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Motivating a fine-grained syntax of Arabic prepositional phrases

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The paper provides a novel motivation in favor of a complex and fine-grained syntax of spatial PPs in Arabic. It neatly fills a gap between the complex semantics of spatial expressions and their morphosyntax, which remains unexplained using wide spread cognitive approaches. We propose a fine-grained architecture of root nodes, categories, and features in the basic representations of Path/Place expressions, inspired by cartographic analyses of PPs, but based on a pP dual-projection model, separating the root/lexical part from the functional/categorial part, as in Distributed Morphology (=DM). In so doing, the paper challenges traditional analyses of PPs as projecting a uniform Path over Place structure (with no bifurcating domain separation). It also provides essential ingredients allowing the decomposition of Place and Path words or expressions, including COINCIDENCE, CONTAIN, CONTACT, etc., or syntactic projections such AxPs, DeixPs, DegPs, ScaleP, GoalPs, etc., which play important syntactico-semantic roles in the grammar. Our analysis successfully accounts for complexity of prepositions or spatial expressions, their morphosyntactic alternations, variation, and polysemy.

KEYWORDS

prepositions, Axial Parts, Place, Path, P, Distributed Morphology, Arabic

1 Basic issues

Prepositions have a rich semantic content and can operate in various domains, including space, time, degree, or force dynamics. Their semantics have been widely studied in the literature (Jackendoff, 1983; Herskovits, 1986; Kracht, 2002; Gärdenfors, 2015, among others). Crucially, some of these properties have been shown to be not only semantic (or ontological), but also of syntactic impact on grammaticality and the syntactic structure of PPs in numerous detailed studies (Jackendoff, 1983; Wunderlich, 1991; Zwarts, 1997, 2005; Koopman, 2000; Zwarts and Winter, 2000; Kracht, 2002; Gehrke, 2008; den Dikken, 2003, 2010; Svenonius, 2010). But more syntactico-semantic features remain to be explored. Our contribution aims at refining the granularity of the PP semantic and syntactic structure in spirit of the Cartography approach (typically Cinque, 2010; Svenonius, 2010, 2012; Procházka, 2011), although relying on a Distributed Morphology design (Halle and Marantz, 1993; Wood and Marantz, 2017). We describe some core fragments of the grammar of Arabic PPs along the lines sketched, in contrast to dominant cognitive approaches of Arabic PPs, in which syntax plays only a minor role in structuring prepositional meanings (Lentzner, 1977; Esseesy, 2010; Jan, 2018).

1.1 Places and paths

As in Talmy (1975, 2000), prepositions normally denote a relation between two arguments, Figure and Ground, which express the external and internal arguments, the

object located and the reference land mark. Jackendoff (1983) decomposes PPs into his “ontological categories” PLACE or PATH, and a consensus has developed since then on the relevance of two main functional/syntactic categories: Place and Path, as illustrated in the examples in (1).

- (1) a. The elephants remained in the boat. (Svenonius, 2006, p. 127)
- b. The boat is drifted to Narvik.

In (1a), the PP *in the boat* is a PlaceP, while the PP in (1b) *to Narvik* is a PathP. Prepositions that are associated with stative locational meanings project are Place heads while prepositions associated with directional meanings projects are Path heads. This classification is not only semantic but also reflected in syntax. For example, locative PPs can co-occur with stative verbs like *be*, *stay*, *remain* (Gehrke, 2008, p. 87), which select them, but not with directional PPs, as the contrast in (2) shows:

- (2) a. The /remained /on /under/ behind the table.
 box in stayed
- b. *The /remained /into/ from /out /down/ through
 box to of the stayed
 table.

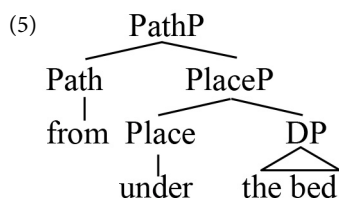
In German, locative prepositions govern the dative case ([+OBL]), whereas directional prepositions mostly govern the accusative case ([−OBL]), as in (3) (Bierwisch, 1996, p. 32):

- (3) a. *Er schwamm unter dem Steg*
 He swam under the bridge. locative
- b. *Er schwamm unter den Steg*
 He swam under the bridge. directional

In Dutch, locative adpositions are prepositional; whereas directional ones are post-positional (den Dikken, 2010, p. 6):

- (4) a. *Jan liep/rende in het bos*
 Jan walked/ran in the woods locative
- b. *Jan liep/rende het bos in*
 Jan walked/ran the woods in directional

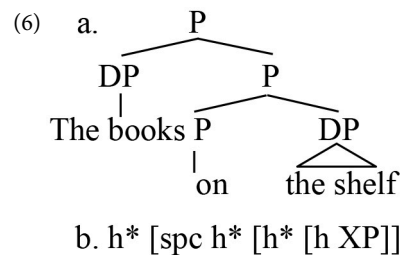
Structurally, PathP can be seen as more complex than PlaceP, given the fact that PathP cartographically embeds PlaceP, as represented in (4) (Svenonius, 2012, p. 5):



1.2 The figure and the ground as p/P arguments

These distinct morphosyntactic properties are best thought as reflecting differences in syntactic structure. In fine-grained syntax, the question arises as to whether the figure F and the ground G are both included in a basic argument configuration type as bi-argumental, as argued for by Hale and Keyser (2002), the P root

being dyadic, as in their argument structure type in (6a); [=their structure (17), p. 7], or their schematic argument structure in (6b):



Alternatively, G is introduced as a complement of (the big) P (or our root P), and F is indeed the external argument of (small) p, a functional head exactly parallel to v, or more commonly voice, in its ability to license an external argument, as in Wood and Marantz (2017). Ideally, various functional heads can be reduced to one single argument introducer, which is referred to as i^* , in distinct syntactic contexts. Differences between different uses of i^* stem from rules that are sensitive to the syntactic context in which it occurs. The functional head i^* encompasses both p, v, or voice, or other flavors of f-categories. So, in terms of argument-introducing heads, we have two essential traditional distinct heads in (7):

- (7) a. Little p (figures): Bare i^* merges with PP.
- b. Voice (agents): Bare i^* merges with vP.

Interpretive differences between the two heads are now understood as contextually determined interpretation rules, as illustrated in (8):

- (8) a. $[[i^*]] \leftrightarrow \lambda x \lambda s. \text{FIGURE}(x,s) / \text{___}(\text{locative PP})$
- b. $[[i^*]] \leftrightarrow \lambda x \lambda e. \text{AGENT}(x,e) / \text{___}(\text{agentive vP})$

As for the root of P (or bigP), it is a root-adjoined i^* with selectional feature checked by complement. The authors pointed out that they follow basically Svenonius in identifying internal argument with G, and external argument with F of prepositions (pp. 258–261).

While we basically adhere to this line of reasoning concerning the general design of the theory, we will leave the room open for the argument structure in (6) as potential structure of big P in some cases, or of the RootP of the PP, given potential evidence for the existence of both basic intransitive and transitive verb roots that can be causativized, and that the structure of the basic transitive cannot be readily derived from that of the intransitive. Parallel preposition configurations can be potentially found conflated in more complex causative structures.¹

1 For example, the two psych verb constructions in the following pair of examples are headed by verbal roots which are arguably monadic and dyadic roots, respectively, as shown in Fassi Fehri (2023, to appear):

- (i) *gađiba* *l-walad-u*
 anger-PAST the child-NOM
 “The child angered; became angry.”
- (ii) *y-akrah-u* *l-walad-u* *t-tanaafus-a*
 3-hate-INDIC the-child-NOM the-competition-ACC
 “The child hates the competition.”

Causativization of (ii) is possible, indicating that it is a basic transitive, whereas the causative of a derived transitive is ill-formed:

(14) a. They cast a wistful glance to the shore. (Svenonius, 2010, p. 127)

b. *saafar-tu* *ʔilaa* *d-doḥat-i*
 traveled-I to Doha-GEN
 “I traveled to Doha.”

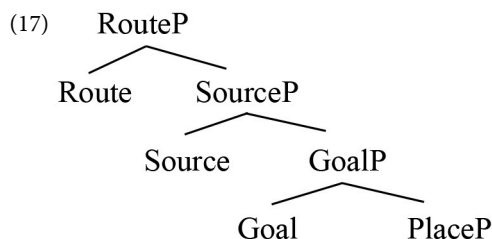
(15) a. The boat drifted farther from the beach. (Svenonius, 2010, p. 127)

b. *ʔamšii* *min* *l-bayt-i*
 walk-I from the-house-GEN
 “I walk to the house.”

(16) a. A band is playing through the trees. (Svenonius, 2010, p. 149)

b. *y-* *ʔ-ʔaaʔir-* *ḥawl-a* *š-šajarat-*
aḥuum-u u *i*
 3-roam- the-bird- around- the-tree-
 IND NOM ACC GEN
 “The bird is roaming around the tree.”

Syntactically then, Path is decomposed into three syntactic heads: Source, Goal, and Route (or symmetric Path) (Procházka, 1993, 2011; Nam, 1995). In languages with rich spatial case system such as Daghestanian languages, the three heads manifest a fixed hierarchy: Route>Source>Goal as illustrated in (17):³



1.5 Research questions and significance of the study

The paper aims at answering two essential research questions:

- (a) How granular are the morphosyntactic features in Arabic locational and directional expressions, to reach a reasonable degree of descriptive adequacy?
- (b) How are these features syntactically represented, given the root/category divide (a basic tenet of DM), and the also potential hierarchical cartography?

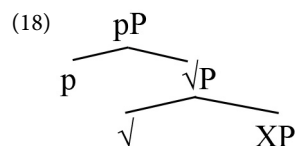
Our contribution explores in particular the internal structure of PPs in Arabic. Arabic is targeted as a relatively poorly described language regarding the topic, when compared to the abundant and meticulous studies of Germanic, Romance, or Slavic. This is not denying the existence of important contributions found in tradition grammar, including namely

Ibn Hišaam (1985) and Al-Muraadii (1992), or in cognitive descriptions as conducted by Lentzner (1977), Esseesy (2010) and Jan (2018), or the generative analysis developed by Saeed (2014), Fassi Fehri (2021), or previous studies by the authors, on which we are building substantially (see also Procházka, 2011). The article investigates and motivates morphosyntactic features or categories in both locational and directional expressions along their semantic interpretations from both theoretical and cross-linguistic perspectives, and how these features and categories are hierarchically ordered, along the root/category divide in a Distributed Morphology (=DM) design of grammar.

1.6 Our basic analysis

In analyzing the Arabic prepositional or axial (Axpert) noun expressions, we adopt a DM model which takes into account the dual life of spatial expressions, as *lexical roots* (normally represented by big P), and as *functional categories* [normally represented by small p; (see e.g., Rooryck, 1996; Marantz, 1997; Deacon, 2011; Wood and Marantz, 2017)]. In DM, lexemes are not formed in the lexicon, before they enter the syntactic derivation. Rather, the necessary aspects of the lexicon are positioned within sentential derivation. The concept of lexeme is replaced by two forms: Lexical Item (LI) and Vocabulary Item (VI). LIs are borne as uncategorial *roots* (or abstract language specific morphemes), which enter the derivation as simple or complex root nodes, and are categorized through various functional category nodes, which form the terminal nodes in syntax, or constitute interpretable phases. Terminal nodes are provided after the syntactic derivation with a specific phonological form of the word, a VI (see Chomsky, 1995, 2001; Harley and Noyer, 1999; Embick and Noyer, 2005; Marantz, 2013; and Harley, 2014, among many others). As for the fine structure of PPs, our work draws heavily from significant cartographic studies on the topic, including notably Koopman (2000), Svenonius (2010, 2012), Cinque (2010), den Dikken (2010), and Pancheva (2011), among others.

As in Wood and Marantz (2017) for English, and Fassi Fehri (2021) and Fassi Fehri and Alrawi (2023) for Arabic, the structure of PPs is split between the root node(s) and the syntactic f-node(s). In parallel to the vP shell (Larson, 1988, 2014), the pP shell is argued to be a dual projection: a Root √ (the traditional big P) and a categorizing (case assignor or small) p:



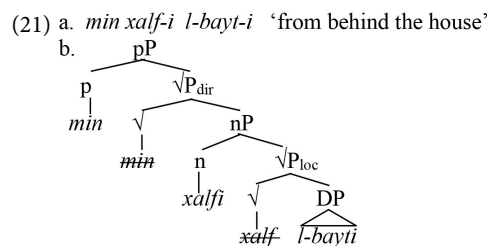
This structure allows us to elegantly account, among other things, for the categorial flexibility of spatial expressions. They can surface as a preposition, a noun, an adjective, or as a (locative) verb phrase, as illustrated in (19):

³ See fn. 5 below for detailed feature-based decomposition of Path PPs into eight subtypes in Pancheva (2011).

- (19) a. *al-kitaab-u ʕalaa t-taawilat-i*
 the-book- on the-table-GEN
 NOM
 “The book is on the table.”
- b. *ʔazal-tu n-naḥlat-a min ʕalaa dahr-i-ka*
 removed-I the-bee- from on back-GEN-
 ACC your
 “I took out the bee from above your back.”
- c. *nazala l-maaʔ-u min ʔaʕlaa*
 came down the-water- from above.GEN
 NOM
 “The water went down from above.”
- d. *l-jabal-u ʔaʕlaa min xams-imitat-i mitr-in*
 the- higher than five meters-GEN
 mountain- hundred-
 nom GEN
 “The mountain more than five hundred meters height.”
 (lit. “The mountain is higher than five hundred meters.”)
- e. *ʕala-t l-miyaah-u l-jabal-a*
 went.high- the-water- the-
 F NOM mountain-
 ACC
 “The water went up the mountain.”

(after Fassi Fehri and Alrawi, 2023, p. 9)

Moreover, the lower $\sqrt{P_{loc}}$ or $\sqrt{P_{dir}}$ (den Dikken, 2010) is responsible for the distinct locative or directional (or Place/Path) meanings associated with spatial expressions. The c-commanding functional *p* is the categorizer that assigns genitive case, parallel to *v* in *vP* that assigns accusative. Movement of $\sqrt{\text{-to-p}}$ is motivated: the interpretable [loc]/[dir] feature makes the spatial expression an appropriate goal probed by *p* (Fassi Fehri, 2021). In our analysis, the traditional single projection PlaceP is split into two projections: $\sqrt{P_{loc}}$ and the axial or AxPart *nP* (see Section 3.1). Similarly, PathP is split into two projections: the root $\sqrt{P_{dir}}$ rode and the *pP* categorial node, as represented in (21):



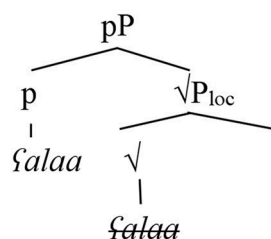
A number of details and motivations can be found in Fassi Fehri and Alrawi (2023), and will not be repeated here. This contribution is an attempt to refine the basic analysis argued for there or in other works on the topic, adding further motivations and clarifications. It focuses chiefly on the granular issue, its syntactic motivation, in addition to elaborating on complexity of prepositions, their polysemy (or allosemy; Marantz, 2013), their homonymy (or allomorphy), as well as dialectal variation.

2 complex polysemies and syntactic alternations

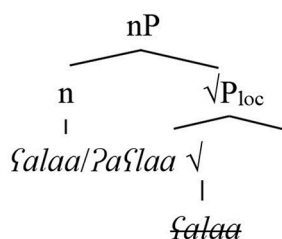
Thus, the root of *ʕalaa* “on,” as seen in (20), can surface as *p* in (20a), *n* in (20b) or (20c), *a* in (20c), or *v* in (20d):

Prepositional phrases are found in complex constructions, polysemies, and dialectal variations. In our system, these

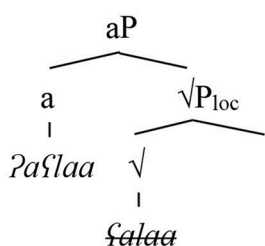
(20) a. *ʕalaa* ‘on’ (p)



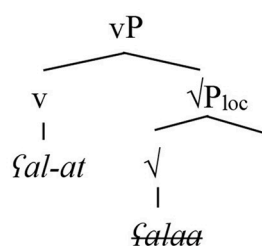
b. *ʕalaa* ‘above’ (n)/*ʔaʕlaa* ‘above’ (n)



c. *ʔaʕlaa* ‘higher’ (a)



d. *ʕal-at* ‘went up’ (v)



(Fassi Fehri and Alrawi, 2023, p. 9)

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 cognitive networks that are associated with words (as in [Lentzner, 1977](#); [Esseesy, 2010](#); [Jan, 2018](#)). We claim that the hierarchically ordered “word approach” used is inadequate, given that it does 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.

2.1 meanings of Place with *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 a broad locative or temporal “circumstantiality”, or more specifically a CONTAINMENT (*htiwaaʔ*), as illustrated in (22):

- (22) a. *zayd-un fii d-daar-i*
 Zayd-NOM in the-house-GEN
 “Zayd is in the house.”
 b. *sa-ʔuʔri fii biqʔ-i siniina*
 FUT-be rich in few-GEN years.GEN
 “I will be rich in few years.”

In modern grammars, most Arabic linguists converge on the idea that *fii* has a broad LOCATIVE meaning, and a more specific meaning of CONTAIN(MENT) that corresponds to those of the English preposition “in,” or more extensively “at” or “on” as illustrated in (23), (24), and (25), respectively ([Lentzner, 1977](#); [Esseesy, 2010](#); [Jan, 2018](#); [Fassi Fehri, 2021](#)):

- (23) *l-jamaaʔat-u fii l-masjid-i*
 The-group-NOM in the-mosque-GEN
 “The group is in the mosque.”
 (24) *y-atajawwalu fii š-šaariʔ-i*
 3-walk in the-avenue-GEN
 “He walks in theavenue.”
 (25) *l-qimmat-u fii y-ulyuuz-a*
 the-summit-NOM in July-GEN
 “The summit is in July”

The locative meaning of *fii* can be partial CONTAIN (rather than total), in which the Ground partially contains the Figure, as in (26).

- (26) a. *l-ʔusʔuur-u fii š-šajarat-i*
 the-bird-NOM in the-tree-GEN
 “The bird is in the tree.”
 b. *l-wardat-u fii l-mazhariyyat-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 ([Esseesy, 2010](#)).

Moreover, localization can be broad or abstract, where no physical or concrete containment is inferred, as in (27):

- (27) *ʔanjat-u fii šamaal-i r-ribaaʔ-i*
 Tangier-NOM in north-GEN Rabat-GEN
 “Tangier is to the north of Rabat.”

In (27), there is no concrete physical containment relation between Tangier and Rabat, but only a broad more abstract location, according to which the Figure F is seen as included in the INTERIOR of the Ground G.

In the time domain, *fii* situates F in a certain G moment in time and means specifically CENTRAL COINCIDENCE in Tense and Aspect. It corresponds to English “at” or “in”, which means that F and G either coincide (i.e., overlap in the positioning in time), as in (28a), or that G is a container inside of which F is temporally located, as in (28b).

- (28) a. *mawʔid-u-na fii l-xaamisat-i*
 appointment-NOM- in the-five-GEN
 our
 “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 these two primary meanings of *fii*- can be confused with those of other close prepositions, typically *bi-*. As we will see, the essential meanings of the two prepositions can be contrasted, and made distinct, despite the fact that they can overlap, or be confused and made interchangeable.⁴

4 Among its less prototypical senses is CAUSATION *taʔliil*, as in (i)-(iii):

- (i) *qutila kulayb-u fii naaqaʔ-in*
 killed.PASS Kulayb-NOM in cow-GEN
 “Kulayb was (Jan, 2018, p. 133)
 killed for (stealing/losing)
 a cow.”

A further meaning is ACCOMPANIMENT *musaahaba*:

- (ii) *xaraja l-ʔamiir-u fii mawkiib-in ʔaaʔil-in*
 went out the-prince- in procession- festive-GEN
 NOM GEN
 “The prince (Jan, 2018, p. 133)
 went out in a festive
 procession.”

Yet another meaning is SUPERPOSITION *stiʔlaaʔ*:

- (iii) *šalaba-hum fii juʔuuʔ-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)

The preposition *bi-* “at, with” is the closest preposition to *fii* “in.” But according to traditional grammars, its primary meaning is CONTACT (*ʔilsaaq*, literally “gluing,” or “sticking”), compared to *fii*, which is primarily dedicated to CONTAINMENT or INCLUSION. The locational contact meaning is clearly found in the following constructions:

- (29) *ʃ-suur-at-u laʃiiq-at-un bi-l-ḥaaʔiṭ-i*
 the-photograph-F- glued-F- at-the-wall-
 NOM NOM GEN'
 “The photograph is glued to the wall.”
- (30) *ʔanaa mutaʃalliḡ-un bi-ka*
 I attached-NOM at-you
 “I am attached to you.”

In verb complexes, favored by traditional grammar, to vehicle CONTACT, prototypical constructions include the following instances, where a contact is established between me and the man’s hand in (31a), or me and the man in (31b):

- (31) a. *ʔaxaḡ-tu bi-yad-i r-rajul-i*
 took-I at-hand-GEN the-man-GEN
 “I took the man’s hand.”
- b. *ltaḡayt-tu bi-r-rajul-i*
 met-I at-the-man-GEN
 “I met the man.”

In all these contexts, *fii* cannot be used instead of *bi-* in the standard variety of Arabic.⁵

What is problematic, in traditional descriptions, however, is that they make no room for the general locational meaning that *bi-* can express, without inducing any inclusion, but still entailing some PROXIMITY or VICINITY meaning, or roundabout (Jan, 2018) as in the following examples:

- (32) *ʔanaa bi-baab-i manzil-i-ka*
 I at-door-GEN house-GEN-
 your
 “I am by your house door.”

Clearly, the preposition in these examples locates F in some proximity or roundabouts of G, but does not induce any containment or inclusion. The introduction of *fii* is clearly not an option here. Moreover, the translation of *bi-* should be “at” rather than “in,” although *bi-* does not have meanings of “at;” in fact, most of the meanings of the English locative “at,” discussed by Brenda (2015), are rather expressed by *fii*. This difference clarifies the

distinctive interpretation of the PP in the classical (33a), compared to (33b):

- (33) 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. *ʔanaa fii l-waadii*
 I in the-valley.GEN
 “I am in the valley.”

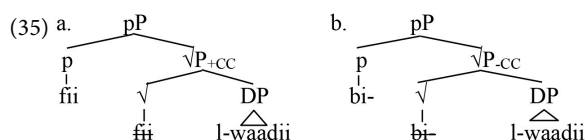
It is possible that both *bi-* and *fii* express COINCIDENCE, and that they differ in that *fii* can be viewed as expressing central COINCIDENCE, whereas *bi-* expresses non-central COINCIDENCE (see Lentzner, 1977, where *fii* expresses COINCIDE INTERIOR, compared to *bi-*, which is not specified for INTERIOR). We propose that CONTACT or non-central COINCIDE(NCE) are the specific meanings of the spatial *bi-* “at.”

Hale (1986) claims that two essential distinct local cases in Walbiri can be defined along the COINCIDE notion, characterizing the role of F (or theme) with respect to G (or Place), or spatial-temporal relations more generally. Demirdache and Uribe-Etxebarria (2014) extend the notion to include both space and temporality, as in (62):

- (34) a. [+ central coincidence]: F within G
 Location, trajectory, or linear arrangement of F centrally coincides with G.
- b. [- central coincidence]: F not within G “terminal,” “initial,” etc. (*bi-*)
 Location, trajectory, or linear arrangement of F does not centrally coincide with G.

In (34a), the location of the interlocutor coincides with that of the valley, without inducing any containment or inclusion, contrary to (34b).

Fii “in,” on the other hand, locates F in a position interior and within the boundaries of G, a CONTAINMENT, or a CC relation. We assume that what differentiates *bi-* “at” from *fii* “in” is the meaning associated with the root, to fit in a suitable construction. Thus, the root of *bi-* “at” is distinct from that of *fii* “in,” as schematized in (35); ± CC abbreviating ±: CENTRAL COINCIDE



Clearly, *bi-* does not normally replace *fii* in Classical or Modern Standard Arabic, although there appear some cases of interchangeability in modern data. In most cases, this is due to dialectal interferences in the diglossic situation of Arabic. Clearly also, there is a quite systematic variation in the dialectal uses, depending on geographical locations, which can be distinguished depending on the two prepositions uses, instantiating vocabulary variation, as we explain in the next subsection.

5 Other typical meanings of *bi-* include notably INSTRUMENT/MEANS, as in (i), or MANNER, as in (ii):

- (i) *ʔaʃana-hu bi-sikkiin-in*
 stabbed.3-him with-knife-GEN
 “He stabbed him with a knife.”
- (ii) *ʔaʃana-hu bi-surʃat-in*
 stabbed.3-him with-quickNESS-GEN
 “He stabbed him quickly.”

2.2 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 CONTAIN (in addition to CC), as in (36a,b) below from Levantine Arabic:

- (36) a. *ʔana bi-l-bet* b. *ʔana bi-l-bab*
 I in-the- I at-the-door
 house
 “I am **in** the house.” “I am **at** the house.”

In Maghribi dialects, on the other hand, *fii* is often generalized, instead of *bi* (both are reduced to *f-* and *b-*), as in Moroccan Arabic (37):

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

For containment in time, by contrast, *bi-* in Mashriqi dialects replaces *fii-*:

- (38) *n-tlaaqa bi-l-masaa/bi-l-lail*
 we-meet in-the-evening
 “We meet in the evening/at night.”
 (Fassi Fehri, 2021, p. 160)

In Maghribi dialects, on the other hand, *f-* is used instead of *b-*, as in Moroccan Arabic (37):

- (39) *n-tlaaqaqaw f-l-ʔaššia/f-l-lail*
 we-meet in-the-evening
 “We meet in the evening/at night.”

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

- (40) a. *ħasse-t fi-k* b. *ħsee-t bi-k*
 felt.I in-you felt.I at-you
 “I felt you”
 (41) a. *tašal-t fi-k* b. *tašal-t bi-k*
 contacted-I in-you contacted-I at-you
 “I contacted you.”
 (42) a. *raħħab fiy-ya* b. *raħħab biy-ya*
 welcomed in-me welcomed at-me
 “He welcomed me.”

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

- (43) a. *ka-n-tkellem b-š-šweyya* (Maghribi)
 PROG-I-talk with-slow
 “I talk slowly.”
 b. *be-n-t-kallam b-š-šwayaš* (Machriqi)
 PROG-we-talk with-slow
 “We talk slowly.”

2.3 Morpho-syntactic alternations

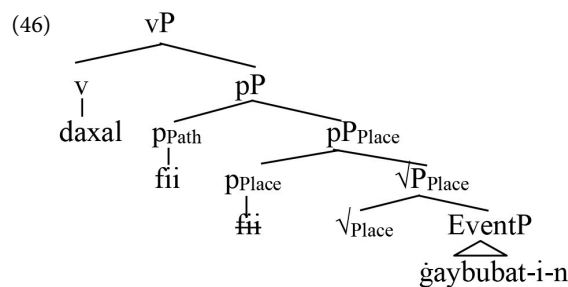
Morpho-syntactic alternations play a major role in revealing the “lexical” or root syntax of prepositions, as well as their functional projections in category syntax. Among these alternations are places/paths, transitives/intransitives, causatives, and the various prepositional uses.

2.3.1 Place/path and CC/TC alternations

The preposition *fii* alternates between being a Place head in space, as in (44a), or state as in (44b), or a Path head when it collocates with a directed motion event such as *daxal* “enter,” indicating a change of state, as in (45):

- (44) 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 gaybubat-i-n*
 the-man-NOM in coma-GEN-N
 “The man is in a coma.”
 (45) *daxala r-rajul-u fii gaybubat-i-n*
 entered the-man-NOM in coma-GEN-N
 “The man entered into a coma.”

It is important to note that this Place/Path alternation results in change from a CC (Central Coincidence) interpretation to a TC (Terminal Coincidence) interpretation, as if the preposition has switched from the equivalent of *in* interpretation in English to that of *into*. That suggests in turn that the TC preposition is complex, made of two prepositions, one of which is unpronounced as in Hale and Keyser (2002, p. 222); [structure (39)]. This is reflected in (46)



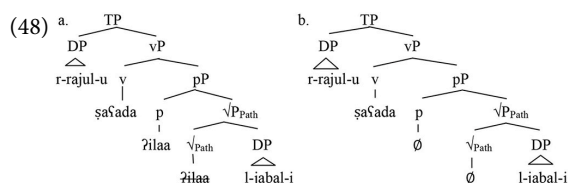
The motion event selects a PathP, when *fii* collocates with a motion event, it denotes a directional Path, having basically the meaning of the directional Path *ʔilaa*, rather than a pure locational Place. This is a case of polysemy of the preposition, involving presumably two distinct syntactic structures (a case of so-called interchangeability of prepositions). It means simply that one preposition (as a vocabulary item, VI) is associated with distinct structures, which are normally associated with two distinct prepositions with some specific senses.

2.3.2 Transitive/intransitive, causative, and alternations

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

- (47) a. *ṣaṣada* *r-rajul-u* *ʔilaa* *l-jabal-i*
 climb the-man- to the-mountain-
 NOM GEN
 “The man climbed (to) the mountain.”
 b. *ṣaṣada* *r-rajul-u* *l-jabal-a*
 climb the-man-NOM the-mountain-
 GEN
 “The man climbed the mountain.”

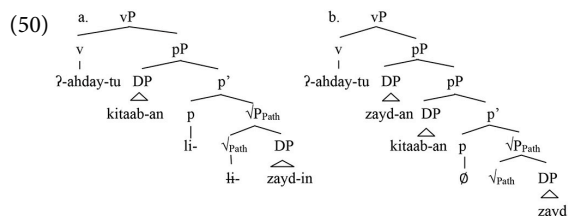
ʔilaa expresses a Goal–Path meaning in these constructions, available in both (47a) and (47b), which suggests the presence of a Path root P in both constructions. If so, then the difference appears to be only in the case assignor. The genitive case assignor, p, is available in (47a), but not in (47b). The absence of the structural case assigner p, leaves *l-jabal-a* “the mountain” in (47b) 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 (49):

- (49) 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* <dative>
 CAUS.gave-I Zayd-ACC book-ACC
 “I gave Zayd a book.”

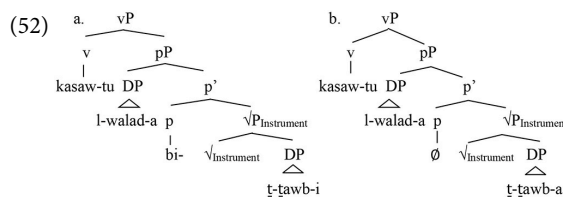
In both (49a) and (49b), *Zayd* is the dative or the Recipient of the action. The dative interpretation is assigned by the Goal root $\sqrt{li-}$. To put it differently, the dative root $\sqrt{li-}$ is assumed to be the source of the dative interpretation, and it is available for both (49a) and (49b). The two constructions then differ only in the source of case assignment. The prepositional p head assigns the genitive case in (49a). But in order for *Zayd* to receive (structural dative) case in (49b), it moves to a position where it is assigned accusative by v. The examples in (49a) and (49b) are represented in (50a) and (50b), respectively:



If (50a) is roughly the basic structure for both constructions in (49), then the dative has to move higher in (50b), adjoining to the pP, to get structural case there.

A further example of an overt/null alternation is illustrated in (51) and represented in (52):

- (51) a. *kasaw-tu* *l-walad-a* *bi-t-tawb-i* <tool/
 wore-I the-child- with-the-
 ACC cloth-GEN
 “I have worn the child with the cloth.”
 b. *ʔ-aksay-tu* *l-walad-a* *t-tawb-a*
 CAUS-wear- the-child- the-cloth-
 I ACC ACC
 “I made the child wear the cloth.” (Fassi Fehri, 2021, p. 183)



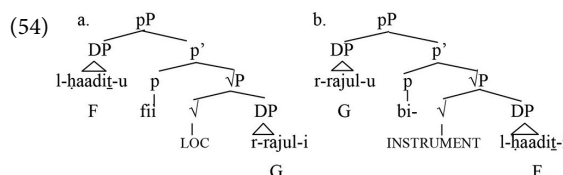
In both (52a) and (52b), *t-tawb* “the cloth” is the tool or instrument used for the action of wearing. In (80a), the causative verb *kasaa* “made him wear” makes use of the overt preposition *bi-*, in expressing the Instrument role. The preposition *bi-* is dominated by the functional p, and it assigns the complement *t-tawb* a genitive case. In (52b), the preposition is silent, and *t-tawb* “the cloth” receives an accusative case via v.

2.3.3 Fii/bi- alternations and inverted roles

Prepositions can have closely related meanings that can relate the same arguments (Figure and Ground) but with different configurational relations. Consider further alternations of *fii* “in” and *bi-* “by” in (81):

- (53) a. *ʔaṭṭara* *l-ḥaadi?-u* *fii* *r-rajul-i*
 affected the-accident- in the-man-GEN
 NOM
 “The accident affected the man.”
 b. *ta-ʔaṭṭara* *r-rajul-u* *bi-l-ḥaadiṭ-i*
 REFLEX- the-man-NOM by-the-
 affected accident-GEN
 “The man got affected by the accident.”

In (53a), *l-ḥaadiṭ-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 (53a). On the other hand, *r-rajul-u* “the man” in (53b), which is the Ground, is in the Specifier position, and the Figure *l-ḥaadiṭ-i* “the accident” is the complement, as represented in (53b). 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.

(61) a. *fii d-daar-i rajul-un*
 In the-house-GEN man-NOM
 “There is man in the house.”

b. *??bi-d-daar-i rajul-un*
 with-the-house-GEN man-NOM

(62) a. *b-ii wajaʕun (fii l-batni)*
 with-me pain-NOM (in the-stomach-GEN)
 “I have a pain (in the stomach).”

b. *??f-ii wajaʕ-un (fii l-batni)*
 in-me pain-nom (in the-stomach-GEN)

The construction (61a) is normally qualified as “existential,” but we concur with Creissels (2022, p. 607) to describe it as “inverse locational predication,” which is basically a locative. The structure in (62a) can be described as “Possessor (be) with possessee,” or what he calls *comitative possessee construction*.⁶ Creissels argues that such a configuration is prototypical in Arabic dialects, and he observes that a true comitative-possessee construction “Possessor (be) with Possessee,” is attested in Sudan (Kordofan, Šukriyya; Manfredi, 2010), Libya (Saad, 2019), and Mauritania (Taine-Cheikh, 2008).⁷

(63) Kordofanian Baggara Arabic (Manfredi, 2010, p. 169)
musa da be bitt=a
 Moses PROX.SG.M with daughter=3SG
 “Moses has a daughter.”

(64) Libyan Arabic, Benghazi variety (Saad, 2019, p. 4)
ħūu-ya ayyub ħatta huwwa b-murattab-a
 brother-1SG Ayoub even 3SG.M with-salary-3SG.M

wu b-sayyart-a wu b-šəggt-a
 and with-car- and with-flat-3SG.M
 3SG.M
 “My brother Ayoub too has a salary, a car, and a flat.”

(65) Hassaniya Arabic (Taine-Cheikh, 2008, p. 429)
ānā b-owlād-i
 1SG with-child.PL-1SG
 “I have children.” (p. 608)

If so, then the parallel contrast between the two (eventually inverse) constructions in (61a) and (62a) represent a contrast between the genuine basic spatial locative in (61a) and the presumably “derived” possessive in (62a), a distinction which collocates with the *be/have* variation in Germanic and Romance (as in Freeze, 1992 and Kayne, 1993). In Arabic, however, no such auxiliary contrast exists. One option would then be to distinguish the roots of the two constructions by marking them tentatively as P_{loc} and P_{poss}, a marking similar to that used by Harley (2002) for English P_{loc} and P_{have} for double object and possessive verbal

constructions, respectively. The difference is that P_{poss} can extend to Arabic and English, whereas P_{have} cannot be motivated for Arabic.

Note that *bi-* is used here with a possessee which is a physical state, as in (62a), or a psych state, as in (66) below. By contrast, *li-*, and eventually *ʕinda* are the most used in predicate possession where the possessee is physical, as in (67) and (68), respectively:

(66) *b-ii shawq-un*
 with-me longing-NOM
 “I have longing.”

(67) *l-ii walad-ani*
 have-me children-DUAL.NOM
 “I have two children.”

(68) *ʕind-ii qalam-un ʔaxdar*
 have-me pen-NOM green-NOM
 “I have a green pen.”

3 Cartographic and feature refinements

3.1 Loc and dir features of pPs

Locational expressions that denote places, regardless of whether they are syntactically nouns or prepositions, relate a Figure to its Ground. In Arabic, we take a stative verbless sentence to be the appropriate context for places. This is illustrated in (97) below, where *fii* “in,” or *ʕalaa* “on,” or *jaanib-a* “next to,” or *ʕind-a* “near” are locative elements that head places:

(69) a. *ʔanaa fii l-bayt-i*
 I in the-house-GEN
 “I am in the house.” (Fassi Fehri, 2021, p. 24)
 b. *l-kitaab-u ʕalaa t-ʔaawilat-i*
 the-book-NOM on the-table-GEN
 “The book is on the table.”
 c. *l-qalam-u jaanib-a l-kitaab-i*
 the-pen-NOM next-ACC the-book-GEN
 “The pen is next to the book.”
 d. *ʔanaa ʕind-a l-bayt-i*
 I near-ACC the-house-GEN
 “I am near the house.”

Under a cross-linguistic view, *fii* “in,” *ʕalaa* “on,” *jaanib-a* “next to,” or *ʕind-a* “near, at” project as a Place head. However, this analysis needs refinement. This is because they are semantically but not syntactically identical to the traditional (single projection) PlaceP. On the one hand, they should be endowed with the feature [+loc] (presumably at the root) that makes them distinct from directional expressions, marked as [+dir]. The latter cannot occur in simple locational contexts, neither in Arabic (70) nor in English (71):

(70) a. **ʔanaa ʔilaa l-bayt-i*
 I to the-house-GEN
 b. **l-kitaab-u min t-ʔaawilat-i*
 the-book-NOM from the-table-GEN

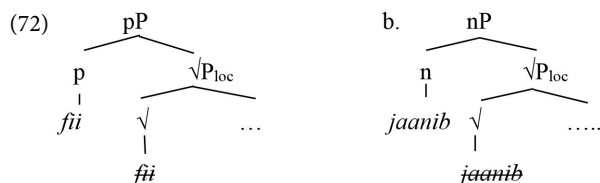
6 Note that the (b) examples are ungrammatical, although the two question marks indicate that they are only hardly acceptable, given interferences with colloquial dialects, in which the two prepositions are at variation. See Section 2.2.

7 Creissels notes that Heine’s (1997) “companion schema” and Stassen’s (2009) “with-possessive” and his “comitative-possessee” construction refer to possessive clauses glossable as “Possessor (is) with Possessee,” and that possessive *maʕa* clauses belong to the same oblique-possessor type as the possessive *ʕinda-* or *li-* clauses of Classical Arabic. In the original example, *be* is glossed “by,” but this preposition also has instrumental and comitative uses, and as the author rightly observes in the section where he describes the uses of *be* (p. 183), its use to flag the possessee in a possessive construction certainly derives from its comitative meaning. Consequently, in this example, the gloss “with” is more adequate.

- (71) a. *I remained to the house.
- b. *The book is located from the table.

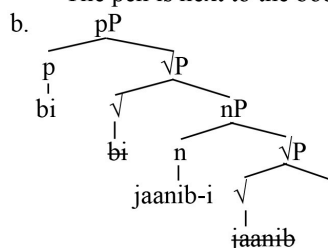
On the other hand, not all of them count as p heads of Places, syntactically speaking. Indeed, if *fii* “in” and *ʕalaa* “on” can be taken as prepositions p’s, assigning genitive case, *ʕind-a* “near” and *jaanib-a* “next to” are in fact axial nouns (denoting axes), which receive case, depending on context (often an accusative).

Within the DM model adopted in this paper, the categorizing nodes (or f-morphemes) are separated from root nodes (or l-morphemes). The structure of (69a) can be represented partially in (72a), and that of (69c) in (72b):

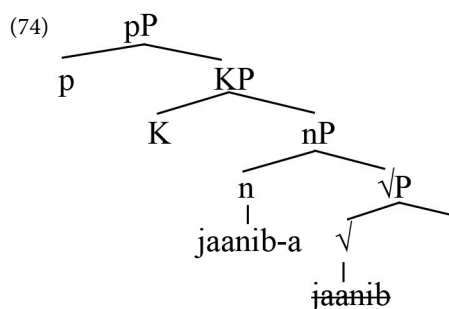


In (72), the root \sqrt{fii} , endowed with the interpretable feature [+loc] is probed by p, which is the locus of the uninterpretable feature [loc]. $\sqrt{\text{-to-p}}$ Move is, accordingly, motivated by the probe-goal matching. After moving the root $\sqrt{\text{ }}$ to the categorizer p, \sqrt{fii} surfaces as a p that assigns a genitive case to its complement. In contrast, $\sqrt{jaanib-a}$ “next to”, although sharing the same [+loc] feature, surfaces as an axial noun, with its specific semantics, and being a noun makes it subject to case assignment, which is a morphological accusative in (69c), and a genitive assigned by the preposition as in (73a), represented in the structure (73b):

- (73) a. *l-qalam-u bi-jaanib-i l-kitaab-i*
the-pen-NOM at-next-GEN the-book-GEN
‘The pen is next to the book.’



To account for the invariant accusative case assigned to *jaanib-a* “next” in (69c), Fassi Fehri (2021) assume an extra structural KP higher than the axial nP as in (74). The K head hosts the accusative case of the axial noun:



In the absence of the preposition, the axial noun is motivated to move 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):

- (75) 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)

Based on (75), the axial locative noun *jaanib-a* “next to” in the absence of a preposition cannot remain *in situ* to ensure that condition (a) be minimally applied. It undergoes head movement to p, although not directly. Due to the Head Movement Constraint, it moves to the lower head K, then next to p.

Beside [+loc], there are other semantic features that can be associated with the locational root. Figure and Ground are associated to spatial configurations based on the relative Size and Stability (or Mobility) properties of F with respect to G (Landau and Jackendoff, 1993). As pointed out by Miller and Johnson-Laird (1976) and Talmy (1983), “if the objects are unequal in size and mobility, the larger and more stable is invariably encoded as the reference object [Ground]” (Landau and Jackendoff, 1993, p. 224). This is illustrated by the awkward status of the English (a) examples, or that of the Arabic (b) examples in (76) and (77):

- (76) a. ?The table is under the book.
- b. **l-maqʕad-u ʕalaa sutrat-i n-najaat -i*
the-seat-NOM on jacket-GEN the-life-GEN

Intended to mean: “The life jacket is under the seat.”

- (77) a. ?The garage is near the bike.
 - b. **l-masjid-u jaanib-a s-sayyarat-i*
the-mosque-NOM next-ACC the-car-GEN
- Intended to mean: “The car is next to the mosque.”

The oddness or ill-formedness of (76) and (77) has its source in the fact that F cannot be bigger in Size than G. Rather, the correct configurations are those exemplified in the following constructions:

- (78) a. The book is on the table.
- b. The bike is near the garage.
- (79) a. *sutrat-u n-njaat-i taht-a l-maqʕad-i*
jacket-GEN the-life- under-ACC the-seat-GEN

“The life jacket is under the seat.”

- b. *s-sayyarat- jaanib-a l-masjid-i*
u
the-car- next-ACC the-mosque-GEN
NOM
“The car is next to the mosque.”

However, we see at this point no reason that treat these features are syntactic (or morphosyntactic), in addition to being semantic, or conceptual, due to cognitive constraints that are grammaticalized.

3.2 AxPartPs

Axial or Axpart expressions, in addition to [loc], [Stab], and [Size], carry a vector space semantics (Zwarts, 1997; Zwarts and Winter, 2000). They denote sets of points occupied by G to some other regions or axes of the G such as its top, bottom, front, sides, etc. This axial property is identified syntactically as AxPart (Svenonius, 2006, 2010). In Arabic, axial expressions are categorized as nouns in most cases. They are identified not only semantically, but also syntactically. It is notable that what corresponds to English axial prepositions (*over, under, behind, in front of*, etc.) are in fact nouns in Arabic (*fawq-a* “over,” *taht-a* “under,” *xalf-a* “behind,” *?amaam-a* “in front of”) that receive various cases, depending on their distribution. To illustrate, consider the following examples:

- (80) a. *?anaa daaxil-a l-bayt-i*
I inside-ACC the-house-GEN
“I am inside the house.”
- b. *?anaa xalf-a l-baab-i*
I behind- the-book-GEN
ACC
“I am behind the door.”
- c. *l-kitaab-u fawq-a t-taawilat-i*
the-book-NOM above-ACC the-table-GEN
“The book is on the table.”

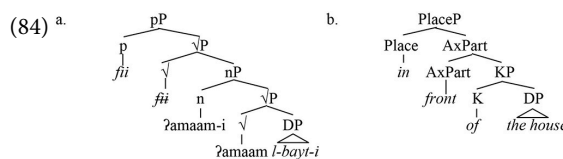
- (81) a. *?anaa fii daaxil-i l-bayt-i*
I in inside-GEN the-house-GEN
“I am inside the house.”
- b. *?anaa fii xalf-i l-baab-i*
I in behind-GEN the-book-GEN
“I am behind the door.”
- c. *l-kitaab-u min fawq-i t-taawilat-i*
the-book- from above-GEN the-table-GEN
NOM
“The book is on the table.”

In (81), the axial expressions *daaxil-a* “inside,” *xalf-a* “behind,” and *fawq-a* “above” are the mere devices for the locational interpretation in the absence of a locative verb. Therefore, *daaxil-a* “inside,” *xalf-a* “behind,” and *fawq-a* “above” are endowed with a semantic/syntactic interpretable feature [loc]. Additionally, they are endowed with the features [Stab] and [Size], given the impossibility to select a Ground that is in motion or smaller than the Figure:

- (82) a. **l-bayt-u xalf-a s-sayyarat-i*
the-house-NOM behind- the-car-GEN
ACC
Intended to mean: “The car is in front of the house.”
- b. **t-taawilat-u fawq-a l-kitaab-i*
the-table-NOM above-ACC the-book-GEN
Intended to mean: “The book is on the table.”

The dual projections nP and √P in our account correspond to the single projection AxPart in Svenonius (2006, 2010) account, represented in (6) above, repeated here in (84b). For the sake of comparison, consider the English and Arabic pairs in (83) and their representations.

- (83) a. *?aqif-u fii ?amaam-i l-bayt-i*
stood-I in front-GEN the-house-GEN
“I stood in front of the house.”
- b. I stood in front of the house.



It is worth noting that the projection of KP does not seem to be supported in Arabic. While K, which in English lexicalizes “of,” holds a Possession relation between the Axial Parts and the Ground DP. The Arabic has no *of*-type Possession relation. The Arabic Possessor merges as a complement in a Construct State configuration, and not as high in the structure as the English synthetic Possessor (see Fassi Fehri, 1993 for detail about construct state possessives).

3.3 DegP

Locative expressions denote a distance on how far F is located with respect to G (see Herskovits, 1986; Koopman, 2000; den Dikken, 2006; Svenonius, 2010, 2012; Gärdenfors, 2015, among others). Some denote a far distance, endowed with the feature [Proj] such as *fawq-a* “over,” *taht-a* “under,” *xalf-a* “behind,” and *?amaam-a* “in front of.” Others denote a near distance, endowed with the semantic features [Prox(imity)], such as *jaanib* “beside” and *?ind* “at/by,” [Interpol(ation)] such as *bayn* “between,” or a zero distance, endowed with [Contact] or [Coincide], such as *salaa* “on” and *bi* “in/at,” respectively. As is the case in English, Arabic makes a syntactic distinction between Proj and non-Proj expressions based on the tolerance to MeasP:

- (85) a. We remained sixty feet in front of the palace.
b. *They opened the door one meter next to the stage.
- (86) a. *y-aqa?u l-masjid- salaa bu?d-i mitr-ayin xalf-a u*
3-locate the- on distance- meter- behind-
mosque- GEN DUAL. ACC
NOM GEN
l-bayt-i
the-house-GEN
Intended to mean: “The mosque is two meters behind the house.”
- b. **y-aqa?u l-masjid- salaa bu?d-i mitr-ayin jaanib-a u*
3-locate the- on distance- meter- next to-
mosque- GEN DUAL. ACC
NOM GEN
l-bayt-i
the-house-GEN
Intended to mean: “The mosque is two meters next to the house.”

Further evidence that Proj is a syntactic feature in Arabic comes from the contrast between semantically related pair expressions such as *fawq* “above” and *ʕalaa* “on.” The Proj feature makes it possible for *fawq* “above” to collocate with far-distance denoting verbs such as *ya-tiiru* “fly” as in (87a), while in the same context *ʕalaa* “on,” which is [-Proj], cannot occur (87b).

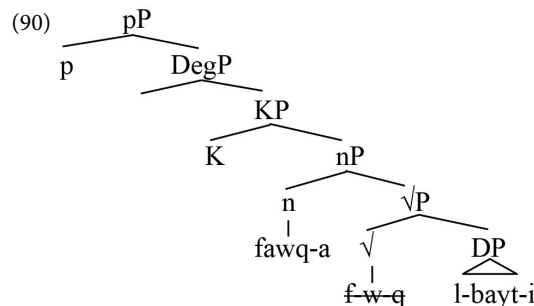
- (87) a. *ta-tiiru ʕ-taaʕirat-u fawq-a bayt-i-na*
 3F-fly the-plane- over-ACC house-GEN-
 NOM our
 “The plane is flying over our house.”
 b. **ta-tiiru ʕ-taaʕirat-u ʕalaa bayt-i-na*
 3F-fly the-plane- on house-GEN-
 NOM our
 Intended to “The plane is flying over our house.”
 mean,

Additionally, the Contact feature associated with the non-Proj expressions provides the meaning of *Support* in spatial and non-spatial domains (Gärdenfors, 2015), which enables *ʕalaa* “on,” but not *fawq* “above,” to collocate with certain verbs such as *ya-ʕtamid* “rely,” *yartakiz* “depend/base:”

- (88) a. *y-aʕtamidu l-ʔab-u ʕalaa bn-i-hi*
 3-rely the-father- on son-GEN-
 NOM his
 “The father relies on his son.”
 b. *y-artakizu r-rajul-u ʕalaa ʕaʕaa-hu*
 3-depend the-man- on stick.GEN-
 NOM his
 “The man depends on his stick.”
 c. *y-artakizu r-raʕ-u ʕalaa ʔasaas-in ʕaħiiħ-in*
 3-base the- on ground- correct-
 opinion- GEN GEN
 NOM
 “The opinion is based on a solid ground.”

- (89) a. **y-aʕtamidu l-ʔab-u fawq-a bn-i-hi*
 3-rely the-father- over- son-GEN-
 NOM ACC his
 Intended to “The father relies on his son.”
 mean:
 b. **y-artakizu r-rajul-u fawq-a ʕaʕaa-hu*
 3-depend the-man- over- stick.GEN-
 NOM ACC his
 Intended to “The man depends on his stick.”
 mean:
 c. **y-artakizu r-raʕ-u fawq-a ʔasaas-in ʕaħiiħ-in*
 3-base the- over- ground- correct-
 opinion- ACC GEN GEN
 NOM
 Intended to “The opinion is based on a solid ground.”
 mean:

Given that [Proj] and other features of the same kind are of syntactic feature in Arabic, we assume, following Svenonius (2010, 2012), that they are hosted under a separate projection, namely DegP. The latter is higher than PlaceP, but lower than pP. It is also higher than KP, leading to the following cartographic structure:



3.4 DeixP

A further interpretation expressed by the spatial expression is related to distality (distance from the speaker). The distal interpretation indicates different degrees of proximity to a deictic center (Svenonius, 2006). In Arabic, this distal information is introduced by the deictic locative adverb *hunaa/hunaaĸ*, parallels English here/there:

- (91) a. a few centimeters under (Svenonius, 2010, p. 140)
 here
 b. *y- l- ʕalaa buʕd-i mitr- hunaa xalf-a*
aqaʕu masjid- ayin
 u
 3- the- on distance- meter- here behind-
 locate mosque- GEN DUAL.GEN ACC
 NOM
l-bayt-i
 the-house-GEN
 “The mosque is two meters behind the house.”

Following Svenonius (2010), we assume that there is an additional a DeixP below DegP that hosts the deictic adverb *hunaa* “here.”

3.5 Directional paths

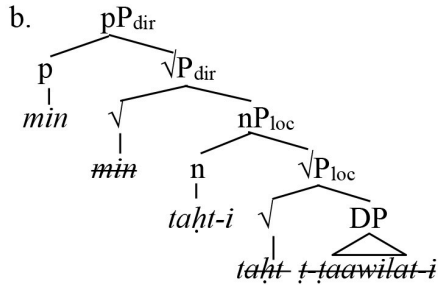
Directional expressions are cross-linguistically, distinguished from locational ones both semantically and syntactically (Jackendoff, 1983; Wunderlich, 1991; Zwarts, 1997, 2005; Koopman, 2000; Zwarts and Winter, 2000; Kracht, 2002; Gehrke, 2008; den Dikken, 2010; Svenonius, 2010). Semantically, they denote a direction of an intended motion, endowed with the feature [dir]. Syntactically, they cannot occur in static contexts as illustrated in English (2b) above, repeated here in (92a). We take the impossibility of directional to occur in the verbless sentence context like (92b) as a negative diagnostic for directional PPs in Arabic:

- (92) a. *The box stayed/remained to/into/from/out
 of/down/through the table.
 (Gehrke, 2008, p. 87)
 b. **ʔanaa ʔilaa /min/ xilaal- ʕawb-a l-bayt-i*
 I to /from/ throu- /toward- the-
 gh- gh- house-
 ACC ACC GEN
 Lit: “I am from /thou- toward the house.”
 to/ gh/

3.5.1 Complexity of dir PPs

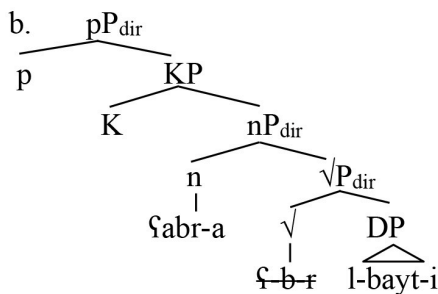
It is generally agreed that directional preposition phrases, or Paths, are structurally complex because they embed Places. We argue that directional expressions are even more complex in Arabic than the widely accepted PathPs. One reason is that each projection of Path or Place root may surface as a preposition *p* or as a noun *n* as illustrated in (93):

- (93) a. *xaraja min taht-i taawilat-i*
 went from under-GEN the-table-GEN
 ‘He went out from under the table.’



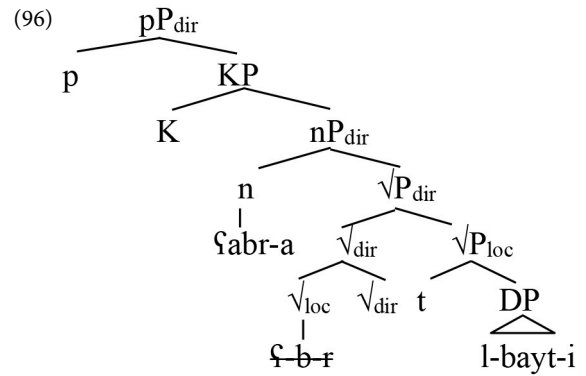
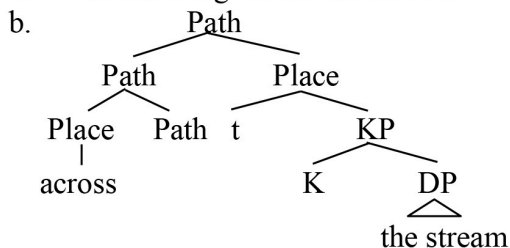
Another reason is related to Path expressions that surface as axial nouns (or AxPart) such as *ṣabr-a* “across,” *ḥawl-a* “around,” *xilal-a* “through,” etc. More projections are required not only because they are syntactically nouns having an interpretable feature [+dir] that checks the uninterpretable feature [dir] of a higher probe *p*, but also because they are assigned a (oblique) case by a *K* head in the absence of a *c*-commanding preposition. For example, the directional expression *ṣabr-a* “across” in sentence (94a) can be represented in (94b):

- (94) a. *saafar-tu ṣabr-a l-muḥiit-i*
 traveled-I across-acc the-ocean-gen
 ‘I traveled across the ocean.’



Additionally, if we follow Svenonius (2010), *ṣabr-a* “across” would be an extended (PathPlace) preposition, like *across* in English, meaning that it is a location head conflated with the directional head. Compare the English example in (95a) (Svenonius, 2010, p. 149), with the structure in (95b), to the representation of the Arabic *ṣabr-a* “across” in (96), as adapted to Arabic:

- (95) a. We found a log across the stream.



3.5.2 Transition and scale

Goal expressions *ʔilaa/li-* “to” vs. *ṣawb-alnaḥw-altujaah-a* “toward” illustrated in (97) typically hold the same contrast between goal-oriented *to* and *toward* in English (98) (Evans and Tyler, 2004, p. 263):

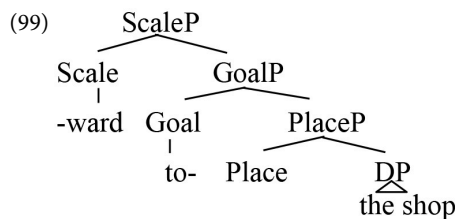
- (97) a. *taḥarraka-t l-kurat-u ʔilaa l-marmaa*
 moved-F the-ball- to the-
 NOM goal.GEN
 “The ball moved to the goal.”

- b. *taḥarraka-t l-kurat-u ṣawb-a l-marmaa*
 moved-F the-ball- towards- the-
 NOM ACC goal.GEN
 “The ball moved towards the goal.”

- (98) a. He ran to the shop.
 b. He ran toward the shop.

The semantic contrast between *to* and *toward* has been described as being relating to whether the trajectory does or doesn’t reach the goal, respectively. In Kracht (2002) and Pancheva (2011) terminology, *to* has a transitional Goal (or Cofinal), whereas *toward* has non transitional Goal (or Approximative) Goal, each one bearing the feature [±TRANSITION]. Accordingly, the ball did reach the goal in (97a) but didn’t in (97b). Similarly, with *to*, the trajectory (i.e. *he*) arrives at the shop in (98a), but with *toward*, sentence (98b), it does not entail that the trajectory (i.e., *he*) arrives at the shop. In Fassi Fehri’s (2021) account, the contrast is attributed by the absence/presence of a semantic Mot(ion) feature in *ʔilaa/li-* “to” vs. *ṣawb-alnaḥw-altujaah-a* “toward,” respectively. That makes the latter interpreted as being in motion. But the contrast between *ʔilaa/li-* “to” and *ṣawb-alnaḥw-altujaah-a* “toward” could be equally attributed to the [±TRANSITION] feature opposition, in parallel to Pancheva’s account.

Pancheva (2011) takes the transition opposition to be syntactically differentiated. She argues that the non-transition path expression *toward* in English is derived from the transition path *to* by having a higher scale head projecting ScaleP, and dominating GoalP, as represented in (99). The Scale head delimits the transition value, turning the goal expression into a non-transitional one:



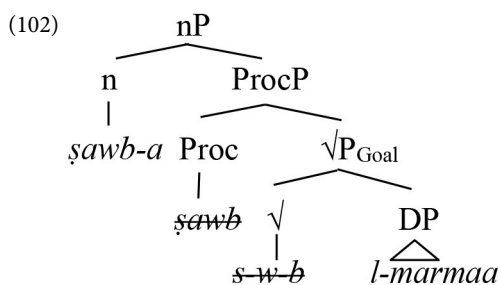
But despite the fact that in (99) Scale may seem to correctly explain the relation between the two morphemes *to-* and *-ward* in English, it doesn't seem to hold in Arabic. And although we agree with Procházka (2011) that *toward* is a complex head, we question that it is Scale. Since the the Mot(ion) feature described by Fassi Fehri (2021) is also semantico-syntactic, the contrast is between the directional *ʔilaa/li-* “to” that can occur in static contexts and the motional *šawb-a/naḥw-a/tujaah-a* “toward,” which cannot tolerate stativity:

- (100) a. *t-ʔariiq-u ʔilaa makkat-a muzdaḥim-un*
 the-road- to Makkah- crowded-
 NOM GEN NOM
 “The road to Makkah is crowded.”
 b. **ʔariiq-u šawb-a makkat-a muzdaḥim-un*
 road-NOM toward- Makkah- crowded-
 ACC GEN NOM
 Intended to mean : “The road to Makkah is crowded.”

Moreover, *ʔilaa* “to” can select a directional-denoting expression such as *yamiin* “right” and *yasaar* “left,” resulting in a directional static interpretation, while *šawb-a/naḥw-a/tujaah-a* “toward” cannot:

- (101) a. *r-rajul-u waaqif-u-n ʔilaa l-yamiin-i*
 the-man- standing- to the-right-
 NOM NOM-N GEN
 “The man is standing to the right.”
 b. **r-rajul-u waaqif-u-n naḥw-a l-yamiin-i*
 the-man- standing- toward- the-right-
 NOM NOM-N ACC GEN
 Intended to mean: “The man is standing to the right.”

We therefore suggest that the additional morpheme is Proc(ess), adopting Ramchand's (2008) terminology, rather than Scale. The construction in (101b) above is represented in (102). The presence of Proc explains why *šawb-a/naḥw-a/tujaah-a* “toward” cannot tolerate static contexts.



4 Conclusion

In this paper, we have provided a finer account of the syntactic and semantic complexity of basic Arabic spatial prepositional and axial noun phrases, as manifested in Places and Paths. As in DM architecture, we have separated root (or “lexical”) nodes from category (or functional) nodes, distinguishing \sqrt{P} (or “big”P) from (“small”) p, as in Larson's (1988, 2014) shell structure. We have provided essential ingredients allowing the decomposition of Place and Path words or expressions into \sqrt{P}_{loc} , \sqrt{P}_{dir} , or P_{mot} roots, in addition to Contain, Contact, or Coincide features, etc. Syntactic projections of AxPartP, DegP, DeixP, RouteP, GoalP, SourceP, and ProcP etc. have been supported and hierarchically ordered, following the lead of Svenonius's and Cinque's cartographies. Moreover, a detailed description of the basic prepositions and axial nouns in Arabic has been provided in the light of examining their syntactic and/or semantic features and their categories or projections, enabling appropriate analyses of their correlated alternations, polysemy, interacting features, as well as their variation across diverse colloquial dialects. Needless to say, more work has to be done, from a cross-linguistic comparative perspective, to see what patterns or construction types are more widespread, and how much allosemy or allomorphy is predictable through the model.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Author contributions

AF: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. MA: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships

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