath 2003; François 2008.
<table>
<thead>
<tr>
<th>No.</th>
<th>Conventional label</th>
<th>English / German</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>#010</td>
<td>SOIL / EARTH</td>
<td>soil / earth / Erdboden / Erdeich</td>
<td>earth material in general, irrespective of its form/shape, potentially focused on fertility, possibly including more specific soils like clay, sediments; see soil in specific functions: PLASTER, MORTAR/GROUT; see shape-oriented (NATURAL) GROUND</td>
</tr>
<tr>
<td>#030</td>
<td>PLASTER</td>
<td>plaster / Putz</td>
<td>to cover a wall; see MORTAR/GROUT</td>
</tr>
<tr>
<td>#040</td>
<td>MORTAR / GROUT</td>
<td>mortar / grout / Mörtel</td>
<td>e.g., to join bricks; see PLASTER</td>
</tr>
<tr>
<td>#050</td>
<td>DIRT</td>
<td>dirt / Dreck / Schmutz</td>
<td>unwanted stuff; see DUST, RUBBLE/DEBRIS</td>
</tr>
<tr>
<td>#060</td>
<td>EXPECTATION SUBSTANCE</td>
<td>expectoration substance / Auswurf</td>
<td></td>
</tr>
<tr>
<td>#070</td>
<td>RUBBLE / DEBRIS</td>
<td>rubble / debris / Schutt</td>
<td>result of mechanical destruction; see DIRT</td>
</tr>
<tr>
<td>#080</td>
<td>DUST</td>
<td>dust / Staub</td>
<td>very fine unspecific substance; see ASH, DIRT</td>
</tr>
<tr>
<td>#085</td>
<td>ASH</td>
<td>ash / Asche</td>
<td>burned wood or similar; see DUST, DIRT</td>
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<tr>
<td>#100</td>
<td>ORE</td>
<td>ore / Erz</td>
<td>the material of a thing, without any other specified features; see A NATURAL ELEMENT</td>
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<td>#110</td>
<td>PHYSICAL MATTER</td>
<td>physical matter / Materie</td>
<td>culture-specific philosophical notion; see PHYSICAL MATTER, SOIL, ORE</td>
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<td>#120</td>
<td>A NATURAL ELEMENT</td>
<td>earth as a natural element / Erde als Naturelement</td>
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<tr>
<td>#135</td>
<td>(NATURAL) GROUND</td>
<td>(natural) ground / (natürlicher) Boden</td>
<td>ground, surface of the earth; see construed FLOOR</td>
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<td>#150</td>
<td>DRY LAND</td>
<td>mainland / dry land / Festland</td>
<td>in opposition to/as viewed from the sea/ocean</td>
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<td>#160</td>
<td>FLOOR</td>
<td>floor / Fußboden</td>
<td>man-made; see (NATURAL) GROUND</td>
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<td>#170</td>
<td>CARPET</td>
<td>carpet / Teppich</td>
<td>specifically 3D, not necessarily a globoid planet Earth; see WORLD</td>
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<td>#190</td>
<td>TERRESTRIAL BODY</td>
<td>terrestrial body / Erdkörper</td>
<td>in mining and other contexts, deep inside the earth</td>
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<td>EARTH'S INTERIOR</td>
<td>interior body of the earth</td>
<td>technical language</td>
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<td>#165</td>
<td>ATTIC</td>
<td>attic / Dachboden</td>
<td></td>
</tr>
<tr>
<td>#200</td>
<td>MATH. VOLUME</td>
<td>mathematical volume / Volumen</td>
<td>habitat located deep in the TERRESTRIAL BODY, see GRAVE</td>
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<tr>
<td>#210</td>
<td>UNDERWORLD</td>
<td>underworld / netherworld / Unterwelt</td>
<td></td>
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<tr>
<td>#215</td>
<td>DEN / LAIR</td>
<td>den / lair / Tierbau / Tierhöhle</td>
<td>area with graves or tombs and fixed perimeter</td>
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<tr>
<td>#220</td>
<td>GRAVEYARD</td>
<td>graveyard / Friedhof</td>
<td>in the ground or similar; see UNDERWORLD</td>
</tr>
<tr>
<td>#230</td>
<td>GRAVE</td>
<td>grave / Grab in der Erde</td>
<td>habitat on the surface of the earth, mainly for the living, possibly including gods and/or the dead</td>
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<td>#255</td>
<td>WORLD</td>
<td>world / Welt</td>
<td>on/in the earth; see UNDERWORLD</td>
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<td>Comments</td>
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<td>#270</td>
<td>HUMANKIND</td>
<td>humankind / Menschheit</td>
<td>see INHABITANTS</td>
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<td>#280</td>
<td>FAUNA</td>
<td>fauna / Tierwelt</td>
<td></td>
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<tr>
<td>#290</td>
<td>INHABITANTS</td>
<td>inhabitants / Bewohner</td>
<td>here: specifically inhabitants of a country</td>
</tr>
<tr>
<td>#300</td>
<td>COUNTRY</td>
<td>country / Land</td>
<td>political notion; political border</td>
</tr>
<tr>
<td>#310</td>
<td>TERRITORY</td>
<td>territory / Territorium</td>
<td>bordered, owned/under someone’s influence; see subpart DISTRICT; see AREA</td>
</tr>
<tr>
<td>#320</td>
<td>DISTRICT</td>
<td>district / Bezirk</td>
<td>bordered, administrative; subpart of a CITY/TERRITORY/COUNTRY</td>
</tr>
<tr>
<td>#330</td>
<td>TERRAIN</td>
<td>terrain / Gelände</td>
<td>textured landscape</td>
</tr>
<tr>
<td>#340</td>
<td>AREA</td>
<td>area / Gebiet</td>
<td>under someone’s influence; with fuzzy/unclear boundaries; see TERRITORY/DISTRICT; see REGION</td>
</tr>
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<td>#341</td>
<td>AREA IN THE SKY</td>
<td>area in the sky / Himmelsgebiet</td>
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<tr>
<td>#345</td>
<td>REGION</td>
<td>region / Region</td>
<td>area around a deictic center; see AREA</td>
</tr>
<tr>
<td>#350</td>
<td>MATH. AREA</td>
<td>mathematical area / mathe-matische Fläche</td>
<td>technical language</td>
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<tr>
<td>#355</td>
<td>STRETCH OF LAND / ROAD</td>
<td>stretch of land/road / Land-strecke / Wegstrecke</td>
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<tr>
<td>#360</td>
<td>BLANK SPACE</td>
<td>blank space / Leerfläche</td>
<td>Akkadian: on a clay tablet; see OPEN/FREE SPACE</td>
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<tr>
<td>#370</td>
<td>PLACE/LOCATION</td>
<td>place / location / Platz</td>
<td>see PLOT OF LAND, AREA, …</td>
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<td>#380</td>
<td>PLOT OF LAND</td>
<td>plot of land / Grundstück</td>
<td>personal property; see FARMLAND</td>
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<tr>
<td>#390</td>
<td>PASTURELAND</td>
<td>pasturage / Weideland</td>
<td>for cattle</td>
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<tr>
<td>#395</td>
<td>AGRICULTURAL LAND</td>
<td>Landwirtschaftliche Nutzfläche</td>
<td>hyperonym for PASTURELAND and FARMLAND</td>
</tr>
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<td>#400</td>
<td>FARMLAND</td>
<td>farmland / Ackerland</td>
<td>for plants; for cattle see PASTURAGE; see PLOT OF LAND</td>
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<tr>
<td>#410</td>
<td>CITY</td>
<td>city / settlement / Stadt / Siedlung</td>
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<tr>
<td>#420</td>
<td>COUNTRYSIDE</td>
<td>countryside / Land</td>
<td>in opposition to CITY</td>
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<tr>
<td>#430</td>
<td>HOMELAND / NATIVE LAND</td>
<td>homeland / native land / Heimatland</td>
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<td>#435</td>
<td>FOREIGN COUNTRY</td>
<td>abroad, foreign country / Ausland</td>
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<tr>
<td>No.</td>
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<td>English / German</td>
<td>Comments</td>
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<tr>
<td>440</td>
<td>LOWLANDS</td>
<td>plain / lowlands / Flachland</td>
<td>in opposition to, e.g., hill country</td>
</tr>
<tr>
<td>450</td>
<td>LOWER PART</td>
<td>lower part / down / Unten / unterer Teil</td>
<td>see BASE/BOTTOM</td>
</tr>
<tr>
<td>460</td>
<td>LOWER LEGS</td>
<td>lower legs / Unterschenkel</td>
<td>see LOWER PART</td>
</tr>
<tr>
<td>465</td>
<td>FOUNDATION</td>
<td>foundation area / base area / Grundfläche</td>
<td>see FLOOR, AREA, MATH. AREA, BASE/BOTTOM</td>
</tr>
<tr>
<td>470</td>
<td>BOTTOM / BASE</td>
<td>base / bottom of e.g. a container</td>
<td>see LOWER PART, (NATURAL) GROUND</td>
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<tr>
<td>475</td>
<td>SHELF BOARD</td>
<td>shelf board / Regalboden</td>
<td>see BASE/BOTTOM</td>
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<tr>
<td>480</td>
<td>HUMILIATION</td>
<td>humiliation / abasement / Erniedrigung / Herabsetzung</td>
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<td>500</td>
<td>OPEN COUNTRY</td>
<td>open country / freies Gelände / offenes Gelände</td>
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<td>510</td>
<td>OPEN/FREE SPACE</td>
<td>open space / free space / offener Raum / Freiraum</td>
<td>see BLANK SPACE</td>
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<tr>
<td>520</td>
<td>ELECTRICAL EARTH</td>
<td>electrical earth / Erdung</td>
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<tr>
<td>530</td>
<td>INNUMERABILITY</td>
<td>very large in number / hohe Zahl, Übermaß</td>
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<td>550</td>
<td>AREA ON AN ORGAN</td>
<td>a certain area of an organ</td>
<td>here: a certain area of the liver/lung</td>
</tr>
</tbody>
</table>

Tab. 2  | Description of senses attested for words colexifying the sense ‘soil/earth’
<table>
<thead>
<tr>
<th>Traditional Label</th>
<th>Hittite</th>
<th>Classical Hebrew</th>
<th>Arabic</th>
<th>Akkadian</th>
<th>English</th>
<th>Egyptian</th>
<th>Greek</th>
<th>Latin</th>
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<th>German</th>
<th>Dutch</th>
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</table>

**Note:** The table represents a comparison of traditional labels across various languages, indicating which languages have entries for specific labels.

- **Hittite**
- **Classical Hebrew**
- **Arabic**
- **Akkadian**
- **English**
- **Egyptian**
- **Greek**
- **Latin**
- **French**
- **German**
- **Dutch**

**Conventional Label**

- **SOIL/Earth**
- **PLASTER**
- **MORTAR/GROUT**
- **DIRT**
- **EXPECTATION SUBSTANCE**
- **RUBBLE/DEBRIS**
- **DUST**
- **NOTHING**
- **ASH**
- **ORE**
- **PHYSICAL MATERIAL**
- **A NATURAL ELEMENT**
- **(NATURAL) GROUND**
- **DRY LAND**
- **FLOOR**
- **ATTIC**
- **CARPET**
- **TERRESTRIAL BODY**
- **MATH. VOLUME**
- **UNDERWORLD**
- **DEN/LAIR**
- **GRAVEYARD**
- **GRAVE**

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Tab. 3 | Senses attested for words colexifying the sense ‘soil/earth’ (‘x’, sense verified; ‘?’ sense verified by a questionable example; ‘[x]’ sense assumed, but no example available, includes external links to online dictionaries).
8.2 Semantic maps

8.2.1 Language specific semantic maps

Fig. 2 | The semantic space of relevant lexemes in Akkadian.

Fig. 3 | The semantic space of relevant lexemes in classical Arabic.
Fig. 4 | The semantic space of relevant lexemes in Egyptian.

Fig. 5 | The semantic space of relevant lexemes in English.
Fig. 6 | The semantic space of relevant lexemes in French.

Fig. 7 | The semantic space of relevant lexemes in German.
Fig. 8 | The semantic space of relevant lexemes in classical Greek.

Fig. 9 | The semantic space of relevant lexemes in classical Hebrew.
8.2.2 Semantic maps of lexemes with the same main sense
Fig. 12 | The semantic space of ‘dust’ lexemes.

Fig. 13 | The semantic space of ‘earth’ lexemes.
The Meaning of Ancient Words for ‘Earth’

Fig. 14 | The semantic space of ‘world’ lexemes.

Fig. 15 | The semantic space of ‘ground’ lexemes.
8.2.3 Semantic map of all researched lexemes

Fig. 16 | The semantic space of ‘land’ lexemes.

Fig. 17 | The semantic space of lexemes colexifying the sense ‘soil/earth’ in different languages.
8.3 Data appendix

The language data appendix is available here: http://hdl.handle.net/21.11101/0000-0001-AE7C-1.

8.4 Glossing abbreviations

1 1st person
2 2nd person
3 3rd person
ACC accusative
ACT active
ADMIR admirative
ADV adverb, adverbial
ADVZ adverbializer, adverbialization
ANT anterior
AOR aorist
C communis (common gender)
COLL collective
CONJ conjunction
DAT dative
DEF definite
DEM demonstrative
DU dual
F feminine
GEN genitive
IMP imperative
INF infinitive
IPFV imperfective
LOC locative
M masculine
N neuter
NOM nominative
OBL oblique
PASS passive
PL plural
PTCL particle
PTCP participle
REL relative
SG singular
STC status constructus
References

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Hasepalmath 1997
Hasedmuth 2003

Kloekhorst 2008

Kövecses 2010

Kövecses and Radden 1998

Kutscher and Werning 2014

Lakoff 1987

Lakoff and Johnson 1980

Lakoff and Johnson 1999

Lane 1997 [1863]

Mallory and Adams 2006

Narrog 2010

Narrog and van der Auwera 2011
Neu 1996

Puhvel 1984–

Radden and Kövecses 1999

Taylor 1995

TLA 2014

Tischler 2001

Tischler and Neumann 1977–2010

van der Auwera and Plungian 1998

Wälchli and Cysouw 2012

Werning 2014

Werning 2012–
Illustration credits

Thanasis Georgakopoulos
PhD (Athens, Greece 2011), studied Greek Philology and Theoretical Linguistics in Athens. He was a postdoctoral fellow in Topoi Research Groups C-1, *Deixis and Frames of Reference*, and C-4, *Pictorial Constructions of Space(s)*. He is currently a Marie Curie BeIPD Cofund Postdoctoral Fellow at the Université de Liège. His main research interests encompass historical linguistics, cognitive linguistics, spatial semantics, language typology, and empirical methods.

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