

Article

Arabic PPs in a Rooted Lexicon

Abdelkader Fassi Fehri ^{1,*}  and Maather Alrawi ^{2,*} 

¹ The ACVL Project at the Linguistic Society of Morocco, Mohammed V University,
P.O. Box 2230, Rabat 10100, Morocco

² Department of European Languages and Literature, King Abdulaziz University, Jeddah 21589, Saudi Arabia

* Correspondence: abdelkaderfassifehri@gmail.com (A.F.F.); mmalrawi@kau.edu.sa (M.A.)

Abstract: We motivate a ‘rooted’ PP shell analysis of Arabic prepositional phrases, which takes into account the prepositional dual life, as a lexical root item and as a vocabulary word, projecting a lexical \sqrt{P} headed by the P root, and a functional pP headed by p, the syntactic case assigner. Moreover, PlaceP and PathP projections are motivated by differentiating locative and directional PPs, and AxPartPs represent the structure of adverbial spatial nouns (*ḍuruuf*). It is shown that alternative analyses using a single source (or projection) of PPs are inadequate in dealing with prepositional polysemies, and their morpho-syntactic alternations or variations. A bifurcation analysis instead (distinguishing root syntax from category syntax) is motivated and implemented along the lines of distributive models of word formation, making use of the simplest composition operation Merge in both syntax and the lexicon.

Keywords: rootP; PP shell; Place; Path; AxPart; containment; contact; coincidence

1. Introduction

The category of preposition is often poorly defined, both traditionally and within generative grammar. In Arabic traditional grammar, prepositions form a closed set that includes *fī* ‘in’, *bi-* ‘with’, *min* ‘from’, *ʔilaa* ‘to’, *l-* ‘for’, *ʔalaa* ‘on’, *ʔan* ‘about’, and *ka-* ‘similar’. Adverbial expressions included in PPs semantically convey similar relational meanings, although they are morpho-syntactically nominal, rather than prepositional. Their list is quite open; it includes *fawqa* ‘above’, *taḥta* ‘below’, *ʔamaama* ‘in front’, *xalfa* ‘back’, *ḥawla* ‘around’, *ʔawba* ‘towards’, etc. They are traditionally thought of as *ḍuruuf* ‘adverbials’, rather than *ḥuruuf* ‘prepositions’. In fact, they are types of ‘weak nouns’, analyzed by Svenonius (2006, 2010), after Landau and Jackendoff (1993), as axial parts (AxPartP; see also Herskovits 1986). Because these prepositions and adverbials have a dual functional and lexical nature (or “mixed signs”, as described by Weinreich 1963, p. 150), their categorial status has been a matter of debate. They are tentatively analyzed as (a) *lexical*, like other lexical categories (nouns, verbs, and adjectives; Chomsky 1970, 1995; Jackendoff 1977); (b) *functional*, like other functional categories (determiners, auxiliaries, modals, and complementizers; Baker 2003; Grimshaw 1991); (c) *both lexical and functional* (Svenonius 2010; Wood and Marantz 2017); or (d) *semi-functional* (Ryding 2005; Saeed 2014; Al-Humari 2015).

This article argues for a specific treatment of prepositions and PPs. Prepositions are cartographically projected as in Svenonius’ (2010, 2012) work, but more specifically generated as distributed words, in ‘rooted’ PPs, as in Wood and Marantz’s (2017) DM analysis of English; see also Deacon (2011); for Arabic, see Fassi Fehri and Aamiri (2021). More like verbs in the vP complex, the preposition in a pP projection has a dual life; as a *lexical root* heading the prepositional \sqrt{P} , and as a *category head* p of pP. ‘Small’ p assigns genitive case, in parallel to *v*, which assigns accusative. Moreover, the analysis adopts a sort of bifurcation hypothesis of root/category syntax and semantics, as represented in (1a), and mirrors a form of PP shell structure (à la Larson 1988, 2014), as in (1b):



Citation: Fassi Fehri, Abdelkader, and Maather Alrawi. 2023. Arabic PPs in a Rooted Lexicon. *Languages* 8: 95. <https://doi.org/10.3390/languages8020095>

Academic Editor: Jeanine Treffers-Daller

Received: 31 December 2022

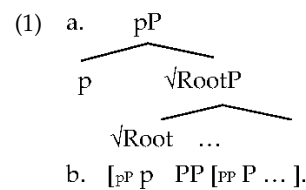
Revised: 17 March 2023

Accepted: 20 March 2023

Published: 27 March 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

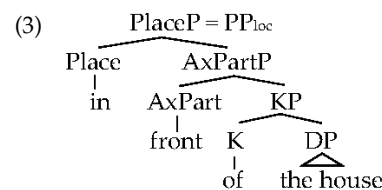


Both structures represent the dual facets of prepositions: as ‘lexical’ or $\sqrt{}$, and as ‘functional’ or categorized.

Cross-linguistically, spatial prepositions are either *locative* or *directional* Ps. Based on its semantics and its syntax, a particular P is merged as either Place or Path. Locational Ps are Place heads, where Place is P_{loc} , and directional Ps are Path heads, where Path is P_{dir} , as in (2a) and (2b) (see Jackendoff 1983; Wunderlich 1991; Zwarts 1997, 2005; Zwarts and Winter 2000; Kracht 2002; Koopman 2000; Svenonius 2010; den Dikken 2010; Gehrke 2008, among others):



Furthermore, axial adverbials that are selected by Place are identified as AxPart heads, as in (3); Svenonius (2006):



By investigating the various morpho-syntactic and semantic facets of spatio-temporal expressions headed by prepositions or AxPart weak nouns in Arabic, the article aims at establishing that PP has a dual projection (a favored hypothesis over single projection analyses), and that P is ‘rooted’ in the lexicon, i.e., having a lexical root (like nouns, verbs, or adjectives), rather than just being only functional.¹ The article aims also at exploring the practical use of ‘roots’ as the irreducible syntactic units in prepositional word formation, using the simplest combinatory Merge operation.² Section 2 discusses the structures and meanings of PPs in the space domain. Section 3 provides evidence for the prepositional \sqrt{P} (root phrase) as distinct from pP (functional phrase). Section 4 investigates the meaning specifications of prepositional roots that motivate the existence of \sqrt{RootP} as a separate projection. It focusses on complex polysemies, variation, and syntactic alternations. Section 5 concludes.

2. Structures and Meanings of PPs

2.1. The Basic Distinction of Locatives: Places and Paths

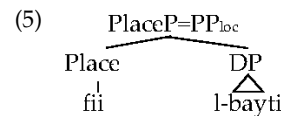
Cross-linguistically, spatial PPs have been shown to distinguish structurally and semantically between two locatives: Places and Paths, projecting as PlaceP and PathP. The locative/directional distinction is often associated with this dichotomy (see Jackendoff 1983; Wunderlich 1991; Zwarts 1997; Zwarts and Winter 2000; Kracht 2002; Koopman 2000; Svenonius 2010; den Dikken 2010; Gehrke 2008; Saeed 2014, among many others).

We show that locatives in Arabic can express three meaning subtypes: (a) locational, (b) directional, and (c) motional.

2.1.1. Locational versus Directional PPs

The locational Places occur in verbless (copulative) sentences, inducing a locative meaning, as illustrated in (4) and represented in (5).

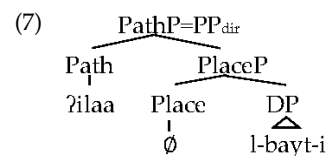
- (4) a. *ʔanaa fii l-bayt-i*
 I in the-house-GEN
 b. *ʔanaa bi-l-bet* (Levantine Arabic)
 I in-the-house
 'I am in the house.'



The prepositions *fii* 'in' and *bi-* 'in', are Place heads (Fassi Fehri 2021; Saeed 2014). They locate a Figure (*ʔanaa* 'I') in (4a) and (4b) in relation to a Ground (*l-bayt-i* 'the house'), where there is no verb that can locate the Figure with respect to the Ground. The fact that the sentences in (4) are verbless suggests that the locational meaning has its source in the PP, and not in any verbal predicate (compare with the collocation in (6) below). Accordingly, the prepositions *fii* 'in' and *bi-* 'in' must be bearing a semantically interpretable feature [LOC(ational)].

On the other hand, directional PPs or Paths easily collocate with motion verbs inducing directional meanings, as illustrated in (6) and represented in (7):

- (6) a. *ʔadhabu ʔilaa l-bayt-i*
 I-go to the-house-GEN
 'I go to the house.'
 b. *mašay-tu ḥattaa l-ḡurfat-i*
 walk-I till the-room-GEN
 'I walked till the room'



The prepositions *ʔilaa* 'to' and *ḥattaa* 'till' are Path heads that are endowed with a [DIR(ectional)] feature. Unlike locational PPs, directional PPs are not found in verbless locative contexts. They are ill-formed in such contexts, as in (8a) and (8b):

- (8) a. **ʔanaa ḥattaa l-ḡurfat-i* *directional
 I till the-room-GEN
 Intended meaning: 'I am (heading) up to the room.'
 b. **ʔanaa ʔilaa l-bayt-i* *directional
 I to the-house-GEN
 Intended meaning: 'I am (heading) up to the house.'

In such contexts, they allow only a locative meaning:

- (9) *l-qalam-u ʔilaa jaanib-i l-kitaab-i* locative
 the-pen-NOM to next-GEN the-book-GEN
 'The pen is next to the book.'

With stative verbs, the directional reading is not licensed. Clearly, directional PPs are not used with stative verbs like *waqafa* 'stood', as the ungrammaticality of (10a) suggests, while locative PPs collocate easily with the stative verb, as in (10c). The PP in (10b) has only a locative interpretation (due to its unambiguous status):

- (10) a. **waqaf-a* *ḥattaa* *l-baab-i* *directional
 stood-3 till the-door-GEN
 Intended to mean: ‘He stood up (heading) to the door.’
 b. *waqaf-a* *ʔilaa* *jaanib-i* *l-baab-i* locative
 stood-3 to next-GEN the-door-GEN
 ‘He stood up next to the door.’
 c. *waqaf-a* *fii* *l-baab-i* locative
 stood-3 in the-door-GEN
 ‘He stood up at the door.’

It is generally agreed that the structure of PPs involves two distinct head projections: Path and Place. Path is outside Place, and when both co-occur, Path is normally placed higher than Place (Jackendoff 1983; Koopman 2000; van Riemsdijk and Huybregts 2002; den Dikken 2010, etc.).³ In (9), *ʔilaa* is heading a complex Place P, the structure of which is (11a), and in (7) it heads a complex PathP, represented as (11b):



2.1.2. AxPartPs

Both Path P and Place P can be more complex when they include adverbial spatial nouns *ḍuruuf* or AxParts, which are not true *ḥuruuf* prepositions. Among these adverbial spatial nouns, we can list the following: *jaaniba* ‘beside’, *xaarija* ‘outside’, *daaxila* ‘inside’, *ʔamaama* ‘in front’, *xalfa* ‘back’, *taḥta* ‘below’, *fawqa* ‘above’, *quddama* ‘in front’, *bayna* ‘between’, *ṣawba* ‘towards’, *wasata* ‘middle of’, *ṣabra* ‘through’, etc. Their English counterparts have been analyzed as Axparts, heading AxPartPs (Jackendoff 1983; Herskovits 1986; Svenonius 2010). We alternatively treat them as simply (spatial) nPs of some specific ‘weak’ sort (Matushansky and Zwarts 2019).⁴ These spatial nPs can be semantically parallel to prepositions conveying locational, directional, or motional meanings, rather than being referential like ordinary nouns. However, unlike prepositions, they categorically function as nouns. They receive case, rather than assign it, and they can be pluralized and modified by an adjective (see Fassi Fehri and Aamiri 2021 for more detail about weak spatial nouns). They can be included lower than Ps in Places or Paths. In (9) above, *ʔilaa* is heading a complex Place P, which embeds nP, the structure of which is (11a). In (12a) below, a Path P embeds nP as represented in (12b):

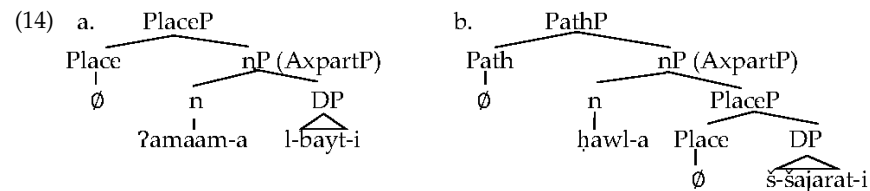
- (12) a. *y-aḥuum-u* *ṭ-ṭaaʔir-u* *min* *ḥawl-i* *š-šajarat-i*
 3-roam-IND the-bird-NOM from around-GEN the-tree-GEN
 ‘The bird is roaming around the tree.’
 b.

As a noun, *ḥawl-i* ‘around’ is assigned a genitive case by the preposition *min* ‘from’.

As explained earlier, the prepositions *ʔilaa* ‘to’ and *min* ‘from’ are (ambiguously) heading a PlaceP or PathP. Prepositions can also remain optionally null (or silent), as in (13a) and (13b), but their interpretation is recovered:

- (13) a. *l-qalam-u* *jaanib-a* *l-kitaab-i*
 the-pen-NOM next-ACC the-book-GEN
 'The pen is next to the book.'
- b. *y-aḥuūm-u* *t-ṭaaʔir-u* *ḥawl-a* *š-šajarat-i*
 3-roam-IND the-bird-NOM around-ACC the-tree-GEN
 'The bird is roaming around the tree.'

Because the adverbial constructions in (13a) and (13b) are the null-P counterparts of (9) and (12a), respectively, they are argued to be headed by a null Place and Path:⁵

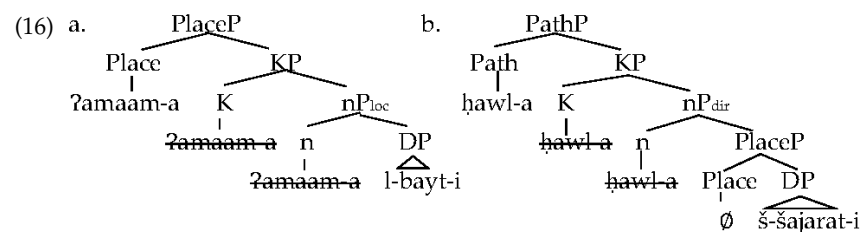


As a result of the null P, the spatial n receives a sort of oblique 'accusative' case (by default), instead of the structural genitive assigned by the overt preposition. The accusative case is in fact assigned at an extra structural layer, KP, dominating nP. The spatial n is not an ordinary n whose root has a referential interpretation. It has a 'lighter' lexical content, and it depends on (the silent abstract) P for its interpretation. Adopting Nchare and Terzi's (2014) silent P analysis, Fassi Fehri and Alrawi (2021) assume that the spatial n undergoes head movement to P according to the requirement imposed by the Edge of XP, developed by Collins (2007), which goes back to the Doubly Filled Comp Filter (Chomsky and Lasnik 1977):⁶

- (15) a. Edge(X) must be phonetically overt.
 b. The condition in (a) applies in a minimal way, so that either the head or the specifier, but not both, are spelled out overtly.

(Nchare and Terzi 2014, p. 694)

Accordingly, the locative or directional n head merges through K into Place or Path, as in (16):



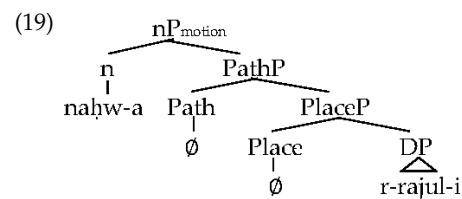
It is worth noting that not all directional spatial nouns are headed by a P. For example, *ṣabr-a* 'through', as illustrated in (17), does not allow an alternation with the overt preposition:

- (17) a. *saafar-tu* *ṣabr-a* *l-muḥiit-i*
 traveled-I through-ACC the-ocean-GEN
 'I traveled through the ocean.'
- b. **saafar-tu* *min* *ṣabr-i* *l-muḥiit-i*
 traveled-I from through-GEN the-ocean-GEN
 Intended meaning: 'I traveled from through the ocean.'

2.1.3. Motional PPs

Spatial nouns, such as *ṣawb-a* ‘towards’, *naḥw-a* ‘towards’, or *tujaah-a* ‘towards’, that express motion Paths as illustrated in (18), constitute a distinct class from both locational and directional nPs. Their structure is arguably more complex than directional Paths as represented in (19):

- (18) a. *dahaba* *s-sahm-u* *ṣawb-a* *r-rajul-i*
 went the-arrow-GEN towards-ACC the-man-GEN
 ‘The arrow went towards the man.’
 b. *taharrak-tu* *naḥw-a* *š-šamaal-i*
 moved-I towards-ACC the-north-GEN
 ‘I moved towards the north.’



The motional *n* forms a distinct category that usually collocates with motion verbs, as exemplified in (18). Without such verbs, the nominal sentence is ungrammatical:

- (20) a. **s-sahm-u* *naḥw-a* *r-rajul-i*
 the-arrow-NOM towards-ACC the-man-GEN
 Intended meaning: ‘The arrow (went) towards the man.’
 b. **ʔanaa* *tujaah-a* *š-šamaal-i*
 I towards-ACC the-north-GEN
 Intended meaning: ‘I am (heading) towards the north.’

Another property that sets these prepositional expressions apart from both locative and directional spatial nouns is that they do not collocate with stative verbs such as *ḍalla* ‘remained’, as illustrated in (21).

- (21) a. **ḍalla* *s-sahm-u* *ṣawb-a* *r-rajul-i* **motional*
 remained the-arrow-NOM towards-ACC the-man-GEN
 Intended meaning: ‘The arrow remained towards the man.’
 b. *ḍalla* *s-siyaaj-u* *ḥawl-a* *l-bayt-i* *directional-static*
 remained the-fence-NOM around-ACC the-house-GEN
 ‘The fence remained around the house.’
 c. *ḍalla* *s-sahm-u* *quddam-a* *r-rajul-i* *locative-static*
 remained the-arrow-NOM in front of-ACC the-man-GEN
 ‘The arrow remained in front of the man.’

A third property is that motional spatial nouns (or A_xpart) do not collocate with change-of-state verbs like *staqarra* ‘settled’, *ʔaṣbaḥa* ‘became’, etc., which are dynamic but not motional, as illustrated in (22), unlike both locational and directional PPs/nPs, which can freely collocate with change-of-state verbs, acquiring a dynamic sense, as illustrated in (23) and (24):

- (22) **staqarra* *s-sahm-u* *ṣawb-a* *l-masjid-i* **motional*
 settled the-arrow-NOM towards-ACC the-mosque-GEN
 Intended meaning: ‘The arrow settled towards the mosque.’
 (23) *staqarra* *l-ʕaduww-u* *ḥawl-a* *l-qalʕat-i*
 settled the-enemy-NOM around-ACC the-castle-GEN
 ‘The enemy settled around the castle.’ *dynamic; non-motional*

- (24) *ʔaṣbaha* *r-rajul-u* *ʔamaam-a* *l-baab-i* *dynamic; non-motional*
 became the-man-NOM in front of-ACC the-door-GEN
 'The man became in front of the door.'

A fourth property is that motional expressions are strictly motional Paths that are only compatible with motional dynamic contexts, but incompatible with static contexts, as illustrated above. They contrast with both directional and locative PPs, which can be either static or directional dynamic depending on the context, as illustrated in (25) and (26):

- (25) a. *saafar-tu* *ʕabr-a* *l-muḥiiṭ-i* *directional-dynamic*
 traveled-I through-ACC the-ocean-GEN
 'I traveled through the ocean.'
 b. *ṭ-ṭariiḡ-u* *ʕabr-a* *l-muḥiiṭ-i* *ṭuul-u-hu*
 the-route-NOM across-ACC the-ocean-GEN length-NOM-its
ʕašra-t-u *kiluumitr-aat-in* *directional-static*
 ten-FEM-NOM kilometer-FEM.PL-GEN
 'The route across the ocean is about ten thousand kilometer long.'
- (26) a. *ṭ-ṭuruḡ-u* *fii* *jaddat-a* *waasiṣat-un* *locative-static*
 the-roads-NOM in Jeddah-GEN wide-NOM
 'The roads in Jeddah are wide.'
 b. *fa-siiruu* *fii* *l-ʔarḍ-i* *locative-dynamic*
 so-travel in the-earth-GEN
 'So travel through the earth.' (Quran, 3)

So, both locatives and directionals can be either dynamic or static. But motional nouns are endowed with a [MOTION] feature that locational or directional Ps or ns are not endowed with. One piece of evidence comes from the fact that motional spatial nouns express a motional reading when collocating with a directional but not (necessarily) motional verb such as *ittajaha* 'directed' (27a). This reading is not available with a locative such as *ʔamaam-a* 'in front of' or a directional spatial noun such as *ʕabr-a* 'across' (as in 27b,c):

- (27) a. *ittajaha* *s-sahm-u* *naḥw-a* *r-rajul-i* *motional*
 Directed the-arrow-NOM towards-ACC the-man-GEN
 'The arrow was directed towards the man.'
 b. **ittajaha* *s-sahm-u* *ʔamaam-a* *r-rajul-i* **locative*
 directed the-arrow-NOM in front of-ACC the-man-GEN
 'The arrow was directed in front of the man.'
 c. **ittajaha* *s-sahm-u* *ʕabr-a* *r-rajul-i* **directional*
 directed the-arrow-NOM across-ACC the-man-GEN
 'The arrow was directed across the man.'

Another piece of evidence can be constructed as follows. Verbs derived from the same base roots of these adverbial nouns are motional, as illustrated in (28), suggesting that the MOTION feature is akin to the base root:

- (28) a. *ʔaṣaaba* *s-sahm-u* *r-rajul-a*
 hit the-arrow-NOM the-man-ACC
 'The arrow hit the man.'
 b. *naḥaw-tu* *naḥw-a-ka*
 leaned-I towards-ACC-you
 'I leaned towards you.'

On the other hand, no motion verbs can be derived from non-motional roots, be they locative nouns such as *ʔamaam-a* ‘in front of’, *xalf-a* ‘behind’, and *quddam-a* ‘in front of’, or directional nouns such as *hawl-a* ‘around’, *xilaal-a* ‘through’, and *ʕabr-a* ‘through’, because their roots, we suggest, are not marked for MOTION, as illustrated in (29) and (30):

- (29) a. **ʔamaama* *s-sahm-u* *r-rajul-a*
 went in from of the-arrow-NOM the-man-ACC
 Intended meaning: ‘the arrow went in front of the man’.
- b. **ʔaxlafa* *s-sahm-u* *r-rajul-a*
 went behind the-arrow-NOM the-man-ACC
 Intended meaning: ‘The arrow went behind the man.’
- (30) a. **ʔaʕbara* *s-sahm-u* *r-rajul-a*
 went across the-arrow-NOM the-man-ACC
 Intended meaning: ‘The arrow went across the man.’
- b. **ʔahwala* *ʔ-ʔaaʔir-u* *ʕ-ʕajarat-a*
 went around the-bird-NOM the-tree-ACC
 Intended meaning: ‘The bird went around the tree.’

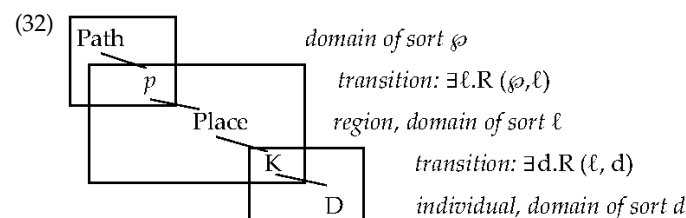
We propose, therefore, that [MOTION] is a feature of the root of motional spatial objects or events. This feature is not available for the locational or directional roots, which have [LOC] and [DIR] features, as represented in (31):

- (31) a.
- b.
- c.

At the same time, it is reasonable to think that Place and Path meanings (or ontologies) are associated with acategorical roots, and that [LOC], [DIR], or [MOTION] are content features of these roots in the root syntax of PPs. By contrast, the categorizing head *p* is found in a separate projection in category syntax, that is pP.

2.2. Sorts of Domains

Paths, Places, or Individuals are entities of different sorts that are cognitively founded and motivated (Svenonius 2012). The Place domain describes a *region*, which is modelled as an entity of sort ℓ (for ‘location’), the Path domain provides a description of sort \wp , and the determiner domain D provides a description of sort d (for individual). Between these sortal domains lie *p* and *K*, which are *transitional* relational heads between the domain of sort \wp , the domain of sort ℓ , and that of sort d , as schematized in (32):



3. Evidence for Rooted PPs

In this section, we build a number of arguments that give further support to the dual nature of PP as both lexical (or root based) and functional (categorized).

3.1. The Multiple Category Argument

As observed earlier, roots of prepositional phrases, (expressing Places or Paths), just like roots of other categories, are *acategorical*. When Places and Paths surface as categories, they do so as p, n, a, or v. A part configurations also take part in this behavior. For example, *ʕalaa* ‘on’ functions as a ‘preposition’ in (33a), as a ‘nominal’ in (33b) or (33c), as a comparative adjective in (33d), and as a (locative) verb in (33e):

- (33) a. *al-kitaab-u* *ʕalaa* *ʔ-ʔaawilat-i*
 the-book-NOM on the-table-GEN
 ‘The book is on the table.’
- b. *ʔazal-tu* *n-naḥlat-a* *min* *ʕalaa* *ḏaḥr-i-ka*
 removed-I the-bee-ACC from on back-GEN-your
 ‘I took out the bee from above your back.’
- c. *nazala* *l-maaʔ-u* *min* *ʔaʕlaa*
 came down the-water-NOM from above.GEN
 ‘The water went down from above.’
- d. *l-jabal-u* *ʔaʕlaa* *min* *xams-imiʔat-i*
 the-mountain-NOM higher than five-hundred-GEN
 mitr-in
 meters-GEN
 ‘The mountain is higher than five hundred meters.’
- e. *ʕala-t* *l-miyaah-u* *l-jabal-a*
 went.high-F the-water-NOM the-mountain-ACC
 ‘The water went up the mountain.’

It is reasonable to think that these words share the same root as the preposition *ʕalaa* ‘on’, assuming that the latter is born as an *acategorical* Place in $\sqrt{\text{RootP}}$, and later categorized as p, n, a, or v; these options are simply represented as in (34):⁷

- (34) a. *ʕalaa* (p)
-
- b. *ʕalaa/ʔaʕlaa* (n)
-
- c. *ʔaʕlaa* (a)
-
- d. *ʕal-at* (v)
-

3.2. Multiple Embeddings of AxPart Roots

Similar results obtain with adverbial Axparts. Thus, *faʔwqa* ‘above’, *xalfa* ‘back’, *xaarija* ‘outside’, *daaxila* ‘inside’, *ʕabra* ‘through’, etc., can function as verbs in (35), nouns in (36), and adjectives in (37):

- (35) a. *kaana* *ʕadad-u-hum* *y-afuuq-u* *l-xamsiin-a*
was number-NOM-their 3-exceeded-IND the-fifty.ACC
'Their number was exceeding fifty.'
- b. *tafawwaqa* *muḥammad-un* *ʕalaa* *ʔax-ii-hi*
outperformed Mohammed-NOM on brother-GEN-his
'Mohammed outperformed his brother.'
- c. *xalafa* *min* *baʕd-i-him* *xalf-un*
came after from after-GEN-them successors
ʔaḍaaʕ-uu *ṣ-ṣalaat-a*
neglected-they the-prayer-ACC
'There came after them successors who neglected prayer.' (Qur'an, 16)
- d. *xaraja* *r-rajul-u* *min* *bayt-i-hi*
left the-man-NOM from house-GEN-his
'The man left his house.'
- e. *daxala* *r-rajul-u* *bayt-a-hu*
entered the-man-NOM house-ACC-his
'The man entered his house.'
- f. *ʕabar-tu* *n-nahr-a*
crossed-I the-river-ACC
'I crossed the river.'
- (36) a. *waqaf-tu* *fii* *l-xalf-i*
stood-I in the-back-GEN
'I stood up in the back.'
- b. *šaraʕ-tu* *fii* *l-xuruuj-i*
started-I in the-leaving-GEN
'I started to leave.'
- c. *l-duxuul-u* *min* *hunaa*
the-entering-NOM from here
'The entrance is from here.'
- d. *nu-ḥaawilu* *l-ʕubuur-a* *ʔilaa* *d-diffat-i* *l-ʔuxraa*
we-try the-crossing-ACC to the-side-GEN the-other.GEN
'We try to cross to the other side.'
- (37) a. *muḥammad-un* *ṭaalib-un* *mutafawwiq-un*
Mohammed-NOM student-NOM top-NOM
'Mohammed is a top student.'
- b. *staxdim* *l-baab-a* *l-xalfiyy-a*
use the-door-ACC the-back.ACC
'Use the back door.'
- c. *laday-ya* *ʔalam-un* *fii* *l-juzʔ-i* *d-daaxil-i* *min*
to-me pain-NOM in the-part-GEN the-inner-GEN of
l-ʔuḍn-i
the-ear-GEN
'I have a pain in the inner part of the ear.'
- d. *ntaḍar-tu-ka* *fii* *l-qaaʕat-i* *l-xaarijiyyat-i*
waited-I-you in the-room-GEN the-outer-GEN
'I waited for you in the outer room.'

As seen in (35), (36), and (37), these words seem to share the same root with *fawq-a* 'above', *xalf-a* 'back', *xaarij-a* 'outside', *daaxil-a* 'inside', and *ʕabr-a* 'through'. Their structures can be simply represented as in (38):

- (38) a. *xalaf* (v) b. *xalf* (n) c. *xalfiy* (a)
-

3.3. Alternating Syntactic and Semantic PP Subtypes

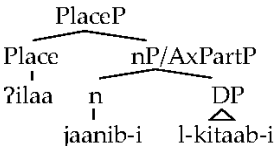
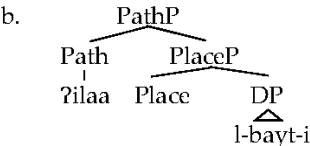
PPs alternate as semantico-aspectual morpho-syntactic types (static/dynamic, loc/dir, Place/Path), in verbless-aspectless (copulative) or verbal (aspectuo-temporal) sentences. They can be classified into three syntactico-semantic subtypes: (a) Loc only, such as *fii* ‘in’; (b) Dir only, such as *sawb-a* ‘towards’; or (c) +Dir, +Loc, such as *?ilaa* ‘to’. In fact, *sawb-a* is also *motional*, as explained above, a fourth subtype. *Fii* ‘in’ occurs in copulative sentences, inducing a locative meaning, as illustrated in (4a) (repeated here in (39a)), unlike *sawb-a* ‘towards’, which is incompatible with static copulative sentences, as illustrated in (39b):

- (39) a. *?anaa fii l-bayt-i*
I in the-house-GEN
‘I am in the house.’
b. **s-sahm-u sawb-a r-rajul-i*
the-arrow-NOM towards-ACC the-man-GEN
‘The arrow towards the man.’

As a matter of fact, *sawb-a* ‘towards’ requires a dynamic motional context, and it normally collocates with motional verbs, as illustrated in (40).

- (40) *taharraka s-sahm-u sawb-a r-rajul-i*
moved the-arrow-NOM towards-ACC the-man-GEN
‘The arrow moved towards the man.’

The roots of *fii* ‘in’ and *sawb-a* ‘towards’ are specified for either only Loc or only Dir or Mot(ion) features. But unlike *fii* and *sawb-a*, *?ilaa* ‘to’ has a root that can be +Dir or +Loc. The duality of $\sqrt{?ilaa}$ ‘to’ has been already introduced in (11a) as PlaceP and in (7) as PathP. It allows the preposition *?ilaa* ‘to’ to occur in both static copulative contexts, as in (9) above, inducing a locative meaning, and dynamic contexts (6a), inducing a directional meaning, hence the two structures in (41):

- (41) a.  b. 

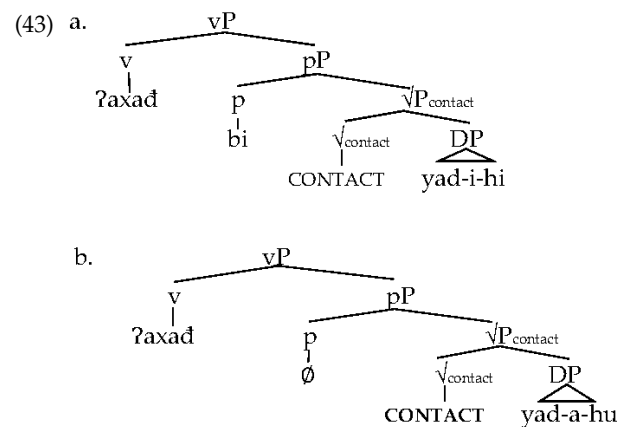
3.4. Conflating Prepositions in Distinct Event Classes or Roles

In the verbal domain, when PPs are part of the semantico-syntactic structure of vPs, syntactic alternations are more clearly associated with semantic correlates: CONTAINMENT, CONTACT⁸, (\pm central) COINCIDENCE, etc.⁹

Consider the CONTACT transitive/PP alternation associated with ‘bi’:

- (42) a. *?axad-tu bi-yad-i-hi* b. *?axad-tu yad-a-hu*
took-I at-hand-GEN-his took-I hand-ACC-his
‘I took (at) his hand.’ ‘I took his hand.’

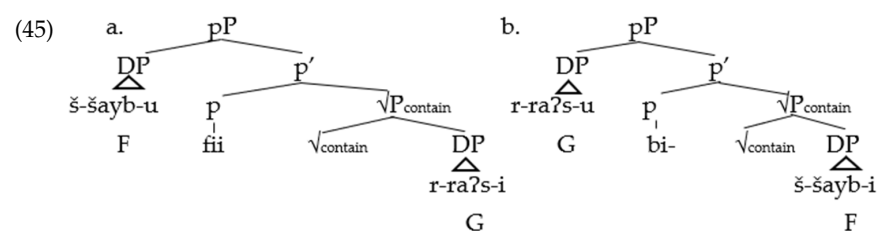
In (42a), *bi-* ‘at’ collocates with the verb *?axad* ‘took’, creating a meaning of CONTACT. This meaning is preserved in the null counterpart (42b), when *bi-* is covert. The difference then between (42a) and (42b) is basically in terms of case assignment. The object *yad* ‘hand’ receives a genitive case in (42a) but an accusative case in (42b). That is to say, the meaning connected with the root is available in both (42a) and (42b), but the genitive case assigning head is available in (42a) but not in (42b). This motivates a separation between the root head ($\sqrt{\text{ }}$) that expresses the CONTACT meaning and the functional head *p* that assigns genitive to the complement. The structures of (42a) and (42b) can be tentatively represented in (43a) and (43b), respectively, where *p* is either overt or covert:



Another syntactic alternation is related to the CONTAINMENT alternation associated with *fii* and *bi-*. While both *fii* and *bi-* seem to relate the same arguments, the roles assigned to the arguments change depending on which preposition is used. *Fii* locates a containee Figure with respect to a container Ground. But *bi-* entails that the container is the Figure and the containee the Ground, the position of which coincides with that of the Figure, reversing somehow the position of the roles. The alternating contrast is illustrated by the pair of constructions in (44):

- (44) a. *štaʕala* *š-šayb-u* *fii* *r-raʔs-i*
 filled the white hair-NOM in the-head-GEN
 'The white hair filled the head.'
- b. *štaʕala* *r-raʔs-u* *bi-š-šayb-i*
 filled the-head-NOM with-the-white hair-GEN
 'The head filled with white hair.'
- (Fassi Fehri 1986; 2021, p. 184)

In (44a), the DP complement of *fii* 'in' (*r-raʔs-i* 'the head') is a G container, whereas the complement of *bi-* 'with' (*š-šayb-i* 'the white hair') is an F containee. At the same time, the subject (or external argument) is an F containee with *fii*, and a G container with *bi-*, or so it seems. These contrasts can be represented as in (45a,b), respectively:

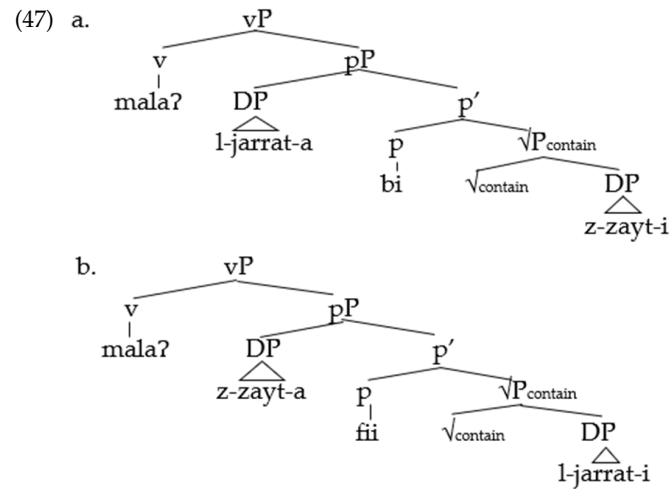


A similar container/containee placement alternation is also manifest in the following pair of sentences:

- (46) a. *malaʔ-tu* *l-jarrat-a* *bi-z-zayt-i*
 filled-I the-jar-ACC with-the-oil-GEN
 'I filled the jar with oil.'
- b. *malaʔ-tu* *z-zayt-a* *fii* *l-jarrat-i*
 filled-I the-oil-NOM in the-jar-GEN
 'I filled the oil in the jar'.

In both (46a) and (46b), *l-jarrat* 'the jar' is a container, and *z-zayt* 'the oil' is the containee. The difference is that *bi-* 'with' relates the container to the containee and *fii* 'in' does the opposite. Both prepositions collocate with the same verb as represented in (47a) and (47b). The complement of *fii*, the container, receives a 'locative' G theta role in (47b), whereas the complement of *bi-*, the containee, appears to play a sort of Means/Instrument role (see

below for more discussion):



It is reasonable to think that the meaning associated with the prepositional root is what determines the thematic roles of its arguments. $\sqrt{bi-}$ carries the meaning of MEANS that makes its complement *z-zayt-i* 'the oil' a tool which the CONTAINER, *l-jarrat-a* 'the jar', is filled with, whereas \sqrt{fii} has a LOC containment meaning that makes its complement *l-jarrat-i* 'the jar' a true container for the Figure CONTAINEE, *z-zayt-a* 'the oil'.

The relation between the Figure and the Ground can also be analyzed in terms of (\pm central) COINCIDENCE, as proposed by Hale and Keyser (1998). It is important to note that *fii* establishes a 'central coincidence' relation, while *bi-* establishes a 'non-central coincidence' relation, as will be explained in the next section.

4. Complex Polysemies and Syntactic Alternations

PPs are found in more complex polysemies, structures, and dialectal variations. In our system, these phenomena are taken care of by distinct structures, depending on constructions that may or may not be related morpho-syntactically, in association with their semantics. Cognitivists, by contrast, rely on hierarchically ordered networks associated with words (Jan 2018; Lentzner 1977; Essees 2010). We claim that this hierarchically ordered 'word approach' is inadequate, given that they do not assume a tight correlation between syntactic (or morpho-syntactic) structure and semantics, do not make meaning depending on constructions (but on words), and hence do not make clear predictions about form–meaning correlations built in the syntax of languages, or about empirically motivated lexical classes or subtypes behind dialectal variation, as we will explain below.¹⁰

4.1. Meanings of *fii* and *bi-*

In traditional grammar, each P is polysemous, although meanings are ordered, starting with basic or primary meanings (Ibn Hišaaam 1985; Al-Muraadii 1992, among others). *Fii* has a number of meanings that are instantiations of the 'lexical' root P. Chiefly, among those meanings is 'locative and temporal circumstantiality', or more specifically, CONTAINMENT *htiwaaʔ*, as illustrated in (48):

- (48) a. *zayd-un fii d-daar-i*
 Zayd-NOM in the-house-GEN
 'Zayd is in the house.'
- b. *sa-ʔutrii fii biqʃ-i siniina*
 FUT-be rich in few-GEN years.GEN
 'I will be rich in few years.'

Another meaning is CAUSATION *taʃliil*, as in (49).

- (49) *qutila kulayb-un fii naaqat-in*
 killed.PASS Kulayb-NOM in cow-GEN
 ‘Kulayb was killed for (stealing/losing) a cow.’ (Jan 2018, p. 133)

A third meaning is ACCOMPANIMENT *musaahaba*:

- (50) *xaraja l-ʔamiir-u fii mawkib-in ḥaaḥil-in*
 went out the-prince-NOM in procession-GEN festive-GEN
 ‘The prince went out in a festive procession.’ (Jan 2018, p.133)

A fourth meaning is SUPERPOSITION *stiflaaʔ*:

- (51) *ṣalaba-hum fii juḍuūʕ-i n-naxl-i*
 crucified-them in trunks-GEN the-palm trees-GEN
 ‘He crucified them on the trunks of palm trees.’ (Jan 2018, p. 134)

In modern grammars, most Arabic linguists converge on the idea that *fii* has a broad LOCATIVE meaning, and a more specific meaning of CONTAINMENT (Fassi Fehri 2021; Lentzner 1977) that corresponds to those of the English preposition ‘in’, or more extensively ‘at’ or ‘on’ as illustrated in (52), (53), and (54), respectively (see also Jan 2018; Esseesy 2010):

- (52) *l-jamaaʕat-u fii l-masjid-i*
 The-group-NOM in the-mosque-GEN
 ‘The group is in the mosque.’
 (53) *y-atajawwalu fii š-šaariʕ-i*
 3-walk in the-avenue-GEN
 ‘He walks in the avenue.’
 (54) *l-qimmat-u fii y-ulyuu*
 the-summit-NOM in July-GEN
 ‘The summit is in July’

The locative meaning of *fii* can be PARTIAL CONTAINMENT (rather than total), in which the Ground partially contains the Figure, as in (55):

- (55) a. *l-ʕuṣfuur-u fii š-šajarat-i*
 the-bird-NOM in the-tree-GEN
 ‘The bird is in the tree.’
 b. *l-wardat-u fii l-mizhariyyat-i*
 the-flower-NOM in the-vase-GEN
 ‘The flower is in the vase.’

The bird in (55a) is not contained by the tree but it is located in one branch of the tree, and only part of its body is attached to the branch. Similarly, in (55b), only part of the flower is located inside the vase (Fassi Fehri and Aamiri 2021; Esseesy 2010).

Moreover, localization can be broad or abstract, where no physical or concrete containment can be inferred, as in (56):

- (56) *ṭanjat-u fii šamaal-i r-ribaaʕ-i*
 Tangier-NOM in north-GEN Rabat-GEN
 ‘Tangier is to the north of Rabat.’

In (56), there is no physical containment relation between Tangier and Rabat.

In the time domain, *fii* situates the Figure in a certain Ground moment in time and means specifically CENTRAL COINCIDENCE in Tense and Aspect. It corresponds to English ‘at’ or ‘in’, which means that the Figure and the Ground either coincide (i.e., overlap in the position in time), as in (57a), or that the Ground is a container inside of which the Figure is located, as in (57b).

- (57) a. *mawʕid-u-na* *fii* *l-xaamisat-i*
 appointment-NOM-our in the-five-GEN
 ‘Our appointment is at 5 o’clock.’
 b. *nahnu* *fii* *l-masaaʔ-i*
 we in the-evening-GEN
 ‘We are in the evening’.

What is of interest, in particular, is to see whether the primary meanings of *fii*- can be confused with those of other close prepositions such as *bi*-. As we will see, their meanings can be contrasted, and the answer appears to be negative.

Bi- ‘at’ is the closest preposition to *fii* ‘in’. But according to traditional grammar, its primary meaning is CONTACT (*ʔilsaaq*), compared to *fii*, which is primarily dedicated to CONTAINMENT or INCLUSION. Prototypically, constructions include first the following verbal complex, where a contact is established between me and the man’s hand in (58a), or me and the man in (58b):

- (58) a. *ʔaxad-tu* *bi-yad-i* *r-rajul-i*
 took-I at-hand-GEN the-man-GEN
 ‘I took the man’s hand.’
 b. *ltaqayt-tu* *bi-r-rajul-i*
 met-I at-the-man-GEN
 ‘I met with the man.’

In all these contexts, *fii* cannot be used instead of *bi*- in the standard variety of Arabic. Other typical meanings of *bi*- include INSTRUMENT/MEANS, or MANNER, as in the following pair, respectively:

- (59) a. *ʔaʕana-hu* *bi-sikkiin-in*
 stabbed.3-him with-knife-GEN
 ‘He stabbed him with a knife.’
 b. *ʔaʕana-hu* *bi-surʕat-in*
 stabbed.3-him with-quickness-GEN
 ‘He stabbed him quickly.’

What is problematic, in traditional descriptions, however, is that they make no room for the general locational meaning that *bi*- can express, which entails that the Figure and the Ground can coincide spatially (or temporally), as in the following example:

- (60) *ʔanaa* *bi-baab-i* *manzil-i-ka*
 I at-door-GEN house-GEN-your
 ‘I am by/at your house door.’

Clearly, the preposition in (60) contributes to locate F with respect to G, but without inducing any containment or inclusion, as indicated by the fact that the introduction of *fii* is not an option here. Moreover, the translation of *bi*- should be ‘at’ rather than ‘in’. This difference clarifies the distinctive interpretation of the PP in (61a), compared to (61b):

- (61) a. *ʔinnaka* *bi-l-waadii* *l-muqaddas-i,* *ʔawaa*
 you at-the-valley.GEN the-sacred-GEN Tawa
 ‘You are at the sacred valley, Tawa.’ (Quran, 16)
 b. *ʔanta* *fii* *l-waadii*
 you in the-valley.GEN
 ‘You are in the valley.’

We propose that CONTACT or non-central COINCIDENCE is the specific meaning of the spatial *bi*- ‘at’. Hale (1986) claims that two essential distinct local cases in Walbiri can be defined along the coincidence notion, characterizing the role of F (or theme) with respect to G (or Place), or spatial–temporal relations more generally; see Demirdache and Uribe-Etxebarria (2014) for the (adapted) following formulation that extends to temporality:

- (62) a. [+ CENTRAL COINCIDENCE; +CC]: F within G (*fii*)
Location, trajectory, or linear arrangement of F centrally coincides with G.
b. [- CENTRAL COINCIDENCE; -CC]: F not within G: 'terminal', 'initial', etc. (*bi-*)
Location, trajectory, or linear arrangement of F does not centrally coincide with G.

In (61a), the location of the interlocutor coincides with that of the valley, without inducing any containment or inclusion, contrary to (61b), that is, without inducing central coincidence. *Fii* 'in', on the other hand, locates the Figure in a position interior and within the boundaries of the Ground, a CONTAINMENT or CENTRAL COINCIDENCE relation. What differentiates *bi-* 'at' from *fii* 'in' is, we propose, the meaning connected with the root. The root of *bi-* 'at' is distinct from that of *fii* 'in':



Therefore, in Standard Arabic, *bi-* 'at' does not normally replace *fii* 'in', although it so often does in dialects, a variation that we return to in the next subsection.

4.2. Lexical Variation as Distinct Vocabulary

Lexical variation can elegantly be associated with a distributed model in the standard variety or between other varieties. For example, in Mashriqi dialects, *bi-* 'at' replaces *fii* in denoting CONTAINMENT (in addition to CENTRAL COINCIDENCE), as in (66a,b) below, from Levantine Arabic:

- (64) a. *ʔana bi-l-bet* b. *ʔana bi-l-bab*
I in-the-house I at-the-door
'I am **in** the house.' 'I am **at** the door.'

In Maghribi dialects, on the other hand, *fii* is often generalized, instead of *bi* (both are mostly reduced to *f-* and *b-*), as in Moroccan Arabic (65):

- (65) a. *ʔana f-d-dar* b. *ʔana f-l-bab*
I in-the-house I at-the-door
'I am **in** the house.' 'I am **at** the door.'

Bi- in Mashriqi dialects replaces *fii-* in denoting containment in time:

- (66) *n-tlaaqa* *bi-l-masaa/bi-l-lail*
we-meet in-the-evening
'We meet in the evening/at night.'
(Fassi Fehri and Aamiri 2021, p. 160)

In Maghribi dialects, on the other hand, *f-* is used instead of *b-*, as in Moroccan Arabic (67):

- (67) *n-tlaaqaaw* *f-l-ʕaššia/f-l-liil*
we-meet in-the-evening
'We meet in the evening/at night.'

With perception or contact verbs, Maghribi dialects, as in the (b) examples, more often use *b-*, while Mashriqi dialects use *f-*, as in the (a) examples:

- (68) a. *ħasse-t fiik* b. *ħssee-t bi-k*
felt.I in-you felt.I at-you
'I felt you'
- (69) a. *taṣal-t fi-k* b. *taṣal-t bi-k*
contacted-I in-you contacted-I at-you
'I contacted you.'

- (70) a. *raḥḥab* *fiy-ya* b. *raḥḥab* *biy-ya*
welcomed in-me welcomed at-me
'He welcomed me.'

To express MANNER, *b-* is mostly used in these dialects, rather than *f-*:

- (71) a. *ta-n-ṭkellem* *b-š-šweyya* (Maghribi)
PROG-I-talk with-slow
'I talk slowly.'
b. *be-n-t-kallam* *b-šwayaš* (Mashriqi)
PROG-we-talk with-slow
'We talk slowly.'

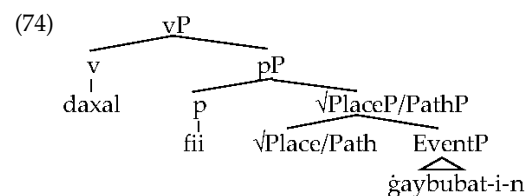
4.3. Morpho-Syntactic Alternations

Morpho-syntactic alternations play a major role in revealing the lexical side of the prepositions. Among these alternations are Places/Paths, transitivity, causativity, or other prepositional alternations.

4.3.1. Place and Path Alternations

Fii 'in' alternates between being a Place head in space and state as in (72), or a Path head when it collocates with a motion verb such as *daxal* 'enter', indicating a change of state as in (73), represented in (74):

- (72) a. *r-rajul-u* *fii* *l-manzil-i*
the-man-NOM in the-house-GEN
'The man is in the house.'
b. *r-rajul-u* *fii* *ḡaybubāt-i-n*
the-man-NOM in coma-GEN-N
'The man is in a coma.'
- (73) *daxala* *r-rajul-u* *fii* *ḡaybubāt-i-n*
entered the-man-NOM in coma-GEN-N
'The man entered into a coma.'



The motion event can only select a PathP. When *fii* collocates with a motion event, it denotes a directional Path, having basically the meaning of the directional Path *ʔilaa*, rather than a pure locational Place.

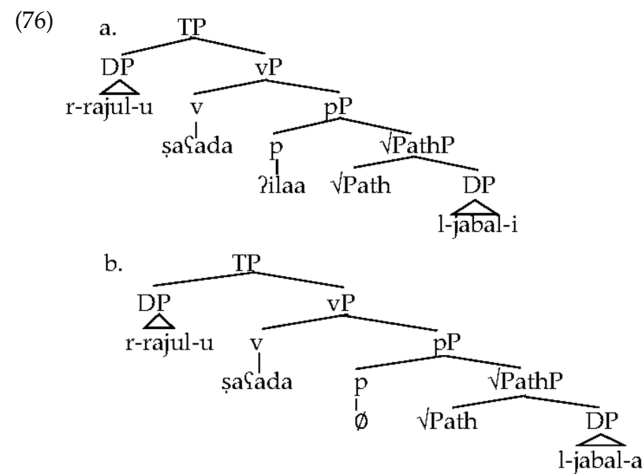
4.3.2. Transitivity and Causative Alternations

Constructions with *ʔilaa* 'to' seem to exhibit a prepositional/accusative alternation in which *ʔilaa* 'to' is either overt or hidden:

- (75) a. *šaʕada* *r-rajul-u* *ʔilaa* *l-jabal-i*
climb the-man-NOM to the-mountain-GEN
'The man climbed (to) the mountain.'
b. *šaʕada* *r-rajul-u* *l-jabal-a*
climb the-man-NOM the-mountain-ACC
'The man climbed the mountain.'

ʔilaa expresses a Goal–Path meaning here. This meaning is available in both (75a) and (75b), which suggests the presence of a Path root P in both constructions. If so, then the difference appears to be only in the case assignor. The genitive case assignor, *p*, is available

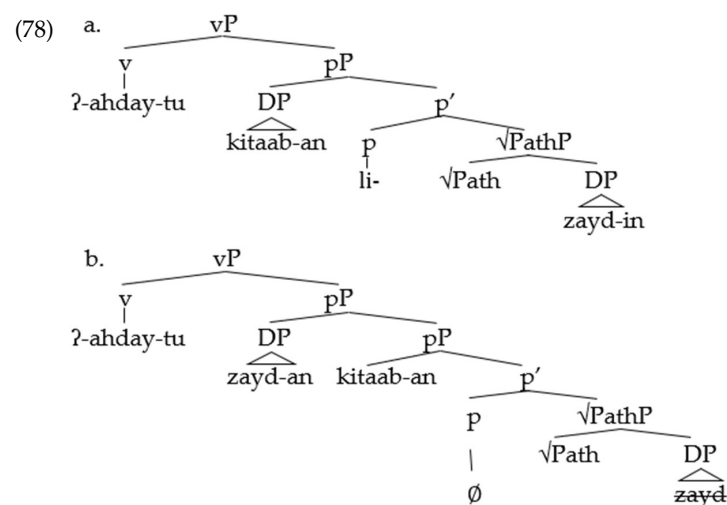
in (75a) but not in (75b). The absence of the structural case assigner, *p*, leaves *l-jabal-a* ‘the mountain’ in (75b) without case. It is then assigned a sort of oblique ‘accusative’ by default. The two alternations can be represented as follows:



Consider now causative alternations. Prepositional/accusative alternations also occur in causative constructions in which the preposition has an overt/null alternation, as illustrated in (77):

- (77)
- a. ʔ-ahday-tu kitaab-an li-zayd-in
 CAUS.gave-I book-ACC to-Zayd-GEN
 ‘I gave a book to Zayd.’
- b. ʔ-ahday-tu zayd-an kitaab-an
 CAUS.gave-I Zayd-ACC book-ACC
 ‘I gave Zayd a book.’

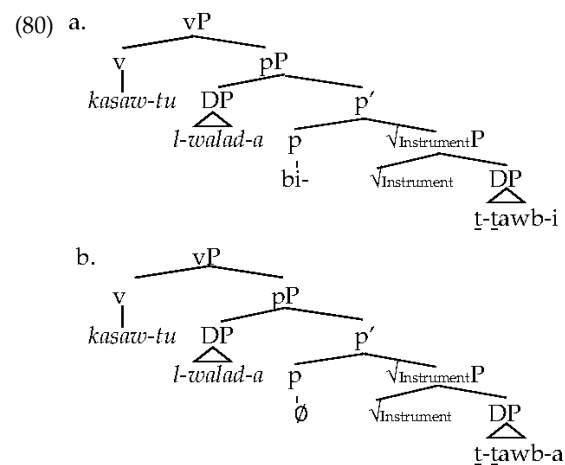
In both (77a) and (77b), *Zayd* is the dative or the Recipient of the action. The dative interpretation is assigned by the Goal root $\sqrt{\text{li-}}$. To put it differently, the dative root $\sqrt{\text{li-}}$ is assumed to be the source of the dative interpretation, and it is available for both (77a) and (77b). The two constructions then differ only in the source of case assignment. The prepositional *p* head assigns the genitive case in (77a). But in order for *Zayd* to receive (structural dative) case in (77b), it moves to a position where it is assigned accusative by *v*. The examples in (77a) and (77b) are represented in (78a) and (78b), respectively.¹¹



If (78a) is roughly the basic structure for both constructions in (77), then the dative has to move higher in (78b), adjoining to the pP, to get structural case there.

A further example of an overt/null alternation is illustrated in (79) and represented in (80):¹²

- (79) a. *kasaw-tu* *l-walad-a* *bi-t-tawb-i* (tool/instrument)
 wore-I the-child-ACC with-the-cloth-GEN
 'I have worn the child with the cloth.'
 b. *kasaw-tu* *l-walad-a* *t-tawb-a*
 wore-I the-child-ACC the-cloth-ACC
 'I made the child wear the cloth.'
 (Fassi Fehri 2021, p. 183)



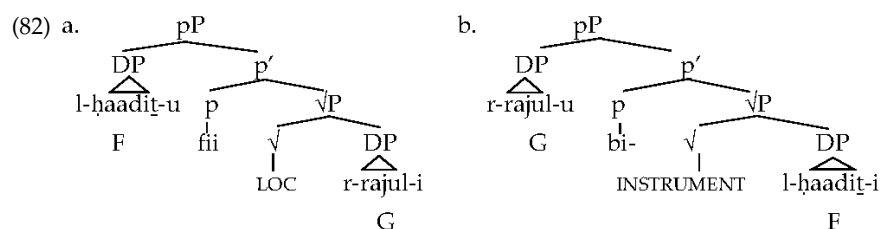
In both (80a) and (80b), *t-tawb* 'the cloth' is the tool or instrument used for the action of wearing. In (80a), the causative verb *kasaa* 'made him wear' makes use of the overt preposition *bi-*, in expressing the Instrument role. The preposition *bi-* is dominated by the functional p, and it assigns the complement *t-tawb* a genitive case. In (80b), the preposition is silent, and *t-tawb* 'the cloth' receives an accusative case via v.

4.3.3. Distinct Role Alternations

Prepositions can have closely related meanings that can relate the same arguments (Figure and Ground) but with different relations, as discussed in Section 3.4 above. Consider further alternations of *fii* 'in' and *bi-* 'by' in (81):

- (81) a. *ʔattara* *l-ħaadit-u* *fii r-rajul-i*
 affected the-accident-NOM in the-man-GEN
 'The accident affected the man.'
 b. *ta-ʔattara* *r-rajul-u* *bi-l-ħaadit-i*
 REFLEX-affected the-man-NOM by-the-accident-GEN
 'The man got affected by the accident.'

In (81a), *l-ħaadit-u* 'the accident' is the Figure or the Cause and *r-rajul-i* 'the man' is the complement Ground or the entity affected, as represented in (82a). On the other hand, *r-rajul-u* 'the man' in (81b), which is the Ground, is in the Specifier position, and the Figure *l-ħaadit-i* 'the accident' is the complement, as represented in (82b). It is true that the selection of the preposition depends on the form of verb, but the relation between the Figure and the Ground is determined by the preposition (or, more specifically, the prepositional root).



These alternations suggest the presence of the lexical meaning associated with the P root, regardless of its function as a case assignor.

5. Conclusions

In this article, we have argued for a dual PP structure: a (lexical) \sqrt{P} and a (functional) categorizing pP. One complexity of the traditional one-projection structure (i.e., PlaceP and PathP) is that not all Ps that are semantically locational Places or directional Paths function as prepositions. Adverbial AxPart phrases (*ḍuruuf*) semantically denote location, direction, or motion, but function syntactically as nouns or nPs. We provided evidence that prepositions have a dual life based on the multiple category argument, the syntactic and semantic subtypes of the prepositional roots, and the conflation of prepositions in distinct event classes and roles, resulting in overt/null prepositional/accusative alternations. Different categories of v, n, a, or p can be derived from the same prepositional root, which carries the meaning of three semantic subtypes: locational, directional, and motional. It is proposed that the meaning content of the PP survives even when the preposition is silent. Further complex polysemies, variations, and syntactic alternations have been provided to add further support to the distinct lexical and functional projections of the prepositions. Lexical variation between *fii* and *bi* is accounted for as distinct vocabulary instantiations of the same contentful root. Such considerations can hardly be accounted for if the lexical root ('big P') and the case assignor ('small p') are fused into one projection. The arguments provided throughout the article aim at establishing the superiority of the dual distributed treatment of the PP structure, compared to single projection approaches. If true, then the duality of root and category specifications of DM generalizes to PPs, in addition to other more studied verb, noun, or adjective roots and categories, already well-integrated into the system.

Author Contributions: Both authors have equally contributed to the conceptualization, methodology, formal analysis, data curation, writing—original draft, writing—review and editing, visualization, supervision, and project administration. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: We would like to thank two anonymous reviewers of *Languages* for insightful remarks and suggestions. This piece of work is part of the ACVL project conducted by various scholars from Arabic universities and research centers, under the direction of Pr Fassi Fehri, and coordinated by the Linguistic Society of Morocco, Rabat. We would like to thank the various teams involved in this project, including Nadia Aamiri, Huda Salem Taha, Samira Saeed, Bashayer Al-Otaibi, Nuha al-Shurafa, and Meera Al-Mabkhout, for fruitful discussions and remarks. Needless to say, errors are our own.

Conflicts of Interest: The authors declare no conflict of interest.

Notes

- ¹ Our conception of 'roots' is basically that of Distributed Morphology (Marantz 1997; Wood and Marantz 2017; Harley 2014, among others), which holds that roots are the more basic units of the lexicon, devoid of category features, and they merge with categorizers in the grammar, vocabulary words being only lately merged. This view suggests that roots are inserted earlier in the derivation, and when a root combines with n, it becomes nominal, with v, it becomes verbal, with p, prepositional, etc., Borer (2014, p. 343) observes similarly that a "central role is played not by a 'word' or a 'lexeme' ... , but rather by a 'root' [...

and] there is a general understanding that roots are at the very least devoid of syntactic category . . . Beyond that, what roots are, exactly, is by no means agreed upon . . . ”.

With the exoskeletal approach to grammar (Borer 2005, 2014), roots are inserted lately into syntactic structures which carry the relevant category, meaning that the syntactic environment is already created.

In our view, roots are provided with semantic content. As Levinson (2014, p. 209) puts it: “roots must be specified for semantic type (in the sense of formal type theory) in order to compose with other syntactic constituents. The type of the root has apparently syntactic ramifications, as it determines the arguments the root combines with, and the combinatorial possibilities in semantic composition”. See also Levinson (2019).

Chomsky (2013) argues that Merge is the simplest computational operation, an operation that takes two objects X, Y (already constructed) and forms a new object Z in its simplest form. That is, Merge (X, Y) = {X, Y}. Merge thereby creates the relation ‘member of’ for X and Y. See also Collins (2017). As in Chomsky (2019), we assume that Merge associates Root (a lexical ‘word’) and f (a functional word) to form a complex word, in line with Distributed Morphology. The ‘single engine hypothesis’, a key assumption in Marantz (1997), unifies the computational generation for both words and larger phrases. Words are then built not in the ‘lexicon’, but in syntax (a sort of L-syntax; see Hale and Keyser 1998, 2002; Halle and Marantz 1993). Words are primarily born as roots, the atomic syntactic units which provide the “lexical” content. Roots are acategorial, and category features (like ‘verb’ or ‘noun’) become parts of ‘words’ only when they combine with category-specific heads in category syntax. For application to Arabic specifically, and various lexical classes in the *Arabic Constructional and Variational Lexicon*, (= ACVL), built along the DM design, see Fassi Fehri (2021) ed.

In Svenonius’ work, Path and Place are not only semantic (as in Landau and Jackendoff 1993), but also syntactic and ‘cartographic’, a view that we adopt here, taking them to be ‘flavors’ of p. Place and Path can also be roots, providing content to ‘where’, essentially, as we will see below.

Among the nominal properties of these weak ns, compared to prepositions, we can mention that they obtain structural case, assign genitive to their complement (in construct states), receive genitive case from prepositions, etc. Unlike normal Ns, they do not carry a definite article, and they can receive a ‘frozen’ nominative case’, as in (i), compared to (ii):

- | | | | | | |
|------|----------------------------------|---------------|------------|---------------|------------------------|
| (i) | <i>haṣala</i> | <i>haaḍaa</i> | <i>min</i> | <i>baʿd-u</i> | |
| | happened | this | from | after-NOM | |
| | ‘This happened after.’ | | | | |
| (ii) | <i>haṣala</i> | <i>haaḍaa</i> | <i>min</i> | <i>baʿd-i</i> | <i>l-istiraah-at-i</i> |
| | happened | this | from | after-GEN | the-break-FEM-GEN |
| | ‘This happened after the break.’ | | | | |

Such mixed behavior then suggests a semi-lexical treatment; see Klockman (2017) on this option cross-linguistically, and Saeed (2014), Al-Bataineh (2021) for Arabic.

Recall that there is a general consensus that directional PPs are PathP that embeds a PlaceP. The Place head is either empty/silent (with simple directional Ps), or filled with a locative P (with complex directional PPs).

In fact, the empty P analysis has its original source in Emonds (1987), akin to his Invisible Category Principle, according to which an empty category is not silent syntactically, although it is phonologically silent. Kayne (2005), in particular, has since then enlarged the use of silent words or categories in the grammar.

We represent the content or ‘CONCEPT’ denoted by the prepositional root in small capital letters, and the ‘vocabulary’ item by small letters, to distinguish the root (or P) from the category (p).

For more on the feature [± CONTACT], see, e.g., Jackendoff (1990), pp. 106–12.

For more on spatial configurations of CONTAINMENT, see, e.g., Tyler and Evans (2003), pp. 23–53.

We distinguish simply here between two main groups of dialects, Mashriqi and Maghribi, although there are obviously differences between dialects inside groups, or more sophisticated sub-classifications, as correctly pointed out by a reviewer. A detailed description of the variation is beyond the aim of this article. See Fassi Fehri (2021), for some elaborations.

The linguistic literature is full of competing approaches for analyzing dative-like alternations, occurring typically in English, and especially with regard to whether the two structures are derivationally related, or base-generated with distinct, though quite close structures. See Harley (2002) for a partial overview and references there. Our structures here are similar in spirit to Pesetsky’s (1995) and Harley’s (*ibid*) in that both the complement structure and the double object structure assume a PP derivation for the dative, in which the Pgoal may be empty (see structures (2), p 33). Harley adds that the essential alternation is between PLOC in the complement structure and PHAVE in the double object structure. We leave it here for further motivation in Arabic along DM lines; see various chapters and authors in Fassi Fehri (2021) ed.

The detailed motivation of these structures is obviously in need of more precision and argumentation than this space will allow here. For more clarifications, see Fassi Fehri (2021), and (2012).

References

- Al-Bataineh, Hussein. 2021. The Syntax of Exceptives and Exclamatives in Arabic. Ph.D. dissertation, Memorial University of Newfoundland, St. John's, NL, Canada. [CrossRef]
- Al-Humari, Mustafa Ahmed. 2015. Spatial prepositions in Modern Standard Arabic. *Language in India* 15: 1–16. Available online: <http://www.languageinindia.com/aug2015/alhumarispatialprepositions.pdf> (accessed on 20 July 2022).
- Al-Muraad, Hassan. Qassim. 1992. *Al-junaa al-daani fii huruufi-l-maʿaanii*. [14th Century]. Beirut: Dar al Afaaq. Available online: https://archive.org/details/1249pdf_201912/page/n13/mode/2up (accessed on 15 August 2020).
- Baker, Mark. 2003. Verbal adjectives as adjectives without phi-features. Paper presented at the Fourth Tokyo Conference on Psycholinguistics, Tokyo, Japan, March 14–15; Edited by Yukio Otsu. Tokyo: Keio University, pp. 1–22.
- Borer, Hagit. 2005. *Structuring Sense Volume I: In Name Only*. Oxford: Oxford University Press. [CrossRef]
- Borer, Hagit. 2014. The category of roots. In *The Syntax of Roots and the Roots of Syntax*. Edited by Artemis Alexiadou, Hagit Borer and Florian Schäfer. New York: Oxford University Press, pp. 112–48. [CrossRef]
- Chomsky, Noam. 1970. Remarks on nominalization. In *Readings in English Transformational Grammar*. Edited by Roderick A. Jacobs and Peter S. Rosenbaum. Boston: Ginn, pp. 184–221. Available online: [http://hborer.sllf.qmul.ac.uk/Chomsky%20Remarks%20on%20Nominalization%20\(1970;%20rev%201975\)%20OCR.pdf](http://hborer.sllf.qmul.ac.uk/Chomsky%20Remarks%20on%20Nominalization%20(1970;%20rev%201975)%20OCR.pdf) (accessed on 29 December 2022).
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: The MIT Press. [CrossRef]
- Chomsky, Noam. 2013. Problems of Projections. *Lingua* 130: 33–49. [CrossRef]
- Chomsky, Noam. 2019. The UCLA Lectures on Linguistic Theory. Available online: <https://linguistics.ucla.edu/noam-chomsky/> (accessed on 29 December 2022).
- Chomsky, Noam, and Howard Lasnik. 1977. Filters and control. *Linguistic Inquiry* 8: 425–504.
- Collins, Chris. 2007. Home sweet home. *NYU Working Papers in Linguistics* 1: 1–34. Available online: <https://as.nyu.edu/content/dam/nyu-as/linguistics/documents/nyuwpl/collins-2007-nyuwpl.pdf> (accessed on 4 January 2021).
- Collins, Chris. 2017. Merge(X,Y) = {X,Y}. In *Labels and Roots*. Edited by Leah Bauke, Andreas Blümel and Erich Groat. Berlin: De Gruyter Mouton, pp. 47–68. [CrossRef]
- Deacon, Robert Joel. 2011. P-Forms in Distributed Morphology: Accounting for a Type of Semilexical Form. Master's dissertation, University of Florida, Gainesville, FL, USA.
- Demirdache, Hamida, and Myriam Uribe-Etxebarria. 2014. Aspect and temporal anaphora. *Natural Language and Linguistic Theory* 32: 855–95. [CrossRef]
- den Dikken, Marcel. 2010. On the functional structure of locative and directional PPs. In *Mapping Spatial PPs: Cartography of Syntactic Structures*. Edited by Guglielmo Cinque and Luigi Rizzi. Oxford: Oxford University Press, pp. 74–126. [CrossRef]
- Emonds, Joseph. 1987. The Invisible Category Principle. *Linguistic Inquiry* 18: 613–32.
- Esseesy, Mohssen. 2010. *Grammaticalization of Arabic Prepositions and Subordinators: A Corpus-based Study*. Leiden: Brill. [CrossRef]
- Fassi Fehri, Abdelkader. 1986. *Al-muʿjam al-ʿarabii: Namaadij tahii liyah jadiidah*. [The Arabic lexicon: New analytical issues]. Casablanca: Dar Tubqal Publishers.
- Fassi Fehri, Abdelkader. 2012. *Key Features and Parameters in Arabic Grammar*. Amsterdam, Philadelphia: John Benjamins. [CrossRef]
- Fassi Fehri, Abdelkader, ed. 2021. *The Arabic Constructional and Variational Lexicon. Foundations, Models, and Issues*. Amman: Dar Kunuuz Almaarifa, (In Arabic and English).
- Fassi Fehri, Abdelkader, and Nadia Aamiri. 2021. *binaaʔ al-murakkabat al-ḥarfiyyah wa-ḍ-ḍarfiyyah* [Constructing Prepositional and Adverbial Phrases]. In *The Arabic Constructional and Variational Lexicon*. Edited by Abdelkader Fassi Fehri. Amman: Dar Kunuuz Almaarifa Publishers, pp. 105–188.
- Fassi Fehri, Abdelkader, and Maather Alrawi. 2021. Arabic spatial PPs and beyond. In *The Arabic Constructional and Variational Lexicon*. Edited by Abdelkader Fassi Fehri. Amman: Dar Kunuuz Almaarifa, pp. 17–71.
- Gehrke, Berit. 2008. *Ps in Motion: On the Semantics and Syntax of P Elements and Motion Events*. LOT Dissertation Series 188. Utrecht: LOT.
- Grimshaw, Jane. 1991. Extended Projection. Master's thesis, Brandeis University, Waltham, MA, USA.
- Hale, Kenneth L. 1986. Notes on world view and semantic categories: Some Warlpiri examples. In *Features and Projections, Studies in Generative Grammar*. Edited by Pieter Muysken and Henk van Riemsdijk. Dordrecht: Foris Publications, pp. 233–54.
- Hale, Kenneth, and Samuel Jay Keyser. 1998. The Basic Elements of Argument Structure. pp. 1–50. Available online: <https://www.semanticscholar.org/paper/THE-BASIC-ELEMENTS-OF-ARGUMENT-STRUCTURE-Hale-Keyser/14ab5a36029121022e546aa4b951cec4cd1d8943> (accessed on 20 March 2000).
- Hale, Kenneth, and Samuel Jay Keyser. 2002. *Prolegomenon to the Theory of Argument Structure*. Cambridge, MA: MIT Press. [CrossRef]
- Halle, Morris, and Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In *The View from Building 20*. Edited by Kenneth Hale and Samuel Jay Keyser. Cambridge, MA: MIT Press, pp. 111–176.
- Harley, Heidi. 2002. Possession and the double object construction. *Linguistic Variation Yearbook* 2: 31–70. [CrossRef]
- Harley, Heidi. 2014. On the identity of roots. *Theoretical Linguistics* 40: 225–76. [CrossRef]
- Herskovits, Annette. 1986. *Language and Spatial Cognition: An Interdisciplinary Study of the Prepositions in English*. Cambridge: Cambridge University Press.
- Ibn Hišām, Jamaledin. 1985. *Muḡnii l-labiib*, 6th ed. [14th Century]. Cairo: Al-Madani Publishers.
- Jackendoff, Ray. 1977. *X-Bar Syntax: A Study of Phrase Structure*. Cambridge, MA: MIT Press. [CrossRef]
- Jackendoff, Ray. 1983. *Semantics and Cognition*. Cambridge, MA: MIT Press.

- Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge, MA: The MIT Press.
- Jan, Hana. 2018. A Cognitive Linguistic Approach to Explaining the Polysemy of ‘Alaa and Fii in Modern Standard Arabic. Ph.D. dissertation, Georgetown University, Washington, DC, USA. Available online: https://repository.library.georgetown.edu/bitstream/handle/10822/1051993/Jan_georgetown_0076D_14095.pdf?isAllowed=y&sequence=1 (accessed on 1 March 2022).
- Kayne, Richard S. 2005. *Movement and Silence*. New York: Oxford University Press. [CrossRef]
- Klockman, Heidi. 2017. The Design of Semi-Lexicality. Evidence from Case and Agreement in the Nominal Domain. Ph.D. dissertation, Utrecht University, Utrecht, The Netherlands.
- Koopman, Hilda. 2000. Prepositions, postpositions, circumpositions, and particles. In *The Syntax of Specifiers and Heads*. Edited by Hilda Koopman. London: Routledge, pp. 204–60. [CrossRef]
- Kracht, Marcus. 2002. On the semantics of locatives. *Linguistics and Philosophy* 25: 157–232. [CrossRef]
- Landau, Barbara, and Ray Jackendoff. 1993. “What” and “where” in spatial language and spatial cognition. *Behavioral and Brain Sciences* 16: 217–65. [CrossRef]
- Larson, Richard. 1988. On the Double Object Construction. *Linguistic Inquiry* 19: 335–91.
- Larson, Richard. 2014. *On Shell Structure*. New York and London: Routledge. [CrossRef]
- Lentzner, Karin Ryding. 1977. Semantic and Syntactic Aspects of Arabic Prepositions. Ph.D. dissertation, Georgetown University, Washington, DC, USA.
- Levinson, Lisa. 2014. The ontology of roots and verbs. In *The Syntax of Roots and the Roots of Syntax*. Edited by Artemis Alexiadou, Hagit Borer and Florian Schäfer. New York: Oxford University Press, pp. 208–29. [CrossRef]
- Levinson, Lisa. 2019. Semantic domains for syntactic word-building. In *The Oxford Handbook of Event Structure*. Edited by Robert Truswell. Oxford: Oxford University Press, pp. 265–86.
- Marantz, Alec. 1997. No Escape from Syntax: Don’t Try Morphological Analysis in the Privacy of Your Own Lexicon. *University of Pennsylvania Working Papers in Linguistics* 4: 201–25.
- Matushansky, Ora, and Joost Zwarts. 2019. Tops and bottoms: Axial nominals as weak definites. In *Proceedings of WCCFL 36*. Edited by Richard Stockwell, Maura O’Leary, Zhongshi Xu and Z. L. Zhou. Sommerville: Cascadia Press, pp. 270–80. Available online: <http://www.lingref.com/cpp/wccfl/36/paper3471.pdf> (accessed on 5 October 2020).
- Nchare, Abdoulaye Laziz, and Arhonto Terzi. 2014. Licensing silent structure: The spatial prepositions of Shupamem. *Natural Language & Linguistic Theory* 32: 673–710. [CrossRef]
- Pesetsky, David. 1995. *Zero Syntax: Experiencers and Cascades*. Cambridge, MA: The MIT Press.
- Ryding, Karin C. 2005. *A Reference of Modern Standard Arabic*. Cambridge: CUP. [CrossRef]
- Saeed, Sameerah. 2014. The syntax and semantics of Arabic spatial Ps. *Newcastle and Northumbria Working Papers in Linguistics* 20: 44–66. Available online: https://www.researchgate.net/publication/330003099_The_Syntax_and_semantics_of_Arabic_spatial_Ps (accessed on 2 January 2021).
- Svenonius, Peter. 2006. The emergence of axial parts. *Tromsø Working Papers in Linguistics* 33: 50–71. [CrossRef]
- Svenonius, Peter. 2010. Spatial P in English. In *Mapping Spatial PPs, The Cartography of Syntactic Structures*. Edited by Guglielmo Cinque and Luigi Rizzi. Oxford: Oxford University Press, pp. 127–60. [CrossRef]
- Svenonius, Peter. 2012. Structural Decomposition of Spatial Adpositions. Master’s dissertation, Universitetet i Tromsø, Tromsø, Norway. Available online: <https://blogg.uit.no/psv000/wp-content/uploads/sites/55/2018/04/Bochum2012.pdf> (accessed on 4 February 2021).
- Tyler, Andrea, and Vyvyan Evans. 2003. *The Semantics of English Prepositions*. Cambridge: Cambridge University Press. [CrossRef]
- van Riemsdijk, Henk, and Riny Huybregts. 2002. Location and locality. In *Progress in Grammar*. Edited by Marc van Oostendorp and Elena Anagnostopoulou. Amsterdam: Meertens Instituut, pp. 1–23. Available online: <https://www.meertens.knaw.nl/books/progressingrammar/riemsdijk.pdf> (accessed on 15 March 2021).
- Weinreich, Uriel. 1963. On the semantics structure of language. In *Universals of Language*. Edited by Joseph H. Greenberg. Cambridge: Cambridge University Press, pp. 142–216. Available online: https://ia800504.us.archive.org/16/items/universalsoflang00unse/universalsoflang00unse_bw.pdf (accessed on 29 December 2022).
- Wood, Jim, and Alec Marantz. 2017. The interpretation of external arguments. In *The Verbal Domain*. Edited by Roberta D’Alessandro, Irene Franco and Ángel J. Gallego. Oxford: Oxford University Press, pp. 255–78. [CrossRef]
- Wunderlich, Dieter. 1991. How do prepositional phrases fit into compositional syntax and semantics? *Linguistics* 29: 591–621. [CrossRef]
- Zwarts, Joost. 1997. Vectors as relative positions: A compositional semantics of modified PPs. *Journal of Semantics* 14: 57–86. [CrossRef]
- Zwarts, Joost. 2005. Prepositional aspect and the algebra of paths. *Linguistics and Philosophy* 28: 739–79. [CrossRef]
- Zwarts, Joost, and Yoad Winter. 2000. Vector space semantics: A model theoretic analysis of locative prepositions. *Journal of Logic, Language, and Information* 9: 169–211. [CrossRef]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.