Navigating polyfunctionality in the lexicon[*]

Semantic maps and Ancient Egyptian lexical semantics

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Abstract

In lexical semantic descriptions of Ancient Egyptian, there is a tendency to search for a single basic meaning or *Grundbedeutung*, even if the element in question has a wide range of meanings or functions. The actual functions of these elements — as they occur in texts — are usually explained as contextual or combinatory, derived from the interaction of the basic meaning with environmental cues or triggers. While there are certainly lexical items for which this is appropriate, there are nonetheless other ways of describing polyfunctionality, a generic term for situations in which multiple functions (or meanings or senses) are associated with a single signifier. The goal of the present article is to demonstrate that other kinds of analyses are possible, and can be equally interesting and useful for describing the facts of Ancient Egyptian and for relating them to cross-linguistic research. Moreover we show that Ancient Egyptian linguistic data allow us to test — corroborate, extend, or revise — hypotheses that have been proposed in the typological literature. The paper is structured as follows: Part 1 raises the problem of polyfunctionality and possible approaches to this pervasive linguistic phenomenon; Part 2 presents the (classical) semantic map model developed by typologists in order to account for the cross-linguistically recurrent relationships between two or more meanings of single linguistic forms; Part 3 examines the applicability and usefulness of this model in Ancient Egyptian with two small-scale case studies dealing with specific semantic areas ([a] instrument-companion and [b] allative). In each case, the semantic map provides a principled method for the analysis of polyfunctionality in both synchrony and diachrony.

0 Introduction

In lexical semantic descriptions of Ancient Egyptian — whether of lexemes, grammatical elements, or larger constructions — there is a tendency to search for a single basic meaning or *Grundbedeutung*, even if the lexical item in question has a wide range of functions. Such an approach is found in most reference or teaching grammars, but it is also typical of contemporary semantic research. The actual functions of these elements — as they occur in *texts* — are usually explained as contextual or combinatory, derived from the interaction of the basic meaning with environmental — constructional, cotextual, and contextual — cues. While there are certainly elements for which such an approach is appropriate, there are nonetheless other ways of describing *polyfunctionality*, a generic term for situations in which multiple functions

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(or meanings or senses)[2] are associated with a single signifier.[3] The goal of the present article is to demonstrate that other kinds of analyses are possible, and can be equally interesting and useful for describing the facts of Ancient Egyptian and for relating them to cross-linguistic research.[4] Moreover we will show that Ancient Egyptian linguistic data allow us to test — corroborate, extend, or revise — hypotheses that have been proposed in typological literature.

1 Describing polyfunctionality

There are three basic ways of understanding a situation in which a signifier A is associated with functions 1, 2 and 3 (without deciding in advance whether they are meanings or senses), such as in the simplified example of Fig. 1 where Russian плыть *plyt'*, which refers (*inter alia*) to various kinds of motion in water, can be translated as *float*, *swim* or *sail*.
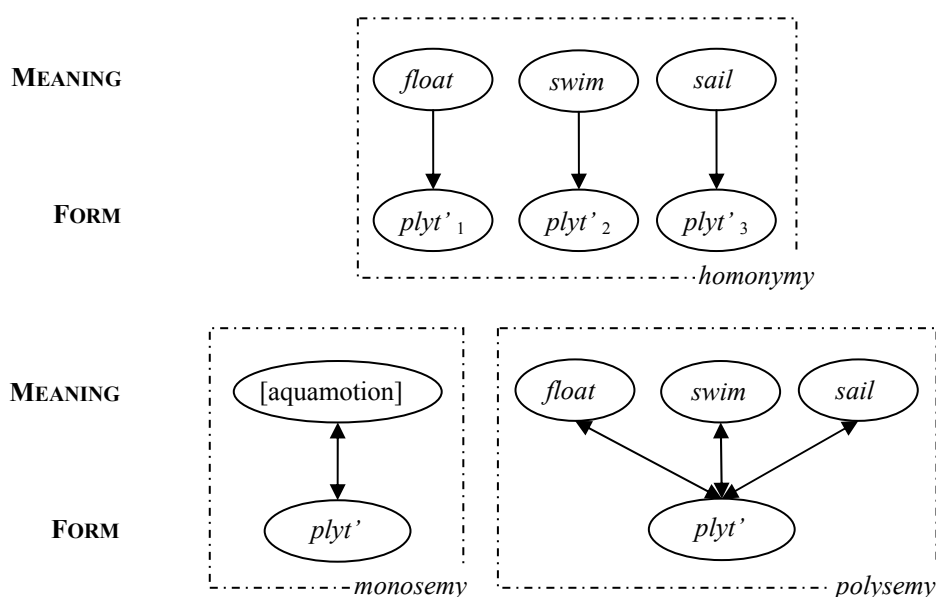

Figure 1. Three approaches to polyfunctionality
(adapted from Koptjevskaja-Tamm 2008: 8-9)

The first kind of analysis — called homonymy — identifies three distinct signs. The second kind — called monosemy or semantic generality — is to attach an under-specified basic meaning to a single signifier, in a one-to-one relationship. The third — called polysemy — is to link multiple meanings or senses (that are in a structured relationship) to a signifier.

While a given theoretical orientation may predispose a linguist towards one of these approaches — e.g., certain structuralist and generative approaches insist on

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2   In this paper, we use the term 'function', 'meaning' and 'sense' in a general way and grammatical items are considered here from the point of view of the lexicon. As such, the term 'lexical item' also includes what are normally considered grammatical elements.

3   We use this term in a pretheoretical way, to indicate the formal 'shape' of a linguistic item.

4   A state-of-the-art presentation of lexical semantics in a typological perspective is found in Koptjevskaja-Tamm et al. 2007 and Koptjevskaja-Tamm 2008.

monosemy, while others prefer homonymy, and practitioners of Cognitive Linguistics tend to see polysemy everywhere — it is clear that all three analyses can be necessary at different times for describing the lexical semantics of a language.[5] As such, deciding between them is not a purely theory-internal issue. Moreover, these decisions have practical consequences for descriptive lexicography, since homonymous elements are usually treated as distinct lemmata, while polysemic analyses usually entail a single lemma with multiple sub-entries.

We will briefly discuss the three main types of analysis below, highlighting some of the issues they raise. We would like to stress that in this section we are focusing on language-specific descriptions and not on cross-linguistic comparison, since the two have quite different goals and interact differently with the issues we are dealing with here.

1.1 Homonymic analyses

In radical structuralist approaches, there is a strong predisposition to distinguish signs from each other on the basis of paradigmatic commutation at a given point in the syntagmatic chain. In such an approach, it is enough for a signifier to occur in different syntagmatic environments or to have different paradigmatic commutations for the linguist to decide on a homonymic analysis. For example, the preposition *r* marking purpose would be a linguistic sign in its own right (Ex. 1), entirely distinct from the preposition *r* marking the standard of comparison (Ex. 2):

Ex. 1   *wn.in*   *grg*   *ḥr*   *šm.t*   *r*   *sḫ.wt*   *r*   *ptr*   *nȝy=f*   *iḥ.w*
        CORD.PST Falsehood   on   go:INF   ALL   fields   ALL   see:INF his   oxen
        "Falsehood went to the fields in order to view his cattle"
                             (P. Chester Beatty II, rᵒ 7,8-8,1 = *LES* 34,6-7)

Ex. 2   *ꜥšȝ*   *rmw.w*   *r*   *šꜥy*   *n*   *wḏb.w*
        numerous   fishes   ALL sand   of   river-banks
        "Fishes are more numerous than the sand of the riverbanks"
                                (P. Lansing, 12,10 = *LEM* 112,1)

Similarly, *ir* the topic marker (TOPZ) and *ir* the conditional marker introducing protases (PROT) would be distinct signs, on functional and distributional grounds:

Ex. 3   *ir*   *ink*   *tw-i*   *sḏr-kwi*
        TOPZ   1SG   1SG   lie\STAT-1SG
        "As for me, I was sleeping"   (O. DeM 569, 5 = K*RI* V, 569,3)

Ex. 4   *ir-iw=i*   *gm(-t)*   *r-ḏd*   (…)   *iw=i*   *di-t*   *n=f*   […]
        PROT.SBRD=1S   find:INF   that   (…)   FUT=1SG give:INF   to=3SG.M
        "If I find out that (…), I will give him [_{LAC}]"
                           (P. Geneva D187, vᵒ 1-2 = *LRL* 42,2-4)

While most linguists would agree that topic-marking and protasis-marking are two distinct functions, typologically-minded linguists would probably observe that this polyfunctionality is well-motivated and recurs across languages (e.g. Haiman 1978; Traugott 1985: 291-292; Croft ²2003: 12). This highlights the main characteristic of homonymist analyses: they are strongly oriented towards synchronic description, and

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5   Nonetheless, there are approaches that minimize the difference between the three, such as that found in Croft & Cruse 2004.

tend to eschew explanatory accounts. This does not present a major problem *per se*, since description and explanation are better kept distinct, but if taken to an extreme, homonymist analyses can be overly atomistic.

1.2 Monosemic analyses

Monosemic analyses[6] are attractive to linguists for a number of reasons, the most important of which is the assumption that it is possible to derive multiple 'surface' meanings or functions from a basic (vague or underspecified) meaning[7] plus context.[8] To the extent that a monosemic analysis appeals to vagueness, thereby appealing to context for the resolution of meaning, it is compatible with impoverished or minimalist conceptions of semantics vis-à-vis pragmatics.[9] In some cases, this appears to be justified. For example, in English, one can "eat" an apple, a steak, or soup. While the actual physiological routines in each of these three cases are quite different from each other, most linguists would probably not claim that the English verb "eat" is polysemous in this respect.

However, in some cases a monosemist analysis runs into empirical problems. For one thing, it requires *all* observed functions to be derived from the basic meaning. As such, there can be no interrelationship between observed 'surface' functions. For example, if one assumes a single basic meaning for the Ancient Egyptian preposition *r*, whatever it may be (see under §3.2), one will probably miss out on the insight that RECIPIENT, BENEFICIARY and PURPOSE, on the one hand, are more closely related to each other than PURPOSE and COMPARISON, on the other.

Additionally, in some cases, context might not be enough to derive the observed function.[10] For example, the basic meaning of the preposition *r* has often been under-

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6   Concerning the historical links in the field of linguistics between the homonymic and monosemic analyses, see Cuyckens & Zawada (2001: XI) who stress that "polysemy (...) posed a problem for structuralist semantics as the pairing of *signifiant* (one form) and *signifié* (one meaning) required, except in obvious cases of homonymy, that two related meanings pair up with different forms (on that account, *school₁* 'institution' and *school₂* 'building' would have to be considered as two different form-meaning pairs). One way to solve this problem, and at the same time to do justice to the 'one form – one meaning' adage, was to search for a single meaning for each distinct phonological form, this entails bringing polysemous lexical items under one (abstract) definition — consisting of a criterial set of singly necessary and jointly sufficient features — and treating their various senses as contextually determined realizations or instantiations of that general definition."

7   See Jakobson's (1936) notions of *Gesamtbedeutung* and *Sonderbedeutung* as well as Coseriu's (1977) distinction between general (abstract/criterial) meanings at the level of "system" and specific readings at the level of "norm".

8   It is worth pointing out that while monosemist analyses virtually entail deriving observed meaning from basic (or underspecified) meaning plus context, it does not follow that "making room for the contextual determination […] automatically impl[ies] that the stored meanings are monosemous or highly schematic" (Geeraerts 2010: 231-232).

9   Generally speaking, monosemist approaches often stipulate a division of labor between semantics and pragmatics, but do not actually 'do the work' necessary to argue that a given meaning is a matter of inference rather than code. For the argument that the semantics-pragmatics division should be based on the distinction between coded meaning vs. inferred meaning, see Ariel (2008; 2010). Ariel shows that a number of canonical 'pragmatic' topics involve both semantics and pragmatics.

10   Moreover, it seems unlikely in terms of memory and costly in terms of processing that listeners compute or infer the observed surface function each and every time from scratch.

stood as a "distant relation".[11] But it is not clear what computational or inferential processes are supposed to lead from this basic meaning to some surface functions observed, such as the PURPOSE meaning (Ex. 5) or the STATUS function (Ex. 6-7):

Ex. 5 *sw   spr   m   ꜣbw   r   wḫꜣ   nꜣ   it*
       3S.M arrive\RES   in   Elephantine ALL   search:INF   ART.PL   cereals
       "He has arrived in Elephantine in order to demand the cereals"
                                                    (P. Valençay I, rᵒ 7 = *RAD* 72,7)

Ex. 6 *gm=i   sw   iw=f   didi-tw   r   ꜥḥꜣwty   n   pr   ḏḥwty*
       find\PST=1S 3S.M   SBRD=3S.M   give\RES-3S   ALL cultivator of temple Thoth
       "I found that he had been appointed as cultivator of the temple of Thoth"
                                              (P. Bologna 1086, 9-10 = K*RI* IV, 79,13-14)

Ex. 7 *iw=s   n=f   r   ḥm.t*
       FUT=3SG.F   for=3SG.M   ALL   wife
       "She will be his wife (lit. she will be for him as wife)"
                                                    (P. Harris 500, vᵒ 5,6 = *LES* 3,9)

Let's continue to look at the meanings of the preposition *r*. Other than the DISTANT RELATION meaning, less abstract basic meanings have been proposed for this preposition. For example, Werning (current volume) argues that the spatial meaning of the preposition *r* is ATTACHED in non-dynamic contexts. A second basic spatial meaning TO is available in dynamic contexts, such as in the environment of verbs of motion. Therefore, this approach makes the prediction that dynamic meanings will rather occur when there is a cotextual or contextual trigger. This prediction, however, is not necessarily borne out in some occurrences in which a dynamic meaning of *r* occur, apparently without any such contextual trigger:

Ex. 8 *iw   wnis   r   s.t=f   tw   ḫnt(-t)   s.wt*
       MCM   Unis   ALL   seat=3S.M   DEM   foremost   seats
       "(O you in charge of hours, who precede the Sun, make way for Unis … for) Unis is (off/going/on his way) to this seat of his, foremost of the seats"
                                              (*PT* 251, §§269a-270b; see Allen 2005: 42)

Judging from such examples, it seems that a dynamic orientation has already been semanticized in specific constructions[12] by the time of the *Pyramid Texts*, and is perhaps better understood as an early coded meaning.

This leads us directly to another common issue linked to monosemist approaches, namely that they often seem to imply the existence of a panchronic stable invariant meaning, which is assumed to resist change over time, if not in theory then in practice. As such, some monosemist approaches run into difficulties with the fact that meanings are liable to change over time. Nevertheless, a major mechanism of semantic change involves the accumulation and eventual semanticization of pragmatic inferences available for given constructions.[13] The only way such a mechanism could work is if contextual meanings or pragmatic inferences are at least potentially stored in association with lexical items and constructions.

Whatever the basic meaning attributed to the preposition *r* in Earlier Egyptian, it runs into problems as soon as one expands the corpus to include later phases of the

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11   See under §3.2[.1].
12   In the sense of Goldberg 1995 & 2006.
13   See e.g. Bybee et al. 1994: 281-302; Traugott & Dasher 2002.

Ancient Egyptian language. For example, if we take into account Demotic and Coptic, we would be forced to admit functions like the marking of objects of verbs of perception and cognition (Ex. 9) as derived from the synchronic interaction of a basic meaning (e.g. DISTANT RELATION, ATTACHED or TO), plus the specific meanings of verbal lexemes.

Ex. 9   ⲛⲧ-ⲁ-ⲛⲁⲩ   ⲉⲣⲟ-ϥ
         nt-a-nau   *ero-f*
         CORD.MOD-1SG-see:INF   ALL-3SG.M
         "And I will see him"

(*Shenoute and his Brethren* 104 = Reymond & Barns 1973: 85)

While a synchronic 'explanation' is not easily forthcoming, a diachronic one is: diachronic changes in verbal meaning, as well as generalization of valency patterns with argument-marking *r*, account for the presence of this preposition in these constructions.

All of the issues raised above are manifestation of a fundamental problem inherent in monosemic analyses: they primarily reflect abstractions made by linguists, the assumption being that if linguists can abstract a basic meaning from a wide range of diverse functions by eliminating contextual, inferential and constructional meanings, then speakers and listeners should be able to do the same thing, but in reverse and in real time ('online'). In fact, as Haspelmath (2003: 231) points out, basic meanings posited by linguists are often so abstract that they would be unrecognizable by speakers as such.

1.3 Polysemic analyses

In a polysemic analysis, lexical items have multiple meanings or senses, which collectively constitute a lexeme. This is similar to a homonymic analysis, in that there are multiple meanings, but differs from homonymic analyses too, by explicitly considering them to be part of the same lexeme. Most of the frameworks that favor polysemic analyses have developed elaborate ways of specifying and structuring these multiple meanings into networks; this kind of approach does have certain advantages, mainly insofar as it takes into account cognitive, functional, and typological evidence. The important point to be stressed here is that the meanings are mutually interrelated, and that it is this web of related meanings that is attached to the signifier.

However, it is not always obvious how to conceive of the relationships between meanings of a polysemic or polyfunctional item. Let's consider a simple example. Intuitively, most readers of the present paper would probably consider that RECIPIENT and ADDRESSEE are related meanings or functions. The source of this intuition, however, might be itself dependent on the languages with which (s)he is familiar — in the present case, languages that use a single form in order to express both functions. Moreover, it often appears that intuitions tend to vary from speaker to speaker, and are not a firm basis for linguistic research.

Therefore, some theoretical frameworks, such as Cognitive Linguistics, developed explicit ways of constructing polysemy networks in a principled way (e.g. Cuyckens

& Zawada 2001; Nerlich & Clarke 2003).[14] Practitioners of Cognitive Linguistics work with a particular conceptual toolbox that both motivates and constrains their analyses. In general, Cognitive Linguistics seeks to draw direct links between linguistic structures and conceptual structures, using notions such as conceptual categories (which are often based on a prototype and/or have radial structures), image schemes, and conceptual or ontological metaphors.

While Cognitive Linguistic accounts are very appealing, they are also problematic. For one thing, they are relatively unconstrained, as linguists can posit and apply conceptual metaphors rather freely. For example, Nyord (2010), in the most articulated attempt to apply Cognitive Linguistics to the semantic description of Ancient Egyptian, proposes that the central or prototypical meaning of the preposition *m* is CONTAINMENT:[15]

Ex. 10 *iw=f*   *m-sšr*   *m*   *pr=f*
        SBRD=3SG.M   very_good   in   house=3SG.M
        "But he is doing perfectly well in his house"
                                  (P. Anastasi I, 10,2 = Fischer-Helfert 1983: 92)

This meaning is extended, via conceptual metaphor — e.g. UNITS OF TIME ARE CONTAINERS, STATES ARE CONTAINERS, CATEGORIES ARE CONTAINERS, MATERIALS ARE CONTAINERS — to other static and dynamic (CONTAINER + PATH schemata) meanings of the preposition, which are arranged as a polysemy network. Based on this principle, some usages of the preposition *m* are admittedly (see §1.5) more difficult to derive than others:

Ex. 11 *s₃-t*   *kt-t*   *in-t-n=i*   *m*   *sš₃*
        daughter   little   bring\REL-F-ANT=1SG INS   prayer
        "(…) the little daughter whom I acquired through prayer"
                            (*Shipwrecked Sailor* 129 = Blackman 1932: 45,7)

Ex. 12 *iw=tw*   *ꜥḥ₃*   *m-di=f*   *m*   *md.wt* *bin*   *ḏriw*
        CORD.PST=one   fight:INF   with=3SG.M INS   words   bad   stout
        "And one attacked him with very serious grievances"
                            (P. Turin 1875, 6,6 = K*RI* V, 360,8-9)

In the preceding examples, for instance, the instrumental use of the preposition *m* is not so easily explained starting from the CONTAINER and PATH schemata. Hence, Nyord (2010: 33), following Langacker and others, has to resort to a somewhat acrobatic description of the derivation process when dealing with the instrumental meaning of the preposition *m* in an example like Ex. 11:

> "the daughter (or perhaps the acquisition) is conceptualized as having resided as a potential in the CONTAINER metaphorically constituted by the prayer, and subsequently emerging when the action is fulfilled and brought to fruition."

This explanation highlights the kind of maneuvers that linguists sometimes have to undertake in order to map a proposed "prototypical" meaning with the actual functions observed in usage. More importantly, it shows that some types of polysemic

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14 An excellent illustration of a cognitive approach to polysemy and polyfunctionality in Ancient Egyptian is proposed by Nyord in the current volume.

15 This suggestion is based on the high frequency of the spatial use of the preposition (*m* "of place") as well as on the experientially high salient image schema of containment (Nyord 2010: 29).

analyses in fact sneak monosemy in through the back door, via basic meaning plus metaphorical extension: prototypical meanings, in practice, are often treated as 'basic' meanings.

1.4 Form/meaning pairing in lexical semantics

While we have presented the boundaries between the three basic approaches to poly-functionality as relatively clear-cut, the actual practices of linguists often require a more nuanced view.

For example Oréal (current volume) argues for a monosemic analysis, while explicitly disavowing the vagueness of the basic meaning attributed to the discourse particles she investigates. Moreover her account addresses semantic change, which indicates that in her framework monosemy does not entail resistance to diachronic change.

Another example is Werning (current volume), who aims for a monosemic description of Ancient Egyptian prepositions. However, for some prepositions, he posits multiple basic meanings related by shared semantic features, which amounts to admitting polysemic relationships between basic meanings.

Finally, as we have argued above, some polysemic analyses equate, in practice, prototypical meanings with basic meanings and as such approach monosemic analyses.

1.5 Other ways of navigating polyfunctionality?

While the choice between analyzing a given case of polyfunctionality as homonymy, monosemy, or polysemy might be arbitrary — or motivated by a linguist's theoretical framework — in the synchronic description of a language, cross-linguistic comparison might reduce this arbitrariness. Indeed, cross-linguistic comparison shows that *patterns of polyfunctionality* recur in language after language.

Take for example the case of the instrumental function of the preposition *m* mentioned in §1.3. Nyord analyzes the prototypical meaning of *m* as CONTAINER, and considers that "[p]erhaps the most difficult usages to derive from the basic meaning of the preposition are those labelled by Gardiner '*m of instrument*' and '*m of concomitance*'" (2010: 32). This difficulty, however, is perhaps an artefact of the prototypical meaning chosen as a point of departure (as well as of the metaphor principle) rather than of any real problem in understanding the polysemy of the preposition *m*, at least in this domain. Actually, as will be discussed further in §3.1, it has been well established by typologists that INSTRUMENT, ACCOMPANIMENT, and LOCATIVE are frequently expressed by one and the same linguistic item (Stolz, Stroh & Urdze 2006).

There is reason to believe that patterns of polyfunctionality are not distributed randomly across linguistic space. However, it is probably not justified to link patterns of polyfunctionality *directly* with 'image schemata' or 'conceptual metaphors,' since lexical items in different languages carve out different areas of polyfunctionality.

A tool that has been developed to provide principled, empirical, cross-linguistic accounts of polyfunctionality is that of semantic maps. In the next part of this paper (§2), we will present the goals and methods of semantic maps and illustrate how this

tool can shed light on problems of synchronic lexical semantic descriptions in Ancient Egyptian, and clarify the relationship between synchronic meaning and language change. In the final section (§3), we will illustrate some of the proposals with two case studies.

2 Semantic maps:
What are they? How are they built? What are they good for?

The *semantic map model* is a relatively new way of representing functional or semantic relationships in languages (Narrog 2010a: 233) that has been developed by typologists in order to describe both "language universals and language-specific grammatical knowledge" (Croft [2]2003: 133). This "empirically testable tool for the study of semantic variation across languages" (Cysouw et al. 2010: 1) was introduced[16] during the late 1970s and early 1980s by, e.g., Anderson (1974, 1982) and Lazard (1981) as a way of capturing the relationships between cross-linguistic functions or meanings and language-specific forms, but became widely-used only in the late 1990s.

In this section, we first (§2.1) give a general overview of what a semantic map is. We then describe the ways in which it can be built (§2.2) and we show that a semantic map can be "dynamicized" by integrating the diachronic dimension (§2.3), in order to underline the interest of such a tool for studying both the polysemic networks of Ancient Egyptian linguistic forms and their diachronic evolution. At the end of this section (§2.4), we discuss the pros and cons of this method before proceeding with two small-scale case studies.

In a nutshell, we argue that the use of semantic maps is of clear interest for the study of Ancient Egyptian semantics in at least three respects. First, it could help overcome shortcomings of the kind addressed in §1. Second, the semantic map model allows linguists to relate the Ancient Egyptian data to cross-linguistic observations in an empirically falsifiable fashion. Third, given the richness of the material in terms of synchronic variation and diachronic length, Ancient Egyptian is likely to make an important contribution to the attempt to develop more accurate semantic maps.

2.1 What is a semantic map?

A semantic map is a way to visually represent the interrelationships between meanings or functions that are overtly encoded by languages. There are two main approaches to drawing semantic maps:[17] on the one hand, the so-called "classical" approach with primitive meanings connected by lines (Fig. 2) and, on the other hand, the more recent distance-based approach, where spatial proximity indicates semantic

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16 An early approach is to be found in Hjelmslev (1963: 53) when he deals with the *form of content*; see the remarks in Haspelmath (2003: 237).

17 For the study of the spatial topological domain, a special kind of elicitation tool (based on line drawings) has been developed by Bowerman & Pederson (2003); see the application in Levinson & Meira (2003), and Werning (current volume) for an application to Ancient Egyptian.

similarity. The latter usually takes into account the frequency of occurrence of meanings/forms and uses statistical techniques[18] (Figs. 3-4):
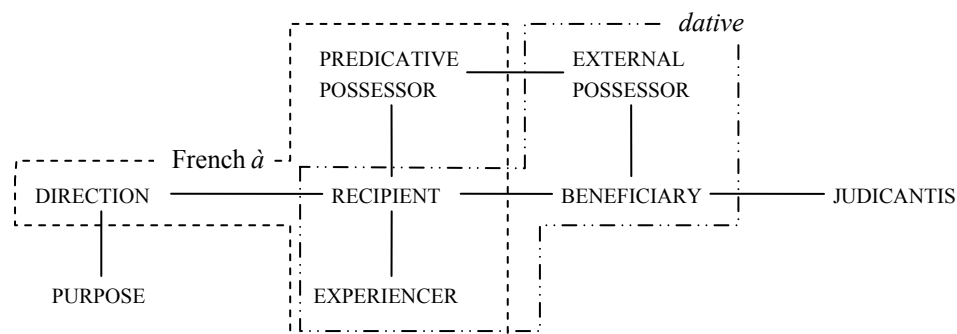

Figure 2. Semantic map of typical dative functions with the boundaries of French *à* and dative clitics (*me*, *te*, *lui*, etc.) after Haspelmath (2003: 219)
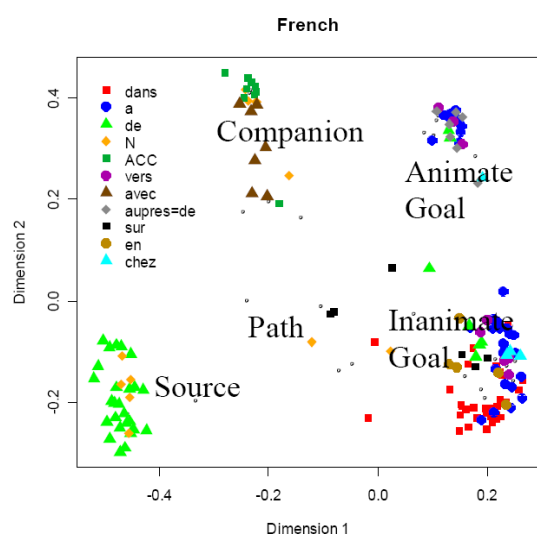

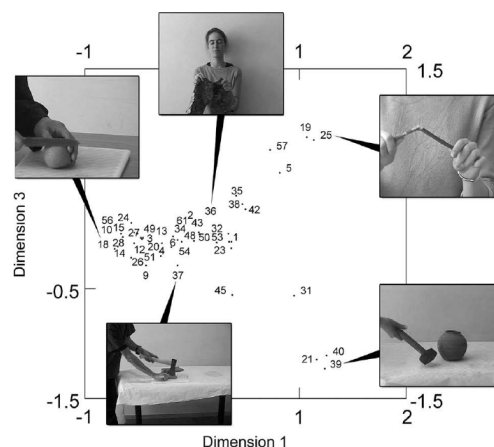Figure 3. MDS visualization of the French local phrase markers in *Mark* (from Wälchli 2010: 348)

Figure 4. Correspondence analysis of "cutting and breaking" verbs (from Majid et al. 2008: 241, Fig. 4)

As is obvious from the comparison between the two types of maps (respectively in Fig. 2 and Figs. 3 & 4), the principles at stake are essentially different. While the analytical primitives in the *classical* semantic map model are meanings[19] (or functions) structured in a network onto which linguistic forms are mapped, the distance-based approach takes as primitives either formal coding means (Fig. 3) or meanings (including visual stimuli, like in Fig. 4) and arranges them, using e.g. Multi-Dimensional Scaling [MDS], according to dimensions — generated automatically based on a distance matrix — which need to be interpreted afterwards by linguists.[20]

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18   See in particular Cysouw (2001; 2007; 2010a); Levinson & Meira (2003: 503-511); and Croft & Poole (2008) for a full discussion of the use of multidimensional scaling.

19   After Cysouw (2010a: 70), we define the meaning of a language-specific expression "as the collection of all the contexts in which the expression can be used."

20   In Fig. 4, for instance, correspondence analysis extracts dimensions of similarity in order of importance with the first dimension accounting for the most variance in the data, etc.; see Majid et

Both approaches have pros and cons that have been discussed at length in the literature (see e.g. Cysouw 2007, 2010a; van der Auwera 2008; Narrog & van der Auwera 2011). What is of particular importance here is that (a) they are based on different principles and (b) they do not have the same purposes and functions. The graph structure of the classical semantic map model is an *explanans*, in the sense that it establishes implicational universals, which generate predictions[21]: it is the result of empirical study; it has been construed based on (cross)linguistic data in combination with deductive semantic analysis; and it can be falsified with new linguistic data. The distance-based representation is an *explanandum*: the maps are plotted based on the data alone and they represent the point of departure of the study. Accordingly, as van der Auwera (2008) puts it, "multidimensional scaling representations can never be as semantic as semantic maps", mainly because "the graph structure […] is derived from the cross-linguistic data without prior assumptions about the semantic and/or pragmatic properties that determine the graph structure of the conceptual space" (Croft & Poole 2008), so that the semantic/pragmatic properties are to be analyzed in a second step.

Since in this paper we are primarily interested in suggesting a principled way for describing patterns of polyfunctionality in Ancient Egyptian, we will adopt here the classical semantic map model, which allows the visualization of a "regular relationship between two or more meanings or grammatical function of one and the same linguistic form" (Narrog & van der Auwera 2011: 318).

The classical "[s]emantic maps are effective ways of representing what is universal about the grammars of languages [i.e. the structure of the *content plane*, EG & SP] and what is language-specific [i.e. the formal means, EG & SP]" (Croft [2]2003: 133). In practical terms — as exemplified in Fig. 2 — forms of a given language system (grams, lexemes, constructions) are mapped onto a cross-linguistically valid structured network of meaning. This calls for several remarks:

(1) The meanings dealt with can be "grammatical", "lexical" or "constructional." There is no need to distinguish between them, since semantic maps can be used for any kind of structuration of the *content plane*. It is worth noticing that, if the semantic map methodology has been mostly applied to functional domains[22] (such as tense/aspect, modality, pronouns, voice, case-marking, clause linkage, spatio-temporal relations as well as different kinds of predication types), recent years have also seen the first applications of the semantic map methodology to lexical typology, see e.g. François (2008), who uses semantic atoms or "senses" of lexical items in context in order to analyze cross-linguistic patterns of colexification and Perrin (2010

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   al. 2008: 240. According to the authors (Majid et al. 2008: 242), Dimension 1 captures a "relatively abstract notion: the predictability of the locus of separation in the affected object", while Dimension 2 "differentiates between event of snapping and smashing'."

21 This is of course not to be equated with a "theory", the method itself being descriptive and rather "theory-free". As Cysouw (2007) phrased it: "[a] semantic map is a model of attested variation, which might […] be the basis for the formulation of a theory."

22 As already observed by Haspelmath (2003: 211), "grammatical morphemes" tend to have more abstract and general meanings than content words, which lead to a potentially greater degree of polyfunctionality. For this reason, they have attracted most linguists' attention. A list of the functional domains that have been treated in the literature is given in van der Auwera & Temürcü (2006: 132); Cysouw et al. (2010a); Narrog & van der Auwera (2011).

and Cysouw 2010b), who studies the semantic organization of adjectival qualities and suggests using semantic maps for the analysis of cross-linguistically recurrent patterns of polysemy.[23]

(2) The relation between the meanings (or points) of a semantic map and the forms that actualize them in a given language is theory-neutral: a *monosemic* approach will consider the different meanings of a form as being contextually driven (based on a vague or underspecified abstract meaning); a *homonymic* position will argue that each meaning on the map corresponds to a single form; a *polysemic* account will recognize that different meanings are attached to each lexical items (Haspelmath 2003: 212-213; van der Auwera and Van Alsenoy forthcoming: 5). Given the fact that the meanings are structured in a network, however, the semantic map model is particularly well suited for polysemic analyses that advocate some kind of relation between the meanings of a linguistic form.

(3) The structured network of meaning[24] (values and links between values) is what is envisioned as universal across languages and has received several labels in the literature: "conceptual space"[25] (e.g. Croft 2001: 92-94; [2]2003), "semantic map" (e.g. Kemmer 1993; Stassen 1997; van de Auwera & Plungian 1998), "cognitive map" (e.g. Kortmann 1997) or "mental map" (e.g. Anderson 1986). The mapping of particular forms onto this network, on the other hand, is of course language-specific.

Now, linguistic forms should not map randomly onto the meanings: they are expected to cover connected and adjacent regions on the map. This principle is known as the *Semantic Map Connectivity Hypothesis* (or contiguity requirement): "any relevant language-specific and/or construction-specific category should map onto a *connected region* in conceptual space" (Croft 2001: 96).

Let's consider an example based on the semantic map of dative functions suggested by Haspelmath (e.g. 2003: 213; see already Fig. 2):
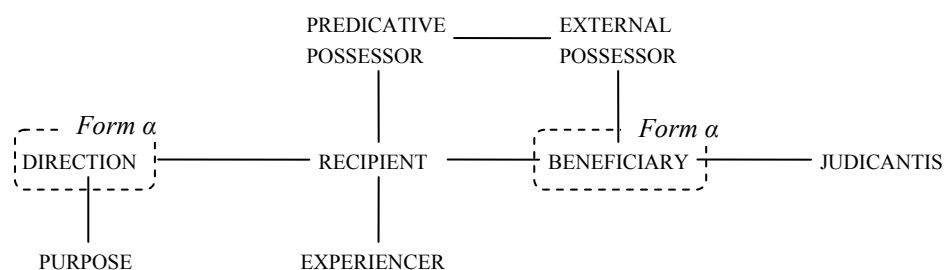

Figure 5. Illustration of the connectivity hypothesis

This map predicts that, if one finds a language in which a *Form α* encodes both DIRECTION and BENEFICIARY, then it will also be used for RECIPIENT. If not, the

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23 See also Cysouw's (2010b) suggestions for the visualization of recurrent polysemies.

24 We are agnostic about the cognitive reality of semantic maps. See the discussions in Croft (2001: 92-98; 105-108) who states that that it "represents a universal structure of conceptual knowledge for communication in human beings" and talks (2001: 139) of the geography of the human mind"; Haspelmath 2003; 232-233). It is important to note that they generate hypotheses that should be evaluable by any theoretical framework.

25 Semantic maps are a key component of the grammatical model developed by Croft (2001 & 2003). He calls "conceptual spaces" what is usually labeled "semantic maps" and reserves the label "semantic map" for any form-specific region of the conceptual space.

semantic map is falsified[26] and requires revision. A powerful feature of the classical semantic maps is therefore that they generate strong predictions regarding the possible patterns of polyfunctionality in languages.[27]

2.2 How a semantic map is built

In principle, a semantic map can be constructed with or without linguistic data, i.e. one can proceed inductively based on the linguistic evidence or deductively by building a semantic network *in abstracto*. In practice, one generally observes a dialectic[28] between the two approaches and semantic maps are traditionally built "through a combination of deductive semantic analysis and inductive generalizations on a sufficiently large sample of languages" (van der Auwera & Temürcü 2006: 132). However, for the sake of clarity one will envision here the two approaches successively with examples belonging to both ends of the continuum (Zwarts 2010a):

> (a) Some maps have been developed deductively and are either based on extra-linguistic data (e.g. the organization of colour chips into a colour space according to physical features of hue, saturation and brightness; e.g. Regier et al. 2007) or the product of pre-empirical conceptual analysis (see, e.g., Lakoff 1987 for the famous case of the English preposition *over*). Of course, such maps have to be tested at some point, i.e., to be confronted with actual linguistic data in order to assess the empirical validity of the claim they make regarding the organization of the content plane. Consequently, it is worth adopting an inductive approach from the outset, if one wishes to avoid time-consuming theorizing that is likely to be falsified as soon as actual linguistic data are taken into account.
>
> (b) Accordingly, most linguists make use of inductive reasoning[29] and of linguistic data in the process of building a map. In this case, there are two possible approaches (see de Haan 2010). With the *top-down* (or *onomasiological*) approach, a given functional or lexical domain is investigated (expression of voice, verbs of perception, etc.) and the relevant linguistic expressions are listed (and subsequently structured). With the *bottom-up* (or *semasiological*) approach, one starts the analysis with actual grams, lexemes or constructions and their diverse meanings.

Observation of actual practice reveals that while most research questions are chiefly onomasiological in nature, the semasiological dimension is usually integrated using lexical matrices [30] that help to visualize, "for each word in a set of words or (grams), which meaning (or functions) from the conceptual space it can express" (Zwarts 2010a: 377).

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26 Other explanations are discussed in §2.3

27 Hence the name "implicational maps" suggested by Haspelmath 1997b: 105-108; see also Hengeveld & van Lier 2010.

28 van der Auwera 2008 speaks of a "*va et vient* between armchair hypothesis building and empirical validation."

29 Let's recall here that the distance-based semantic map makes *exclusive use* of the inductive method (see §2.1).

30 See Zwarts (2010b: 124) for a plea for combining both approaches.

	MEANING 1	MEANING 2	MEANING 3	MEANING 4
Form 1	√	√	√	
Form 2			√	√
Form 3		√		√
Form 4	√	√		

Figure 6. A theoretical lexical matrix

This kind of matrix clearly shows that the "comparison of two expressions from two different languages consists in the comparison of the selected subsets of analytical primitives" (Cysouw 2010a: 71). In order to build a lexical matrix (of the sort illustrated in Fig. 6), these analytical primitives (labelled meanings) or points to be put later on the map have to be identified, which is admittedly not an easy enterprise.

2.2.1 How are the meanings identified?

If one excludes purely deductive reasoning[31] (see §2.2.a), there are only two options: the identification of meanings can be carried out based on a single language or on multiple languages. In both cases, it implies the use of data from polyfunctional items.[32]

In the context of a single language, one can identify distinct meanings in at least three ways:

(1) The existence of different lexical items or grams with overlapping distribution (see Haspelmath 2003: 218).
(2) The existence of two distinct antonyms for a given lexical item means that both meanings can be put on the map. For instance, take English "right," which has (more than) two antonyms, "left" and "wrong/incorrect". In this case, the two meanings of "right" would be put on the map separately.
(3) Another possibility is to compare different diachronic stages of the same language. Languages for which we have both a long documented history and accurate lexicographical tools are extremely illuminating in this respect: if, at some point in time, one of the meanings of a given lexical item or construction comes to be expressed by a new formal means, then this specific meaning should be put on the map.

Nonetheless, these "intralinguistic" methods (antonyms, language change) can hardly replace cross-linguistic comparison in the construction of a semantic map, for the last is arguably the only way to identify meanings that are as *primitive* as possible[33] (Cysouw 2007; 2010a). The basic principle for identifying *analytical primitives* is as follows:

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31 In this respect, Haspelmath (2003: 216) somewhat provocatively stresses that "a complete theory of grammatical meaning would allow us to derive deductively the functions that are needed for the world's languages and their relative position on the map. This is, of course, totally utopian, but we can take recourse to induction."
32 "The evidence that is normally, but not necessarily, used as the basis for the construction of semantic maps is polysemy data" (Narrog & van der Auwera 2011: 318).
33 Cysouw (2007) notes that we should remain agnostic about the universality of these primitives, stressing instead their analytical nature. In his view, an analytical primitive is primarily a concept that is needed for the analysis of a particular set of data.

> "A function is put on the map if there is at least one pair of languages that differ with respect to this function" (Haspelmath 2003: 217).

Phrasing it in terms of Cysouw's analytical primitives would turn Haspelmath's principle into:

> A meaning *X* is primitive if it cannot be subdivided into two (or more) meanings that are expressed by two separate lexical or grammatical items in a given language. Conversely, if we postulate two meanings *X* and *Y* that are never expressed by two lexical or grammatical items in any single language, they may be conflated into a single meaning on the map.

This principle ensures that distinctive meanings will be as *linguistically* relevant as possible. Let's take a classic example from the realm of modality (see van der Auwera et al. 2004: 44-45; van der Auwera & Malchukov 2005: 394-395) in order to illustrate the argument. The English modal verb *must* in Ex. 13, depending on the context of use, express either (a) an obligation or (b) a high degree of likelihood:

Ex. 13   (a) Mary *must* go home.
           (b) Mary *must* be home now.

Obligation and probability are probably not the same concept, but they nevertheless share a semantic feature in common: an element of necessity which applies to the grammatical subject in Ex. 13a (situational necessity) on the one hand, and which refers to the judgment of the speaker in Ex. 13b (degree of commitment), on the other hand. Now, as the two meanings are expressed by a single gram, it would remain disputable that we need to posit two distinct meanings on the map based on English solely. But, as soon as one finds a language that uses two different grams for the expression of situational necessity and epistemic necessity (like *-mAchim* vs. *-nA* in Evenki, a Tungusic language), we have a mini-typology that leads to the following mini-map:
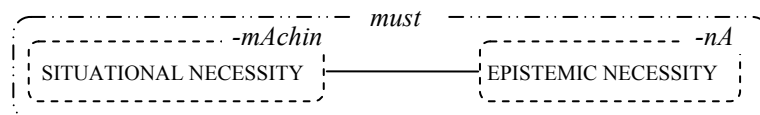

Figure 7. Mini-semantic map of situational vs. epistemic necessity (English and Evenki)

Following such a procedure, we inductively capture cross-linguistic variation in categorization and the underlying conceptual space is derived empirically, through a cross-linguistic comparison[34] (Haspelmath 2003: 216-217). The result is the identification of linguistically relevant analytical primitives. In addition, this example illustrates the *va et vient* between deductive and the inductive reasoning.

    With this example, not only do we identify two meanings, but we link them with a line that means "they are connected in some way", the English modal verb *must* being a realization of this connection or contiguity between the two meanings. However, things are obviously not so simple when a greater number of meanings are involved.

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34 The evolution of the semantic map of modality from van der Auwera & Plungian (1998) to van der Auwera et al. (2009) is an interesting example of how semantic maps can evolve and be progressively enriched by the inclusion of new languages and constructions.

2.2.2 How are the meanings arranged and connected?

In order to cope with the connectivity hypothesis[35] (see §2.1),

> "[t]he functions must be arranged in such a way that all multifunctional grams can occupy a contiguous area on the semantic map." (Haspelmath 2003: 217)

Accordingly, if one takes the data of the (theoretical) lexical matrix of Fig. 6, we can suggest the following (theoretical) semantic map:
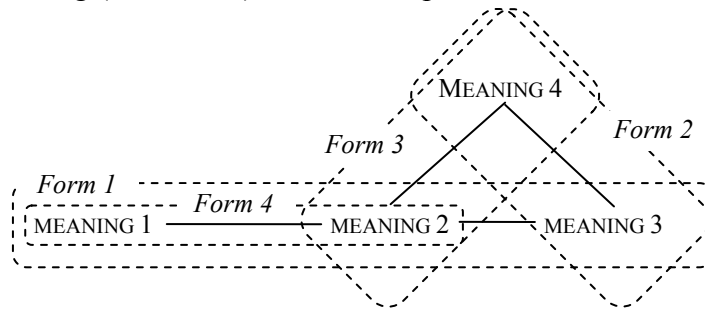

Figure 8. A theoretical semantic map based on the lexical matrix of Fig. 6

This map respects the *connectivity hypothesis*: all the polyfunctional forms occupy a contiguous area on the semantic map,[36] which leads to the observation that, in a semantic map, "[m]ultiple uses of a marker are related in a systematic and universal way" (van der Auwera & Temürcü 2006).

   As already argued by Haspelmath (1997b), the structure of the semantic space is related to the semantic relationship among the functions.[37] Indeed, the basic idea that lies behind the connectivity hypothesis is that "[e]lements of structure are similar because the meanings they encode are similar" (van der Auwera et al. 2004: 44): the meanings linked by lines are therefore semantically closer than those that are not.[38] This observation points to a possible interesting use of semantic maps (Zwarts 2010a: 397-393): the decomposition of the analytical primitives into semantic features. Having at least one semantic feature in common can lead to contiguity in the map and be manifested by a line between the two analytical primitives. If one takes the simple example of the obligation vs. probability meanings of the English *must* (see §2.2.1),

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35 See Croft ([2]2003: 137): "[t]he structure of the semantic space is empirically constructed, on cross-linguistic facts combined with the Semantic Map Connectivity Hypothesis" and Boye (2010: 9): "[t]he criterion of semantic map continuity provides us with a guarantee of empirical linguistic significance which purely notional generalizations over linguistic expression cannot provide themselves."

36 Croft & Poole (2008): "A range of functions expressed by a certain class of language-specific categories is arranged and rearranged in a single graph structure so that for the sample of languages under investigation, all or almost all of the language-specific categories satisfy the Semantic Map Connectivity Hypothesis for that one graph structure. A semantic map is a way of capturing and graphically representing the relationships between related meanings."

37 In this respect, see van der Auwera & Van Alsenoy (forthcoming) who suggest a link between the semantic map of indefinite pronouns (Haspelmath 1997a) and the neo-Aristotelian quantifier map (based on the 'Square of Opposition').

38 Of course, this does not entail that semantic proximity is the *direct result of* or is *directly motivated* by perceived similarities between individual *conceptual* components; see Cristofaro (2010) and §2.2.2 below.

one could argue that, although being distinct analytical primitives, they share a semantic feature, viz., the expression of some kind of necessity.

In this respect, we should point out that the map in Fig. 8 is not strictly linear: due to the fact that *Form 3* expresses both meaning 2 and meaning 4, we have to draw a line between these two meanings. As a result, in the part of the map constituted by meanings 2, 3 and 4, all the meanings are somehow connected, i.e. we have to assume that they share a common semantic feature despite being distinct analytical primitives. A map or a part of a map in which all the meanings are interconnected is traditionally called a *vacuous map* (Haspelmath 2003: 218), because it says nothing about the patterning of multiple meanings. A vacuous map is not especially problematic *per se*, for it has the value of showing that the three meanings are intimately connected, and possibly share a common semantic feature; however, it makes no predictions about the relation between forms and meanings or about which languages are possible and which are not.

According to Haspelmath (2003: 118), there are many functional domains in which there are very strong *universal restrictions*, so that interesting maps can nevertheless be drawn. Moreover, Haspelmath (2003: 217) claimed that "it is generally sufficient to look at a dozen of genealogically diverse languages to arrive at a stable map that does not undergo significant changes as more languages are considered." These two observations, however, appear to bear reconsideration. Indeed, Cysouw (2007, 2010a) and Wälchli (2010) showed that the sample size has considerable influence on the outcome of a map and that small sample size can have significant distorting effects on the map (distance-based maps, in this case).[39]

This issue poses a challenge for the classical semantic map model itself (see Narrog & Ito 2007: 276; Narrog 2010a: 234), for it entails that either (a) we have to accept numerous exceptions to the contiguity of polysemous linguistic items on the map, in violation of the connectivity hypothesis, or (b) we have to construct maps that are to a large extent vacuous (i.e. where most of the meanings or points are interrelated). However, a number of ways out of this vacuity have been suggested in recent studies:

> (a) First, various studies based on large-scale typological samples tend to corroborate earlier semantic maps. For example, Narrog & Ito's (2007) and Narrog's (2010a) map of instrumental and related functions largely corroborate Haspelmath's (2003) map, which was based on a smaller language sample. However, it should be noted that polysemies of instrumental case markers that are found in less than 10% of cases are not integrated in the map.[40] This problem is addressed in point (b) below.
> (b) Malchukov (2010) comments extensively on the fact that exceptional cases of polysemy would not make it into the classical map: "[w]hile this is a legitimate approach," he says, "it involves data reduction; so the question arises as to what extent such data reduction is justified" (2010: 177). Interestingly enough, he shows that "rare patterns [of polysemy] are often not indicative of (immediate) semantic relatedness of respective categories, but are due to other factors," such as markedness,

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39 In practice, the number of languages needed to establish a stable map is actually highly dependent on the functional/lexical domain under investigation.

40 See also Rice & Kabata (2007) who resort to Fischer's "exact test" to determine which cases of polysemy/polyfunctionality are statistically significant.

distinguishability and, crucially, diachronic evolution (polygrammaticalization of a lexical item or construction, gram replacement, etc.), which induce contiguity violations in the map.[41]

Consequently, rare patterns of polyfunctionality definitely deserve to be analysed in their own right as they can provide important insights into the motivations behind the emergence of polyfunctional forms. In this respect, classical semantic maps — which can filter out some exceptional patterns of polyfunctionality[42] — can actually be considered as an excellent heuristic tool for detecting interesting *loci* for linguistic investigation.[43] The crucial point to be made here is that studying the origin of polyfunctional patterns requires the full integration of diachronic information about language change into the semantic map model.

2.3 Semantic maps, polyfunctionality and language change

The semantic maps that we have discussed up to this point account for the synchronic polyfunctionality of linguistic grams, lexemes or constructions. This polyfunctionality almost always turns out to be the result of diachronic processes of language change.[44] Indeed, synchronic polysemy and diachronic change in meaning are but two sides of the same phenomenon: in order for synchronic polysemy to exist, it must have emerged by a specifiable diachronic process. Even in cases where one meaning completely replaces another, it must — on general principles and empirical grounds — have gone through an interim phase with overlapping polysemic patterns (A > AB > B).

In order for a semantic map to be "dynamicized", i.e., to take into account the diachronic evolution of form-meaning pairings,[45] all that needs to be done is to turn the neutral connecting lines into directed arrows that indicate the empirically documented paths of evolution between points on a map. The advantages of diachronic semantic maps are numerous, but two of them should be explicitly mentioned here.

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41 Correlatively, similar encoding may not reflect a semantic similarity, but may be the result of other — functional, structural and diachronic — factors. Moreover, "one should not exclude that two markers with different etymologies (possibly even borrowings from other languages) coalesce formally and that their uses end up on one and the same semantic map" van der Auwera & Temürcü (2006: 132).

42 In this respect, Cristofaro (2010) stressed that multifunctionality patterns may originate "from processes of form-function recombination in particular contexts rather than any perceived similarity between individual conceptual components." This is evidently much in tune with the non-teleological relationship between source constructions and target constructions posited in grammaticalization studies.

43 See Malchukov (2010: especially 195). See also Narrog & van der Auwera (2011: 325): "Semantic maps are primarily means of representation, but they can lead to new questions and can illustrate where clarification is needed."

44 The importance of the diachronic dimension in building semantic maps has been stressed by several scholars, see *inter alii* Haspelmath (2003: 233-237); van der Auwera et al. (2004: 48-49); van der Auwera (2008).

45 "Diachronic changes in the distribution of a construction should follow connected paths in conceptual space (dynamicized version of the Semantic Map Connectivity Hypothesis)" (Croft 2001: 105).

2.3.1 Reducing the cases of infringement of the connectivity hypothesis

Diachronic semantic maps reduce significantly the number of connectivity hypothesis violations if one considers the following principle:

> "noncontiguous markers are acceptable in cases where they are the remnants of a contiguous area in an earlier stage of the language" (van der Auwera & Temürcü 2006: 132).

Let's illustrate this claim by an example. In Japanese, the gram *ta* can perform two seemingly opposite functions: apart from the general past meaning as in Ex. 14, it can also be used as an emphatic (or "mirative") present (Malchukov 2010: 192), as in Ex. 15:

Ex. 14 *Kinou   ame-ga   sanjikan   fu-tta*
        yesterday   rain-NOM   three_hours   fall-*ta*
        "Yesterday it rained for three hours."

Ex. 15 *A,   hora   annna   tokoro-ni   inoshishi-ga   i-ta-yo*
        oh   look   such   place-LOC   wild_hog-NOM   exist-*ta*-AFF
        "Oh, look, there is a wild boar over there."
        [uttered at the sudden sight of a wild hog during an excursion in the mountains]

A synchronic semantic map would therefore look like the one in Fig. 9, where the gram *teiru*, the perfect continuous form, has also been mapped. The issue is of course that while the connection between RESULTATIVE, PERFECT and PAST is well-established across languages (e.g. Bybee et al. 1994: 105), the polysemy between PAST TENSE and PRESENT MIRATIVE is virtually unattested.
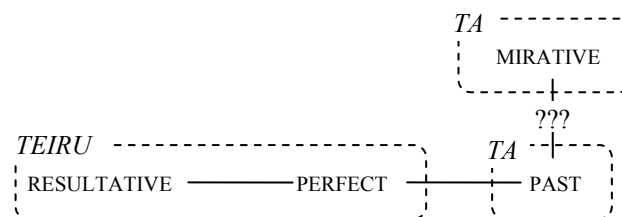
Figure 9. Synchronic semantic map of the gram *teiru* and *ta* in Modern Japanese
(adapted from Sadanobu & Malchukov 2011: 152)

The semantic map, however, makes sense diachronically (see Malchukov 2010; Sadanobu & Malchukov 2011). Indeed *ta* is derived from *tari*, the original meaning of which seems to be STATIVE-RESULTATIVE; moreover MIRATIVE-EVIDENTIAL and RESULTATIVE polysemies are common cross-linguistically. Therefore, an historical scenario as sketched in Fig. 10 can provide an explanation for the unexpected polysemy of *ta* in Japanese.

Figure 10. Historical functions of *ta(ri)* in Japanese and present function of *teiru*
(adapted from Sadanobu & Malchukov 2011: 152)

So, even if meanings RESULTATIVE/PERFECT are no longer encoded by the same lexical item as MIRATIVE and PAST, the diachronic semantic[46] map (a) accounts for the fact that these four meanings belong to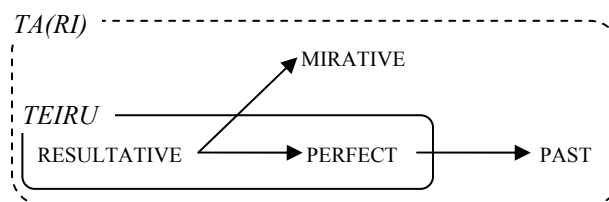 a contiguous semantic space; (b) it provides explanatory power and avoids the need to postulate semantic gaps (or infringement of the connectivity hypothesis); (c) these diachronic links represent strong, direct and motivated *semantic* relations, while the synchronous links represent weak, indirect and synchronously unmotivated ones. As van der Auwera (2008) argues, "the best semantic map is a *semantic* semantic map". In other words, it is better to prefer a strong semantic link that is historical to a weak one that is synchronous, viz., it is better to link two later meanings indirectly via their source meaning than to link two weakly related ones directly.[47]

Incidentally, if there is room for homonymy in semantic maps,[48] the historical dimension in a semantic map makes it unlikely that homonyms would make their way into a semantic map in an unmotivated fashion. A nice example has been discussed by van der Auwera et al. (2009) with respect to the two meanings of the "got to" construction in English, expressing respectively permission (*I got to watch TV last night*) and obligation (*I gotta go*; deriving from *I have got to go*).

2.3.2 Making vacuous maps less vacuous

Diachronic semantic maps reduce the vacuity of some semantic maps and generate interesting hypotheses (Haspelmath 2003: 217-218; 233-237). For example, let's take the vacuous part of the theoretical semantic map presented in Fig. 8:

MEANING 4
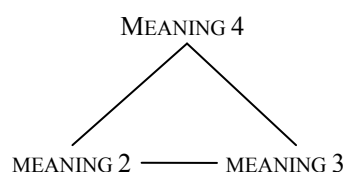
MEANING 2 ——— MEANING 3

Figure 11. A typical vacuous semantic map

As observed earlier (§2.2.2), this map says nothing, beyond the fact that these three meanings are related. It makes no predictions. However, a diachronically-informed semantic map can get us out of this predicament.

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46 It is worth noticing that, when dealing with grams, there are few (if any) differences between diachronic semantic maps and traditional grammaticalization pathways that can be found everywhere in the literature (e.g. Bybee et al. 1994).

47 Moreover, as has also been argued by van der Auwera (2008), one can label the directed arrows in order to specify the diachronic processes that led to the movement of lexical items through a semantic space. Take for example, the common processes of specialization of meaning, generalization of meaning, and metaphor or metonymy.

48 The "idea is simple: the weaker the semantic link between any uses, especially also when the uses are not (no longer or not yet) contiguous, the more likely uses are to count as homonymous" (van der Auwera & Temürcü 2006: 132).

MEANING 4

MEANING 2 ⟶ MEANING 3

Figure 12. A diachronic semantic map

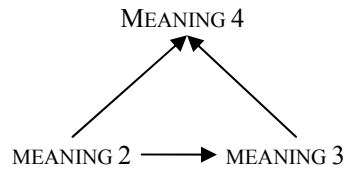The dynamicized semantic map in Fig. 12 says that: (a) MEANING 2 can lead to MEANING 3 and MEANING 4; (b) MEANING 3 leads to MEANING 4 but not to MEANING 2; (c) MEANING 4 leads to neither MEANING 2 nor MEANING 3.

When mapped to actual linguistic meanings, this kind of map makes significant and useful predictions about language. For example, if we assume that MEANING 2 is DIRECTION, MEANING 3 is PURPOSE and MEANING 4 is FUTURE, our map predicts that:

(a) DIRECTION can lead to PURPOSE or FUTURITY;
(b) PURPOSE can lead to FUTURITY but not to DIRECTION;
(c) FUTURE leads to neither DIRECTION nor PURPOSE.

This prediction, in turn, can be evaluated empirically.

2.4 Why are semantic maps a valuable tool?

In this section, we briefly summarize the main advantages of "classical" semantic maps (e.g. Haspelmath 2003: 230-233; van der Auwera 2008; Janda 2009; Narrog 2010a: 233-234, 2010b), especially regarding the study of a language that is well-attested in terms of both diversity of text types and length of documentation, like Ancient Egyptian:

(1) *Cross-linguistic*. Semantic maps graphically represent similarity relationships between meanings (i.e. universals or strong tendencies of patterning) that are based, even if not exclusively, on cross-linguistic comparison. Cross-linguistic comparison provides an empirical basis to questions that are otherwise considered purely theoretical and/or language-internal. Accordingly, we consider this method to be a way out of some of the problems of the language-internal semantic analysis often characteristic of a dead language.

(2) *Predictive*. Semantic maps make predictions about the connections between meanings and functions that are expected to occur in a language (based on empirically attested vs. unattested patterns of polysemy). Moreover, *diachronic* semantic maps graphically capture the directionality in the connections between meanings. Therefore, they suggest hypotheses regarding language change: a diachronic semantic map predicts that certain paths of evolution are possible while others are not.

(3) *Falsifiable*. Semantic maps express generalizations about language structure that are falsifiable by additional evidence from further languages. They describe the meanings in a very concrete fashion that can easily be discussed, improved on, or proven wrong. In contrast, the general-meaning approach generally arrives at "descriptions so abstract and vague that it is practically impossible to work with them" (Haspelmath 2003: 231). In practical terms, this means that we have a win-win situation between typological linguistics and descriptive studies of Ancient Egyptian.

(4) *Implicational*. Semantic maps suggest implicational universals, which are more interesting than absolute ones for attempts to explain why languages are the way they are.

(5) *Theory-neutral*. (a) Semantic maps render decisions about vagueness vs. polysemy less problematic (and maybe less relevant) and provide limits to the postulation

of distinctive meanings: if at least some languages encode two meanings separately, these meanings can be treated as distinctive, but if no language encodes two meanings separately, it is probably best not to treat them as distinctive at any level. (b) Semantic maps are not contingent on prototype approaches, but are compatible with them. For example, one could consider that the prototype meaning is the most central one, with the most direct links with other meanings. Classical semantic maps also make it clear that prototypical meanings are not a sneaky way of reintroducing monosemic basic meanings.

(6) *Semantic*. Semantic maps do not discriminate between lexical and grammatical meanings: any kind of overt marker may be mapped onto a semantic domain,[49] since descriptive categories (e.g., word, clitic, affix) differ from language to language, while functions can be characterized in universal terms.[50] Correlatively, within any language, semantic maps make it possible to identify how individual grams, lexemes and constructions overlap and compete in their functions in a given domain.

Nonetheless, "classical" semantic maps also have limitations, which can be summarized as follows:

(1) *Frequency*. Classical semantic maps (as opposed to distance-based semantic maps) do not indicate frequency of occurrence of polysemy patterns across languages. This might have significant distorting effects, as a number of linguists have pointed out (e.g., Croft, Cysouw). This problem, however, can be addressed by representing the frequency of co-occurrence of two meanings by the thickness of the linking line or arrow between them (e.g. Narrog & van der Auwera 2011).

(2) *Rare patterns of polysemy*. In order to cope with advantages 2-4 mentioned above, semantic maps have to simplify the diversity of cross-linguistic data by not integrating (very) rare patterns of polysemy[51] — the goal being to avoid the spread of vacuous maps (§2.2.2) where all the meanings are interconnected "if minority patterns are taken into account on par with majority patterns" (Narrog 2010b: 199). The main point to be made here is that, in a typological perspective, the difference between very rare and unattested is negligible for drawing conclusions about the patterning of linguistic structure in the languages of the world,[52] while the difference between very rare and common is highly significant for the same purposes. As argued above (§2.2.2), this can actually be turned into an advantage, for semantic maps can be conceived of as a heuristic tool for detecting interesting *loci* of study of "unexpected" cases of polyfunctionality.

(3) *Items vs. constructions*: Semantic maps often attribute functions or meanings to lexical or grammatical items, despite the fact that we are usually dealing with larger constructions. For example, one might speak, in a shorthand fashion, of French *aller* as a future marker, but it is more precise to refer to the *aller*-future construction, with its specific formal features (e.g., syntactic and semantic compatibilities or selectional restrictions).

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49   The distinction between lexical and grammatical — which is a shaky one at best — is perhaps less important than the hitherto unexplored distinction between coded and inferred meanings (see n. 8).

50   A central issue is nevertheless the inconsistencies in labeling functions cross-linguistically. As pointed out by Narrog & Ito (2007: 276), these inconsistencies have their source in the grammatical description of languages and are therefore a problem "for typological semantics in general, and not only for the semantic maps".

51   In the same vein, semantic maps "smooth over some of the complexity of any given language" (Janda 2009: §5). In reducing meanings to present vs. absent, it risks hiding binary discreteness in what purports to reflect a continuous conception of meaning (Janda 2009: §3-5).

52   Furthermore, very rare features are often dependent on the languages in the sample, while common types will tend to pop up in any sample, due to the nature of things.

(4) *Over-generation.* Semantic maps might over-generate, postulating arrangements that are never actually attested in a single natural language. In other words, it is not enough to model which linguistic structures are possible; one has to show which are probable. This is not a criticism of semantic maps *in se,* but rather of the classical semantic map model.

(5) *Conceptual space.* As a consequence of disadvantages (2) and (3), doubts have been expressed about the claim of semantic maps to represent a universal conceptual space, due to the fact that languages "have significantly different ways of organizing […] concepts": "[s]ome phenomena indicate that different languages may just be doing things differently, in ways that defy meaningful comparison" (see especially Janda 2009: §4-5). As said earlier (see n. 23), we remain agnostic regarding the cognitive reality of the conceptual spaces created by semantic maps: we use them as a tool in order to structure meaningfully the patterns of polyfunctionality encountered in the languages of the world.

These issues may be addressed by future developments or they may remain intractable in the classical semantic map model, but we consider that for now there is hardly any other tool that allows linguists to describe and structure polyfunctional patterns in a principled way that results in falsifiable generalizations.

3 Two case studies: Semantic maps and the Ancient Egyptian lexicon

In this section, we present two case studies that illustrate the usefulness of semantic maps for describing and structuring the Egyptian lexicon. The argument is oriented towards methodological claims. From an empirical point of view, additional corpus-based evidence is required if one wishes to produce a more accurate picture of the kind of polyfunctionality treated here.

In the first case study (§3.1), we show how the semantic space of comitative and instrumental meanings is structured and expressed in Late Egyptian by several prepositions. The orientation of this case study is *onomasiological*: we aim at mapping the division of labor between different markers (i.e. linguistic forms) in a specific semantic domain and at describing the (overlapping) patterns of polysemy. This case study allows us to: (1) evaluate the connectivity hypothesis of a typological semantic map against the Ancient Egyptian data — are all the meanings of a single form connected on the map? (2) illustrate how semantic maps can be used to describe the systems of oppositions in a given semantic domain; and (3) track down the diachronic evolution of the systems of opposition in a given semantic domain.

The second case study (§3.2) proceeds on *semasiological* grounds. The highly polysemous preposition *r* "at, to, towards, against, as for" — attested from the earliest stages of the language down to the latest Coptic — is taken as a point of departure. After reviewing the main proposals that have been put forward in the Egyptological literature in order to account for the multiple meanings of this preposition, we argue that *r* can be described as an *allative* marker, i.e. a goal-oriented marker that develops a polysemy network typical of other allative markers in the languages of the world. In order to ground our argument, we first draw a semantic map of allative markers based on cross-linguistic evidence. In a second step, we map the Ancient Egyptian preposition *r* onto the points of the semantic space that has been articulated based on typological data. Finally, we show that the preposition *r* helps to extend previous hypothe-

ses regarding the polyfunctionality of allative markers. The structure that emerges from the present study being somewhat different from previous analyses, we conclude this section by pointing out the advantages of the semantic map methodology when compared to others.

The two case studies highlight the main domains in which semantic maps can be used as a heuristic tool in lexical semantics by combining onomasiological and semasiological approaches to the lexicon and by integrating the dynamic dimension of its evolution.

It is noticeable that, in these case studies, we focus on markers (prepositions) that are situated, in some senses, between lexicon and grammar. There are at least two reasons for doing so. First, "grammatical" meanings (especially the ones related to case functions) have received much more attention in the literature on semantic maps (see §2.1) than "lexical" meanings. This allows us to relate our study to a considerable body of research. Second, grammatical markers are often more polyfunctional than strictly lexical ones: in order to test the applicability of the semantic map tool for studying polysemy networks in Ancient Egyptian, the choice of markers related to grammatical meanings therefore appears to be the more challenging from a methodological viewpoint.[53] Third, 'lexical' and 'grammatical' meanings are often linked diachronically by pathways of grammaticalization; semantic maps allow us to visually represent such links in a way that generates testable hypotheses about (im)possible pathways of change.

3.1 The distribution of Late Egyptian prepositions
      in the companion/instrument area

In this section, we introduce (§3.1.1) typologically-based semantic maps that have been drawn for the comitative and instrumental domain. In a second step, we present (§3.1.2) the division of labor between Late Egyptian prepositions in this domain. Finally (§3.1.3), we evaluate whether the map is adequate (i.e. respects the connectivity hypothesis) and we discuss the diachronic dimension of the map based on the Ancient Egyptian data.

3.1.1 The semantic maps of comitative and instrumental meanings

The semantic field of comitatives, instrumentals and related functions has been especially well studied in the typological literature[54]. Haspelmath (2003: 230) suggests a classical semantic map of this domain[55] based on the analysis of several patterns of polysemy involving comitative and instrumental markers (Michaelis & Rosalie 2000: 89).

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53   For prepositions as a challenge for descriptive semantics in a dead language, see already Junge's (1973) treatment of the Middle Egyptian prepositions.
54   See e.g. Schwarz et al. 2001; Stolz 2001; Lehmann & Shin 2005; Stolz et al. 2006.
55   Additionally, see the map of semantic roles based on Indo-European in Luraghi (2001: 50).
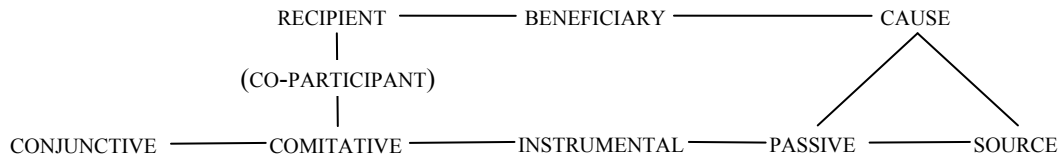
RECIPIENT ——————— BENEFICIARY ——————————— CAUSE

(CO-PARTICIPANT)

CONJUNCTIVE ———— COMITATIVE ———— INSTRUMENTAL ———— PASSIVE ———— SOURCE

Figure 13a. Map of comitatives and instrumentals (adapted from Haspelmath 2003: 229)

While some languages have highly polysemous markers in this area[56], in other languages, the expression of these functions is split between several grams. In English, for instance, the preposition *with* encodes COMITATIVE (*He came with me*), CO-PARTICIPANT (*I am talking with him*) and INSTRUMENTAL (*I cut it with a knife*), but other points of the map are expressed by means of other prepositions.

On the basis of extensive cross-linguistic comparison (200 different languages), Narrog & Ito (2007) and Narrog (2010a) suggest a more detailed (and more accurate) semantic map of the companion-instrumental area:

DURATION

CO-PARTICIPANT   LOCATION   ROUTE

CAUSE/REASON

CLAUSAL   NP-
COORDINATION   COORDINATION   COMITATIVE ——→ INSTRUMENT

(PASSIVE) AGENT

POSSESSION   SOURCE
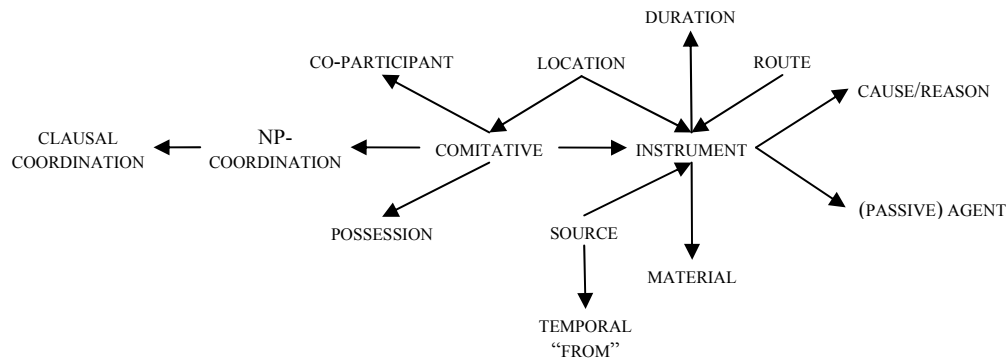
MATERIAL

TEMPORAL
"FROM"

Figure 13b. Map of comitatives and instrumentals (after Narrog 2010a: 242)

This map is a diachronic semantic map of the comitative and instrumental semantic space. As discussed earlier (§2.3), the arrows between meanings indicate the pathways of development that recur cross-linguistically: the map is 'dynamicized'. These arrows therefore offer hypotheses that can be tested against the data of a long-attested text language like Ancient Egyptian.

3.1.2 The division of labor between prepositions in Late Egyptian

In Late Egyptian, several prepositions share the expression of the COMPANION/ INSTRUMENT domain. Here follows a list of the form/function pairings[57] in this semantic area, beginning with the most polysemic preposition in the INSTRUMENT area, namely *m*[58]:

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56 For example, Seychelles Creole, in which the preposition *ek* expresses all the functions of Fig. 13a except for BENEFICIARY.

57 The list of functions is based on the meanings acknowledged in lexicographical tools and grammars such as the *Wb.* and Lesko (2004); Erman [2]1933 and Černý & Groll [3]1984; as well as on corpus data extracted from *Ramses* (see Polis 2006; Rosmorduc et al. 2009; Winand et al. 2012). The prepositions that can be paired with a single function (usually with very specific meanings) have not been treated systematically in the present case study.

58 Other frequent functions fulfilled by the preposition *m* — which could be used in order to expand the semantic map of COMPANION/INSTRUMENT, but will not be addressed in the present paper —

(1) In Late Egyptian, the preposition *m* (*Wb.* II, 1,4-2,6) covers only part of the semantic map under examination; specifically, it covers the right side, with functions directly associated with INSTRUMENT (Ex. 16-18): LOCATION[59] (Ex. 19) and SOURCE (Ex. 20), as well as DURATION[60] (Ex. 21), ROUTE (Ex. 22-23) and MATERIAL (Ex. 24-25).

Ex. 16   *wn.in*   [*t3y=f   ḥm.t   ḥr   rdi.t   ir*].*y-tw=f*   *m*   *fdk.w*
           CORD.PST his   wife   on- CAUS:INF do\SBJV-PASS=3SG.M   in   pieces
           m   *p3y=s   minb*
           INS   her   axe
           "Thereupon, his wife turned it (i.e. the snake) into pieces with her axe"
                                    (P. Harris 500, v° 8,3-4 = *LES* 8,2-3)

Ex. 17   *t3*   *nḥ*(.*t*)   *šri*   *i.dg3=s*   *m*   *dr.t=s*
           the   sycamore small   plant\REL.PFV=3SG.F   INS   hand=3SG.F
           "The small sycamore that she planted with her hands"
                             (P. Turin 1966, r° 1,15-2,1 = López 1992: 138-139)

Ex. 18   (…) *iw=s*   *mḫ-ti*   *m*   *nbw*
           (…) SBRD=3SG.F   fill\RES-3SG.M   INS   gold
           "(A basket) filled with gold"   (P. BM EA 10052, r° 4,5 = K*RI* VI, 776,2-3)

Ex. 19   (…) *iw=i*   *m*   *p3*   *pr*   *n*   A   *irm*   *ktḫ*   *rmṯ*
           (…) SBRD=1SG   LOC   the   house   of   A   COM   other   men
           "(…) while I was in the house of A with other men"
                       (P. BM EA 10052, r° 7,12-13 = K*RI* VI, 784,16-785,1)

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are: (a) PARTITIVE (e.g. *iw=f w3ḥ wˤ im=sn* "he spared one of them" P. d'Orbiney, 11,9 = *LES* 21,12; compare with the use of *m-m*, see *Wb.* II, 2,9-16); (b) STATUS/CONDITION (see El-Din 1998; e.g. *iw=i ˤḥˤ.k*(*wy*) *m p3y=f sn ˤ3* "(…) even though I am his older brother" [P. Chester Beatty I, r° 8,7 = *LES* 48,2-3; for the semantic distinction between the constructions *rdi* NP *m* STATUS and *rdi* NP *r* STATUS "to appoint NP as STATUS", see Vernus 1997: 73, n. 205; 1999: 104]; *ḥmty m ḳnḳn* "beaten copper" [P. Mayer A, r° 4,7 = K*RI* VI, 811,10]); (c) EXTRAPOSED LEXICAL NP ARGUMENT MARKER (SUBJECT, e.g. as in *wn.in=w šm.t r t3 ḳnb.t m p3 z 2* "then they went to court, the two men" [P. Chester Beatty I, r° 12,1-2 = *LES* 53,3-4]; DIRECT OBJECT, as e.g. *ḥr bn tw.tw rḫ wdˤ=w m p3 z 2* "but one is unable to decide between them, the two men" [P. Chester Beatty I, r° 2,13-3,1 = *LES* 39,14-15]; RECIPIENT/BENEFICIARY, as e.g. *iw=n pš=w n=n m p3 5 rmṯ* "and we shared them between the five of us" [P. BM EA 10052, 5,8 = K*RI* VI, 779,11-12]; see Winand forthcoming(a) [with Ex. 7, 13 & 17]); (d) DIFFERENTIAL OBJECT MARKER (e.g. *sw ir m p3y=f sḥn* "he is doing his job" [P. Turin 1971, v° 6 = *LRL* 32,13]; cf. Winand forthcoming(b) [with Ex. 4] and the remarks in Peust 2008: 82-84); (e) PROGRESSIVE/MELLIC MARKER (e.g. *iw=w m{n} iw m{n} p3 ym* "(11 boats) that were coming on the sea" [P. Moscow 120, 2,63 = *LES* 73,10-11]; cf. Winand 2006: 304-310 with previous literature); (f) FOCUS MARKER, as e.g. *m ktḫ.w i.ir šsp n3 šˤ.t* "it is others who receive the letters" (P. Geneva D 407, v° 8 = *LRL* 15,11-12; cf. Neveu 1994).

59   Uses of the preposition *m* as ADVERBIAL MARKER are also frequent, with abstract LOCATIONS expressing STATES (see e.g. *p.t t3 m ršw.t* "the sky and the earth are joyful", O. Turin CG 57001, r° 1 = López 1978: pl. 1*a*-1) and MANNER. Besides the idiom *m p3y=f sḫr* "according to his habit", consider other adverbial constructions with *m* (*m-m3ˤ.t, m-m3w.t, m-mitt, m-ḫ3w*, etc.; see e.g. P. Leiden I 369, v° 4 = *LRL* 2,8-9). For recent approaches to the spatial meanings of the preposition *m* and their relations to the compound preposition *m-ḫnw* "inside" (cf. Erman ²1933: 322-323 [§652]; Černý & Groll ³1984: 117), see the literature quoted in Werning (current volume: §4.6 & n. 23). See also the strict monosemist position endorsed by Hannig et al. 1986: 145-147a.

60   The preposition *m* is used both for DURATION (Ex. 21) and SIMULTANEOUS LOCATION IN TIME (day part, day, month, season, year; see Haspelmath 1997b: 8), as e.g. *h3b pw r rdi.t rḫ p3y=i nb m* DATE "this is a letter to inform my lord on DATE" (P. Anastasi IV, v° C7-8 = *LEM* 56,1).

Ex. 20 [*m*]*k* *bw* *ȝb=i* *pr*(.*t*) *m* *wȝs.t*
Look NEG wish:IPFV=1SG leave:INF SOUR Thebes
"Look, I do not wish to leave Thebes"

(O. Petrie 39,1 = *HO*, 8,3)

Ex. 21 (*i*)*n* *pȝ* *ꜥmw* *i.ir=k* *pȝy* *m* *tȝy* *20 n* *rnp.t*
INT the discover:INF do\REL.PFV=2SG.M this DUR the 20 of year
i.ir=i *m* *pȝy=k* *pr*
do\REL.PFV=1SG in your house
"Is this the discovery you made during these twenty years that I spent in your
house?" (P. BN 198 II, rᵒ 10-11 = *LRL* 67,16-68,1)

Ex. 22 *iw=i* *nw* *ḥr=w* *m* *tȝ* *ḳrr*(.*t*) *n* *pȝ* *sbȝ*
CORD.PST=1SG look:INF on=3PL ROUTE the hole of the door
"And I caught a glimpse of them through the hole of the door"

(P. Mayer A, vᵒ 6,23 = K*RI* VI, 816,15-16)

Ex. 23 *mi* *r-bnr* *m* *msḏr=f*
come:IMP out ROUTE ear=3SG.M
"Come out through his ear!" (P. Chester Beatty I, rᵒ 12,9-10 = *LES* 54,2)

Ex. 24 (…) *ḥnꜥ* *wꜥ-n* *wt* *m* *ḫt*
(…) and one coffin MAT wood
"(…) and one wooden coffin" (O. Gardiner 34, 2-3 = *HO* 20.6, 3-3)

Ex. 25 *ḳd=i* *n=k* *bḫn.wt* *ꜥȝ.w* *m* *inr*
build:PST=1SG for=2SG.M pylons big MAT stone
"I built big stone pylons for you" (P. Raifé-Sallier 3, 2,8-9 = K*RI* II, 38,4)

Functions associated with comitativity are very rare and limited to particular syntactic
environments for the prepositions *m*.[61] Instead, Late Egyptian has a number of dedi-
cated COMITATIVE markers, such as (*r-*)*ḥnꜥ*, *irm*, and *m-di*. The diachronic and
functional overlapping of these highly frequent prepositions has never been analyzed
in any systematic fashion. Hence, the description that follows is a rough sketch, aimed
at illustrating the principles of a semantic map:

> (2) The ancient[62] preposition *ḥnꜥ* "with" (*Wb.* III, 110,12-111,18) expresses functions
> related to COMITATIVE (Ex. 26), CO-PARTICIPANT (Ex. 27) and POSSESSION (Ex. 28)
> in Late Egyptian. Theses uses, however, tend to be limited to older documents or to
> appear in the conservative registers of later texts. Indeed, in Late Egyptian, the most
> frequent function of this preposition is NP-COORDINATION[63] (Ex. 29). The prepo-

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61 Several of the examples quoted in favor of the existence of a COMITATIVE meaning of the prepo-
sition *m* in Late Egyptian (see Erman ²1933: 296 [§605.18]; Smither 1939: 167 [Ex. 9-12];
Caminos 1970: 129, n. 2; Černý & Groll ³1984: 93) do not hold up under closer scrutiny. These
examples have the meaning "among, in the midst of" (which can be close to a comitative meaning
in context), see e.g. P. d'Orbiney 11,10-12,1 = *LES* 21,14-15; P. Abbott, rᵒ 4,15 = K*RI* VI, 474,7.
The examples that apparently have this COMITATIVE meaning all follow the pattern VERBS OF
(CAUSED) MOTION (*iy, wḏi*) + *m* ADJUNCT "to come / to send someone *with* ADJUNCT"; see
esp. P. Anastasi III, rᵒ 2,12 (*LEM* 22,14); P. Turin 1896, rᵒ 6 & rᵒ 9 (K*RI* VI, 734,13 & 16);
P. Moscow 120, 2,72 = *LES* 74,12.

62 See Kahl 2003: 165.

63 The most detailed treatment of other NP-coordinating prepositions in Late Egyptian is still Erman
(²1933: 85-89 [§192-199]; see also Černý & Groll ³1984: 104-107; Ernst 1994: 107-111 for *ḥnꜥ*
and *irm*; and Winand 2011: §0.2). In the present paper, the following NP-COORDINATION markers
will not be discussed further: *ḥr* "on" (for words that have closely related meanings, reminiscent of
dvandva-type composita, e.g. *it ḥr bd.t* "barley and wheat"; *ꜥḳw ḥr ḥnḳ.t* "food and beer"); *m-mitt*
"likewise"; *mi*(-*ḳd*) "like"; and *wȝḥ* (Coptic ⲁⲩⲱ).

sition *ḥnꜥ* did not grammaticalize as an independent CLAUSE-COORDINATION marker, but — according to a widely accepted hypothesis[64] — it was part of a construction[65] (Ex. 30) that developed into the so-called Conjunctive (in fact, a sequential verb form) of Later Egyptian.

Ex. 26   *wn.in*   *p3*   *ẖrd*   *ḥr*   *iy.t*   *r*   *pwi.t*   *ḥnꜥ*   *n3-n*   *ẖ<r>d.w*
         CORD.PST the   child   on-   come:INF   to   jump:INF   COM   the   children
         (*n*)   *n3-n*   *wr.w*
         of   the   chiefs
         "Then the child came to jump with the children of the chiefs"
                                   (P. Harris 500, vᵒ 6,5 = *LES* 4,14-15)

Ex. 27   *mdw*   *ḥnꜥ*   *wḥmw* PN
         speak:IMP   CO_P   herald   PN
         "Speak with the herald PN!"   (P. MMA 27.3.560, 3 = Hayes 1957: 81)

Ex. 28   (...) *p3-wn*   *itw*   *p3*   *nty*   *ḥnꜥ=n*
         (…) because take:PFV.PASS the   REL   POSS=1PL
         "(Could you have another very good rope made for us?) because the one which
         we had has been stolen"   (P. Cairo CG 58055, 3 = K*RI* I, 325,3-4)

Ex. 29   DATE *iry*{=*i*}   *md3y*   PN₍ₐ₎   *ḥnꜥ*   *md3y*   PN₍ᵦ₎   *ꜥnḫ*   *n*   *nb*   *ꜥ.w.s*
         DATE make:PFV policeman PN₍ₐ₎ CORD   policeman PN₍ᵦ₎ oath   to   Lord l.p.h.
         "DATE, the policeman PN₍ₐ₎ and the policeman PN₍ᵦ₎ swore an oath by the Lord,
         l.p.h."   (O. Gardiner 137, rᵒ 1-3 = K*RI* VI, 251,2-3)

Ex. 30   *iḫ-wn=k*   *p3*   *wdꜥ*   *ḥnꜥ*   *ntk*   *rdi.t*   *ḫrr*   7
         OPT-open=2SG.M the   magazine   CORD   2SG.M   give:INF bundle?   7
         "Could you open the magazine and give 7 bundles?"
                             (O. Amarna 3, 1-3 = Pendlebury 1951:)

(3) The preposition *irm* "with" (*Wb*. I, 115,17-20) appears during the New Kingdom. It use becomes frequent in the 19th dynasty, when it quickly supersedes the preposition *ḥnꜥ* in the functional domain of COMITATIVE (Ex. 31-32). Moreover, it spreads to valency patterns expressing CO-PARTICIPANT (Ex. 33; compare with Ex. 27 and Ex. 43). As Winand (2011) has shown, during the Ramesside period *irm* competes more and more with *ḥnꜥ* in the function of NP-COORDINATION (Ex. 34), but does not replace it entirely.

Ex. 31   (…)   *mtw=i*   *ꜥḥꜥ*   *irm=k*
         (…)   CORD.MOD=1SG   stand:INF   COM=2SG.M
         "(I shall bring him back) and I shall side with you."
                            (P. Turin 1977, 3-4 = Bakir 1970: pl. 26)

Ex. 32   (…)   *n3y=f*   *iry.w*   *ꜥ3.w*   *nty*   *m*   *t3*   *ꜥ.t-n-sb3*   *irm=f*
         (…)   his   fellows   big   REL   LOC   the   school   COM=3SG.M
         "(and he outmatched) his older fellows who were at school with him"
                       (P. Chester Beatty II, rᵒ 5,1-2 = *LES* 32,12-13)

Ex. 33   *iw*   *iw=f*   *mdw*   *irm=f*
         SBRD FUT=3SG.M   speak:INF   CO_P=3SG.M
         "(…) when he will speak with him"   (P. Berlin P 10494, vᵒ 5 = *LRL* 24,7)

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64   See Winand 1992: 457-465 (§709-723), with previous literature.

65   For this construction in Earlier Egyptian, see e.g. Gardiner ³1957: 130 & 226 (§171.3 & §300, Obs.).

Ex. 34   *mtw=t*   *in*(.*t*)   *nꜣ*   *dꜥm*(.*w*)*nty*   *im=f*
         CORD.MOD=2SG.F   bring:INF   the   papyri   REL   in=3SG.M
         irm   *pꜣ*   *gsti*   *šri*
         CORD   the   scribal_palette   small
         "(Please go to the magazine of Nefery) and fetch the papyri which are therein as
         well as the small scribal palette"   (O. Petrie 62, 2-3 = *HO* 73.2)

(4) The preposition *m-di* (*Wb.* II, 176,14-177,13) is associated with several important grammatical functions in Late Egyptian[66], most of which are relevant for the COMITATIVE/INSTRUMENTAL semantic map. Synchronically, it expresses alienable or temporary POSSESSION[67] in several patterns[68] (predicative possession, see Ex. 35-37, and attributive[69] possession in later Late Egyptian; besides the often quoted, but dubious Ex. 38, see Ex. 39). It is also used in related constructions expressing more or less abstract COMITATIVE functions (Ex. 40-42 & 45). Furthermore, it can introduce CO-PARTICIPANT (Ex. 43; compare with Ex. 27 & 33) and SOURCE[70] (Ex. 44; see also Ex. 47 & 59) in various valency patterns. Finally, *m-di* is sometimes used for NP-COORDINATION (mostly when preceded by the particle *ḥr* with the meaning "as well as"[71], see Ex. 45):

Ex. 35   *ḥr*   *wn*   *m-di=k*   *šmsw.w*   *ḳnw*   *zp-2*
         and   EXIST   POSS=2SG.M   servants   numerous   twice
         "And you have very many servants"   (P. Anastasi V, 11,5 = *LEM* 61,12-13)

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66   On the problematic etymology of *m-di*, see Edel 1967: 74-75 and Depuydt 2010: 46-47. For the irritating confusion between *m-di*, *m-ꜥ* and *m-dr*(.*t*) at the graphemic level in Late Egyptian texts, see already Erman ²1933: 312 (§623, anm.) & 313 (§625). We decided not to take sides here in the debate concerning the much disputed issue of the diachronic relationship between the old compound preposition *m-ꜥ* and the preposition *m-di*: do we have (1) to postulate a direct relationship *m-ꜥ* > *m-di* between the two (as e.g. Neveu 1996: 26; this solution is not unproblematic from a phonological point of view, see e.g. Kammerzell 1998: 34-35; Peust 1999: 99-102; Depuydt 2010: 47), (2) to consider that *mdi* is a new simple preposition emerging in Middle Egyptian, or (3) to posit that *m-di* is a new compound based on the same principles as *m-ꜥ* (namely, the preposition *m* + AGENTIVE BODY PART)? Pending further investigation, we have taken the following practical stance: (1) given that the preposition *m-ꜥ* is able to express a wide range of functions such as AGENT, INSTRUMENT, SOURCE, CAUSE, POSSESSION, and COMITATIVE in Earlier Egyptian (Hannig 2003: 491-492; 2006: II, 973-978) — most of which are expressed by *m-di* in Late Egyptian —, and (2) knowing the (as for now intractable) graphemic interchangeability between the spellings of these prepositions in Late Egyptian for every single function, all the writings (and their related functions) have been dealt with under the heading of the preposition *m-di* in this paper.

67   The expression of RECIPIENT/BENEFICIARY with *m-di* after verbs like *ḫpr* "to become" (in Middle Egyptian, see examples with *m-ꜥ* such as *Shipwreck Sailor* 21-22) is semantically close to the expression of POSSESSION, as shown by examples such as O. Ashmolean 1945.37 + 1945.33 + O. Michaelides 90, v° 14 = K*RI* II, 383,1.

68   See e.g. Erman ²1933: 312-311 (§624); Théodoridès 1970; Černý & Groll ³1984: 392-403; Vernus 1985; Depuydt 2008.

69   See e.g. Borghouts 1980; Egedi 2010; Depuydt 2010.

70   See Erman ²1933: 311 (§622); Černý & Groll ³1984: 113-114. When it has the SOURCE function, the preposition is often written *m-ꜥ*, which could point to the survival of the ancient preposition *m-ꜥ* in this particular use; on this point, see the remark in *Wb.* II, 177,7-9.

71   Cf. Erman ²1933: 87 & 334-335 (§196 & §672), and Neveu 2001: 139-144, with previous literature. The coordinating strategy *ḥr m-di* NP does not surface before the end of the 20th dynasty in our documentation. Especially frequent in the texts from this period is the coordination of a second topic with *ḥr-m-di* in patterns like *ir* NP₁ (…), *ḥr-m-di* NP₂ (…) "as for NP₁, (…), and as for NP₂ (…)". The same construction is found for CLAUSAL COORDINATION, but is apparently an exploratory construction that one finds only in the letters written by Thutmose (*Late Ramesside Letters* corpus), see Neveu 2001: 143-144.

Ex. 36   *nn*   *wn*   *rmw.w*   *m-di=i*   *ḥnˁ{n}*   *smw.w*
         NEG   EXIST   fishes   POSS=1SG   CORD   vegetables
         "I have no fishes or vegetables"   (O. DeM 581, 9 = K*RI* III, 536,12-13)

Ex. 37   *yꜣ*   *bn*   *se*   *m-di=f*   *m*   *wˁ*   *ip.t*   *r*   *pꜣy=f*   *ḥtp-ntr*
         indeed   NEG   3SG   POSS=3SG.M ELAM   one   oipe   for   his   divine_offering
         "Indeed, he does not have a single *oipe* measure for his divine offering (today)"
                                    (P. Geneva D 191, vᵒ 5-6 = *LRL* 58,14-15)

Ex. 38   *ḏdḥ*   *sw,*   *m*   *dy*   *br*   *m-di=f*   *r*   *pꜣ*   *tꜣ*   *n*   *km.t*
         stop:IMP   him   PROH   let   boat   POSS=3SG.M   to   the   land   of   Egypt
         "Stop him! Do not put any boat at his disposal for the land of Egypt"
                                   (P. Moscow 120, 2,63-64 = *LES* 73,11-12)

Ex. 39   *(i)n*   *bn*   *iw*   *pꜣy=s*   *nb*   *gm(.t)*   *10*   *n*   *is.t*   *m-di=t*
         INT   NEG   FUT   its   lord   find:INF   10   of   crew   POSS=2SG.F
         "Won't its lord find 10 crews of yours (and kill them too)?"
                                   (P. Moscow 120, 2,82-83 = *LES* 75,14-15)

Ex. 40   *nfr.wy*   *wn*   *pꜣy(=i)*   *sn*   *m-di=k*
         how_good   be:SBJV   my   brother   COM=2SG.M
         "How good it is that my brother be next to/with you!"
                          (P. BM EA 10102, rᵒ 17 = Glanville 1928: pl. XXXV)

Ex. 41   [*iw*   *pꜣy=*]*f*   *sn*   *šri*   *m-di=f*   *mi-sḥr-n*   *šri*
         SBRD   his   brother   young   COM=3SG.M   as   child
         "And his younger brother was as a child to him"
                                  (P. d'Orbiney, 1,2 = *LES* 9,12-13)

Ex. 42   *nk=f*   *ˁnḫ(.t)*PN_(a)   *iw=s*   *m-di*   PN_(b)
         fuck:PST=3SG.M   lady   PN_(a)   SBRD=3SG.F   COM   PN_(b)
         "He fucked lady PN_(a) despite the fact that she lives with PN_(b)"
                              (P. Salt 124, rᵒ 2,2 = K*RI* IV, 410,15-16)

Ex. 43   *iw=f*   *ḥr*   *ḫpr*   *ḥr*   *mdw*   *m-di=s*   *m-dd*   *(...)*
         CORD.PST=3SG.M   on-   become:INF   on-   talk:INF   CO_P=3SG.F   QUOT   (…)
         "and he began to argue with her saying: '(…)'"   (P. d'Orbiney, 15,7 = *LES* 25,9)

Ex. 44   *(mi-ḳd)*   *hnw*   *sgnn*   *i.dbḥ=i*   *m-di=k*
         like   hin   ointment   ask:REL.PFV=1SG   SOUR=2SG.M
         "Like the *hin* of ointment that I asked of you"   (P. DeM 5, 6-7 = K*RI* VI, 266,5-6)

Ex. 45   *i.ḏd*   *nbw*   *nb*   *(…)*   *ḥr-m-di*   *rmt*   *nb*   *i.wn*   *m-di=k*
         say:IMP   gold   all   (…)   as_well_as   people   all   be:REL.PFV   COM=2SG.M
         "Tell (about) all the gold (that you tore down from the House of Gold of the
         King RN) as well as all the people who were with you"
                              (P. BM EA 10053, vᵒ 2,10 = K*RI* VI, 757,4)

The means of expressing functions associated with INSTRUMENT are especially numerous in Late Egyptian. Indeed, in addition to *m* (see above), the following two prepositions[72] are relevant for our semantic map:

(5) The compound preposition *m-ḏr(.t)*, lit. "in/from/by the hand of"[73] (*Wb.* V, 583,2-8), occupies an important space within the semantic domains of INSTRUMENT and related functions. Besides its compositional lexical meaning (Ex. 46), *m-ḏr.t* is indeed

72   For the preposition *m-ˁ*, see above under *m-di* (especially n. 66).

73   This preposition is sometimes written like the preposition *m-di*, but the two must be clearly distinguished based on diachronic phonological evidence (see e.g. Spiegelberg 1925; Erman ²1933: 328-329 (§663); Černý & Groll ³1984: 120-21; Colin 1998: 347-348).

able to introduce INSTRUMENT (Ex. 47), SOURCE (Ex. 48-49), and AGENT[74] (Ex. 50-51 — illustrating the semantic bridge between INSTRUMENT and AGENT — and Ex. 52 & 59). For each of these functions, one observes that the compound preposition did not yet reach an advanced stage of grammaticalization in Late Egyptian. Indeed, *m-ḏr.t* imposes clear selectional restrictions on the following noun phrase:[75] it is always a human, i.e. an agentive entity who actually has *hands* (lit. "from the hand of", "by the hand of"; see e.g. Ex. 52). Among its other functions, the preposition *m-ḏr.t* regularly expresses a special type of abstract LOCATION (close to other possessive expressions, being "in the hand of someone" with the meaning "being under the authority of"[76], see Ex. 53-54) and is used in several valency patterns (with animate arguments; see Ex. 55). To these meanings, one should perhaps add the CAUSE function (Ex. 56).[77]

Ex. 46 (…) *iw*   *tȝy=f* *ḥsk̠.t* *m* *ḏr.t=f*
        (…) SBRD   his   knife   in hand=3SG.M
        "(He went out …) with his knife in hand"

                                   (P. Chester Beatty I, rᵒ 9,8 = *LES* 49,14)

Ex. 47 (…) *m-ḏr.t* *pȝ* *nty* *nb*   *iy.t*   *dy* *m-di=k*
        (…) INS   the REL   QUANT come:INF here SOUR=2SG.M
        "(and write me how you are) by means of anyone who comes here from you!"

                                   (P. Bologna 1094, 5,7-8 = *LEM* 5,10)

Ex. 48 *i.ir=i*   *in(.t)*   *tȝy* *rmt* *m-ḏr.t* PN
        do:THMZ=1SG bring:INF this girl   SOUR   PN
        "It was from PN that I bought this girl"

                                   (P. Bankes I, rᵒ 7-8 = Demarée 2006: pl. 2)

Ex. 49 DATE *šsp*   *m-ḏr.t* *šmsw*   *n* *tȝty*
        DATE receive:PTCP.PASS SOURCE servant   of vizier
        "DATE, received from the servant of the vizier: LIST OF GOODS"

                                   (O. DeM 721, rᵒ 2 = Grandet 2000: 122-123)

Ex. 50 *iny.t*   *n=k*   *m-ḏr.t* PN : *t* *ꜥȝ* *1*
        bring:PTCP.PASS for=2SG.M AGENT   PN : loaf big 1
        "Brought to you by PN: one big loaf"

                                   (O. DeM 551, rᵒ 1-3 = Sauneron 1959: pl. I)

Ex. 51 *rdy.t*   *n=f*   *m-ḏr.t* PN : AMOUNT
        give.PTCP.PASS for=3SG.M AGENT   PN : AMOUNT
        "Given to him by PN: AMOUNT"   (O. DeM 592, 3-4 = K*RI* V, 593,4-5)

Ex. 52 *sw* *gmy*   *m*   *r3-ꜥ_wtn*   *m-ḏr.t* *nȝ* *itȝ.w*
        it   find:RES   in   activity_drill:INF AGENT   the thieves
        "It (i.e. a pyramid) has been found to be drilled by the thieves"

                                   (P. Abbott, rᵒ 2,16-17 = K*RI* VI, 471,2)

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74 According to Stauder (2007: 472): "[e]n néo-égyptien, le successeur fonctionnel de *m-ꜥ*, *m-ḏr.t* introduit encore la source d'une situation, jamais l'agent d'un procès détransitif. Ce n'est qu'en démotique, timidement, que (*n-*)*ḏr*(*t*) pourra occasionnellement introduire l'agent d'une construction détransitive." See also Winand 2006: 78 & 88 n. 85.

75 With his usual sharpness, Erman (²1933: 329 [§663]) noticed quite early on: "[m]an beachte, dass es sich in diesen Beispielen noch meistens um Gegenstände handelt, die man wirklich in der Hand halten kann, oder um Tätigkeiten, die man mit der Hand verrichtet."

76 Compare with the meaning of the preposition *r-ḫt*; cf. *Wb.* III, 340,12-16.

77 In the few examples where the REASON/CAUSE function is attested, the spellings rather point to a prepositional use of *m-ḏr* than *m-ḏr.t*. Regarding the causal meaning of the conjunction *m-ḏr* in Late Egyptian, see Collombert 2004: 21-22.

Ex. 53   *m   rdi.t   šn.tw*   *wᶜ   nty   m-ḏr.t=k*
          PROH CAUS   inquire:SBJV.PASS one REL POSS=2SG.M
          "Do not let anyone who is under your responsibility be summoned"
                                                    (P. Cairo CG 58055, 6 = K*RI* I, 325,1)

Ex. 54   (…)   *i.di=i*   *m-ḏr.t=tn   m   mḏꜣ.t*
          (…)   give:REL.PFV=1SG POSS=2PL   in   register
          "(and please do not bring the whole bunch of people) whom I put under your
          responsibility in the register"   (P. Anastasi V, 18,7-19,1 = *LEM* 66,6-7)

Ex. 55   *iw=n   šd=s*   *m-ḏr.t   šḥm.t   ḥnᶜ   pꜣy=s   šri*
          FUT=1PL   protect:INF=3SG.F   SOURCE Sekhmet CORD   her   child
          "We will protect her from Sekhmet and her son"
                                                    (P. BM EA 10083, 6-7 = *OAD* pl. I)

Ex. 56   *(…)   m-ḏr(.t)   nꜣ-n   msḥ.w*
          (…)   CAUSE   the   crocodiles
          "(as it was impossible for him to cross the river) because of the crocodiles"
                                                    (P. d'Orbiney, 8,1 = *LES* 17,5-6)

(6) For the expression of SOURCE functions, the use of the old preposition *ḏr* (*Wb.* V,
592,1-593,14) is limited to idioms or highly formal registers in Late Egyptian[78] where
it has the temporal SOURCE meaning "since".[79] In Late Egyptian, it is functionally
replaced by the compound preposition (*r-*)*šꜣᶜ*(*-m*)[80], which express both spatial
(Ex. 57) and temporal (Ex. 58) SOURCE,[81] mostly in expressions involving two limits
("from … to", "since … until").

Ex. 57   *(…)   ḏr   nḥnw=i   nfry.t-r   ḥkꜣ=i*
          (…)   since youth=1SG   until   rule=1SG
          "(…) since my youth until my rule"   (Nauri Decree, l. 27-28 = K*RI* I, 50,9)

Ex. 58   *(…)   (r-)šꜣᶜ(-m)   tp=s   r   ṯb.ty=s*
          (…)   SOURCE   head=3SG.F   to   feet=3SG.F
          "(…) from her head to her feet"   (P. Turin 1983, l. 16-17 = *OAD* pl. 18)

Ex. 59   *(…)   nꜣ   ḥ.wt   i.šd*   *m-di=i   r-šꜣᶜ-m   ḥsb.t 31   r*
          (…)   the   goods   take_away:PTCP:PASS SOUR=1SG   since   year 31   to
          rnp.t   3   (…)   m-ḏr.t   PN
          year   3   (…) AGENT   PN
          "(…) the goods taken away from me from year 31 to year 3 (…) by PN"
                                                    (P. Mallet I, 2-3 = K*RI* VI, 65,5)

3.1.3 The Late Egyptian preposition in the COMPANION/INSTRUMENT semantic space

Based on the semantic description of six polysemic Late Egyptian prepositions used
for expressing functions belonging to the COMPANION/INSTRUMENT semantic space
(§3.1.2), one can suggest the following FORM/FUNCTION pairing on the map of
Fig. 13b:

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78   See Erman [2]1933: 315 (§631).
79   The spatial meaning "from" is virtually unattested in Late Egyptian.
80   See e.g. Erman [2]1933: 325 (§656.1); Černý & Groll [3]1984: 123.
81   Regarding the use of this preposition as conjunction in the construction (*r*)-*šꜣᶜ-m-ḏr-sḏm=f*, see
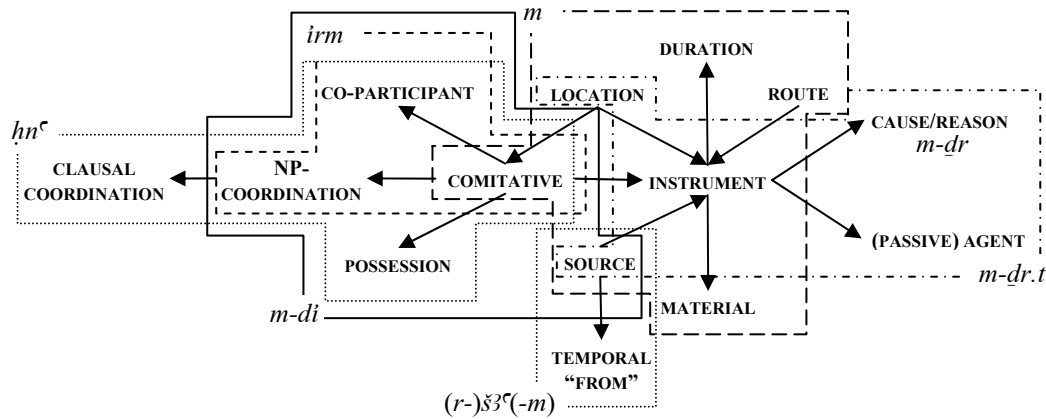   Collombert 2004.

Figure 14. The Late Egyptian prepositions of the COMPANION/INSTRUMENTAL domain

– – – – – – – – – The preposition *m* fully respects the contiguity requirement: it maps onto a connected region of the semantic space and expresses the spatial LOCATION, ROUTE and SOURCE functions, temporal DURATION, as well as MATERIAL and INSTRUMENT. The COMITATIVE use of this preposition is extremely rare (see n. 60) and should be examined with respect to the COMITATIVE uses of the prepositions *ḥnꜥ*, *irm* and *m-di*.

·············· – The preposition *ḥnꜥ* — inherited from Earlier Egyptian, like *m* — can still encode part or all of the functions directly associated with COMITATIVE in Late Egyptian: POSSESSION, CO-PARTICIPANT and CO-ORDINATION (especially lexical NPs).

– – – – – – – – – The preposition *irm* quickly takes over the COMITATIVE function of *ḥnꜥ* in Late Egyptian. Furthermore, it invades the related domain CO-PARTICIPANT and NP-COORDINATION during the Ramesside period.

———————— – The preposition *m-di* also mainly occupies the COMITATIVE side of the map, with function such as CO-PARTICIPANT and, most importantly, POSSESSION. Unlike the other prepositions, however, *m-di* violates the connectivity hypothesis: the SOURCE meaning is not directly connected to any other functions of *m-di*.

– · – · – · – · – · – The functions of the preposition *m-ḏr.t* are still intimately connected with its etymological meaning in Late Egyptian ("in/from/by the hands of", with dependents restricted to human animates); INSTRUMENT, SOURCE and AGENT are among the most frequent meanings.

·············· – The preposition (*r-*)*šꜥ*(-*m*) expresses both spatial and temporal SOURCE (superseding the ancient *ḏr*).

As a whole, Late Egyptian data fit apparently quite well the generalizations that have been put forward in the literature based on cross-linguistic evidence. Indeed, the only obvious infringement of the *connectivity hypothesis* occurs with the preposition *m-di*.

Is the map falsified? Do we have to postulate a direct link between functions that are not connected in the map (like e.g. SOURCE and POSSESSION)? The answer is probably *no*. Although complex, this issue is of considerable interest for the semantic map methodology.

First, in Late Egyptian, the wide range of functions that used to be expressed by *m-ꜥ* in Earlier Egyptian[82] ("in/from/with/by the forearm of"; POSSESSION, COMITATIVE,

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82 See e.g. *Wb.* I, 156,9-12 & II, 45,10-46,3; Gardiner [3]1957: 132 (§178); Malaise & Winand 1999: 164 (§248a).

SOURCE, INSTRUMENT, AGENT, CAUSE) is taken over mainly by two prepositions: *m-di* and *m-ḏr.t*.
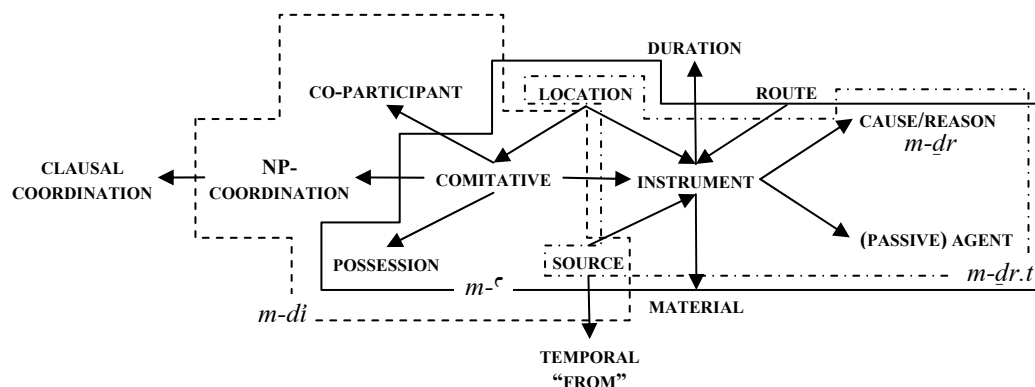

Figure 15. The distribution of the preposition *m-ꜥ*, *m-di* and *m-ḏr.t*
in Earlier Egyptian and Late Egyptian

Fig. 15 shows that the division of labor between *m-di* and *m-ḏr.t* is neat: *m-di* takes over the expression of COMITATIVE and POSSESSION, and develops the functions CO-PARTICIPANT and NP-COORDINATION following the directions predicted by the semantic map, while *m-ḏr.t* covers the INSTRUMENT, AGENT, LOCATION (and CAUSE?) functions of *m-ꜥ*. The main functional overlap between the two prepositions is SOURCE, which leads to a violation of the contiguity hypothesis in the case of *m-di*.

Now, two explanations are possible here, depending on the origin of the preposition *m-di*[83]:

(1) If *m-di* were a graphemic/phonetic development of *m-ꜥ*, then we are dealing with a classic case of gram replacement[84]: later meanings of *m-ꜥ/m-di* are loosely connected (SOURCE on the one hand, COMITATIVE and POSSESSION on the other), but they are both directly connected to a common earlier function (INSTRUMENT). The instrument function of *m-ꜥ* is indeed taken up by *m-ḏr.t* in Late Egyptian.

(2) If *m-di* is etymologically unrelated to *m-ꜥ*, then the following reasoning applies. The two compound prepositions *m-di* and *m-ḏr.t* share a common feature with the old compound *m-ꜥ*: they are built from two elements, namely the simple preposition *m* (see §3.1.2) and an agentive body part (forearm, hand, etc.). During the grammaticalization process, the meaning of these prepositions remains compositional for the most part, and the selectional restrictions imposed by the construction do not change significantly[85]. We hypothesize that this would be the source of connectivity infringements for compound prepositions. The meanings associated with compound prepositions specify and/or extend the functions of the simple prepositions, in combination with the lexical meaning of the body part, *even ones that are not connected on the semantic map*. In the present case, the functions of *m-di* are apparently based on the LOCATIVE/COMITATIVE/SOURCE meanings of *m*, but none of its functions are directly associated with INSTRUMENT (expressed by *m*, *m-ꜥ*, *m-ḏr.t*). Yet this instrumental meaning of *m* is the one that bridges the source meaning of *m-di* with its other

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83 Regarding the problematic origin of *m-di* and its diachronic relationship with *m-ꜥ*, see n. 65.

84 See §2.3.1 for a discussion of this issue.

85 See especially the remarks about *m-ḏr.t* in §3.1.2. The selectional restrictions bearing on *m-di* are more relaxed, evidently due to a more advanced stage of grammaticalization: starting in Middle Egyptian already, *m-di* spellings began to take over some functions (POSSESSION, COMITATIVE, etc.) of *m-ꜥ*.

functions. As a result, the preposition *m-di* spans over unconnected points of the map that can only be bridged by the meanings of the simple preposition.

In this section, we showed that semantic maps are highly convenient tools for describing an entire semantic domain. In any onomasiological approach to the lexicon, it allows linguists to:

> (1) structure semantic spaces in a principled way: the comparison of cross-linguistic patterns of polysemy is the basis for the inductive generalizations on which the maps are based;
> (2) match the linguistic forms with this network of functions and, thereby, to identify the overlapping polysemous patterns. These patterns represent a strong foundation for semantic analyses that aim to explain the system of oppositions between forms in a given semantic area.

In this respect, the present case study is but a step in the description of the COMPANION/INSTRUMENT area in Late Egyptian: the (diachronic, diatopic, diaphasic) factors and (semantic) motivations for the existence of various markers paired with a single function have not been even broached. These issues must remain for future research.

3.2 The allative preposition *r*: When typological approaches enrich Egyptological discussions and vice versa

Recent approaches[86] to the polyfunctionality of the preposition *r* do not differ strikingly with respect to the range of meanings they identify in context, most of which have already been noted in previous grammatical and lexicographical descriptions.[87] However, they differ with respect to the way they handle the organization (or structuring) of these contextual meanings. Three main lines of thought can be identified:[88]

> (1) The analysis in terms of a basic meaning[89] or notion is found in accounts[90] such as Stauder-Porchet (2009: 231): "relation sans contact – régime inanimé"; or Gracia Zamacona (2010: 23): "Basic notion: Facing (orientation mainly towards the 'right' and separation from a limit)".
> (2) A restricted polysemic account is favoured by Werning (current volume) who distinguishes between two basic spatial meanings: ATTACHED (static) and TO (dynamic). A third meaning, CLOSE_TO, is seen as an extension of the meaning ATTACHED.[91]

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86   An early in-depth description of the uses of the preposition *r* is found in Roeder 1904.

87   Such as Gardiner ³1957: 126-127 [§163] and *Wb.* II, 386,6-388,4.

88   These lines of thoughts can be combined. Both Stauder-Porchet (2009) and Gracia-Zamacona (2010), for instance, recognize spheres of extension of the basic meaning that are consonant with the polysemic network developed by Nyord (2010).

89   This approach is also found in reference grammars such as Malaise & Winand (1999: 161): "Le sens fondamental de cette préposition doit être de marquer une relation entre deux choses ('relativement à')"; Allen (²2010: 87): "The preposition *r* has the basic meaning 'with respect to.' Depending on how it is used, many different translations are required in English".

90   Vernus (current volume) stresses the importance of the abstract "notion d'adaptation à la configuration de son régime" in a monosemic approach to the meaning of *r*.

91   As Werning (current volume) states it, a crucial difference between his approach and the analysis of Nyord (2010) is that he identifies "both TO and ATTACHED as 'primary'/basic meanings of *r*,"

(3) Based on the tenets of Cognitive Linguistics, Nyord (2010: 39-43) argues in favor of radial polysemic networks for describing prepositions in general: "a preposition marks a category of relations between entities, and each sense of the preposition would be expected to have semantic connections to one or more of the other members of the category". Regarding the preposition *r*, the polysemic network is organized around a central "path schema",[92] which is "extended metaphorically or specified by path or end-point focus" (Nyord 2010: 42). Nyord identifies four main groups of usages derived from the path schema (i.e. the TO or TOWARDS meaning): the static usage (AT), the directional usage (AT, TO, CONCERNING, AGAINST), the distance usage (FROM, COMPARATIVE), and the temporal usage (AT, UNTIL, FUTURE STATUS, DESTI-NATION, PURPOSE).

The aim of this section is not to review the pros and cons of these accounts, but rather to show that the use of semantic maps can shed new light on the polyfunctionality of the preposition *r,* by describing it in a principled and non-aprioristic way.

In the following sections, we argue that the preposition *r* is probably best described as a highly polyfunctional ALLATIVE marker.[93] The argument is structured as follows. First (§3.2.1), we draw a "classical" semantic map of allativity based on previous cross-linguistic studies. Second (§3.2.2), we show how the various meanings of the preposition *r* in pre-Demotic Ancient Egyptian can be put on the map. In the last section (§3.2.3), we discuss meanings of the preposition *r* that are virtually absent from cross-linguistic descriptions of allative markers, and propose possible extensions to existing maps. This shows how Egyptian data can refine existing typological approaches.

3.2.1 The polyfunctionality of allative markers: Towards a "classical" semantic map

Rice and Kabata (2007) survey the polyfunctionality of 54 goal-marking morphemes (ALLATIVES) in 44 genetically and areally diverse languages.[94] Following the authors, we do not define allative restrictively as an inflected case label.[95] Rather, by ALLATIVE, we refer to a comparative concept[96] defined as:

> Any construction in a language, "be it adposition, case affix, body part term, coverb, or other class of item, which is associated semantically with the marking of spatial goals, direction or destination" (Rice & Kabata 2007: 452).

The main claim we make here is that the preposition *r* matches this cross-linguistic comparative concept of allative marker.[97] It is not that we think that the 'basic' meaning of *r* is GOAL, but rather that the rich polysemy of *r* is typical of allative markers.

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while Nyord (2010) identifies "at" or "attached to" as "a secondary meaning in dynamic contexts, an 'end-point focus' on a telic path."

92   Nyord (2010: 39): the preposition *r* "denot[es] basically dynamic directionality", i.e. "the preposition marks the landmark as the goal of the movement undertaken by the trajectory."

93   Much in the same vein, see Borghouts (2010: 113) who states: "(*i*)*r*= expresses goal".

94   The language sample is admittedly a bit idiosyncratic and not very well balanced in terms of genetic and geographical independence (see Schmidtke-Bode 2010: 127), but we think it is suffi-cient to suggest a falsifiable pilot "classical" semantic map.

95   For the relationship between case labels and semantic functions, see Narrog (2010a: 238, Table 1). Regarding the semantic system of adpositions more broadly, see Hagège (2010: 261-262, Table 5.1).

96   On comparative concepts, see Haspelmath 2010, with previous literature.

97   Compare with the centrality of the "path schema" in Nyord (2010).

Because of their methodology, which consists of a statistical analysis of the co-occurring patterns of polysemy for allative makers[98], Rice & Kabata (2007) do not draw a "classical" semantic map,[99] but they provide the data needed in order to do so. The semantic map of allativity in Fig. 16 has been drawn according to the following principles:

(1) The map is based on the lexical matrix provided by Rice & Kabata (2007: 500-503) for 54 allative markers.

(2) We used 24 out of the 33 possible meanings identified by Rice & Kabata (2007: 473-474, Tab. 6) for these allative markers. Nine meanings,[100] which occur in less than 10% of the investigated patterns of polyfunctionality and which are not directly relevant for the study of the Ancient Egyptian preposition *r*, have been discarded.

(3) The hierarchical mapping of the major relationships between the "cohort senses" of allatives suggested by Rice & Kabata (2007: Fig. 7, 11, 14, 19) has been taken into account, but has not been followed systematically when it leads to obvious infringements of the semantic map connectivity hypothesis.

(4) For specific areas of the map (especially the DATIVE/BENEFACTIVE/PURPOSIVE domains) we included data and suggestions from other semantic maps[101] (Haspelmath 1999 & 2003; Malchukov & Narrog 2009; Malchukov 2010; Malchukov et al. 2010; Narrog 2010a: 249-251 who suggested different directionalities; Daniel & Malchukov forthcoming), models of allative extensions (Heine 1990) and studies on specific polysemic patterns (Heine 1997; Schmidtke-Bode 2010; Zúñiga & Kittilä 2010: 1-28).

(5) In order to avoid too much "vacuity" in the map, we did not take into account rare[102] patterns of polyfunctionality (see §2.2.2[b]) that are likely to result from language specific phenomena of (poly-)grammaticalization, gram replacement and systemic re-organization.

The resulting semantic map has been drawn according to the principles advocated for in §2. Furthermore, we took the following decisions:

(1) In order to make the map as useful a heuristic tool as possible for the Egyptian data, we included as many meanings as possible (including functions that sometimes appear rather remote from the central ALLATIVE meaning). Consequently, the degree of granularity for the points on the map is rather low because of lack of space: each

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98   They identify the possible relationships between the 33 meanings related to primary allative makers based on statistical relationships of independence (meaning A and meaning B never occur together in the sample), coincidence (meaning A and meaning B co-occur frequently in the sample set), dependence (meaning B occurs only — or mostly — when meaning A also occurs). They finally propose a model "in which four distinct semantic/functional domains are initially available to a grammaticalizing allative" (Rice & Kabata 2007: 494): the spatio-temporal domain, the logico-textual domain, the mental domain and the social domain.

99   See however Rice & Kabata (2007: 490, Fig. 19), which is actually very close to a semantic map, even if not based on the principles presented in §2.

100 These meanings are: INSTRUMENT (9.3%), PASSIVE AGENT (8.3%), HUMAN SOURCES (8.3%), CAUSEE (6.5%), COMITATIVE (1.9%), PRAGMATIC (1.9%), ACCUSATIVE (1.9%), ERGATIVE (1.9%). For the links between these meanings, see the semantic map of COMITATIVE and INSTRUMENT in Fig. 13b.

101 One can notice that the map is compatible with Blansitt's (1988) functional contiguity hypothesis about shared overt marking for object≡dative≡allative≡locative, which predicts that, if a gram encodes, e.g., dative and locative, then it will also be used for allative.

102 A polyfunctional pattern has been considered to be rare when it occurs in less than 3 cases of the sample.

point is better understood as a semantic "domain".[103] The connections between domains graphically capture a continuum of "primitive and unique functions" (de Haan 2010). In the allative domain, for instance, several functions can be distinguished[104], such as (a) DIRECTION (a goal at the end of a path, but no movement; e.g. "toward the East"), (b) DESTINATION (a goal at the end of a path with movement; e.g. "she arrived at the airport"), (c) GOAL (e.g. "he reached for the gun), etc.[105]

(2) A practical issue with drawing classical semantic maps is that they turn into multi-dimensional maps when many languages are taken into account, due to the high number of co-existing patterns of polyfunctionality in the languages of the world (Haspelmath 2003: 218). As a result, a lot of crossing lines would appear when the map is reduced to two dimensions, making it hard to read. In order to overcome this issue, some points of the map have been duplicated (with exponent letters).

(3) Because of the lack of typological evidence, we put on the semantic map points for abstract functions such as PROPORTION/RATE, EQUIVALENCE, EXTENT and ADDITIVE, but we refrain from linking them to other functions. While the literature on spatial and temporal functions — as well as on major semantics roles — is abundant, we had little information at hand for these more specific meanings in order to ascertain their position on the map.

It falls beyond the scope of the present paper to justify every single decision we made regarding the proposed connections between the points of the map. A note on the COMPARATIVE function and its relation to allative markers might however be necessary, because the position of this function in relation to semantic maps has — to the best of our knowledge — never been addressed.

Among the five major types of comparative constructions that recur cross-linguistically,[106] Stassen (2011) identifies three kinds of "locational comparatives" that are "characterized by the fact that the standard NP is invariably constructed in a case form which also has locational/adverbial function": *From*-comparative (also known as separative or ablative comparatives); *To*-comparatives (also known as allative comparatives; the standard NP is constructed as the goal of a movement or as a benefactive); *At*-comparatives (also known as locative comparatives; the standard NP is encoded as a location). Based on these observations and considering the fact that the COMPARATIVE function is obviously not dependent on any other meaning in the lexical matrix of Rice & Kabata (2007: 500-503), we posit a direct link between the ALLATIVE[107] and COMPARATIVE functions.[108]

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103 The point/domain LOCATION IN TIME, for example, is meant for any simultaneous location (at 5 o'clock, in the morning, on Tuesday, this year, etc.). Haspelmath (1997b: 106-107) showed that one needs at least six different semantic points or functions in order to account for the distribution of "simultaneous adverbials" in the languages of the world.

104 See Newman (1996: 91) for the use of English *to* in valency patterns.

105 In our view, this is unproblematic as long as it is properly acknowledged: the existence of more than one gram for a given domain simply points to the need for further refinement of the map. In such a case, the map has played its heuristic role.

106 See Stassen (1985: 39-44) who posits the existence of the following types of comparative construction: SEPARATIVE, ALLATIVE, LOCATIVE, EXCEED, CONJOINED.

107 The *To*-comparative type is attested in genetically and areally unrelated languages (e.g. Siuslaw/ Siuslawan in Oregon; Maasai/Nilotic in Kenya and Tanzania).

108 See also the remarks in Rice 2004. Nyord's suggestion (2010: 41) that the *r* of comparison in Egyptian is an extension of the *r* of "distance" (cf. the gloss "at a distance from") based on the metaphor DIFFERENCE IS DISTANCE seems problematic in light of the typological evidence.

3.2.2 Mapping the preposition *r* in pre-Demotic Egyptian

Using the lexicographical tools and grammars available for Old, Middle and Late Egyptian, we have been able to recognize 16 out of the 33 cohort senses identified by Rice and Kabata (2007) for the allative markers in their language sample.[109]

Such a high degree of polyfunctionality is quite exceptional for allatives. Indeed, besides the highly polyfunctional allative case particle/postposition *ni* in Japanese (with 23 different functions; see Kabata 2000), few of the markers discussed in the typological literature develop such rich polysemies.[110]

ALLATIVE (direction, destination, goal, etc.)	He went *to* the store	Ex. 1, 8, 38; *Wb.* II, 386,A.I-II; A.V; B.a; Erman [2]1933: 300 (§610.2-3); Gardiner [3]1957: 125 (§163.1); Černý & Groll [3]1984: 96; Nyord 2010: Ex. 39-40; Werning current volume.
LOCATIVE (including addessive, etc.)	He stands *at* the door	*Wb.* II, 387,J & K; Erman [2]1933: 300 (§610.1); Gardiner [3]1957: 125 (§163.1); Černý & Groll [3]1984: 96; Nyord 2010: Ex. 41-42; Werning current volume.
ABLATIVE (source, separative, etc.)[111]	He distinguishes one *from* another	*Wb.* II, 387,C & H; Erman [2]1933: 301 (§610.7); Gardiner [3]1957: 126 (§163.8); Nyord 2010: Ex. 49-50.
TEMPORAL LOCATIVE	He is up *at* 6 AM	Erman [2]1933: 301 (§610.8); Gardiner [3]1957: 126 (§163.3); Černý & Groll [3]1984: 96; Nyord 2010: Ex. 53, 57.
TEMPORAL BOUNDARY	He worked from six *to* eight	*Wb.* II, 387,B.b; Erman [2]1933: 301 & 302 (§610.5 & §611); Gardiner [3]1957: 126 (§163.3); Ex. 59; Nyord 2010: Ex. 54-56.
TEMPORAL DURATION	He worked there for three months	*Wb.* II, 387,B.b & L; Gardiner [3]1957: 126 (§163.3); Nyord 2010: Ex. 58.
ADDRESSEE	He talked *to* him	*Wb.* II, 386,A.IV; Erman [2]1933: 302 (§610.12); Gardiner [3]1957: 125 (§163.2); Nyord 2010: Ex. 44.
MALEFACTIVE[112]	He fought *against* them	*Wb.* II, 387,D; Erman [2]1933: 301 (§610.6); Gardiner [3]1957: 126 (§163.9); Černý & Groll [3]1984: 96; Nyord 2010: Ex. 46-48.
CONCEPTUAL TARGET	He thought *about* him	See below and under §3.2.3.
PERCEPTUAL TARGET	He looked *at* the girl	*Wb.* II, 386,A.III; Erman [2]1933: 300 (§610.4); Nyord 2010: Ex. 43.
PURPOSE (object or event)[113]	This is for your birthday; he came *to* see her	Ex. 1, 5, 26, 37; *Wb.* II, 388,M; Gardiner [3]1957: 126 (§163.4); Černý & Groll [3]1984: 96; Nyord 2010: Ex. 62-64.
RATE/PROPORTION	He took the stairs 3 at a time	*Wb.* II, 388,O.b; Erman [2]1933: 301 (§610.8); Gardiner [3]1957: 126 (§163.5).

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109 See p. 504-510 for a complete list of the 33 cohort senses (with examples).

110 More than 90% of them have between 1 and 10 cohort senses.

111 According to Rice and Kabata (2007: 492), "[t]he seemingly counterintuitive source-oriented ALLATIVE senses typically manifest themselves only when a sufficient level of sense density has been reached" – "highly frequent senses are represented by allatives exhibiting a relatively low sense density across languages, while infrequent senses are associated with relatively high sense densities among their allatives."

112 For a recent discussion of benefactives vs. malefactives, see Zúñiga & Kittilä 2010.

113 On the polysemy of purpose clause markers with locative, allative, benefactive and goal markers, see Schmidtke-Bode 2010: 126.

EQUIVALENT[114]	He paid $30 *for* dinner; the score is 7 *to* 3	*Wb.* II, 387,C.
COMPARATIVE	He is bigger *than* his brother	Ex. 2; *Wb.* II, 387,G; Erman [2]1933: 301-302 (§610.10); Gardiner [3]1957: 126 (§163.7); Černý & Groll [3]1984: 97; Nyord 2010: Ex. 52.
RESULT (event)	It turned *to* yellow; he did it *so that* he could become famous	*Wb.* II, 388,II; Nyord 2010: Ex. 66.
EXTENT	He drank *too much*; he worked on it *to the degree* he could	*Wb.* II, 388,N; Erman [2]1933: 284 (§590).
FUTURE	He is *going to* take your donkey	*Wb.* A.V.b; Gardiner [3]1957: 126 (§163.10); Nyord 2010: Ex. 60.

Fig. 16 shows that the preposition *r* maps the functions that are cross-linguistically the most typical of allative markers.[115] It covers a large connected region of the map, with no infringement of the connectivity hypothesis.[116] In our view, this is perhaps the strongest possible argument in favor of describing this preposition as an allative marker.[117]

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114 For the FUTURE STATUS/CONDITION function specifically, see n. 57 & Ex. 6-7; and *Wb.* A.V.a; Erman [2]1933: 302 (§610.11); Černý & Groll [3]1984: 97; Nyord 2010: Ex. 59, 61.

115 For less frequent polysemic extensions, see above, n. 100.

116 The only region of the map that is not well covered by the preposition *r* is the one with functions usually linked to the DATIVE case (which are usually covered in Egyptian by another preposition, *n* "for/to"), namely the expression of BENEFICIARY and POSSESSION (as well as RECIPIENT/ ADDRESSEE which is rarely expressed by *r*).

117 Given the fact that almost all the functions examined here are already expressed by the preposition *r* in Old Egyptian (see especially Edel 1964: 390-391 [§760]), it is difficult to evaluate whether the evolution of this preposition in pre-Demotic Egyptian conforms to expected diachronic pathways. The situation is somewhat different for Later Egyptian, in which we observe a development of the preposition *r* as OBJECT MARKER of verbs of perception and cognition (see above §1.2 and Ex. 9).
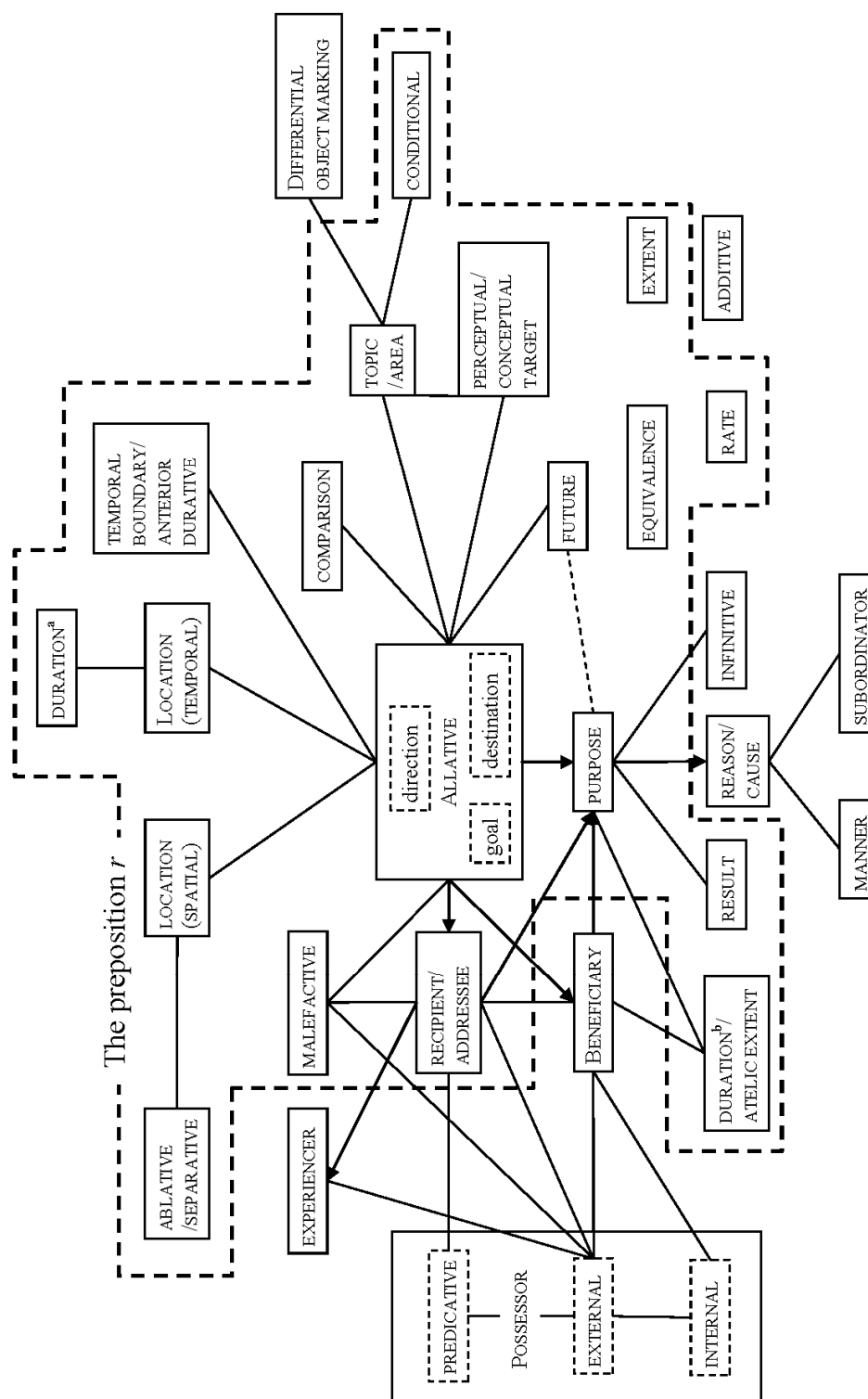
Figure 16. The Ancient Egyptian preposition *r* on the semantic map of allative markers

3.2.3 Extending the map of allative markers

Interestingly enough, the dense polysemy patterns of the Ancient Egyptian preposition *r* prove to be useful for expanding the map. In addition to the functions acknowledged in Rice and Kabata (2007), the preposition is indeed also used *inter alia* for introducing topics (Ex. 3) and conditional protases[118] (Ex. 4).

Since Haiman (1978), the semantic link between topic and conditional markers is typologically well established.[119] The question that remains is therefore: where do we put these points on the map?

At the semantic level, a topic can be defined[120] as the "referent that the proposition is about". In this respect, the TOPIC function is quite close to the CONCEPTUAL TARGET function[121] ("about, regarding"), which — although occurring in quite different syntactic environments[122] — also refers to the referent/theme a word or event is about (e.g. "to tell, think, teach about"; "memorandum concerning"; etc.).

We can therefore postulate a strong semantic link between ALLATIVE, CONCEPTUAL TARGET and TOPIC.[123] This hypothesis is confirmed by patterns of polyfunctionality in other languages, such as Latin with the allative preposition *ad* + ACC.:

Ex. 60   *ad Dolabellam   ut   scribis   ita   puto   faciendum*
ALL Dolabella:ACC.SG   as   write:PRS.2SG   so   think:PRS.1SG   do:GER.ACC.SG
"As for Dolabella, as you write, I think one should act this way"
(Cicero, *Att.*, 13,10,2; after Iemmolo 2011: 26)

Ex. 61   *ita   ad   Capuam   res   compositae*   (…)
so   ALL   Capua:ACC   thing:NOM.PL   settle:PTCP.PFV.PASS.NOM.PL   (…)
"This way things regarding Capua were settled (…)"
(Tit. Liv., *Ab Vrbe Condita* 26, 16,11; after Iemmolo 2011: 26)

Given the fact that CONCEPTUAL TARGET is a common function for allative markers,[124] but that the TOPIC function has not yet been recognized as such in typological large-scale studies of allative markers, it remains difficult to know whether the TOPIC meaning is dependent upon the CONCEPTUAL TARGET function or if it derives directly from the ALLATIVE spatial meaning[125] without a thorough excavation of typological

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118 See especially Satzinger 1976; Malaise 1985; Collier 2006 & 2009.

119 For the literature, see §1.1.

120 See e.g. Lambrecht 1994.

121 Another label found in the literature for this semantic role is AREA, which can refer to the topic/theme of verbs of communication, etc. See e.g. Luraghi 2003: 47-48 & 327; 2010, with previous literature.

122 See *Wb.* II, 387,E; Erman ²1933: 301 (§610.9); Nyord 2010: Ex. 45; Černý & Groll ³1984: 96-97. Gardiner (³1957: 126 [§163.6]) qualifies this use of the preposition as *r* "of *respect*" and he links it to the TOPIC use.

123 Regarding the link between TOPIC marker and DIFFERENTIAL OBJECT marker, see Iemmolo 2010 & 2011.

124 Rice and Kabata (2007: 472) observe that, in their languages sample, "the single most prevalent cohort sense of an allative is to mark purpose", while "[t]he second more prevalent were conceptual senses […] followed by recipient usages".

125 This is Iemmolo's hypothesis (2011: 26): "[t]he topic marking function was probably inferred from the directional meaning of the preposition, with a meaning like '(turning our attention) to/toward this'."

data. Pending further investigation, we have therefore opted for a vacuous semantic map in this area (see §2.2.2).

The main point to be made here is that the Ancient Egyptian written material is likely to open new avenues for research in this[126] and others areas, capitalizing on a fruitful dialog between cross-linguistic generalizations and rich empirical linguistic data.

4 Conclusions

The aim of this paper has been to explain and illustrate the usefulness of classical semantic maps for providing a principled way to deal with polyfunctionality in Ancient Egyptian. Unlike other methodological tools, semantic maps lead to falsifiable synchronic and diachronic generalizations about patterns of polyfunctionality, based on cross-linguistic comparison.

To an extent, describing Ancient Egyptian patterns of polyfunctionality in terms of classical semantic maps tells us about the place of a given Ancient Egyptian construction in cross-linguistic typologies. For example, the Late Egyptian preposition *m* is associated with a coherent chunk of the semantic map of COMITATIVE-INSTRUMENTAL: while many languages have a COMITATIVE-INSTRUMENTAL syncretism, Late Egyptian belongs to the class of languages in which the instrumental marker does generally not encode meanings associated with comitativity. Such insights are potentially important for the typological project of building cross-linguistic hierarchies, and for the descriptive goal of matching language-specific categories with appropriate cross-linguistic comparative concepts.

Furthermore, the Ancient Egyptian data allow us to extend previous semantic maps, such as the maps of allativity and comitativity that have been proposed in typological literature. Such extensions, e.g., the connection between ALLATIVE, CONCEPTUAL TARGET, and TOPIC MARKER (and thereby CONDITIONAL MARKER), raise new problems to be tested and evaluated cross-linguistically. The later phases of Egyptian (Demotic and Coptic) may furnish crucial data for testing the hypotheses suggested by typologists regarding the relationship between TOPIC markers and DIFFERENTIAL OBJECT markers, on the one hand, and their relations with ALLATIVE markers.

In our view, classical semantic maps highlight the necessary *va et vient* between descriptive linguistics and linguistic typology: on the one hand, semantic maps provide a principled way of examining patterns of polyfunctionality observed in a given language; on the other hand, descriptive linguistics supply the data necessary to evaluate the predictions made by semantic maps.

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126 Other meanings of the preposition *r* could also be studied following the same methodology. Consider, for instance, the so-called "MODEL" function ("according to the writing of PN; according to the law, etc."; see e.g. Gracia Zamacona 2010: 22). This function did not find its way into the study of Rice & Kabata (2007), even though other polysemic allative makers that encode this function are not difficult to find, see e.g. Latin *ad* + ACC., e.g. *hanc ad legem* "according to this law" (Cicero, *de Or.*, 3,190).

Glossing abbreviations

ACC	accusative	INS	instrumental	POSS	possessive
ALL	allative	IMP	imperative	PROH	prohibitive
ANT	anterior	INT	interrogative	PROT	protasis marker
ART	article		particle	PST	past
CAUS	causative	IPFV	imperfective	QUANT	quantifier
COM	comitative	LOC	locative	QUOT	quotative
CORD	coordinating	M	masculine	REL	relative / relative
	particle	MAT	material		form
CO_P	co-participant	MCM	main clause marker	RES	resultative
DEM	demonstrative	MOD	modal	S(G)	singular
DUR	duration (time)	NEG	negation	SBJV	subjunctive
ELAM	extraposed lexical	NOM	nominative	SBRD	subordinating
	argument marker	OPT	optative		particle
EXIST	existential	PASS	passive	SOUR	source
F	feminine	PFV	perfective	STAT	stative
FUT	future	P(L)	plural	THMZ	thematization
GER	gerundive	PRS	PRESENT	TOPZ	topicalizer
INF	infinitive	PTCP	participle		

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