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, Kopeczka (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 & Petrucc 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, 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

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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 satellites (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 Fil-
ipović (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’ anaïksante ho mèn Thréikènde bebêkei,
   at.once dart:part.aor.nom.du dem.nom ptc Thrace:all walk:plpf.3sg
   hè d’ āra Kúpron hikane philommeidês
   dem.nom ptc ptc Cyprus:acc.sg.f go:impf.3sg laughter:loving:nom
Aphrodítê, 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) bè dè kat’ Oulúmpoio karénôn
   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 eim in the diachrony of Greek.
4. See the Appendix for a list of the abbreviations used in the glosses.
(7) ὀ παιδί ho ἄρτη
VOC little.child:VOC.PL.N.DIM ART.NOM.SG.M father:NOM.SG.M
ἀπολιπὸν ἀπέρκηται humâs erēmous es
leave:PART.AOR.NOM.SG.M depart:PRS.3SG 2PL.ACC lonely:ACC.PL ALL
tὸν οὐρανόν 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 Θρῆκην; (b) the plain accusative form of a toponym (Κύρων); (c) the preposition es co-occurring with a NP in the accusative (es Πάφων). In (6), the Source is expressed through the preposition κατά 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 diphroio, eks okhéon) as well as a Goal (parà trochhôn, hamâze).

(8) ἀυτὸς ἐκ δ' ἐκσφόξειν parà trokhôn
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) ἀυτίκα ἐκ δ' ἐκσφόξειν τὸν τρόχον
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 mékhri.

(10) πλέειν es τὸν Pónton mékhri Îstrou
sail:inf.prs.all.art.acc.sg.m Pontus:acc.sg.m term Ister:gen.sg.m
potamoû 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 \( \text{pléō} \) takes an ablative spatial expression and the Goal-profiled verb \( \text{aphiknéomai} \) an allative complement.

(11) \( \text{pléōn ek tôn Kegkhreiôn aphikneítai es} \)
\( \text{sail:part.prs.nom.sg.m elat art.gen.pl Cenchreae:gen.pl arrive:prs.3sg all} \)
\( \text{Khion} \)
\( \text{Chios:acc.sg.f} \)

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

<table>
<thead>
<tr>
<th>Verb</th>
<th>Stage</th>
<th>Author (or text)</th>
<th>Total N tokens</th>
<th>N valid tokens for the analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>elmi, érkhomai 'go, come'</td>
<td>A⁶</td>
<td>Iliad</td>
<td>520</td>
<td>150</td>
</tr>
<tr>
<td>bainó 'walk, go'</td>
<td>A</td>
<td>Odyssey</td>
<td>173</td>
<td>136</td>
</tr>
<tr>
<td>pléō 'navigate'</td>
<td>B</td>
<td>Herodotus; Thucydides</td>
<td>309</td>
<td>150</td>
</tr>
<tr>
<td>aphíkomai/ ap(h)iknéomai 'reach'</td>
<td>B</td>
<td>Herodotus; Thucydides</td>
<td>708</td>
<td>150</td>
</tr>
<tr>
<td>hikánō 'reach'</td>
<td>A</td>
<td>Iliad</td>
<td>126</td>
<td>117</td>
</tr>
<tr>
<td>pheúgō 'flee, take flight, escape'</td>
<td>A &amp; B</td>
<td>all authors</td>
<td>478</td>
<td>460 (Homer: 127; History: 150; Comedy: 48; Tragedy: 135)</td>
</tr>
<tr>
<td>apérkhomai 'go away, depart'</td>
<td>A &amp; B</td>
<td>all authors</td>
<td>151</td>
<td>140</td>
</tr>
</tbody>
</table>

5. The verbs trékhō ‘run’ and péтомai ‘fly’ were also included in the initial list of verbs, but due to their low frequency in the corpus \(N_{trékhō} = 46; N_{péтомai} = 82\), 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, 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 pheúgō, 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 hupekpheúgō; (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.

\[^{12}\text{allà sû mèn tôd’ áethylon ékhôn}
\]

but 2SG.NOM PTC DEM.ACC prize:ACC.SG.N have:PART.PRS.NOM.SG
koilas epi nèas 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)

\[^{13}\text{Aías dè prôtos prokaléssato makrà}
\]

Aías: NOM PTC first call:forth:AOR.MID.3SG. long:ACC.PL.N
bibásthôn. daimónie skhedôn 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. *Eîmi* 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 *eîmi* and *érkhomai* in *Iliad*

<table>
<thead>
<tr>
<th>Opposition in deixis</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrifugal</td>
<td>50 (33.3%)</td>
</tr>
<tr>
<td>Centripetal</td>
<td>57 (38%)</td>
</tr>
<tr>
<td>Neutral (érkhomai)</td>
<td>20 (13.3%)</td>
</tr>
<tr>
<td>Uncategorized(^8)</td>
<td>23 (15.33%)</td>
</tr>
<tr>
<td>Total</td>
<td>150 (100%)</td>
</tr>
</tbody>
</table>

**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

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

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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 ḏ’ émata thumòn etépeto hoisi*
eleven PTC day:ACC.PL.N spirit:ACC.SG.M delight:IMPF.M/P.3SG REL.DAT.PL
philoiśin  *elthôn ek Lémnoio*
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 ḏ’ es dôma Diós*
come:PART.AOR.NOM.PL.M PTC all house:ACC.SG.N Zeus:GEN
nephelēgerētao ksestēs aithouśēisin enizanō
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 polished 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 *eîmi* 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 *eîmi* and *érkhomai*

<table>
<thead>
<tr>
<th>Verb</th>
<th>Goal Literal</th>
<th>Goal Non-Literal</th>
<th>Source Literal</th>
<th>Source Non-Literal</th>
<th>Source &amp; Goal Literal</th>
<th>Source &amp; Goal Non-Literal</th>
<th>Other (Medial, zero, etc.) Literal</th>
<th>Other (Medial, zero, etc.) Non-Literal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centripetal forms</td>
<td>25 (16.7%)</td>
<td>4 (2.85%)</td>
<td>6 (4.7%)</td>
<td>1 (0.7%)</td>
<td>0</td>
<td>0</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Centrifugal forms</td>
<td>18 (12%)</td>
<td>4 (2.85%)</td>
<td>3 (2%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td><em>érkhomai</em></td>
<td>12 (8%)</td>
<td>0</td>
<td>1 (0.7%)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Uncategorized forms</td>
<td>12 (8%)</td>
<td>0</td>
<td>1 (0.7%)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>67 (44.7%)</td>
<td>8 (5.7%)</td>
<td>11 (7.3%)</td>
<td>1 (0.7%)</td>
<td>1</td>
<td>1</td>
<td>61</td>
<td>(40%)</td>
</tr>
</tbody>
</table>

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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) bän rh’ imen hôs te léonte diáô
    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 mè nûks elthoûsa diakrinéei
    till PTCL night:NOM.SG.F come:PART.AOR.NOM.SG.F separate:FUT.3SG
    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 pléô ‘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 Athēnaiói épleusan authêmerôn es
    ART.NOM.PL.M Athenians:NOM.PL sail:AOR.3PL the.same.day ALL
    Crommuôna
    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).
The second verb of this category is bainō (‘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 ouranói estérikse kárē kai epi
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 Argeiôi,
3SG.DAT speak:1SG.IMPRT.M/P when IIlos:ACC embark:3PL.IMPRT Argives: NOM
metà dé sfin ébê polúmêtis
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 IIlos and with them went Odysseus of many wiles.’
(Homer, Odyssey 2.172–73)

In (21), the meaning of bainō can be paraphrased simply as ‘go’. Odysseus does not go on foot (bainō 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 bainō 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) bè pròs dòma Diòs
walk:aor.3sg prox house:acc.sg.n Zeus:gen
’he went to the house of Zeus’ (Homer, Iliad 5.398)

(23) bè dè kat’ Idaíōn oréōn
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>
<thead>
<tr>
<th>Goal</th>
<th>Source</th>
<th>Source + Goal</th>
<th>Other (Medial, zero, non-literal, etc.)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₁: báinò</td>
<td>50 (36.8%)</td>
<td>6 (4.4%)</td>
<td>1 (0.7%)</td>
<td>79 (58.1%)</td>
</tr>
<tr>
<td>M₂: pléō</td>
<td>70 (46.7%)</td>
<td>13 (8.7%)</td>
<td>2 (1.3%)</td>
<td>65 (43.3%)</td>
</tr>
</tbody>
</table>

The results show once again a strong preference for Goal paths. 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 báinò (26), but no metaphorical uses of the two verbs (they are not attested in the sample analyzed).

9. The verb trèkhò ‘run’ (Ntrèkhò = 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’ (Npétomai = 82), Goals prevail over Sources once again (NGoals = 18 vs. NSources = 6). The ‘Other’ category consisting of metaphorical uses and instances in which no path information is mentioned is highly frequent (Nother = 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) grēùs dè dièk megároio bebēkei
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, bainó 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 bainó 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 aphikomai ‘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 aphikomai, 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).
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)

(28) **toûton**  

then, when he (i.e., the Ethiopian) **departed to Syria**

(29) **hòs hé**  

then so **weeping Artemis**

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) \( \text{pêi pheúgeis metà nõta balôn} \)
    where flee:PRS.3SG among back:ACC.PL.N put:PART.AOR.NOM.SG.M
    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. Özçalıskan & 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).\(^\text{10}\) 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\(^\text{11}\) 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.

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\(^\text{10}\). Compare, for example, the <Goal prefix + verb> combinatorial possibilities of the following manner verbs: prospéтомαι ‘fly to or towards’; eispéтомαι ‘fly into’; eispedáō ‘leap in’; prospéđaō ‘leap upon’; eistrékhō ‘run in’; prostrékhō ‘run to or towards’; eispléō ‘sail into’; prospléō ‘sail towards’; prosnéō ‘swim towards’.

\(^\text{11}\). 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.

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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 Phókaia*; in (32), the Source-profiled verb *pheúgō* is accompanied by the Source expression *ek tês Helládos*.

(31) **aphikómenoi**

*dè hoûtoi es Phókaian*

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) **hós Xérxes**

*pheúgōn ek tês Helládos*

when Xerxes:nom fle: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:

\[ H_3 : \] 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 *pheugō* 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:

\[ H_4 : \] The combination of Source-profiled verbs \( V_{\text{source}} \) with a Goal path \( \text{path}_{\text{goal}} \) will be more frequent than the combination of Goal-profiled verbs \( V_{\text{goal}} \) with a Source path \( \text{path}_{\text{source}} \): \( V_{\text{source}} \text{path}_{\text{goal}} > V_{\text{goal}} \text{path}_{\text{source}} \).

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

<table>
<thead>
<tr>
<th></th>
<th>Goal</th>
<th>Source</th>
<th>Source + Goal</th>
<th>Other (Medial, zero, non-literal, etc.)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>G₁: ἀφικομαι/ ἀπ(ʰ)ικνέομαι</td>
<td>91 (60.7%)</td>
<td>7 (4.7%)</td>
<td>4 (2.66%)</td>
<td>48 (32%)</td>
<td>150 (100%)</td>
</tr>
<tr>
<td>G₂: ἕκανο</td>
<td>97 (82.9%)</td>
<td>1 (0.85%)</td>
<td>2 (1.7%)</td>
<td>17 (14.52%)</td>
<td>117 (100%)</td>
</tr>
<tr>
<td>S₁: πεύγω</td>
<td>59 (12.8%)</td>
<td>37 (8%)</td>
<td>7 (1.5%)</td>
<td>357 (77.6%)</td>
<td>460 (100%)</td>
</tr>
<tr>
<td>S₂: ἀπέρχομαι</td>
<td>28 (20%)</td>
<td>13 (9.28%)</td>
<td>2 (1.4%)</td>
<td>97 (69.3%)</td>
<td>140 (100%)</td>
</tr>
</tbody>
</table>

the former this category is significantly more frequent than in the latter. This is mainly due to the fact that πεύγω and ἀπέρχομαι are more prone to leave the complement implicit than are ἕκανο and ἀφικομαι. 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 πεύγω (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) mέτε tis oὖn Τρόον thánaton phύgoi
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) and Ishibashi’s (2010) results, which have reported a Source |

<table>
<thead>
<tr>
<th></th>
<th>Goal</th>
<th>Source</th>
<th>Source + Goal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>G₁: ἀφικομαι/ ἀπ(ʰ)ικνέομαι</td>
<td>91 (89.2%)</td>
<td>7 (6.9%)</td>
<td>4 (3.9%)</td>
<td>102 (100%)</td>
</tr>
<tr>
<td>G₂: ἕκανο</td>
<td>97 (97%)</td>
<td>1 (1%)</td>
<td>2 (2%)</td>
<td>100 (100%)</td>
</tr>
<tr>
<td>S₁: πεύγω</td>
<td>59 (57.3%)</td>
<td>37 (35.9%)</td>
<td>7 (6.8%)</td>
<td>103 (100%)</td>
</tr>
<tr>
<td>S₂: ἀπέρχομαι</td>
<td>28 (65.1%)</td>
<td>13 (30.23%)</td>
<td>2 (4.65%)</td>
<td>43 (100%)</td>
</tr>
</tbody>
</table>
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 G₁ and G₂ respectively vs. only 12.8% and 20% in S₁ and S₂ respectively) and simultaneously in a small increase of Source paths (4.7% and 0.85% in G₁ and G₂ respectively vs. 8% and 9.28% in S₁ and S₂ 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 (S₁ + pathGOAL: 12.8% (N=59); S₂ + pathGOAL: 20% (N=28); G₁ + pathSOURCE: 4.7% (N=7); G₂ + pathSOURCE: 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: G₁ + pathSOURCE – S₁ + pathGOAL: $\chi^2(1)=7.8, p<.01$; G₁ + pathSOURCE – S₂ + pathGOAL: $\chi^2(1)=16.04, p<.01$.\footnote{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 G₂·S₁ and G₂·S₂. FET tests yield significant results for both ($p<.01$).}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Directional verbs in occurrence with incongruent paths}
\end{figure}
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

<table>
<thead>
<tr>
<th>Semantic role of the locative argument</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td>Source-profiled (S) &lt; neutral/ manner (N/M) &lt; Goal profiled (G)</td>
</tr>
<tr>
<td><strong>Source</strong></td>
<td>Goal-profiled (G) &lt; neutral/ manner (N/M) &lt; Source profiled (S)</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Semantic role of the path</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td></td>
</tr>
<tr>
<td>S₁ (12.8%)</td>
<td>M₁ (36.8%)</td>
</tr>
<tr>
<td>S₂ (20%)</td>
<td>N (44.7%)</td>
</tr>
<tr>
<td></td>
<td>G₁ (60.7%)</td>
</tr>
<tr>
<td></td>
<td>M₂ (47.3%)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Semantic role of the path</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
<td></td>
</tr>
<tr>
<td>G₂ (0.85%)</td>
<td>N (7.3%)</td>
</tr>
<tr>
<td>M₁ (4.4%)</td>
<td>S₁ (8%)</td>
</tr>
<tr>
<td>G₁ (4.7%)</td>
<td>M₂ (8.7%)</td>
</tr>
<tr>
<td></td>
<td>S₂ (9.28%)</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Type of comparison</th>
<th>Verb comparisons</th>
<th>N of Goals / Total N of tokens in the sample</th>
<th>Chi-Square Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-group</td>
<td>$S_1 - S_2$</td>
<td>$S_1$: 59/460 – $S_2$: 28/140</td>
<td>$\chi^2 (1) = 4.45, p &lt; .05$</td>
</tr>
<tr>
<td>Intra-group</td>
<td>$M_1 - M_2$</td>
<td>$M_1$: 50/136 – $M_2$: 70/150</td>
<td>$\chi^2 (1) = 2.87, n.s.$</td>
</tr>
<tr>
<td>Intra-group</td>
<td>$M_1 - N$</td>
<td>$M_1$: 50/136 – $N$: 67/150</td>
<td>$\chi^2 (1) = 1.84, n.s.$</td>
</tr>
<tr>
<td>Intra-group</td>
<td>$N - M_2$</td>
<td>$N$: 67/150 – $M_2$: 70/150</td>
<td>$\chi^2 (1) = 0.12, n.s.$</td>
</tr>
<tr>
<td>Intra-group</td>
<td>$G_1 - G_2$</td>
<td>$G_1$: 91/150 – $G_2$: 97/117</td>
<td>$\chi^2 (1) = 15.6, p &lt; .01$</td>
</tr>
<tr>
<td>Inter-group</td>
<td>$S_2 - M_1$</td>
<td>$S_2$: 28/140 – $M_1$: 50/136</td>
<td>$\chi^2 (1) = 9.56, p &lt; .01$</td>
</tr>
<tr>
<td>Inter-group</td>
<td>$M_2 - G_1$</td>
<td>$M_2$: 70/150 – $G_1$: 91/150</td>
<td>$\chi^2 (1) = 5.9, p &lt; .05$</td>
</tr>
</tbody>
</table>

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 $S_1$ and $M_1$ is significant by the fact that the difference between $S_2$ and $M_4$ is significant. Thus, the $S_1$-$M_1$ 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 *plēô* (*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**

<table>
<thead>
<tr>
<th>Type of comparison</th>
<th>Verb comparisons</th>
<th><em>N</em> of Goals/Total <em>N</em> of paths</th>
<th>Chi-Square Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-group</td>
<td><em>S₃</em> – <em>S₂</em></td>
<td><em>S₃</em>: 59/103 – <em>S₂</em>: 28/43</td>
<td>$\chi^2 (1) = 0.7$, n.s.</td>
</tr>
<tr>
<td>Intra-group</td>
<td><em>M₁</em> – <em>M₂</em></td>
<td><em>M₁</em>: 50/57 – <em>M₂</em>: 70/85</td>
<td>$\chi^2 (1) = 0.75$, n.s.</td>
</tr>
<tr>
<td>Intra-group</td>
<td><em>M₂</em> – <em>N</em></td>
<td><em>M₂</em>: 70/85 – <em>N</em>: 67/81 –</td>
<td>$\chi^2 (1) = 0$, n.s.</td>
</tr>
<tr>
<td>Intra-group</td>
<td><em>G₁</em> – <em>G₂</em></td>
<td><em>G₁</em>: 91/102 – <em>G₂</em>: 97/100</td>
<td>$\chi^2 (1) = 4.74$, <em>p</em> &lt; .05</td>
</tr>
<tr>
<td>Inter-group</td>
<td><em>S₂</em> – <em>N</em></td>
<td><em>S₂</em>: 28/43 – <em>N</em>: 67/81</td>
<td>$\chi^2 (1) = 4.85$, <em>p</em> &lt; .05</td>
</tr>
<tr>
<td>Inter-group</td>
<td><em>S₂</em> – <em>M₁</em></td>
<td><em>S₂</em>: 28/43 – <em>M₁</em>: 50/57</td>
<td>$\chi^2 (1) = 7.29$, <em>p</em> &lt; .01</td>
</tr>
<tr>
<td>Inter-group</td>
<td><em>M₂</em> – <em>G₁</em></td>
<td><em>M₂</em>: 70/85 – <em>G₁</em>: 91/102</td>
<td>$\chi^2 (1) = 1.8$, n.s.</td>
</tr>
<tr>
<td>Inter-group</td>
<td><em>M₂</em> – <em>G₂</em></td>
<td><em>M₂</em>: 70/85 – <em>G₁</em>: 97/100</td>
<td>$\chi^2 (1) = 11.22$, <em>p</em> &lt; .01</td>
</tr>
<tr>
<td>Inter-group</td>
<td><em>N</em> – <em>G₁</em></td>
<td><em>N</em>: 67/81 – <em>G₁</em>: 91/102</td>
<td>$\chi^2 (1) = 1.61$, n.s.</td>
</tr>
<tr>
<td>Inter-group</td>
<td><em>N</em> – <em>G₂</em></td>
<td><em>N</em>: 67/81 – <em>G₂</em>: 97/100</td>
<td>$\chi^2 (1) = 10.72$, <em>p</em> &lt; .01</td>
</tr>
</tbody>
</table>

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 *bainô* (*M₃*), which with 4.4% (*N* = 6/136) had the lowest frequency, and *apérkhomai* (*S₃*), 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 relating 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)

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

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
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

<table>
<thead>
<tr>
<th>Category</th>
<th>Markers used in Source contexts</th>
<th>Markers used in Goal contexts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5. <em>hupó</em> (<em>infr</em>) + gen.</td>
<td>5. <em>hupó</em> (<em>infr</em>) + acc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. <em>epí</em> (<em>supr</em>) + gen.</td>
</tr>
<tr>
<td>Cases</td>
<td>6. genitive</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>13. accusative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14. dative</td>
</tr>
<tr>
<td>Adverbs; Suffixadverbs and nouns</td>
<td>7. <em>énthen</em> (<em>thence</em>)</td>
<td>15. <em>állose</em> (<em>elsewhither</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17. <em>éntha</em> (<em>here, hither</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18. <em>deúro</em> (<em>hither, here</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19. <em>ekése</em> (<em>thither</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20. <em>eggúthen</em> (<em>close</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21. <em>hóthi</em> (<em>where</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22. <em>kató</em> (<em>below</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23. <em>mēdanêi</em> (<em>nowhere</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24. <em>opísô</em> (<em>backwards, back</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25. <em>oikade</em> (<em>to one’s home or country</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26. <em>pálin</em> (<em>backwards, back</em>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27. <em>pêi</em> (*whither?, where?)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28. <em>pôi</em> (*whither?)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29. <em>pôse</em> (*whither?)</td>
</tr>
</tbody>
</table>

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, pôi* and *pôse*), 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 tou dè naiës enthád’ ásteôs 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) sôtheis d’ ekeîthen enthád’ élthes es
save:PART.AOR.PASS.NOM.SG PTC from.there here come:AOR.2SG ALL
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 naiô ‘dwell’ and érkhomai ‘come’ in (27) and (28), respectively. Entháde was originally a Goal marker and

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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) teiroménois hetároisin amunémen, énthen
oppress:part.prs.dat.pl.m comrade:dat.pl.m ward.off:prs.inf whence
apéthen Antílokhos
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 gàr ephaineto pása mèn Ídê
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) tôn mèn Phyleídês 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) *ṓsper ēn amhipoleúousan en Thēbēisi*
even.as be.IMPF.3SG serve:PART.PRS.ACC.SG.F iness Thebes:DAT.PL.F
hirôn Diós, *éntha apíketo* enthauτa
temple:ACC.SG.N Zeus:GEN.SG there arrive:AOR.3SG where
mnēmēn autoū 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](image-url)

**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-predominance hypothesis, it is assumed that <V_{\text{GOAL}}, \text{PATH}_{\text{SOURCE}} > combinations should take longer to process than <V_{\text{SOURCE}}, \text{PATH}_{\text{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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https://doi.org/10.1075/tsl.25


Appendix

Abbreviations used in the glosses

<table>
<thead>
<tr>
<th>Abbreviation</th>
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