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A frame-based approach to the source-goal asymmetry

Synchronic and diachronic evidence
from Ancient Greek

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This paper investigates the asymmetrical behavior of Sources and Goals of motion in Homeric and Classical Greek within the frame semantics paradigm. In particular, based on a corpus of 26 works covering four text types, it is shown that (a) regardless of their semantic class, motion verbs display preference for Goal PATHS compared to Source ones; (b) the frame that a verb belongs to affects the type of PATH chosen only to a certain degree that does not change the Source-Goal imbalance; (c) semantically incongruent motion verb – PATH combinations are naturally less frequent than congruent combinations, but within the category of incongruent combinations the tokens are distributed in a way that reflects the prevalence of Goals; (d) the number of markers for the encoding of Goal is higher than that of Source; and (e) Source and Goal markers interact with Place ones in an asymmetrical way: Goal markers come to encode Place and, similarly, Place markers come to express Goal. Conversely, the interaction of markers exhibiting Source-Place polysemy is unidirectional, in the sense that none of these markers was originally used to encode Place alone. Theoretical implications of the study are discussed and directions for future research are suggested.

Keywords: Source-Goal asymmetry, Ancient Greek, frame semantics, motion verbs, language of space

1. Introduction

Language-of-space literature has shown that Goals and Sources of motion behave asymmetrically in the linguistic encoding of motion events (see, among others, Ikegami 1987; Landau & Zukowski 2003; Stefanowitsch & Rohde 2004; Lakusta & Landau 2005; Papafragou 2010). In most studies, this asymmetry has a clear

directionality, in that a clear preference for the endpoint of motion is reported. For example, Goals are often mentioned as being the unmarked member of the contrasting pair Source-Goal (Ikegami 1987; Fillmore 1997; Taylor 1995:128) or as having more prominent syntactic status than Sources (i.e., being arguments rather than adjuncts; Nam 2004) or as being more frequent in discourse (Stefanowitsch & Rohde 2004; Lakusta & Landau 2005; Georgakopoulos & Sioupi 2015). This preference for the Goal has been attributed to a perceptual bias favoring the endpoint over the starting point (Regier & Zheng 2007), a bias which is more profound in events involving a Goal-directed motion by an agent (Lakusta & Landau 2012; Lakusta & Carey 2014). On the basis of such reported asymmetries in perception and cognition, Mandler and Pagán Cánovas (2014) listed Goal but not Source as a motion primitive that forms the building block for the Source-Medial-Goal image schema. Although broadly speaking the perceptual/cognitive bias seems to be reflected in language, a growing body of research has started to challenge the linguistic prevalence of Goal through data showing that it is not attested across languages. For example, Gehrke (2008) – contra Nam (2004) – argues that the Goal bias is only cognitive and is not necessarily expressed in semantic or syntactic asymmetries between Goals and Sources (but see Landau & Zukowski 2003; Lakusta & Landau 2005). Similarly, Kopecka (2012) uses the ‘put and take’ stimuli (Bowerman, Gullberg, Majid, & Narasimhan 2004) to elicit descriptions of ‘putting’ (i.e., Goal-profiled) and ‘taking’ (i.e., Source-profiled) events in Polish, showing that the linguistic encoding of the two PATH types is equally frequent (see also Ishibashi 2010; Petersen 2012).

Given such conflicting evidence, it is an open empirical question whether and under what conditions a particular language prefers Goals over other elements of the Source-Medial-Goal schema. This article delves into this question by presenting data on Ancient Greek and, more particularly, it seeks to determine whether Ancient Greek exhibits balance or imbalance in the representation of Source and Goal in motion events. The data used in this investigation derive from a corpus covering two different stages of Greek, namely Homeric and Classical. The study adopts a cognitive semantics approach, which sustains that linguistic meaning is a manifestation of conceptual structure. An issue that ranks high in the cognitive semantics agenda is the way we associate words with frames, which are cognitive structures that determine our understanding of linguistic expressions. The basic assumption is that lexical units evoke a frame and profile some aspect(s) of this frame (Fillmore 1985:224; Boas 2001; Geeraerts & Cuyckens 2007:4; Fillmore & Baker 2009). This can be illustrated for different motion verbs in examples (1)–(4):

- (1) *Jo moved past Dad into the hall*
(<https://framenet2.icsi.berkeley.edu/fnReports/data/frame/Motion.xml>)
- (2) *We departed from New York on Friday*
(<https://framenet2.icsi.berkeley.edu/fnReports/data/frameIndex.xml?frame=Departing>)
- (3) *As the train crossed the bridge, the entire span collapsed, sending eleven railcars and one locomotive into the creek below* (<http://goo.gl/oOPftx>)
- (4) *Some students arrived at the school on Sunday*
(<https://framenet2.icsi.berkeley.edu/fnReports/data/frameIndex.xml?frame=Arriving>)

In (1) the lexical unit *move* evokes the MOTION frame. This general MOTION frame comprises three components: a starting point (Source), a trajectory (Medial), and an ending point (Goal), each of which can be profiled through appropriate elaborations. Elaborations such as the verbs *depart* (2), *cross* (3), *arrive* (4) profile the Source, the Medial and the Goal, respectively (Fillmore, Wooters, & Baker 2001:16; Johnson et al. 2001:76). These elaborations belong to more specific frames and stand in a relation of inheritance to the superordinate MOTION frame. For example, *arrive* evokes the ARRIVING frame, which elaborates the parent frame MOTION (Fillmore & Petruck 2003). In the present study, elaborations such as *arrive*, the semantics of which includes a definite ending point, will be termed Goal-profiled and elaborations such as *depart*, the semantics of which includes a definite starting point, will be termed Source-profiled.

The present paper is structured around two axes. The first examines the frequency distribution of Source and Goal PATHS for a number of motion verbs, whereas the second deals with the differences in the inventories of the two PATH types. In particular, the first axis focuses on verbs denoting various types of locomotion, more specifically those that express direction, manner or are neutral with respect to directionality, aiming to investigate whether (a)symmetry depends on the lexical semantics of the verb. The approach taken here resembles that of Stefanowitsch and Rohde (2004), who argue that the frame semantics of a motion verb influences the distribution of PATH expressions in English (see also Ishibashi 2010 for Japanese). For example, they report that Goal-profiled verbs (e.g., *climb* in their classification) prefer Goal Prepositional Phrases (henceforth, PP), whereas Source-profiled verbs (e.g., *escape* in their classification) show a preference for Source PPs. In contrast to Stefanowitsch and Rohde's however, the current study relies on independent criteria to justify the classification of each verb (relying on intuitions for identifying the profiling of the verbs would not be possible anyway).

In addition, taking as a starting point the semantic role, be it Source or Goal, I focus on the inter-group (i.e., those referring to members of different classes) and intra-group (i.e., those referring to members of the same class) distribution differences of the verbs in their combination with either a Goal or a Source PATH. Regarding the inter-group comparison, it is expected that, other things being equal, semantic incongruence and congruence between the verb and the PATH expression accompanying the verb will constitute the two opposite poles of the frequency continuum,¹ with manner and neutral verbs occupying the space in-between. No difference is expected in the verbs belonging to the same category.

Assuming that an equal basis of comparison is provided when Source and Goal are both explicitly expressed in a <verb + PATH> combination (where PATH is not realized as prefix), I put forward and test a 'Goal-Source incongruence hypothesis', which suggests that the combination of Source-profiled verbs with a Goal PATH should be more frequent than the combination of Goal-profiled verbs with a Source PATH. This hypothesis is in line with the characterization of Goals as being more prominent syntactically than Sources. It is more likely that a semantic role will be assigned by Goal-profiled rather than by Source-profiled verbs. Theoretically, this makes it possible for the latter to co-occur with both Goal and Source locations.

As far as the second axis of the study is concerned, I start with the idea that the prevalence of Goal over Source could be reflected in the number of means employed to express these concepts (Ikegami 1987; Kopecka & Narasimhan 2012). Under the Goal-over-Source-predominance hypothesis, it is expected that the Goal expressions will exceed in number the Source ones, suggesting that more detailed distinctions about Goal events are possible. In a recent typological study, Kabata (2013), examining the grammaticalization patterns of the markers encoding Source and Goal, found that in her sample of languages Goal markers exhibit Source-type senses (e.g., the Japanese Goal marker *ni* can express the meaning 'human source', which in English is encoded by a Source marker, as in the example *I got it from my sister*; Kabata 2013:86), but the opposite hardly occurs. Some further evidence in favor of this hypothesis comes from Svorou's (1994) cross-linguistic study of spatial grammatical morphemes. She found that the total number of markers with Goal uses was higher than the number of the markers with Source uses (153 Goal vs. 68 Source markers in a sample of 26 genetically unrelated languages; see also Landau & Zukowski 2003:130–131; Papafragou 2010:1087; Kopecka 2012; Kabata 2013; Georgakopoulos & Karatsareas 2017; Iacobini, Corona, De Pasquale, & Buoniconto 2017:104–107). Focusing on

1. Instance of a semantic congruent relation: Goal-profiled verb combined with a Goal PATH; instance of a semantic incongruent relation: Goal-profiled verb combined with a Source PATH.

the motion verbs analyzed in the first part of the paper, I also report on the specific markers employed to encode Source and Goal. This dimension of the study adds a diachronic parameter to the investigation, as it raises the questions of how Source and Goal markers interact with Place markers and of whether this relation is symmetrical or asymmetrical with respect to the directionality of change.

Overall, the present study contributes to the spatial semantics literature by addressing the issue of the Source-Goal asymmetry from both a synchronic (to a greater extent) and a diachronic (to a lesser extent) point of view through the case of Ancient Greek. Previous studies have assessed the role of Source and Goal in spatial representation mostly synchronically (cf. several of the papers in Luraghi et al. 2017), but it seems reasonable that the simultaneous analysis of synchronic and diachronic aspects of their relation would sharpen our understanding of their asymmetrical behavior. Moreover, the paper provides insights into the role of verbal semantics in the distribution of *PATH* elements and extends previous research by investigating incongruent <verb + *PATH*> semantic combinations. Lastly, taking independently each semantic role as a starting point, it seeks to provide answers to the question of whether the boundaries of the different verb classes are better defined when the verb occurs with an expression bearing the Goal – as opposed to the Source – semantic role.

The paper is structured as follows. The various means of expressing the Source and the Goal in Homeric and Classical Greek are outlined in section 2. In section 3, the method used to extract and process the data is discussed and information about the verbs used in this study is provided. Sections 4–5 represent the main focus of the paper. Section 4 consists of two parts. The first part justifies the classification of the various motion verbs as direction, manner, and neutral and reports the results from the different corpus analyses. The second part deals with the distribution differences of the motion verbs in their combination with either a Goal or a Source *PATH*. Section 5 focuses on the different types of *PATH* expressions co-occurring with the verbs analyzed in section 4 and shows how Source and Goal markers interact with Place markers. Section 6 summarizes the results, discusses the theoretical and empirical implications of the study, while also identifying directions for further work.

2. Expression of Source and Goal in Ancient Greek

As already mentioned, Source and Goal are two of the main structural elements of the *PATH* schema, the third being the Medial, which connects the starting and the ending point (Johnson 1987: 28; Lakoff 1987: 275; Slobin 1997: 439). While

this schema is attested cross-linguistically, languages differ with respect to the devices they use to package the information relating to Path: some languages predominately encode it in modifiers outside the verb root in satellites² (Satellite-framed languages), while in others the Path is encoded in the verb root (Verb-framed languages; see Talmy 2000). Ancient Greek has been listed as a Satellite-framed language, since the Path typically appears in satellites (Talmy 2000, 2007; Skopeteas 2002, 2008a, 2008b; Nikitina 2013; Nikitina & Maslov 2013). In the present study, I adopt a broader definition of the term ‘satellite’. Following Filipović (2007), Beavers, Levin, & Tham (2010), Goschler & Stefanowitsch (2013), Nikitina (2013), and Verkerk (2014), in addition to verbal prefixes and adverbs, I treat also case markers and prepositions as satellites (see also Nikitina & Maslov 2013; Zanchi 2017; cf. Iacobini et al. 2017 for a different classification based on Fortis & Vittrant 2011).

In Homeric and Classical Greek, Source and Goal are expressed by various linguistic means: through a preposition-case combination, a morphological case marker (genitive for Source and accusative for Goal; mostly limited to Homeric Greek), a prefix, an adverb, or a local suffix attached to nominals or adverbs.³ By way of illustrating the different possibilities, consider examples (5)–(7).⁴

- (5) *autík’ anaíksante ho mèn Thréikēnde bebékei,*
 at.once dart:PART.AOR.NOM.DU DEM.NOM PTC Thrace:ALL walk:PLPF.3SG
hē d’ ára Kúpron híkane philommeidēs
 DEM.NOM PTC PTC Cyprus:ACC.SG.F go:IMPF.3SG laughter.loving:NOM
Aphrodítē, es Páphon
 Aphrodite:NOM ALL Paphos:ACC.SG.F
 ‘And Ares departed **to Thrace**, but she, the laughter-loving Aphrodite, went **to Cyprus, to Paphos**’
 (Homer, *Odyssey* 8.361–363)
- (6) *bē dē kat’ Oulúmipoio karénōn*
 go:AOR.3SG PTC DIR.INFR Olympus:GEN.SG.M peak:GEN.PL.N
aíksasa
 dart:PART.PRS.NOM.SG.F
 ‘Then she went darting down **from the heights of Olympus**’
 (Homer, *Odyssey* 1.102)

2. Talmy (2000:102) defines a satellite as the “grammatical category of any constituent other than a noun phrase or a PP that is in a sister relation to the verb root”.

3. See Luraghi 2003 and Bortone 2010 for a thorough study on the meanings of prepositions and cases in Homeric and Classical Greek; also Georgakopoulos 2011 for a study on the Goal preposition *eis* in the diachrony of Greek.

4. See the Appendix for a list of the abbreviations used in the glosses.

- (7) *ô paidî ho patèr*
 VOC little.child:VOC.PL.N.DIM ART.NOM.SG.M father:NOM.SG.M
apolipôn apérkhetai humàs erémous es
 leave:PART.AOR.NOM.SG.M depart:PRS.3SG 2PL.ACC lonely:ACC.PL ALL
tòn ouranón láthrai
 ART.ACC.SG.M sky:ACC.SG.M secretly
 'Dear little girls, your father is deserting you secretly to **go to heaven**'
 (Aristophanes, *Peace* 112–113)

In (5), the Goal is encoded by three different means: (a) the enclitic *-de* attached to an already inflected form, namely the noun in the accusative *Thréikēn*; (b) the plain accusative form of a toponym (*Kúpron*); (c) the preposition *es* co-occurring with a NP in the accusative (*es Páphon*). In (6), the Source is expressed through the preposition *katá* with the genitive. As shown in (7), different components of PATH are highlighted through different means: the prefix *ap-* encodes Source and the PP <*es* + accusative> encodes Goal. Complex clauses profiling both PATH components are also available. This is illustrated in (8)–(9), which contain a Source (*ek díphroio*, *eks okhéōn*) as well as a Goal (*parà trokhòn*, *hamâze*).

- (8) *autòs d' ek díphroio parà trokhòn*
 DEM.NOM PTC ELAT chariot:GEN.SG.M PROX/LAT wheel:ACC.SG.M
eksekulístē
 roll.out:PASS.AOR.3SG
 'and he himself was hurled **from out the chariot beside the wheel**'
 (Homer, *Iliad* 23.394)
- (9) *autíka d' eks okhéōn sùn teúkhesin álto*
 at.once PTC ELAT carriage:GEN.PL.N with armour:DAT.PL.N leap:AOR.M/P.3SG
hamâze
 ground:ALL
 'And forthwith he leapt in his armour **from his chariot to the ground**'
 (Homer, *Iliad* 3.29)

Occasionally, more detailed information is provided regarding Goal. Consider (10), in which the final location of the moving entity, namely Pontus, is further specified through the PP introduced by *mékhrī*.

- (10) *pléein es tòn Pónton mékhri Ístrou*
 sail:INF.PRS ALL ART.ACC.SG.M Pontus:ACC.SG.M TERM Ister:GEN.SG.M
potamoú
 river:GEN.SG.M
 'to sail into the Pontus **as far as the Ister river**'
 (Herodotus, 4.89.1)

In some cases, both Source and Goal are described, but each PATH element combines with different verbs. This is exemplified in (11), where the manner verb *pléō* takes an ablative spatial expression and the Goal-profiled verb *aphiknéomai* an allative complement.

- (11) *pléōn* *ek tôn Kēgkhreiōn aphikneítai es*
sail:PART.PRS.NOM.SG.M ELAT ART.GEN.PL Cenchreae:GEN.PL arrive:PRS.3SG ALL
Khíon
Chios:ACC.SG.F
'(Astyochus) set sail from Cenchreae and arrived at Chios' (Thucydides, 8.23.1)

3. Methodology: Data and corpus

The data for the current study are drawn from a corpus constructed by the author and cover two different stages of Greek, Homeric and Classical, spanning from approximately 8th c. BC to 4th c. BC. They have been extracted from the Perseus digital library (<http://www.perseus.tufts.edu/hopper/>; last access March 2016). The corpus comprises 26 works by five authors, covers four text types (Epic poetry, Tragedy, History, and Comedy) to maximize representativeness (albeit with the usual shortcomings applying to a study of an ancient language corpus), and contains approximately 725,000 words. Table 1 presents details on the authors, the type of texts used, and their size.

Table 1. The corpus constructed for the current study

Diachronic stage	Date	Author	Work	Subcorpus	Words
A	8th BC	Homer	Iliad, Odyssey	Epic poetry	198,977
B	5th BC	Euripides	Andromache, Bacchae, Electra, Hecuba, Heracles, Hippolytus, Iphigenia in Aulis, Iphigenia in Tauris, Medea, Orestes, Phoenissae	Tragedy	96,047
	5th BC	Herodotus	The Histories	History	184,947
	5th BC	Thucydides	History	History	150,173
	5th–4th BC	Aristophanes	Acharnians, Birds, Clouds, Ecclesiazusae, Frogs, Knights, Lysistrata, Peace, Plutus, Thesmophoriazusae, Wasps	Comedy	94,658

In addition to corpus data, dictionaries and grammars were used as supplementary sources mainly in order to extract examples that describe static scenes not involving translocation (which naturally did not appear in our constructed corpus; see section 5).

The data extracted to investigate the hypothesis regarding the role of verbal semantics in the distribution of *PATH* expressions and the Goal-Source incongruence hypothesis were initially processed by the concordancing software package WordSmith 6.0 (Scott 2011). This enabled us to generate concordances providing lists of the search word in context. The data were hand-coded for the following parameters: (a) the component of the *PATH* schema explicitly expressed: (i) Source, (ii) Goal, (iii) both Source and Goal, or (iv) other (e.g., Medial, zero complement, non-literal complement, etc.); and (b) the lexical semantics of the motion verb (neutral verb *vs.* manner verb *vs.* verb of inherent directionality; the last category was further divided into two subtypes: Goal-profiled verbs *vs.* Source-profiled verbs). Table 2 presents the verbs under investigation.

Table 2. Motion verbs per text and diachronic stage used in the corpus analyses⁵

Verb	Stage	Author (or text)	Total <i>N</i> tokens	<i>N</i> valid tokens for the analysis
eîmi, érkhomai 'go, come'	A ⁶	Iliad	520	150
baínō 'walk, go'	A	Odyssey	173	136
pléō 'navigate'	B	Herodotus; Thucydides	309	150
aphíkomai/ ap(h)iknéomai 'reach'	B	Herodotus; Thucydides	708	150
hikánō 'reach'	A	Iliad	126	117
pheúgō 'flee, take flight, escape'	A & B	all authors	478	460 Homer: 127; History: 150; Comedy: 48; Tragedy: 135)
apérkhomai 'go away, depart'	A & B	all authors	151	140

5. The verbs *trékhō* 'run' and *pétomai* 'fly' were also included in the initial list of verbs, but due to their low frequency in the corpus ($N_{trékhō} = 46$; $N_{pétomai} = 82$), they were not further investigated (but see footnote 9 for their frequency distribution).

6. The fact that for the majority of the verbs the analysis was restricted to only one diachronic stage does not mean that these verbs are not attested in the other stages as well. The aim of this study is not to trace the diachronic development of the verbs, but rather to report on their frequency distribution at a certain stage.

The numbers reported under the label ‘Total *N* of tokens’ are the result of the automatic extraction of the data. After the extraction of the data, the first step was to manually check each token and remove any invalid hits (e.g., errors due to automatic extraction of the material, such as irrelevant homonyms of the verbs under examination, and instances of tmesis in Homer,⁷ namely the separation of preverb and verbal stem). In a second step, wherever the number of the overall extractions was over 200 tokens, I performed a random sorting with MS Excel 2016 by means of the random number generator formula “=rand()”. The number of tokens for the analysis of all verbs was set to *N*=150 (see the right edge column in Table 2). However, in some cases this number was not reached due to the lack of available data (e.g., in *apérkhomai*). In *phéugō*, the number of valid tokens used in the analysis is higher, because the data come from the full constructed corpus. For this particular verb, I analyzed the overall retrieved data for Homer, Aristophanes and Euripides and 150 randomly selected tokens from Herodotus and Thucydides following the procedure described above. Once the material collection, data extraction, and classification were completed, the distribution and the frequencies of variants of the valid instances of the verbs were analyzed. Section 4 reports the results of these analyses.

4. Corpus analysis

As mentioned in the Introduction, the conflicting findings on whether Sources and Goals are asymmetrically represented in the linguistic encoding of events highlight the need for more work specifically in regard to the conditions under which languages behave asymmetrically. In this section, the Source-Goal asymmetry hypothesis is tested by examining the frequency distribution of some Ancient Greek motion verbs.

4.1 Corpus analysis I: Neutral verbs with respect to directionality

4.1.1 Classification

I take as a point of departure the verbs *eîmi* and *érkhomai* ‘go, come’, which are considered neutral with respect to directionality. The two verbs, which stand in

7. For example, *hupék* (away.from) *kakótēta* (badness:ACC.SG.f) *phúgoimen* (escape: AOR.OPT.1PL) ‘we might escape out of our evil plight’ (Homer, *Odyssey* 9.489) counted as tmesis, because (a) *hupék* is separated from the verb; (b) there is an attested compound verb *hupekphéugō*; (c) *hupék* cannot govern the accusative *kakótēta* (for the criteria determining instances of tmesis see Haug 2011; also Hajnal 2004).

suppletive relation, can describe-among other functions-motion away from the speaker or the addressee (12) and toward the speaker or the addressee (13), thus manifesting the deictic usages one finds in the English verbs *go* and *come*.

- (12) *allà sù mèn tód' áethlon ékhōn*
 but 2SG.NOM PTC DEM.ACC prize:ACC.SG.N have:PART.PRS.NOM.SG
koílas epì nêas érkheu
 hollow:ACC.PL. SUPR ship:ACC.SG.F go:PRS.IMPT.2SG
 'but take this prize and **go your way** to the hollow ships'
 (Homer, *Iliad* 23.892–893)
- (13) *Aías dè prôtos prokaléssato makrà*
 Aias: NOM PTC first call.forth:AOR.MID.3SG. long:ACC.PL.N
bibásthōn. daimónie skhedòn elthé.
 stride:PART.PRS.NOM.SG.M marvelous:VOC.SG close come:AOR.IMPT.2SG
 'And Aias came on with long strides, and was first to challenge him: Good sir,
 come here'
 (Homer, *Iliad* 13. 809–810)

According to Létoublon (1985), specific forms of these verbs exhibit different behavior regarding deixis. *Eimi* is centrifugal, *élthon*-which is also in suppletive relation to the other two forms – is centripetal and *érkhomai* is neutral with respect to directionality (cf. Napoli 2006:164–172). Table 3 presents the distribution of the different forms in our sample from *Iliad*.

Table 3. Distribution of the various forms of *eimi* and *érkhomai* in *Iliad*

Opposition in deixis	N (%)
Centrifugal	50 (33.3%)
Centripetal	57 (38%)
Neutral (<i>érkhomai</i>)	20 (13.3%)
Uncategorized ⁸	23 (15.33%)
Total	150 (100%)

4.1.2 Hypothesis and analysis

Given that this sample is balanced across centrifugal and centripetal forms and that it also contains the neutral *érkhomai*, any effect caused by directionality alone should be minimized. The null hypothesis is that the distribution of Source PATHS

8. The uncategorized forms refer to forms that could belong both to *eimi* and *érkhomai*, such as the participle *iōn*.

equals the distribution of Goal PATHS. If this were the case, examples like (14) and (15) would occur equally often in the corpus.

- (14) *héndeka d' émata thumòn etérpeto hoísi*
 eleven PTC day:ACC.PL.N spirit:ACC.SG.M delight:IMPF.M/P.3SG REL.DAT.PL
phíloisin elthôn ek Lémmoio
 friend:DAT.PL.M come:PART.AOR.NOM.SG.M ELAT Lemnos:GEN
 'For eleven days had he joy amid his friends, having **come from Lemnos**'
 (Homer, *Iliad* 21.44–45)
- (15) *elthóntes d' es dôma Diôs*
 come:PART.AOR.NOM.PL.M PTC ALL house:ACC.SG.N Zeus:GEN
nephelēgerétao ksestêis aithoúsēisin enízanon
 cloud.gatherer:GEN.SG.M shaped:DAT.PL.F collonade:DAT.PL.F sit.down:IMPF.3SG
 'And **having come to the house** of Zeus they sate them down within the pol-
 ished colonnades'
 (Homer, *Iliad* 20.10–11)

However, under the view that Goal is more important than Source, the research hypothesis is formulated as follows:

H₁: When the neutral verbs *eími* and *érkhomai* are used, Goal PATHS prevail in terms of frequency over Source PATHS.

The distribution of Source and Goal elements in the data is presented in Table 4.

Table 4. Frequencies for expressions with the verbs *eími* and *érkhomai*

Verb	Types of verb complement							
	Goal		Source		Source & Goal		Other (Medial, zero, etc.)	
	Literal	Non-literal	Literal	Non-literal	Literal	Non-literal	Literal	Non-literal
Centripetal forms	25 (16.7%)	4 (2.85%)	6 (4.7%)	1 (0.7%)	0	0	21 (14%)	0
Centrifugal forms	18 (12%)	4 (2.85%)	3 (2%)	0	0	0	25 (16.7%)	0
érkhomai	12 (8%)	0	1 (0.7%)	0	0	1 (0.7%)	6 (4%)	0
Uncategorized forms	12 (8%)	0	1 (0.7%)	0	1 (0.7%)	0	9 (6%)	0
Total	67 (44.7%)	8 (5.7%)	11 (7.3%)	1 (0.7%)	1 (0.7%)	1 (0.7%)	61 (40%)	0 (0%)

These results demonstrate, for one, that explicit expression of Goal is more frequent than that of Source. Goal PATHS represent 44.7% of all tokens, whereas Source PATHS about 7.3%. The score is even higher if we consider both the literal and the non-literal uses of the verbs. Second, encodings of both Source and Goal do occur, but are rare (cf. Iacobini et al. 2017:102 for a similar observation). Finally, the categories I collapsed into a single group (i.e., type of expression: ‘Other’), which predominantly include instances of no overt directional complement (see 16–17), make up the second largest group of the uses of the neutral verbs (example 17 is additionally an instance of a non-literal usage of the verb).

- (16) *bán* *rh’ ímen* *hós te léonte* *dúō*
 go/walk:AOR.3PL PTC go:PRS.INF like PTC lion:NOM.DU.M two
 ‘They **went their way** like two lions’ (Homer, *Iliad* 10.297)
- (17) *ei mē nūks* *elthoûsa* *diakrinēei*
 till PTCL night:NOM.SG.F come:PART.AOR.NOM.SG.F separate:FUT.3SG
ménos *andrôn*
 fury:ACC.SG.N man:GEN.PL.M
 ‘until night at its **coming** shall part the fury of warriors’ (Homer, *Iliad* 2.387)

4.2 Corpus analysis II: Manner verbs

4.2.1 Classification

Proceeding now to the second cluster of verbs, I chose two verbs encoding manner of motion in order to minimize the possible impact of the verb’s inherent directionality on the choice of the spatial complement (cf. section 4.3). The first verb is *pléō* ‘navigate’, which describes the motion of an entity which uses a particular type of transport, i.e., a ship. The nuance of directionality is possible only when an explicit directional complement (preposition, directional suffix or accusative of direction) is present (see Horrocks & Stavrou 2007: 613; also Levin 1993: 268 for similar manner verbs in English). This is illustrated in (18).

- (18) *hoi* *Athēnaíoi* *épleusan* *authēmeròn es*
 ART.NOM.PL.M Athenians:NOM.PL sail:AOR.3PL the.same.day ALL
Krommuôna
 Crommyon:ACC.SG
 ‘The Athenians **sailed** the same day **to Crommyon**’ (Thucydides 4.45.1)

Conversely, when there is no explicit Goal phrase, the directed motion reading is ruled out, as in (19).

- (19) *kai hai nêes katà tákhos épleon*
 and ART.NOM.PL.F ship:NOM.SG.F DIR.INFR speed:ACC.SG.N SAIL:IMPF.3PL
 ‘While the ships **hastened** on their voyage’ (Thucydides 4.8.4)

The second verb of this category is *baínō* (‘walk’, ‘go’). The semantics of this verb is more complicated and difficult to define (see Georgakopoulos et al. (submitted) for a thorough analysis; cf. Napoli 2006:164–166). Its etymology suggests that the manner component is prevalent (Chantraine 1968:156–158). This is evident in examples such as (20), where the figure moves on foot, thus the scene includes the (undirected) displacement of an entity in a particular manner.

- (20) *autàr épeita ouranōi estéríkse kárē kai epì*
 PTC thereafter sky:DAT.SG.M set:AOR.3SG head:ACC.SG.F and SUPR
kthoni baínei·
 earth:DAT.SG.F walk:PRS.3SG
 ‘yet thereafter she set her head in heaven, while **her feet tread** on earth’
 (Homer, *Iliad* 4.443–444)

There are further examples in Homer in which a direction of motion is implied even in the absence of an overt directional complement. Consider (21).

- (21) *oi emutheómēn, hote Ílion eisanébainon Argeíoi,*
 3SG.DAT speak:1SG.IMPRF.M/P when Ilios:ACC embark:3PL.IMPRF Argives:NOM
metà dé sfin ébē polúmētis
 with PTC 3PL.DAT go:AOR.3SG of.many.councils:NOM.SG.M
Odusseús.
 Odysseus:NOM.SG.M
 ‘I told him, when the Argives embarked for Ilios and with them **went** Odysseus
 of many wiles.’ (Homer, *Odyssey* 2.172–73)

In (21), the meaning of *baínō* can be paraphrased simply as ‘go’. Odysseus does not go on foot (*baínō* makes no reference to Odysseus’ way of movement); rather he follows the Argives who sailed for Troy. Although this description favors its classification as a neutral verb, in our categorization *baínō* is listed as a manner verb. Crucially, this decision does not affect our analysis, because the assumptions for both neutral and manner verbs are the same.

4.2.2 Hypothesis and analysis

Although verbal semantics does not pre-determine the type of spatial expression that will occur with these manner verbs, we expect that the Goal bias will be strong enough to affect the distribution of Sources and Goals. Thus, similarly to the first phase of the analysis, the research hypothesis is formulated as follows:

H₂: Due to the Goal bias, verbs that encode manner of motion will occur more frequently with Goal PATHS rather than Source PATHS.

More specifically, it is expected that examples like (22) will appear more often in the corpus than examples like (23).

(22) *bê pròs dôma Diòs*
 walk:AOR.3SG PROX house:ACC.SG.N Zeus:GEN
 'he went **to the house** of Zeus' (Homer, *Iliad* 5.398)

(23) *bê dè kat' Idaíon oréon*
 walk:AOR.3SG PTC DIR.INFR Ida:GEN.PL mountain:GEN.PL.N
 'But went down **from the hills** of Ida' (Homer, *Iliad* 15.237)

The frequencies of the expressions accompanying these verbs are presented in Table 5.

Table 5. Frequency distribution of the expressions occurring with *baínō* and *pléō*

	Goal	Source	Source + Goal	Other (Medial, zero, non-literal, etc.)	Total
M ₁ : baínō	50 (36.8%)	6 (4.4%)	1 (0.7%)	79 (58.1%)	136 (100%)
M ₂ : pléō	70 (46.7%)	13 (8.7%)	2 (1.3%)	65 (43.3%)	150 (100%)

The results show once again a strong preference for Goal PATHS.⁹ Similar to the frequencies reported for the neutral verbs, mentions of both Sources and Goals in adnominal items are rare, but still attested. Conversely, the data that fall into the 'Other' category appear to be dominant in terms of frequency. This category includes diverse types of data, such as combinations of the verbs with Medial PATHS (24 and 25] and instances of the inchoative construction of *baínō* (26), but no metaphorical uses of the two verbs (they are not attested in the sample analyzed).

9. The verb *trékhō* 'run' ($N_{trékhō} = 46$), the third manner verb I picked, shows a similar tendency (6 Goal PATHS, Zero Source PATHS, 1 Source-Goal PATH, 32 Zero complements, and 7 metaphorical uses). In *pétomai* 'fly' ($N_{pétomai} = 82$), Goals prevail over Sources once again ($N_{Goals} = 18$ vs. $N_{Sources} = 6$). The 'Other' category consisting of metaphorical uses and instances in which no PATH information is mentioned is highly frequent ($N_{other} = 56$). Since the total number of attestations for both verbs as well as the distribution of the various PATH types is very low to be of any significance, I do not include them in the main body of the analysis.

- (24) *grēūs* *dè dièk megároio* *bebékei*
 old.woman:NOM.SG.F PTC MDL chamber:GEN.SG.N walk:PLPF.3SG
 ‘and the old woman went forth **through the chamber**.’
 (Homer, *Odyssey* 18.185–186)
- (25) *éplei* *dià toû* *pelágous*
 sail:IMPF.3SG MDL ART.GEN.SG.N sea:GEN.SG.N
 ‘He sailed **across the open sea**’
 (Thucydides 3.33.1)
- (26) *bè* *d’ iénai pròs dôma,*
 go:3SG.AOR PTC go:INF PROX house:ACC.SG.N
 ‘but **went his way** to the house’
 (Homer, *Odyssey* 2.297)

In the inchoative construction, *baínō* is followed by the present infinitive of another motion verb (here *iénai*; see also Yates 2014). What is relevant for the purposes of this paper is the fact that the construction as a whole favors the presence of a Goal complement. In fact, out of the 40 attestations of the construction in *Odyssey*, in 30 of them, the second motion verb is followed by a Goal expression. This makes the dominance of Goal expressions in *baínō* even greater.

4.3 Corpus analysis III: Directional verbs

4.3.1 Classification

Let us now focus on verbs of inherently directed motion, more particularly *aphíkomai* ‘reach’, *hékō* ‘arrive’, *pheúgō* ‘flee, take flight, escape’ and *apérkhomai* ‘go away, depart’. I consider the first two as elaborations of the ARRIVING frame (hence, they are called Goal-profiled), whereas the last two of the DEPARTING frame (hence, they are named Source-profiled). Both frames further elaborate the general MOTION frame, similarly to the English examples discussed in the Introduction.

In the ARRIVING frame, the Goal is one of the core Frame Elements, which means that the Goal is an argument of the verb (Atkins, Fillmore, & Johnson 2003). Additionally, it means that the ending point is profiled, even in instances where either some other or no other place is explicitly mentioned in the sentence. In (27) with the motion verb *aphíkomai*, despite the use of the Source preposition *ek* which brings to the foreground the starting point of the described motion, the Goal of motion (Egypt) is required by the predicate in the first place (and is also recoverable from the preceding context).

- (27) *hōs ára oíkhesthai tòn Aithíopa eks*
 when PTC go:PRS.M/P.INF ART.ACC.SG.M Egyptian:ACC.SG.M ELAT
Aigúptou aútis tòn tuphlòn árkhēin ek
 Egypt:GEN.SG.F again ART.ACC.SG.M blind.man:ACC.SG.M rule:PRS.INF ELAT
tòn heléōn apikómenon
 ART.GEN.PL.N marsh:GEN.PL.N arrive:PART.AOR.MID.ACC.SG.M
 ‘When the Ethiopian left Egypt, the blind man (it is said) was king once more,
returning the from the marshes (or the blind man who **arrived from the**
marshes to govern)’ (Herodotus, 2.140.1)

In the same way, in the DEPARTING frame, the Source constitutes one of the core Frame Elements, which again means that the Source is an argument of the verb. Further, it means that the point of departure is profiled, even in the case that some other place is explicitly mentioned in the sentence or even in the absence of any directional phrase. The former case is illustrated in (28) in which, despite the presence of a Goal spatial expression, the existence of a Source is still strongly evoked by the predicate. The figure (*toúton*) moves away from a (non explicitly expressed but contextually known) place towards another place (*Suriēn*).

- (28) *toúton pheúgonta tote es Suriēn*
 DEM.ACC.SG.M depart:PART.PRS.ACC.SG.M then ALL Syria:ACC.SG.F
 ‘then, when he (i.e., the Ethiopian) **departed to Syria**’ (Herodotus, 2.152.1)

When verbs belonging to this frame are not accompanied by any spatial expression, then again these constructions favor the meaning ‘leave’ or ‘depart’ from a certain point of origin, e.g. (29), where Artemis leaves the battlefield without this place being mentioned in the sentence.

- (29) *hòs hē dakruóessa phúgen, lípe d’ autóthi*
 so ART.NOM.SG.F weeping:NOM.SG.F flee:AOR.3SG leave:AOR.3SG PTC there
tóksa
 arrow:ACC.PL.N
 ‘even so **fled** Artemis weeping, and left her bow and arrows where they lay’
 (Homer, *Iliad* 21.496)

To wrap up, I classify a motion verb as inherently directional, if (a) it profiles a definite starting or ending point; (b) the place profiled is a departure or a goal, even in the case that some other place is explicitly mentioned in the sentence; and (c) the focused place is a departure or a goal, even in the absence of any explicit spatial expression.

A caveat is due at this point for the verb *pheúgō*. There are few contexts, especially in Homer, in which its semantic value additionally includes manner information, in particular information about the speed of motion. Consider (30),

where the meaning ‘fast pedestrian movement away from a location’ of the figure is expressed.

- (30) *pēi pheúgeis metà nōta balōn*
 whither flee:PRS.3SG among back:ACC.PL.N put:PART.AOR.NOM.SG.M
kakòs hòs en homíloi;
 bad:NOM.SG.M like INESS crowd:DAT.SG.M
 ‘whither do you **flee** with your back turned, like a coward in the throng’
 (Homer, *Iliad* 8.94)

That being said, *pheúgō* shares properties of both English verbs *escape* and *flee*, as reflected in its glosses used so far in the text. It could then be characterized as an intermediate verb (Wälchli 2006; cf. the ‘hybrid patterns’ in Pourcel & Kopecka 2006; but see Levin 1993:263 for the categorization of *escape* and *flee* as verbs of inherently directed motion), which encodes manner but with a preferred direction (cf. Özçaliskan & Slobin 2000). Note that the behavior of *pheúgō* deviates from that of other prototypical manner verbs in that it does not co-occur with the genuine Goal prefixes *eis-* and *pros-* (there are no prefixed motion verbs *eis-pheúgō*, *pros-pheúgō*).¹⁰ On the contrary, it can be found with semantically congruent prefixes (i.e., *ek*, *apò* as in *ek-pheúgō*, *apo-pheúgō*). In this respect, *pheúgō* clusters with *leípō*, another Source-oriented verb (the forms **eis-leípō*, **pros-leípō*¹¹ are not attested; cf. the attested forms *ek-leípō* ‘leave out’, which is post-Homeric, and *apo-leípō* ‘leave, quit’).

A second caveat should be mentioned regarding the selection of *apérkhomai*. *Apérkhomai* consists of the Source preverb *apó* and the motion verb *érkhomai*. This means that it is not strictly speaking a Source-profiled verb, since the Source information comes from the preverb. Nevertheless, it was included in the sample, because the verb as a whole denotes the motion of a figure away from a place. What is important for our purposes is that the Source information is already present as a directional component in this <preverb + verb> combination.

10. Compare, for example, the <Goal prefix + verb> combinatorial possibilities of the following manner verbs: *prospétomai* ‘fly to or towards’; *eispétomai* ‘fly into’; *eispedáo* ‘leap in’; *prospedáo* ‘leap upon’; *eistrékhō* ‘run in’; *prostrékhō* ‘run to or towards’; *eispléo* ‘sail into’; *prospléo* ‘sail towards’; *prosnéo* ‘swim towards’.

11. This verb is scarcely attested in Classical Greek. In fact, I found only two examples, one in Aristotle and one in Theophrastus, with the meanings ‘leave on’ and ‘be lacking’, which carry little or no spatial meaning.

4.3.2 Hypotheses and analysis

As already stated, Source- and Goal-profiled verbs can co-occur with both core and non-core Frame Elements. However, it is more likely for a core Element to be explicitly expressed in a sentence than it is for a non-core Element. This is one of the reasons why we expect that Goal-profiled verbs will preferably occur with Goal PATHS and Source-profiled verbs with Source PATHS (cf. Stefanowitsch & Rohde 2004 for English; Ishibashi 2010 for Japanese). Examples (31) and (32) illustrate these patterns. In (31), the Goal-profiled verb *aphiknéomai* occurs with the Goal PP *es Phókaiā n*; in (32), the Source-profiled verb *pheúgō* is accompanied by the Source expression *ek tēs Helládos*.

- (31) *apikómenoī* *dē hoūtoi* *es Phókaiān*
 arrive:PART.AOR.NOM.PL.M PTC DEM.NOM.PL.M to Phocaea:ACC.SG.F
 ‘These, after coming to Phocaea...’ (Herodotus, 1.152.3)
- (32) *hōs Xérxēs* *pheúgōn* *ek tēs* *Helládos*
 when Xerxes:NOM flee:PART.PRS.NOM.SG.M ELAT ART.GEN.SG.F Hellas:GEN.SG.F
 ‘When Xerxes fled from Hellas’ (Herodotus, 9.82.1)

The research hypothesis is then formulated as follows:

- H₃: The specific frame a motion verb belongs to has an effect on the choice of the PATH type. Goal-profiled verbs prefer Goal PATHS and Source-profiled verbs prefer Source PATHS.

As also shown above, semantic congruence between the verb and the PATH element is not exceptionless; rather, instances of semantic incongruity are also possible. We find <Goal-profiled verb + Source PATH> combinations, as in (27) above, where *aphikomai* combines with the elative *ek*, as well as <Source-profiled verb + Goal PATH> combinations, as in (28) above, where *pheúgō* combines with the allative *es*.

Along the lines of the Goal-over-Source-predominance hypothesis, we may further hypothesize that incongruent combinations will favor the expression of the Goal. More specifically, it is expected that:

- H₄: The combination of Source-profiled verbs (V_{SOURCE}) with a Goal PATH (PATH_{GOAL}) will be more frequent than the combination of Goal-profiled verbs (V_{GOAL}) with a Source PATH (PATH_{SOURCE}): V_{SOURCE}, PATH_{GOAL} > V_{GOAL}, PATH_{SOURCE}.

Table 6a summarizes the results for the four directional verbs.

To start with, concerning the ‘Other’ category, two points are of note: first, there is a striking difference between Source- and Goal-profiled verbs in that in

Table 6a. Frequencies for expressions occurring with the directional verbs

	Goal	Source	Source + Goal	Other (Medial, zero, non-literal, etc.)	Total
G ₁ : aphíkomai/ ap(h)iknéomai	91 (60.7%)	7 (4.7%)	4 (2.66%)	48 (32%)	150 (100%)
G ₂ : hikánō	97 (82.9%)	1 (0.85%)	2 (1.7%)	17 (14.52%)	117 (100%)
S ₁ : pheúgō	59 (12.8%)	37 (8%)	7 (1.5%)	357 (77.6%)	460 (100%)
S ₂ :apérkhomai	28 (20%)	13 (9.28%)	2 (1.4%)	97 (69.3%)	140 (100%)

the former this category is significantly more frequent than in the latter. This is mainly due to the fact that *pheúgō* and *apérkhomai* are more prone to leave the complement implicit than are *hikánō* and *aphíkomai*. Overt coding of PATH is less prevalent in the former pair of verbs than in the latter. A second point of note concerns the inclusion in this category of the transitive uses of *pheúgō* (N=108), e.g. (33), in which it takes the accusative and means – in the majority of the cases – ‘avoid someone’, ‘escape from an unpleasant situation’.

- (33) *mété tis* *oûn Tróōn* *thánaton* *phúgoi*
NEG INDEF.NOM.SG PTC Trojan:GEN.PL death:ACC.SG.M leave:AOR.OPT.3SG
‘no man of the Trojans might **escape death**’ (Homer, *Iliad* 16.98)

Regarding the results that are directly relevant to the assumptions above, these partly confirm the hypothesis that Goal verbs attract Goal PATHS and Source verbs attract Source PATHS. For Goal-profiled verbs the hypothesis turns out to be completely valid, but for Source-profiled verbs the picture is not as straightforward, since Goal complements still prevail. This finding contradicts Stefanowitsch and Rohde’s (2004)¹² and Ishibashi’s (2010) results, which have reported a Source

12. Stefanowitsch and Rohde (2004) do not report on the frequencies of the non-literal uses of the verbs analyzed or on the number of examples where there is no overt directional complement. Table 6b shows the frequencies of expressions occurring with the directional verbs of our sample, if we exclude these types of data as well.

Table 6b. Frequencies for PATH elements (excluding Medial ones) occurring with the directional verbs

	Goal	Source	Source + Goal	Total
G ₁ : aphíkomai/ ap(h)iknéomai	91 (89.2%)	7 (6.9%)	4 (3.9%)	102 (100%)
G ₂ : hikánō	97 (97%)	1 (1%)	2 (2%)	100 (100%)
S ₁ : pheúgō	59 (57.3%)	37 (35.9%)	7 (6.8%)	103 (100%)
S ₂ :apérkhomai	28 (65.1%)	13 (30.23%)	2 (4.65%)	43 (100%)

PATH preference in Source-profiled verbs. However, it seems that the semantics of the Source-profiled verbs influences the type of PATH chosen, because the use of such verbs results in a large decrease of Goal PATHS (60.7% and 82.9% in G_1 and G_2 respectively vs. only 12.8% and 20% in S_1 and S_2 respectively) and simultaneously in a small increase of Source PATHS (4.7% and 0.85% in G_1 and G_2 respectively vs. 8% and 9.28% in S_1 and S_2 respectively; see also the discussion in section 4.4). In other words, the frame that a verb belongs to does affect the type of PATH chosen, despite the fact that the data from the Ancient Greek corpus indicate a stronger Goal bias overall.

Furthermore, the investigation of the ‘Goal-Source incongruence hypothesis’ reveals that the combination of a Source-profiled verb with Goal PATHS is more frequent than the combination of a Goal-profiled verb with Source PATHS ($S_1 + \text{PATH}_{\text{GOAL}}$: 12.8% ($N=59$); $S_2 + \text{PATH}_{\text{GOAL}}$: 20% ($N=28$); $G_1 + \text{PATH}_{\text{SOURCE}}$: 4.7% ($N=7$); $G_2 + \text{PATH}_{\text{SOURCE}}$: 0.85% ($N=1$); see also Figure 1). This finding accords with the idea that the Goal is more important than the Source. The Pearson’s chi-square test showed a significant association between the type of verb (Source vs. Goal) and use of an incongruent PATH element: $G_1 + \text{PATH}_{\text{SOURCE}} - S_1 + \text{PATH}_{\text{GOAL}}$: $\chi^2(1)=7.8$, $p < .01$; $G_1 + \text{PATH}_{\text{SOURCE}} - S_2 + \text{PATH}_{\text{GOAL}}$: $\chi^2(1)=16.04$, $p < .01$.¹³

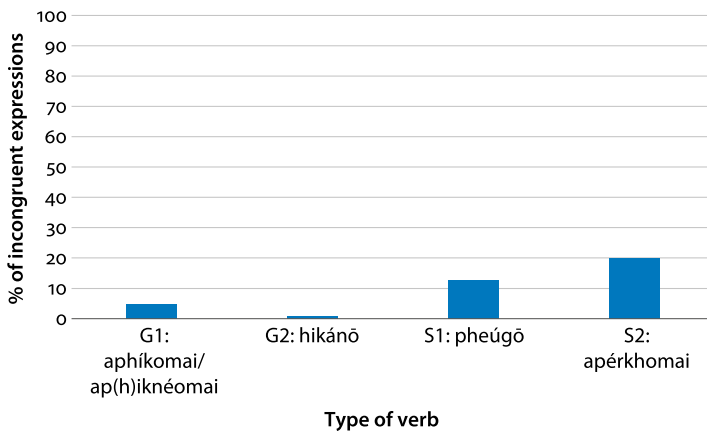


Figure 1. Directional verbs in occurrence with incongruent PATHS

13. Since in hikánō with an incongruent PATH the minimum expected values were less than 5, I performed Fisher’s exact test (FET) to compare the differences between G_2 - S_1 and G_2 - S_2 . FET tests yield significant results for both ($p < .01$).

4.4 The Ancient Greek motion events frequency continuum

Thus far, the starting point of the analysis were the different verbs belonging to three distinct classes, and my focus was on the distribution of Sources and Goals. In what follows, the point of departure is the locative role, be it a Source or a Goal, and the focus is on the inter-group (i.e., members of different classes: Source-profiled *vs.* manner/neutral *vs.* Goal-profiled) and intra-group (i.e., members of the same class) distribution differences of the verbs in their combination with either a Goal or a Source *PATH*. Following the discussion above, it is expected that verbs belonging to the same class will cluster together and that, other things being equal, semantic incongruence between the verb and the *PATH* will be less preferred, semantic congruence will be the most preferred combination, with neutral and manner verbs being in the middle in both cases. These hypotheses are illustrated in Table 7.

Table 7. Motion-events-frequency continuum hypothesis

Semantic role of the locative argument	Verbs
Goal	Source-profiled (S) < neutral/ manner (N/M) < Goal profiled (G)
Source	Goal-profiled (G) < neutral/ manner (N/M) < Source profiled (S)

The hypotheses are partly confirmed, as shown in Tables 8a–8b and Figure 2.

Table 8a. Ancient Greek motion-events-frequency continuum based on the constructed corpus (Goal *PATH*)

Semantic role of the <i>PATH</i>	Verbs		
Goal	S ₁ (12.8%)	M ₁ (36.8%)	G ₁ (60.7%)
	S ₂ (20%)	N (44.7%)	G ₂ (82.9%)
		M ₂ (47.3%)	

Table 8b. Ancient Greek motion-events-frequency continuum based on the constructed corpus (Source *PATH*)

Semantic role of the <i>PATH</i>	Verbs	
Source	G ₂ (0.85%)	N (7.3%)
	M ₁ (4.4%)	S ₁ (8%)
	G ₁ (4.7%)	M ₂ (8.7%)
		S ₂ (9.28%)

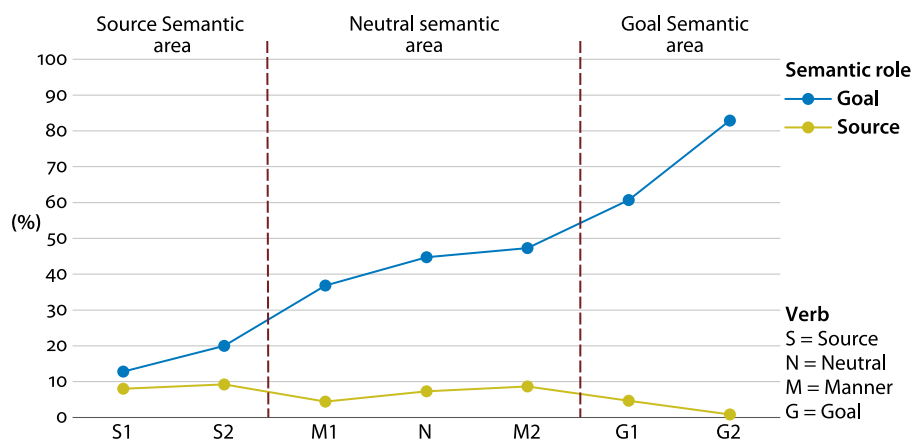


Figure 2. The Ancient Greek motion-events-frequency continuum based on the constructed corpus

The three distinct semantic areas (delineated in the figure with red dashed vertical lines) are *prima facie* more visible in the case of the Goal semantic role. In expressions of the Goal role, the boundaries between the three verb classes are more clear-cut than they are in expressions of Source. Table 9 presents a more detailed breakdown of the differences between the verbs in terms of their frequency of occurrence with a Goal PATH.

Table 9. Differences between verbs in their frequency of occurrence with Goal PATHS ¹⁴

Type of comparison	Verb comparisons	N of Goals / Total N of tokens in the sample	Chi-Square Test
Intra-group	S ₁ – S ₂	S ₁ : 59/460 – S ₂ : 28/140	$\chi^2(1) = 4.45$, $p < .05$
Intra-group	M ₁ – M ₂	M ₁ : 50/136 – M ₂ : 70/150	$\chi^2(1) = 2.87$, <i>n.s.</i>
Intra-group	M ₁ – N	M ₁ : 50/136 – N: 67/150	$\chi^2(1) = 1.84$, <i>n.s.</i>
Intra-group	N – M ₂	N: 67/150 – M ₂ : 70/150	$\chi^2(1) = 0.12$, <i>n.s.</i>
Intra-group	G ₁ – G ₂	G ₁ : 91/150 – G ₂ : 97/117	$\chi^2(1) = 15.6$, $p < .01$
Inter-group	S ₂ – M ₁	S ₂ : 28/140 – M ₁ : 50/136	$\chi^2(1) = 9.56$, $p < .01$
Inter-group	M ₂ – G ₁	M ₂ : 70/150 – G ₁ : 91/150	$\chi^2(1) = 5.9$, $p < .05$

14. Differences between verb pairs that are inferred from the comparison with another verb pair are not included in the Table. For example, we infer that the difference between S₁ and M₁ is significant by the fact that the difference between S₂ and M₁ is significant. Thus, the S₁-M₁ pair does not appear in the Table.

All inter-group differences are statistically significant. However, this is true for the intra-group differences in directional verbs as well. If we now consider only those cases in which there is a (literal) overt directional complement in the sentence, the picture changes mainly with regard to the intra-group differences (see Table 10). All inter-group differences remain, but most intra-group ones disappear. The only outliers in this set are (a) the similar distribution of the Goal-profiled verb *apérkhomai* (G_1) to both the manner verb *pléō* (M_2) and the neutral verb (N); and (b) the significant difference between the two Goal-profiled verbs.

Table 10. Differences between verbs in their frequency of occurrence with Goal PATHS (the total *N* includes only the overt directional complements)

Type of comparison	Verb comparisons	N of Goals/Total N of PATHS	Chi-Square Test
Intra-group	$S_1 - S_2$	$S_1: 59/103 - S_2: 28/43$	$\chi^2(1) = 0.7, n.s.$
Intra-group	$M_1 - M_2$	$M_1: 50/57 - M_2: 70/85$	$\chi^2(1) = 0.75, n.s.$
Intra-group	$M_2 - N$	$M_2: 70/85 - N: 67/81 -$	$\chi^2(1) = 0, n.s.$
Intra-group	$G_1 - G_2$	$G_1: 91/102 - G_2: 97/100$	$\chi^2(1) = 4.74, p < .05$
Inter-group	$S_2 - N$	$S_2: 28/43 - N: 67/81$	$\chi^2(1) = 4.85, p < .05$
Inter-group	$S_2 - M_1$	$S_2: 28/43 - M_1: 50/57$	$\chi^2(1) = 7.29, p < .01$
Inter-group	$M_2 - G_1$	$M_2: 70/85 - G_1: 91/102$	$\chi^2(1) = 1.8, n.s.$
Inter-group	$M_2 - G_2$	$M_2: 70/85 - G_1: 97/100$	$\chi^2(1) = 11.22, p < .01$
Inter-group	$N - G_1$	$N: 67/81 - G_1: 91/102$	$\chi^2(1) = 1.61, n.s.$
Inter-group	$N - G_2$	$N: 67/81 - G_2: 97/100$	$\chi^2(1) = 10.72, p < .01$

Concerning Source, although there is a tendency for it to be more frequently expressed with semantic congruent or neutral verbs, its overt expression is more uniform across the various verb classes. Given that the difference between *baínō* (M_1), which with 4.4% ($N=6/136$) had the lowest frequency, and *apérkhomai* (S_2), which with 9.28% ($N=13/140$) had the highest frequency among the verbs occurring with a Source PATH, is not statistically significant ($\chi^2(1) = 2.55, n.s.$), every other difference in verb pairs is also not significant. Again, if we consider only overt marking of directional complements, the picture changes with most of the inter-group differences becoming statistically significant or approaching the level of significance (except for the difference between the neutral verbs and *apérkhomai*; Table 11).

Summing up, we may conclude that, on the one hand, the two type of analyses (the one including the Total *N* of occurrences and that relying only on the *N* of literal overt directional complements) are consistent regarding the inter-group comparisons in Goal PATHS (heterogeneity) and the intra-group comparisons in

Table 11. Differences between verbs in their frequency of occurrence with Source PATHS (the total *N* includes only the overt directional complements)

Type of comparison	Verb comparisons	N of Sources/ Total N of PATHS	Chi-Square Test
Intra-group	$S_1 - S_2$	$S_1: 37/103 - S_2: 13/43$	$\chi^2(1) = 0.43, n.s.$
Intra-group	$M_1 - M_2$	$M_1: 6/57 - M_2: 13/85$	$\chi^2(1) = 0.66, n.s.$
Inter-group	$S_1 - N$	$S_1: 37/103 - N: 11/81$	$\chi^2(1) = 11.7, p < .01$
Inter-group	$S_2 - N$	$S_2: 13/43 - N: 11/81$	$\chi^2(1) = 5, p < .05$
Inter-group	$S_1 - M_1$	$S_1: 37/103 - M_1: 6/57$	$\chi^2(1) = 12.04, p < .01$
Inter-group	$S_2 - M_1$	$S_2: 13/43 - M_1: 6/57$	$\chi^2(1) = 6.18, p < .05$
Inter-group	$M_2 - G_1$	$M_2: 13/85 - G_1: 7/102$	$\chi^2(1) = 3.45, p = .06$
Inter-group	$N - G_1$	$N: 11/81 - G_1: 7/102$	$\chi^2(1) = 2.3, n.s.$

Source PATHS (homogeneity). These findings suggest that (a) the boundaries of the different verb classes are more visible and well delineated in the case of the Goal semantic role than in that of the Source; and (b) verbs of the same class show similar behavior when co-occurring with Source PATHS. On the other hand, the results of the different analyses show variation in intra-group comparisons in Goal PATHS (heterogeneity in the former type *vs.* homogeneity in the second type) and in inter-group comparisons in Source PATHS (homogeneity in the former type *vs.* heterogeneity in the second type). The inconclusiveness of the results highlights the need for a more thorough corpus-based work covering a more extensive set of verbs, which will test the degree of coherence of each verb class and will determine the boundaries (if any) between the classes.

5. Asymmetries in the inventories for the denotation of Goals and Sources

Section 4 showed that Goal PATHS prevail over Source PATHS in terms of token frequency in all the verbs examined. This section deals with the different types of PATH expressions accompanying these verbs. Table 12 presents the different means used in the constructed corpus. Eight markers were employed to encode the Source and 29 for the denotation of the Goal, thus confirming the preference for Goals on both the token and the type level. It can be argued that this difference somewhat reflects the difference between Goals and Sources with respect to their token frequency. There is a grain of truth in this claim, but the

list contains a representative number of markers for both PATH types. As a matter of fact, in the category of proper prepositions, the only Source preposition that did not make it to the list is *prós* [+ gen.].

Table 12. List of Sources and Goals accompanying the motion verbs of the study

Category	Markers used in Source contexts	Markers used in Goal contexts
<(Proper) Preposition + case>	1. <i>apó</i> (ABL) + gen. 2. <i>ek</i> (ELAT) + gen. 3. <i>katá</i> (DIR.INFR) + gen. 4. <i>pará</i> (LAT) + gen. 5. <i>hupó</i> (INFR) + gen.	1. <i>eis</i> (ALL) + acc. 2. <i>prós</i> (PROX) + acc. 3. <i>pará</i> (LAT) + acc. 4. <i>epí</i> (SUPR) + acc. 5. <i>hupó</i> (INFR) + acc. 6. <i>katá</i> (DIR.INFR) + acc. 7. <i>epí</i> (SUPR) + gen.
<(Improper) Preposition + case>		8. <i>mékhri</i> + gen. ‘up to’ 9. <i>ithús</i> + gen. ‘straight at’ 10. <i>ánta/antíos/enantíos</i> + gen. ‘against’ 11. <i>skhedón</i> + gen. ‘near’ 12. <i>hōs</i> + accus. ‘up to a person’
Cases	6. genitive	13. accusative 14. dative
Adverbs; Suffixed adverbs and nouns	7. <i>énthen</i> (‘thence’) 8. <i>hokóthen</i> (‘whence’)	15. <i>állose</i> (‘elsewhither’) 16. <i>entháde</i> (‘hither, here’) 17. <i>éntha</i> (‘here, hither’) 18. <i>deûro</i> (‘hither, here’) 19. <i>ekeíse</i> (‘thither’) 20. <i>eggúthen</i> (‘close’) 21. <i>hóthi</i> (‘where’) 22. <i>kátō</i> (‘below’) 23. <i>mēdamēi</i> (‘nowhere’) 24. <i>opisō</i> (‘backwards, back’) 25. <i>oíkade</i> (‘to one’s home or country’) 26. <i>pálin</i> (‘backwards, back’) 27. <i>pêi</i> (‘whither?, where?’) 28. <i>poi</i> (‘whither?’) 29. <i>póse</i> (‘whither?’)

In Table 12, the most striking result is the absence of improper (or secondary) prepositions denoting the Source (although there are available means in the time periods examined here) and the limited inventory of spatial adverbs belonging again to the Source domain. For example, although there are three spatial interrogatives for direct questions that serve the purpose of asking about the Goal of movement of a figure (*pêi*, *poi* and *póse*), no Source spatial interrogative occurs

in the sample (the interrogative *póthen* ‘whence’ did not appear in the corpus). Of the three Goal interrogatives, *pêi* is the only one that (a) realizes Place-Goal syncretism and (b) is attested in both Homeric and Classical Greek; *póse* co-exists with *pêi* in Homer (yet, they don’t have equal status in the system; a search in *Iliad* and *Odyssey* revealed only three attestations of *póse* against sixteen of *pêi*) and *poî* alternates with *pêi* in later authors. Except for these Goal interrogatives and the Source marker *póthen*, the paradigm of spatial interrogatives contains also the locative marker *poû* ‘where’ (which again realizes Place-Goal syncretism). Thus, the inventory of the Ancient Greek spatial interrogatives points to the presence of overabundance, i.e. co-existence of synonymous expressions, on the one hand, but also shows a tripartite Source-Place-Goal distinction, on the other hand, since all roles can be encoded through specialized forms (see Stolz, Levkovych, Urdze, & Nintemann 2017 for other patterns found cross-linguistically and for the notion of ‘overabundance’). A similar tripartite distinction can be found in suffixed nouns as well, e.g., in *oíkothen* ‘from one’s home or country’, *oíkoi* ‘at one’s home or country’, and *oíkade* ‘to one’s home or country’ (Schwyzer & Debrunner 1939: I: 552).

As already pointed out for *pêi*, in Table 12 we find markers that are not used exclusively in directional contexts; rather they can also describe a static scene involving no motion. In other words, Sources of motion as well as Goals of motion can be coded by the same markers as static locations.¹⁵ By way of illustration, consider (27)–(30).

- (27) *ek toû dè naíeis enthád’ ásteōs hekás*
 ELAT ART.GEN.SG.N PTC live:PRS.2SG here city:GEN.SG.N afar
 ‘Why are you **living here**, far from the city?’ (Euripides, *Electra* 246)
- (28) *sōtheis d’ ekeíthen enthád’ êlthes es*
 save:PART.AOR.PASS.NOM.SG PTC from.there here come:AOR.2SG ALL
sphagás
 slaughter:ACC.PL.F
 ‘and, saved from there, you have **come here** to the slaughter.’
 (Euripides, *Helena* 778)

In (27) and (28), the deictic adverb *entháde* is found in both Place and Goal contexts, as shown by its co-occurrence with the verbs *naío* ‘dwell’ and *érkhomai* ‘come’ in (27) and (28), respectively. *Entháde* was originally a Goal marker and

15. Formal identity of the expressions employed either for Source-Place or for Goal-Place is commonly found in the languages of the world. In general, however, languages are more likely to use the same form to encode Goal and Place than Source and Place (see Stolz 1992; Creissels 2006; Rice & Kabata 2007; Noonan 2008; Nikitina 2009; Lestrade 2010; Pantcheva 2010; Zwarts 2010; Luraghi et al. 2017; Stolz, Levkovych, Urdze, & Nintemann 2017).

extended its domain to mean also Place, which has the consequence that the distinction between the dynamic relation of Goal and the static relation of Place gets neutralized. Similarly, in (29) and (30), the same adverb *énthen* (originally a Source marker) is used for both Source and static locations (cf. the term ‘ablative-*pro*-locative use’ employed by Nikitina 2017).

- (29) *teiroménōis* *hetároisin* *amunémen,* *énthen*
 oppress:PART.PRS.DAT.PL.M comrade:DAT.PL.M ward.off:PRS.INF whence
apélthen *Antilokhos*
 depart:AOR.3SG Antilochus:NOM.SG
 ‘to ward off the sore-pressed comrades **from whom** Antilochus was departed’
 (Homer, *Iliad* 17.703–704)

- (30) *énthen gár epháinetō* *pâsa* *mên Ídē*
 there PTC appear:IMPF.M/P.3SG all:NOM.SG.F PTC Ida:NOM.SG.F
 ‘for **from thence** all Ida was plain to see’ (Homer, *Iliad* 13.13)

Ablative uses of adverbs suffixed with – *then* are still dominant in Homer (see Lejeune 1939; Risch 1974: 357; Chantraine 1984: 117). However, in some adverbs the ablative value of the suffix is already lost. For example, at this stage the adverb *eggúthen* marks either the Goal of motion (31) or the Place, but not the Source.

- (31) *tòn* *mên Phyleídēs* *dourí* *klutòs* *eggúthen*
 DEM.ACC PTC Phyleus’ son:NOM spear:DAT.SG.N glorious:NOM.SG.M near
elthôn
 come:PART.AOR.NOM.SG.M
 ‘To him Phyleus’ son, famed for his spear, **drew nigh**’ (Homer, *Iliad* 5.72)

In the classical period, the ablative uses of the suffix are marginal and, in later periods completely absent. This has the consequence that in the course of the language history fewer markers can denote both Source and Place, which aligns with the claim that Source-Place polysemy tends to be avoided (Mackenzie 1978; Nikitina & Spano 2014; Luraghi et al. 2017: xiii). Against this tendency, Nikitina (2017) shows that a marker can host these two meanings even for long periods. In any case, it is clear that Goal-Place and Source-Place polysemies are both attested, as was exemplified in (27)–(30). In this respect, Goals and Sources behave symmetrically: both Goal and Source markers came to be used as Place markers. Conversely, if we take into consideration the inventories in Table 12, an asymmetry between the two is evident in the way Source and Goal markers interact with Place markers with regard to the directionality of change. In particular, Goal and Place markers interact with each other in a bidirectional way, in the sense that Goal markers can come to encode Place, as in (27)–(28), and Place markers can come to encode Goal. By way of illustration, consider the deictic adverb *éntha* ‘here’, which can encode not

only Place (as in (32)) in accordance with its etymology, but also Goal (as in (33)). In (33), the dynamic interpretation is possible due to the directionality expressed by the verbal form *apíketo*. In other words, *éntha* is a Place adverb that fulfills the role of a Goal in the context of a dynamic verb.

- (32) *éntha káthiz'* *Helénē*
there seat:IMPF.3SG Helen:NOM.SG.F
'thereon (i.e., on the chair) Helen seated her down' (Homer, *Iliad* 3.426)
- (33) *ósper ên* *amphipoleúousan* *en* *Thébēisi*
even.as be.IMPF.3SG serve:PART.PRS.ACC.SG.F INESS Thebes:DAT.PL.F
hírōn *Diós,* *éntha apíketo* *enthaûta*
temple:ACC.SG.N Zeus:GEN.SG there arrive:AOR.3SG where
mnēmēn *autoû* *ékhein*
memory:ACC.SG.F DEM.GEN.SG have:INF.PRS
'as she had been a handmaid of the temple of Zeus at Thebes, she would
remember that temple at the place where she had come' (Herodotus, 2.56)

On the other hand, the interaction of the markers exhibiting Source-Place polysemy is unidirectional, in the sense that of the eight Source markers listed in Table 12, none of them was originally used to encode Place alone. Figure 3 schematically represents these processes (i.e., the extension possibilities of Source, Place and Goal markers) with reference to the Ancient Greek data in Table 12.

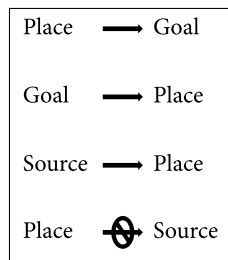


Figure 3. Processes leading to formal identity of expressions (based on the constructed corpus)

6. Discussion and conclusions

The present paper contributes to the Language-of-Space literature in several ways. First of all, it empirically shows that verbs, regardless of their semantic class, display preference for Goals compared to Sources. The theoretical consequence of this is

that the impact of a Goal bias on the choice of the *PATH* expression appears to be stronger than that of verbal semantics. This finding takes issue with claims made by Stefanowitsch and Rohde (2004) and Ishibashi (2010) as to the importance of verbal semantics in affecting the *PATH* distribution. Of course, this is not to deny the importance of verbal semantics. The lexical semantics of a verb influences the distribution of *PATH* expressions in Ancient Greek, as shown in the large decrease of Goal *PATHS* and the increase of Source *PATHS* in Source-profiled verbs, when compared to Goal-profiled verbs. However, this influence is to a certain degree and, in particular, to a degree that does not change the Source-Goal imbalance.

Second, extending previous corpus-linguistic research that focused mainly on semantic congruence between the verb and the *PATH* expressions (e.g., Ishibashi 2010), the present study examined sentences that contain both Source and Goal in a <verb + *PATH*> combination (where *PATH* is not realized as prefix), resulting in what I referred to as the ‘Goal-Source incongruence hypothesis’. The investigation of this hypothesis showed that combinations of a Source-profiled verb with a Goal *PATH* are more frequent than combinations of a Goal-profiled verb with a Source *PATH*. This finding reflects again the prevalence of Goals over Sources.

Third, this study demonstrated that in expressions bearing the Goal semantic role the boundaries between the different verb classes (Source-profiled, neutral/manner, Goal-profiled) are better delineated than they are in expressions bearing the Source role. In the same spirit, the factor of semantic congruence appears to be more relevant for Goals rather than for Sources (although there is a tendency for Sources to prefer semantically congruent and avoid semantically incongruent verbs as well).

Fourth, it was shown that the markers used to denote Goal outnumber those that denote Source, confirming prior evidence about the imbalance in the inventories of *PATH* markers, which is found frequently in the languages of the world.

Addressing the need to investigate not only synchronic polysemy patterns of Source and Goal markers but also their diachronic development, the present study has further provided evidence about possible and impossible paths of change. Specifically, the findings evidenced an imbalance in the way Source and Goal markers interact with Place markers: Goal markers come to encode Place and Place markers come to express Goal. Conversely, none of the markers exhibiting Source-Place polysemy is originally used to encode Place alone.

Future investigations on a cross-linguistic basis should aim to determine whether the unidirectional path leading from Source to Place can be considered a general (irreversible) directionality in semantic change. Given that Source markers are morphologically more complex than Place markers cross-linguistically (see, among others, Pantcheva 2010; Stolz, Lestrade, & Stolz 2014), a diachronic development leading from Place to Source would demand the involvement of a

complicated process, in which non-complexity would result in complexity. We therefore have reason to believe that the development of this type may be a typological rarum. Since the diachronic development of Source and Goal marking in connection with the Source-Goal asymmetry issue is not very well studied, more research in this area is called for (see, however, the articles in Luraghi et al. 2017). Moreover, the findings of this study regarding the semantically incongruent <verb + PATH> combinations, represent a promising direction for further research. Specifically, these findings permit two predictions regarding processing, which can be tested experimentally. First, incongruent combinations should take longer to process than congruent ones. Second, under the Goal-over-Source-pre-dominance hypothesis, it is assumed that <V_{GOAL}, PATH_{SOURCE}> combinations should take longer to process than <V_{SOURCE}, PATH_{GOAL}>. Finally, the paper has underscored the need for further research on the motion events frequency continuum. Additional corpus studies with a larger dataset in Ancient Greek as well as in other languages is necessary for testing the generalizability of the findings of this study.

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Appendix

Abbreviations used in the glosses

ABL	ablative	M	masculine
ACC	accusative	MID	middle
ADV	adverb	MDL	medial
ALL	allative	M/P	medio-passive
AOR	aorist	NEG	negation
DAT	dative	NOM	nominative
DEM	demonstrative	OPT	optative
DIM	diminutive	P	passive
DIR	directional	PART	participle
DU	dual	PL	plural
ELAT	elative	PLPF	pluperfect
F	feminine	POSS	possessive
FUT	future	PRF	perfect
GEN	genitive	PROX/LAT	proximal/lateral
IMPF	imperfect	PRS	present
IMPT	imperative	PTC	particle
INDEF	indefinite	REL	relative
INESS	inessive	SG	singular
INF	infinitive	SUPR	superior
INFR	inferior	TERM	terminative
LAT	lateral	V	verb
LOC	locative	VOC	vocative

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