

Ezafe, PP and the nature of nominalization

Richard K. Larson & Vida Samiian

**Natural Language & Linguistic
Theory**

ISSN 0167-806X

Volume 39

Number 1

Nat Lang Linguist Theory (2021)

39:157-213

DOI 10.1007/s11049-020-09471-1

Your article is protected by copyright and all rights are held exclusively by Springer Nature B.V.. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your article, please use the accepted manuscript version for posting on your own website. You may further deposit the accepted manuscript version in any repository, provided it is only made publicly available 12 months after official publication or later and provided acknowledgement is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at link.springer.com".



Ezafe, PP and the nature of nominalization

Richard K. Larson¹ · Vida Samiiian²

Received: 10 November 2018 / Accepted: 14 April 2020 / Published online: 4 May 2020
© Springer Nature B.V. 2020

Abstract In the paper we argue that the English VP/NP structures in (i) a-d have exact counterparts in the i(ranian)Persian PP/NP structures in (ii) a-d, where P1-P3 are three different classes of iPersian Ps and where -EZ is the so-called “Ezafe” morpheme. (i. a) John [_{VP} destroy the evidence] “Pure VP”; (i. b) John -’s [_{NP} destroying the evidence] Nominalized VP; (i. c) John -’s [_{NP} destroying of the evidence] Nominalized V; (i. d) John -’s [_{NP} destruction of the evidence] Deverbal N; (ii. a) NP [_{PP} P1 NP] “Pure PP”; (ii. b) NP -Ez [_{NP} P2 NP] Nominalized PP; (ii. c) NP -Ez [_{NP} P2 -Ez NP] Nominalized P; (ii. d) NP -Ez [_{NP} P3 -Ez NP] “Deprepositional” N. The notion “nominalization” is thus shown to be relevant to both of the lexical categories - V and P - identified by Chomsky (1974) as [-N]. Our demonstration proceeds in three steps: 1) We establish a common syntactic function for English -’s/of and iPersian -EZ, viz., case-assignment, following Samiiian 1994; Karimi and Brame 1986/2012; Larson and Samiiian 2020; 2) We argue for a shared cross-categorical structure for VP-PP, developing proposals by Jackendoff 1973; van Riemsdijk 1990; Svenonius 2003. We show that if Jackendoff’s (1977) “scopal nominalization” analysis of gerunds is extended to iPersian PPs, the parallelism in (i) and (ii) is accounted for; 3) We show that the full extension of nominalization to iPersian PPs suggests a more general view of nominalization than has been recognized previously, viz., a “split-feature” view of category specification. This has a variety of implications, which we briefly explore.

Keywords Ezafe · Prepositional phrases · PP · Case · Nominalization · Iranian languages

✉ R.K. Larson
richard.larson@stonybrook.edu

V. Samiiian
vidasamiiian@gmail.com

¹ Department of Linguistics, Stony Brook University, Stony Brook, NY 11794-4376, USA

² Department of Linguistics, UCLA, Los Angeles, CA 93740, USA

Chomsky (1970) demonstrated that by viewing syntactic form and operations at a greater level of abstractness than was current at the time, it was possible to express the intuitive parallelisms in sentence - noun phrase pairs like (1-2) in a deeper, more systematic way.

- (1) a. The committee elected John.
b. John was elected by the committee.
- (2) a. The committee's election of John.
b. John's election by the committee.

To express the common form exhibited by (1a)/(2a) Chomsky posited an abstract, cross-categorial syntactic “shape”—X-bar theory, whose descendant is modern “bare phrase structure” analysis (Chomsky 1994). To capture the relation between (1b) and (2b), Chomsky factored the existing rule of Passive into simpler, more general operations, crucially including NP-preposing, which later became NP-movement, A-movement, Move α and ultimately Internal Merge (Chomsky 1995).

In this paper we pursue a similar theme. We argue that the familiar paradigm of English verbal, gerundive and derived nominal structures in (3a-d) have exact parallels in Iranian Persian prepositional and nominal structures, represented schematically (4a-d), where P₁-P₃ are three different classes of Iranian Persian prepositions and where -Ez is the so-called “Ezafe” morpheme.

- (3) a. John [VP destroy the evidence] “Pure VP”
b. John -’s [NP destroying the evidence] Nominalized VP
c. John -’s [NP destroying of the evidence] Nominalized V
d. John -’s [NP destruction of the evidence] Deverbal N
- (4) a. NP [PP P₁ NP] “Pure PP”
b. NP -Ez [NP P₂ NP] Nominalized PP
c. NP -Ez [NP P₂ -Ez NP] Nominalized P
d. NP -Ez [NP P₃ -Ez NP] “Deprepositional” N

Expressing this parallelism requires recognition of a common cross-categorial syntactic shape for verbal and prepositional phrases. As we show, it also requires a broader view of nominalization than has been countenanced heretofore. Under the combined picture, the same space of nominalization possibilities is seen to be realized with both of the lexical categories identified by Chomsky (1974) as [-N] (5).

(5) Syntactically Nominalizable Categories

	[+N]	[-N]
[+V]	A	V
[-V]	N	P

In Sect. 1, developing observations by Samiian (1983, 1994), Karimi and Brame (1986/2012) and Larson and Samiian (2020), we examine the basic distribution of Ezafe in Iranian Persian, noting that in core cases Ezafe occurs between nominal

([+N]) elements, like *'s/of* in English. We introduce the theoretical proposal of Samian (1994) that Ezafe is a clitic element that attaches to its preceding nominal and case-marks its trailing nominal, further strengthening the parallel between Ezafe and English *of*. In Sect. 2, we introduce the problem that Iranian Persian Ps and PPs pose for the basic distributional claim about Ezafe and we introduce the important connection between Iranian Persian prepositions licensing Ezafe and relational nouns. In Sect. 3, we briefly discuss the structure of PP, drawing particular attention to the parallelism between verbal and prepositional syntax under proposals by Jackendoff (1973), van Riemsdijk (1990) and Svenonius (2003). In Sect. 4 we draw the preceding lines together, proposing that the core parallelism in (3) and (4) derives from parallel nominalization syntax. Our proposal develops an idea about gerundive nominalization originally proposed by Jackendoff (1977), retaining its key “scopal” insight, but abandoning its view of nominalization as involving a specific operation or morpheme in favor of a more general, “split-feature” view of category specification. Nominalization as split-feature determination of category is developed more fully in Sect. 5, where English gerunds and derived nouns are considered in detail. These results are extended to the comparable Iranian Persian prepositions in Sect. 6, where the presence of an active, overt relational noun is argued to be the surface “exponence” of nominalization. Finally, in Sect. 7, we briefly compare our view of nominal category determination with the “contextual” theory of Borsley and Kornfilt (2000).

1 The Ezafe phenomenon

“Ezafe” refers to a morpheme found in Iranian Persian (hereafter “iPersian”), Afghan Persian (aPersian), Tajiki Persian (tPersian),¹ Balochi, Kurdish (Sorani, Kurmanji), Zazaki (Dimili) and Hawrami (Gorani). N, A, Q and P heads precede their complements and modifiers. In certain cases, Ezafe (-EZ) appears between them, realized on the preceding element. (6) shows the basic patterns:

- (6)
- | | | | |
|----|---|-----|-----------------------|
| a. | N | -EZ | NP/AP/PP/nonfinite CP |
| b. | A | -EZ | NP |
| c. | Q | -EZ | NP (for some Qs) |
| d. | P | -EZ | NP (for some Ps) |

1.1 Ezafe in Iranian Persian (iPersian)

iPersian exhibits Ezafe in its simplest form; the only variation being phonological (*e/ye*). (7a-g) show Ezafe occurring between a noun and a nominal complement or modifier. (7h) shows Ezafe between a noun and an attributive adjective. (7i) shows

¹The three main geographical variants of Modern Persian spoken in Iran, Afghanistan and Tajikistan are largely mutually intelligible, but nonetheless grammatically distinct, including for the phenomena discussed in this paper. We adopt the terminology “iPersian,” “aPersian” and “tPersian” for these variants in order to accommodate the strong desire of all three communities to be identified as speaking “Persian” (Farsi), but also to distinguish them for linguistic purposes.

it between a noun and a PP. Finally, (7j) shows that the Ezafe is recursive insofar as multiple attributive adjectives trigger multiple instances of Ezafe.

(7) **Modifiers and complements of Ns**

- | | | |
|----|--|-----------------|
| a. | del-e sang
heart-EZ stone
'stone heart' | (N-EZ NP) |
| b. | manzel-e John
house-EZ John
'John's house' | (N-EZ NP) |
| c. | shahr-e Tehran
city-EZ Tehran
'Tehran city' | (N-EZ NP) |
| d. | Ali-e Ghozati
Ali-EZ Ghozati
'Ali Ghozati' | (N-EZ NP) |
| e. | taxrib-e shahr
destruction-EZ city
'destruction of the city' | (N-EZ NP) |
| f. | xordan-e âb
drinking-EZ water
'drinking of water' | (N-EZ NP) |
| g. | forushande-ye ketâb
seller-EZ books
'seller of books' | (N-EZ NP) |
| h. | otâq-e besyâr kucik
room-EZ very small
'very small room' | (N-EZ AP) |
| i. | divâr-e jelo Ali
wall-EZ in-front-of Ali
'wall in front of Ali' | (N-EZ PP) |
| j. | ketâb-e sabz-e jâleb
book-EZ green-EZ interesting
'interesting green book' | (N-EZ AP-EZ AP) |

(8a-c) illustrate the occurrence of Ezafe in an adjective phrase (AP) between the head and its nominal (NP) complement:

(8) **Complements of As**

- | | | |
|----|--|-----------|
| a. | besyâr âsheq-e Hasan
very in love-EZ Hasan
'very enamored with Hasan' | (A-EZ NP) |
| b. | besyâr negarân-e bache-hâ
very worried-EZ child-PL
'very worried about the children' | (A-EZ NP) |

- c. montazer-e Godot² (A-EZ NP)
 waiting-EZ Godot
 'waiting for Godot'

Ezafe also occurs in iPersian between some quantificational elements (Qs) and their restriction phrase (9a-c):

(9) **Partitives**

- a. tamâm-e sherkathâ (Q-EZ NP)
 all-EZ companies
 'all/the-totality-of companies'
- b. bištar-e in sherkathâ (Q-EZ NP)
 most-EZ these companies
 'most/the-majority-of these companies'
- c. hich kodum-e sherkathâ (Q N-EZ NP)
 no one-EZ companies
 'none of the companies'

(10a-c) illustrate an interesting alternation involving Ezafe and relative clauses (RCs). iPersian relative clauses are uniformly post nominal. Finite relative clauses (FRCs) do not involve Ezafe and are instead introduced by the relative marker *ke* (10a,b). By contrast, reduced, nonfinite relative clauses (RRCs) are introduced by Ezafe and no *ke* appears (10c,d):

(10) **Finite and reduced relative clauses**

- a. dust -e Hasan] (*-e) [ke Nanaz-o mišnâs-e] (N FRC)
 friend -EZ Hasan -EZ that Nanaz know-3SG
 'the friend of Hasan who knows Nanaz'
- b. in šâgerd-â (*-ye) [ke zabânšênâsi mi-xun-and] (N FRC)
 DEM student-PL -EZ that linguistics DUR-study-3PL
 'these students who study linguistics'
- c. in javân-e [az suis bar=gašt-e] (N-EZ RRC)
 this young-EZ from Switzerland re=turn-PPL
 'this young man back from Switzerland'
- d. aks-e [čâp šode dar ruznâme] (N-EZ RRC)
 photo-EZ publication become in newspaper
 'the photo published in the newspaper'

Finally, (11a-d) show that with certain iPersian prepositional phrases, Ezafe occurs between the P head and its object. (11e) shows furthermore that when such a PP occurs as a noun modifier, Ezafe may sometimes occur between PP and the head noun:

²*Montazer* 'waiting' is the adjectival form of the noun *entezar* 'wait, expectation', both of Arabic origin. Although glossed here with a gerund, *montazer* exhibits its adjectival nature clearly in predicative constructions like (i) where it appears with an intensifier (*xeylî*):

- (i) Ali xeyli montazer bud
 Ali very waiting was
 'Ali was very much waiting'

(11) **Complements of (certain) Ps**

- a. beyn-e man-o to (P-EZ NP)
between-EZ you and me
'between you and me'
- b. vasat-e otâq (P-EZ NP)
in-the-middle-EZ room
'in the middle of the room'
- c. dor-e estaxr (P-EZ NP)
around-EZ pool
'around the pool'
- d. baqal-e dar (P-EZ NP)
by-EZ door
'by the door'
- e. xune-ye [PP kenâr-e daryâ] (N-EZ [P-EZ NP])
house-EZ next-EZ sea
'house on the beach'

1.2 The distribution of Ezafe

A number of authors (Karimi and Brame 1986/2012; Samiian 1994; Samvelian 2007; Larson and Yamakido 2008; Larson and Samiian 2020) have argued that the core distributional fact about Ezafe is that it occurs between nominals.³ We formulate this idea in terms of the categorial feature [N] from Chomsky (1974) as in (12):

- (12) **Key distributional claim:** Ezafe occurs between [+N] elements.
The correctness of (12) for the iPersian data cited above in (7)-(10) can be established straightforwardly.

Under standard featural assumptions (Chomsky 1974; Stowell 1981; van Riemsdijk 1983, among many others), nouns and adjectives both constitute [+N] categories. If we accept this classification, all cases falling under either of the schemata in (13a) and (13b), conform to the key distributional claim:

- (13) a. N(P) -EZ N(P)/A(P)
b. A(P) -EZ N(P)/A(P)

Consider next (14), involving nouns and reduced relatives. In the typological literature, participles are widely analyzed as adjectival elements; correspondingly, nonfinite, participial relative clauses are widely analyzed as adjectival and hence nominal ([+N]) in category (see Siloni 1995; Hazout 2001; Krause 2001; Marvin 2003; Slesman 2019).

- (14) N -EZ CP(nonfinite, participial)

³Karimi and Brame (1986/2012) argue that Ezafe occurs between nouns, which requires them to argue that the category N in iPersian embraces a far larger group of expressions than might otherwise be thought. Samvelian (2007) argues that Ezafe is specifically nominal morphology; given that Ezafe can attach to adjectives (7j) and to Partitive quantifiers, this entails the claim that these elements are nominal. Samiian (1994), Larson and Yamakido (2008), Larson and Samiian (2020) adopt the claim in the form given in (12).

If so, Ezafe is once again occurring between [+N] categories, in conformity with (12).

Finally consider partitives with Ezafe. In iPersian these occur in the two basic syntactic patterns shown in (15a-b). In pattern (15a), Ezafe attaches to an indefinite noun (*kodum*, literally ‘which’) occurring between the quantifier and the restrictor. In (15b) it appears to attach directly to the quantifier, here *tamâm* ‘all’.

- (15) a. hich kodum-**e** shâgerd-â (Q N-EZ NP)
 no one-EZ student-PL
 ‘none of the students’
 b. tamâm-**e** shâgerd-â (Q-EZ NP)
 all-EZ student-PL
 ‘all of the students’

In (15a) and all similar cases, Ezafe is plainly occurring between two [+N] elements, viz., between the indefinite noun (*kodum*) and the NP restrictor (here *shâgerdâ* ‘students’). Such examples therefore conform to the key distributional claim (12). What about (15b)?

One widely held analysis of partitives of the Q-EZ NP form is that they involve a covert noun following Q, either a deleted version of the restrictor noun (16a) or a covert version of indefinite *kodum* ‘one’ (16b) (see Jackendoff 1977; Chomsky 1981; Sauerland and Yatsushiro 2004; Stickney 2009; Ionin et al. 2006).

- (16) a. tamâm **shaagerd.a** -**e** shâgerd-â (Q N -EZ NP)
 all **student.PL** -EZ student-PL
 ‘all students of the students’
 b. tamâm **kodum** -**e** shâgerd-â (Q N -EZ NP)
 all **one** -EZ student-PL
 ‘all ones of the students’

On this analysis, (15b) simply falls together with (15a) in conforming to (12). An alternative is that Q selects the partitive complement directly, without an intervening N, a view defended for English Q of NP partitives by Matthewson (2001) and Gagnon (2013). On this proposal, conformity with (12) hinges on the nominal status of Q.

The featural composition of quantifiers and determiners is controversial, but at least under the widely influential proposals of Grimshaw (1991, 2005), wherein functional categories occurring within the nominal like D, Q, Number, Gender are analyzed as forming an “extended projection” of NP, these are featurally [+N]. More exactly, Grimshaw proposes that the functional scaffolding above NP must be consistent with it in category features (17). If so, then quantifiers and determiners are all featurally nominal.

- (17) N [+N,-V,...]
 GEN [+N,-V,...]
 NUM [+N,-V,...]
 D/Q [+N,-V,...]

We may also note in this connection that all analyses of partitives arguing for a case-marking analysis of the preposition *of* in examples like *all of the companies* implicitly

adopt the view that the Partitive complement *the students* following *of* is an expression that needs case and that the quantifier head preceding *of* is an expression that cannot itself assign case (see Girbau 2010 and especially Matthewson 2001 for a forceful defense of this idea). In the system of Chomsky (1981) at least (see below), this implies both elements are [+N].⁴

We conclude that the iPersian data cited above in (7)–(10) are either clearly or very plausibly in conformity with the key distributional claim (12) about the distribution of *Ezafe*. Thus in core cases, *Ezafe* occurs between nominal ([+N]) elements, much like *'s/of* in English.

⁴An anonymous *NLLT* reviewer notes that some quantifiers display nominal behavior insofar as they occur in argument position and take a plural morpheme (1a-b):

- (i) a. **tamâm**-o did-am
all-ACC saw-1SG
'I saw everyone'
b. **ba'zi**-â ro mi-shnâs-am
some-PL-ACC DUR-know-1SG
'I know some of them'

This is true of many quantifiers but not all. Specifically, all iPersian quantifiers that are followed by a classifier behave nominally as in (15)a. And some quantifiers without classifiers also occur nominally, e.g., *hame* 'all' in (ii-a-b):

- (ii) a. **hama**-ro did-am
all-ACC saw-1SG
'I saw everyone'
b. be **hame** goft-am
to all said-1SG
'I told everyone'

However, some iPersian quantifiers don't occur in nominal positions, such as *bishtar* 'most' (iii-a-b), *aksar* 'most/majority' (iv-a-b), *aqhlab* 'most/temporal'; even *tamam* 'all' is not acceptable as a nominal for some native speakers (va-b).

- (iii) a. ***bishtar**-o xund-am
most-ACC read-1SG
'I read most'
b. **bishtar**-esh-o xund-am
most-3SG-ACC read-1SG
'I read most of it'
- (iv) a. ***aksar**-o davat=kard-am
most/majority-ACC invitation=made-1SG
'I invited most'
b. **aksar**-eshun-o davat=kard-am
all-3SG.OBL-ACC read-1SG
'I invited most of them'
- (v) a. *?**tamâm**-o xund-am
all-ACC read-1SG
'I read all'
b. **tamâm**-esh-o xund-am
all-3SG.OBL-ACC read-1SG
'I read all of it'

1.3 Ezafe as case-marker

Samiiian (1994) offers a theoretical proposal about Ezafe from which the key distributional claim in (12) follows. Consider the sets of examples below, involving NPs (18), APs (19), QPs (20) and PPs (21). Each of the (a) examples exhibits Ezafe; the remaining ones either show the iPersian preposition *az* or Ezafe and *az* alternating, with largely identical meaning. Semantic variation in heads across the example sets suggests that *az* contributes very little on its own—i.e., that its content is determined contextually.⁵ Like Ezafe, *az* seems to be present largely for grammatical reasons, with examples becoming sharply ungrammatical without it.

- (18) a. ye goruh ***(-e)/*(az)** dâneshtu-yân NP
 a group **-EZ / of** student-PL
 ‘a group of the students’
- b. bayâniye ***(-ye)/*(az)** kârgar-ân-e motehasen
 statement **-EZ / of** worker-PL-EZ striking
 ‘statement of/from/by striking workers’
- c. gozâresh ***(-e)/*(az)** vezârat-e farhang
 report **-EZ / of** ministry-EZ education
 ‘report of/from the ministry of education’
- (19) a. negarân ***(-e)** bache.hâ AP
 worried **-EZ** child.PL
 ‘worried about the children’
- b. deltang *** (az)** zendegi
 depressed **of** life
 ‘depressed about life’
- c. xashmgin *** (az)** natije **-ye** entexabat
 enraged **of** result **-EZ** election
 ‘enraged by/at/about the election result’

⁵Az has independent use in iPersian as an ablative preposition meaning ‘from’ (ia-b); example (ib) shows both partitive and ablative uses together:

- (i) a. Ali **az** N.Y. âmad-e bud
 Ali from N.Y. came-PPT was
 ‘Ali had come from N.Y.’
- b. yek-i **az** dâneshtuy-ân **az** Chomsky soal-e xub-i kard
 one-IND from student-PL from Chomsky question-EZ good-IND made
 ‘one of the students asked a good question of Chomsky’

iPersian speakers detect an “ablative flavor” with *az* in some cases in (19)–(22), such as (21d). Note that *from/of* alternation is also found in English in examples like (iia-b):

- (ii) a. Alice jumped out **of/from** the plane.
 b. Max ran out **of/from** the house.
 c. We require this **of/from** you.

Presumably the semantic differences between use of Ezafe versus *az* follow from the fact that *az* carries genuine semantic features whereas Ezafe is semantically empty, a pure case-marker, counterpart to the difference between English *from* and *of*.

- (20) a. bishtar ***(-e)** ketâb-hâ QP
 most **-EZ** book.PL
 'most of/among the books'
- b. barxi ***(-az)** ketâb-hâ]
 some **of** book-PL
 'some of/among the books'
- c. cand-tâ ***(-ye)/*(-az)** ânhâ
 few-unit **-EZ / of** them
 'few of them'
- d. hic kodum ***(-e)/*(-az)** ânhâ
 not any **-EZ / of** them
 'none of them'
- (21) a. dar-tul ***(-e)** mâh **-e** Fevriye PP
 during **-EZ** month **-EZ** February
 'during the month of February'
- b. qabl ***(-e)/*(-az)** nahâr
 before **-EZ / of** lunch
 'before lunch'
- c. bad ***(-e)/*(-az)** molâqât **-e** Hasan]
 after **-EZ / of** visit **-EZ** Hasan
 'after the meeting with Hasan'
- d. birun ***(-e)/*(-az)** panjare
 out **-EZ / of** window
 'out/outside of the window'

English exhibits a parallel distribution insofar as where iPersian shows *Ezafe* or *az*, English shows the preposition *of* (22a-l).⁶ Here too the semantic contribution by *of* is minimal. The preposition seems to be present for purely grammatical reasons.⁷

⁶The close parallelism between iPersian *Ezafe* and English *of* is noted explicitly in Karimi and Brame (1986/2012) and Samiian (1994).

⁷When the head noun bears the indefinite suffix in iPersian, *Ezafe* is excluded (ref.). In this context, *az* becomes obligatory (i-v):

- (i) ye goruh-i ***e/*(-az)** dâneshtju-yân
 a group-IND **-EZ/of** student-PL
 'a group of students'
- (ii) bayâniye-i ***e/*(-az)** kârgârân-e motehasen
 statement-IND **-EZ/of** workers-EZ striking
 'a statement from striking workers'
- (iii) gozâresh-i ***e/*(-az)** vezârat-e farhang
 report-IND **-EZ/from** ministry-EZ education
 'a report of the ministry of education'
- (iv) a. ketâb-e jadid-e Chomsky
 book-EZ new-EZ Chomsky
 'Chomsky's new book'

- (22) a. del-e sang (N-EZ NP)
heart-EZ stone
'heart **of** stone'/'stone heart'
- b. manzel-e John (N-EZ NP)
house-EZ John
'house **of** John's'/'John's house'
- c. shahr-e Tehran (N-EZ NP)
city-EZ Tehran
'city **of** Tehran'/'Tehran city'
- d. Ali-e Ghozati (N-EZ NP)
Ali-EZ Ghozati
'Ali **of** the Ghozati's'/'Ali Ghozati'
- e. tæxrib-e shahr (N-EZ NP)
destruction-EZ city
'destruction **of** the city'
- f. xordan-e âb (N-EZ NP)
drinking-EZ water
'drinking **of** water'
- g. forushande-ye ketâb (N-EZ NP)
seller-EZ books
'seller **of** books'
- h. ârezumand-e shohrat (A-EZ NP)
desirous-EZ fame
'desirous **of** fame'
- i. bishtar-e ketâb-hâ (Q-EZ NP)
most-EZ book-PL
'most **of** the books'
- j. birun-e panjare (P-EZ NP)
out-EZ window
'out **of** the window'

- b. ketâb-e jadid-i *e/*(az) Chomsky
book-EZ new-IND -EZ/from Chomsky
'a new book by Chomsky'

- (v) a. maqâle-ye Milâd-e Azimi
article-EZ Milad-EZ Azimi
'the article by Milad Azimi'
- b. maqale-i *e/*(az) Milad-e Azimi
article-IND EZ/of Milad-EZ Azimi
'an article by Milad Azimi'

Note, however, that this distribution does not hold of adjectival modifiers, which never co-occur with *az*.

- (vi) Ketab-i (*az) jadid
book-IND **of** new
'a new book'

We assume that whereas adjectives can co-occur with the pure case-marker *-EZ*, they cannot occur with the prepositional case-marker *az* in virtue of residual ablative semantic features inhering in the latter.

- k. bâ-vojud-e Hasan (P-EZ NP)
with-existence-EZ Hasan
'in spite of Hasan'
- l. be-dalil-e in mozu (P-EZ NP)
for-reason-EZ this issue
'because of this issue'

Chomsky (1981) proposes that *of* is present in the English expressions given as glosses in (22) in order to satisfy a case licensing requirement on NPs (i.e., on [+N] elements). In essence, his proposal is that nominal items require case, but nominal elements do not assign or check case. It follows that when two nominals X, Y are adjacent (23a), a case assigner like *of* will be required between them (23b) to assign case to the rightward Y. iPersian *az* 'of' can be analyzed in the same terms (23c):

- (23)
- | | NON-CASE-ASSIGNING | | CASE-ASSIGNING | | CASE-REQUIRING | |
|----|--------------------|---|----------------|---|----------------|---------------------------|
| a. | X[+N] | ⇒ | | | Y[+N] | |
| b. | X[+N] | ⇒ | [PP <i>of</i> | ⇒ | Y[+N]] | English <i>of</i> |
| c. | X[+N] | ⇒ | [PP <i>az</i> | ⇒ | Y[+N]] | iPersian <i>az</i> |

Samiian (1994) proposes essentially the same picture for iPersian *Ezafe*, suggesting that -EZ is a case-assigning element that is merged into the first nominal X and provides case assignment for the second nominal Y (24a); Larson and Yamakido (2008) offer a minor variant of Samiian's proposal wherein *Ezafe* is, in effect, a clitic version of *az*, heading its own phrase (*EzP*) and cliticizing onto the preceding nominal stem (24b)

- (24)
- | | NON-CASE-ASSIGNING | | CASE-ASSIGNING | | CASE-REQUIRING |
|----|--------------------|---|----------------|---|--------------------------------------|
| a. | X[+N] -EZ | ⇒ | | | Y[+N] iPersian <i>Ezafe</i> |
| b. | X[+N] -EZ | | [EzP -EZ | ⇒ | Y[+N]] iPersian <i>Ezafe</i> |
| | | ↑ | -----↓ | | |

On either variant, Samiian's proposal derives the key distributional claim in (12) from case theory: from the inability of nominal items to assign (or check) case, from the licensing requirement on nominal elements that they receive case (or have it checked on them) and from the problem posed by adjacent nominals (23a).⁸ Again, a basic parallelism is observed between *Ezafe* and *'s/of* in English.

2 Ezafe and iPersian PPs

Arguments for the key distributional claim (12) were given above for all iPersian cases except those involving prepositional phrases. And in fact, iPersian Ps and PPs

⁸An interesting implication of Samiian's analysis is that iPersian adjectives can be directly case-marked like iPersian nouns (a point also noted by Haig 2011). This implication is explored and developed for iPersian and a number of other Iranian languages in Larson (2018).

raise a serious puzzle for (12).⁹ In the feature system of Chomsky (1974) and Stowell (1981), prepositions are analyzed as [-N] elements. Accordingly:

- We do not expect Ezafe after P within PP. That is, we predict *P-EZ NP.
- We do not expect Ezafe before PP when the latter modifies an NP. That is, we predict *N-EZ PP.

Neither prediction is correct however.

2.1 PP-internal Ezafe

Samiiian (1994) notes that iPersian prepositions fall into 3 classes with respect to Ezafe and their objects. Some prepositions (P₁) do forbid Ezafe before their objects, as predicted (25a-d). But others (P₂) allow Ezafe in this position (26a-d), and some (P₃) actually require it (27a-d).¹⁰

- (25) **P₁ (forbids Ezafe)**
- a. az (*-e) Maryam
from (-EZ) Maryam
'from Maryam'
 - b. bâ (*-ye) Hasan
with (-EZ) Hasan
'with Hasan'
 - c. be (*-ye) Ali
to (-EZ) Ali
'to Ali'
 - d. dar (*-e) Tehran
in/at/on (-EZ) Tehran
'in/at/on Tehran'

- (26) **P₂ (allows Ezafe)**
- a. bâlâ (-ye) divâr
up (-EZ) wall
'up the wall'
 - b. jelo (-ye) Hasan
in front (-EZ) Hasan
'in front of Hasan'
 - c. ru (-ye) miz
on (-EZ) table
'on top of the table'

⁹See [Appendix](#) for a full list of iPersian prepositions.

¹⁰The P1-P3 division classifies iPersian prepositions with regard to Ezafe, but some iPersian Ps show other options. For example, the prepositions *badl/pas* 'after', *gabll/pish* 'before', and *qeyr* 'except' pattern like P3s, but instead of showing Ezafe before their objects they govern the preposition *az* (see 21b-c). iPersian also exhibits compound prepositions like *bar-asaas-e* 'based on', *banaa bar* 'according to', *bar-mabnaa-ye* 'on the basis of' and *dar-baare-ye* 'about'. See [Appendix](#) for a more complete classification.

- d. tu (-e) divâr
inside (-EZ) wall
'inside the wall'
- (27) **P₃ (requires Ezafe)**
- a. beyn *(-e) man-o to
between -EZ you-and me
'between you and me'
- b. vasat *(-e) otâq
in-the-middle -EZ room
'in the middle of the room'
- c. dor *(-e) estaxr
around -EZ pool
'around the pool'
- d. baqal *(-e) dar
by -EZ door
'by the door'

Under the key distributional claim in (12) whereby Ezafe occurs between [+N] elements, these patterns should reflect “nominality” in P_n. Specifically:

P₁s must be non-nominal ([-N]), since Ezafe is excluded.

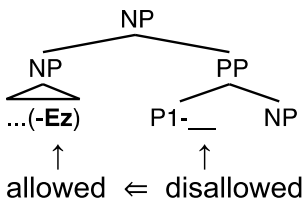
P₂s must be somehow “optionally nominal” ([±N]), since Ezafe is permitted.

P₃s must be nominal ([+N]), since Ezafe is required.

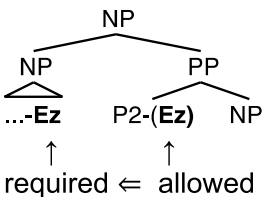
2.2 PP-external Ezafe

Consider next prepositional phrases functioning as NP modifiers. Again, contrary to prediction, Ezafe does occur between NP and PP in such cases. The exact distribution is determined according to P-class. Prepositional phrases headed by P₁s (i.e., P₁Ps) allow a preceding Ezafe (28a). P₂Ps require a preceding Ezafe (28b). And P₃Ps also require a preceding -EZ (28c).

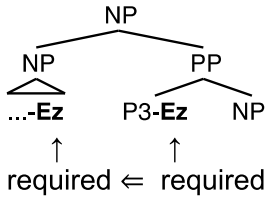
(28) a. **Ezafe and P₁s**



b. **Ezafe and P₂s**



c. **Ezafe and P₃s**



These distributions are illustrated in (29a-d) with Ps from the three respective classes:

(29)

- | | | | | | |
|----|---------------------------|-----------------------|-------|---------|-----------------------------|
| a. | [_{NP} shâm (-e) | [_{PP} bâ | (*-e) | Hasan]] | P₁: bâ |
| | dinner | with | | Hasan | 'dinner with Hasan' |
| b. | [_{NP} divâr -e | [_{PP} jelo | | Ali]] | P₂: jelo |
| | wall | in-front-of | | Ali | 'wall in front of Ali' |
| c. | [_{NP} divâr -e | [_{PP} jelo | -e | Ali]] | P₂: jelo |
| | wall | in-front-of | | Ali | 'wall in front of Ali' |
| d. | [_{NP} miz -e | [_{PP} baqal | -e | Hasan]] | P₃: baqal |
| | table | near | | Hasan | 'table near Hasan' |

Once again, if Ezafe occurs between [+N] elements as hypothesized under (12), then this pattern must reflect “nominality” of P_nP. Specifically:

- P₁Ps must be “optionally nominal” ([±N]), since Ezafe is permitted before them
- P₂Ps must be nominal ([+N]), since Ezafe is required before them
- P₃Ps must be nominal ([+N]), since Ezafe is required before them

What sense can we make of these PP distributions, and how can we connect them to the “nominality” facts about the corresponding P heads?¹¹

¹¹Pantcheva (2008), following Svenonius (2006), analyzes P₂s and P₃s as “Axial Parts,” a locative category distinct from nouns and distinct from functional prepositions (P₁s). To account for the nominal characteristics of P₂/P₃s she posits an empty PLACE node before P₂/P₃s. A major argument she presents is the occurrence of a demonstrative determiner before P₂/P₃s as in (i) which is semantically synonymous with (ii). Since *ja* means ‘place,’ she assumes a silent PLACE before *ru-ye miz* in (i).

(i) in/un ru-ye miz
 this/that top-EZ table
 ‘this/that top of the table’

(ii) inja/unja ru-ye miz
 here/there top-EZ table
 ‘here/there on top of the table’

However, (i) and (ii) exhibit some distinctions. For example, (i) disallows demonstratives before the final noun (iii_a), whereas (ii) allows them (iii_b). Note the bare PP form allows final demonstratives (iii_c).

(iii) a. *in/un ru-ye in/un miz
 ‘this/that top of **this/that** table’
 b. inja/unja ru-ye in/un miz
 ‘here/there on top of **this/that** table’

2.3 Prepositions and relational nouns

A key element of the answer, we believe, lies in the intimate connection between iPersian P_{2s}/P_{3s} and corresponding relational nouns, a link familiar from the grammaticalization literature (Quirk and Mulholland 1964; König and Kortmann 1991; Kortmann and König 1992; Waters 2009; Libert 2013).¹²

To introduce the core issues, consider first the English expressions *inside* and *interior* as they appear in (30) and (31). Co-occurrence in argument position with an article (30a) and an attributive modifier (30b) and appearance in the plural (30c) identify *inside* and *interior* as nouns in these examples. Co-occurrence with an *of*-PP complement in (31a) furthermore identifies the two expressions as relational nouns, with a logical structure as in (31b):

- (30) a. The **inside/interior** is white.
 b. We examined the grimy **inside/interior**.
 c. The company is not responsible for **interiors**/?**insides** (only exteriors/outside(s)).
- (31) a. The **interior/inside** [_{PP} of the box] was filled with foam.
 b. $\lambda y \lambda x$ [interior/inside(x,y)]

Conceptually, something is an interior *x* in virtue of being an interior of something *y*. Likewise something is an inside in virtue of being an inside of something.

Compare next *inside* and *interior* in (32a-b). Again the two expressions occur as nouns, but here within a larger PP structure. Again the two nouns are relational, as can be seen by considering the logical structure of the larger PP (32c):

- (32) a. John put the clock [_{PP} in the [**inside** of the box]].

-
- c. ru-ye **in/un** miz
 'on top of **this/that** table'

Moreover, P_{3s} can occur without a complement with a determiner, but not preceded by *inja* and *unja*.

- (iv) a. in/un ru
 'this/that top'
 b. *inja/unja ru
 'here/there on top'

Also, absent from Pantcheva (2008) is any account of the external occurrence of Ezafe before PPs. (The internal occurrence of Ezafe is not accounted for in detail beyond the assumption that Ezafe is a case assigner and an additional projection KP can host the Ezafe morpheme as proposed by Svenonius 2006.) Finally with respect to optionality of Ezafe following P_{2s}, Pantcheva proposes to classify them as P₁ when there is no Ezafe following them as in (v) or as Axial Part P₃ when there is as in (vi).

- (v) tu jabe
 (vi) tu-ye jabe

This appears to us simply to restate the distributional facts rather than to explain them.

¹²We are grateful to an anonymous *NLLT* reviewer for comments prompting the discussion in this section and to Jonathan Washington (p.c.) for pointing out the relevance of English *inside* and *outside* for the discussion of iPersian prepositions.

- b. John put the clock [pp in the [**interior** of the box]].
 c. $\lambda w[\text{in}(w,tx[\text{inside/interior}(x,\text{the-box})])]$

Intuitively, *in the inside of the box* is true of entities z that are contained within the volume x constituting the inside of the box.

Finally consider (33a-c). (33a) illustrates prepositional *inside*. Here no definite article or *of* is present, indicating that the expression is not a noun. Nonetheless, the synonymy of (32a) and (33a) strongly suggests that the semantics of relational noun *inside* persists within the semantics of prepositional *inside* (33b). To be inside the box is clearly to be located in the box's inside, etc.

- (33) a. John put the clock [pp **inside** the box].
 b. $[\text{inside}] = \lambda z\lambda y\lambda x[\text{IN}(z,x) \ \& \ \text{inside}(x,y)]$
 c. *John put the clock [pp **interior** the box].

These points suggest that when a relational noun develops a corresponding preposition, it does so by incorporating an additional locative relation ('IN') into its existing relational structure.¹³ Plausibly the reason *interior* has no corresponding prepositional form (33c) is because it has failed to undergo a similar incorporation process; native speakers do sense a missing locative relation in this example.¹⁴

2.4 iPersian P₂s and P₃s and relational nouns

The observations made above for English *inside* apply equally to iPersian P₂s and P₃s insofar as all of these forms appear to have active relational noun counterparts in iPersian grammar.

Karimi and Brame (1986/2012) observe that forms corresponding to iPersian P₃s behave like nouns in combining with demonstratives (34), in pluralizing (35), in occurring as prepositional objects (36a) and in being modifiable by attributive adjectives (36b).

- (34) a. **in/un** zir-e miz (=Karimi and Brame 1986/2012: (43a-f))
this/that under-EZ table
 'this/that underspace of the table'
 b. **in/un** vasat-e sandoq
this/that middle-EZ trunk
 'this/that middle part of the trunk'
 c. **in/un** posht-e mâshin
this/that behind-EZ car
 'this/that back area of the car'

¹³Svenonius (2003, 2012) analyzes what are here identified as relational nouns as of the syntactic category Axial Part, and offers an extensive decompositional analysis of spatial adpositions.

¹⁴This difference in prepositional trajectory for *inside* and *interior* plausibly traces to their different origins. According to the *OED*, *inside* originated (1504) from an adjective-relational noun combination *ynsyde* meaning 'inner side,' later generalized to 'interior.' By contrast *interior* (1490) derives from a Latin comparative adjective *intere* meaning 'situated more within.'

- (35) a. un zir-â-ye miz (=Karimi and Brame 1986/2012: (45a,b,d))
that under-**PL**-EZ table
'those under spaces of the table'
b. un vasat-â-ye otâq
that middle-**PL**-EZ room
'those middle parts of the room'
c. in posht-â-ye xune
this behind-**PL**-EZ house
'these back areas of the house'
- (36) a. **be** zir-e miz (=Karimi and Brame 1986/2012: (46a))
to under-EZ table
'to the space under the table'/'under the table' (directional)
b. zir-e **kasif-e** miz (=Karimi and Brame 1986/2012: (47))
under-EZ **dirty-EZ** table
'the dirty underspace of the table'

The same observations hold of iPersian P₂s. Sample cases are shown in (37)-(39), which again display combination with demonstratives (37), pluralization (38), occurrence as object of a preposition (39) and the possibility adjectival modification (40):

- (37) a. **in** ru-ye miz
this top-EZ table
'this top of the table'
b. **un** jelo-ye xune
that front-EZ house
'that front of the house'
c. **in** tu-ye ganje
this inside-EZ closet
'this inside of the closet'
- (38) a. in ru-â-ye miz
this top-**PL**-EZ table
'these top areas of the table'
b. un jelo-â-ye xune
that front-**PL**-EZ house
'those front areas of the house'
c. in tu-â-ye ganje
this inside-**PL**-EZ closet
'these inside areas of the closet'
- (39) a. **az** ru-ye miz
from top-EZ table
'from the top of the table'
b. **dar** jelo-ye xune
in front-EZ house
'in the front of the house'
c. **az** tu-ye ganje
from inside-EZ closet
'from the inside of the closet'

- (40) a. in ru-ye **tamiz**-e miz
this top-EZ **clean**-EZ table
'this clean top of the table'
b. in jelo-ye **qashang**-e xune
this front-EZ **beautiful**-EZ house
'this beautiful front area of the house'
c. in tu-ye **târik**-e ganje
this inside-EZ **dark**-EZ closet
'this dark inside of the closet'

Furthermore, as with *inside*, the prepositional meanings of iPersian P₂s and P₃s plausibly incorporate the meanings of their corresponding relational nouns, as we see from synonymous pairs like (41)–(46), in which the generalized iPersian locative P₁ *dar* 'in/on/at' is present (a) and absent (b) (resp.):

- (41) a. mâshin-e Ali [PP **dar** jelo-ye xune]-ast P₂ (*jelo* 'in front of')
car-EZ Ali **LOC** front-EZ house-is
'Ali's car is in front of the house.'
b. mâshin-e Ali [PP jelo(-ye) xune]-ast
car-EZ Ali front(-EZ) house-is
'Ali's car is in front of the house.'
- (42) a. sâ'at [PP **dar** bâlâ-ye yaxcâl]-e P₂ (*bâlâ* 'on top of')
clock **LOC** top-EZ refrigerator-is
'The clock is on top of the refrigerator.'
b. sâ'at [PP bâlâ(-ye) yaxcâl]-e
clock top(-EZ) refrigerator-is
'The clock is on top of the refrigerator.'
- (43) a. ketâb-e Ali [PP **dar** tu-ye jabe]-ast P₂ (*tu* 'inside')
book-EZ Ali **LOC** inside-EZ box-is
'Ali's book is inside the box.'
b. ketâb-e Ali [PP tu(-ye) jabe]-ast
book-EZ Ali inside(-EZ) box-is
'Ali's book is inside the box.'
- (44) a. in gol-hâ [PP **dar** vasat-e miz]-an P₃ (*vasat* 'middle')
this flower-PL **LOC** middle-EZ table-are
'These flowers are in the middle of the table.'
b. in gol-hâ [PP vasat-e miz] an
this flower-PL middle-EZ table are
'These flowers are in the middle of the table.'
- (45) a. sâ'at [PP **dar** dâxel-e jabe]-ast P₃ (*dâxel* 'inside')
clock **LOC** inside-EZ box-is
'The clock is in the inside of the box.'
b. sâ'at [PP dâxel-e jabe]-ast
clock inside-EZ box-is
'The clock is inside the box.'

- (46) a. xune-ye Hasan [pp dar kenâr-e daryâ]-ast P₃ (*kenar* ‘beside’)
 house-EZ Hasan LOC beside-EZ sea]-is
 ‘Hasan’s house is at the seaside/on the beach.’
- b. xune-ye Hasan [pp kenâr-e daryâ]-ast
 house-EZ Hasan beside-EZ sea]-is
 ‘Hasan’s house is at the seaside/on the beach.’

In all this behavior, iPersian parallels what we saw earlier with English *inside*, where the prepositional form was matched by an active relational noun form that is logically prior (since the prepositional meaning contains the relational noun meaning), grammatically prior (since the prepositional form contains the relational noun form) and historically prior (since the preposition developed from the relational noun). As also in the English case, the added locative component in iPersian P₂s and P₃s can be covert, with the P₂s and P₃s identical in form to the corresponding relational nouns.¹⁵

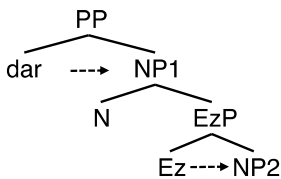
2.5 Grammaticization and synchronic analysis

As noted above, the development of prepositions from relational nouns is a topic widely discussed in the grammaticization literature. A commonly proposed scenario in this context starts from the situation where a nominal containing a relational noun (RN) and its complement NP occur as the object of a preposition (P) (47). RN subsequently incorporates into P, either overtly or covertly. The P-RN composite is later reanalyzed as a P itself, with the complement NP reanalyzed as its grammatical object (Waters 2009; Ogawa 2014).

- (47) P [RN NP] ⇒ P-RN [RN NP] ⇒ [P_{RN} NP]

This picture suggests a potentially attractive synchronic analysis of PP-internal Ezafe. Assume that examples (41a)-(46a) above, with overt P₁ *dar*, have the basic structure in (48), where the complement of *dar* is a relational NP (NP1). Here *dar* assigns case to NP1 and Ezafe assigns case to the complement of N (NP2).

- (48) Overt *dar*

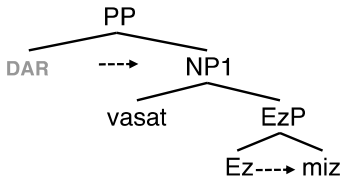


Starting from this basic picture, examples where *dar* is absent (41b)-(46b) might then be accommodated as follows. With P₃s we would take the structure to be identical

¹⁵This identity of form led Karimi and Brame (1986/2012) to conclude that iPersian P₃s simply are nouns. But this cannot be correct, as we have seen, given that prepositions and relational nouns have distinct semantics.

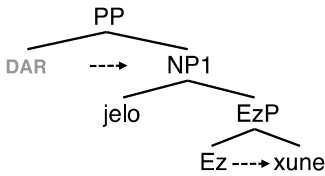
to (48), but with *dar* (or its equivalent) present in null form (*DAR*). This proposal correctly predicts that Ezafe is required internally with P₃s; see (49), corresponding to (44b):

(49) P₃

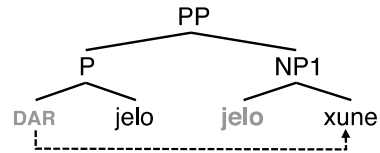


With P₂s, we would assume the same underlying structure, but with an additional option. Thus structure (50a) would be available for (41b), which is essentially identical to (49); here again Ez is realized. But additionally we might assume a structure as in (50b), where the relational noun (*jelo*) incorporates into null *DAR*, following the usual historical sequence, voiding the case requirement on NP1 (Baker 1988) and allowing *DAR* to case-mark the relational complement (*xune*) directly. Ez would then be unrealized.¹⁶

(50) a. P₂ (with Ezafe)



b. P₂ (without Ezafe)



This account would ascribe the obligatoriness of Ezafe with P₃s to the fact that these are not really prepositions at all, but rather relational NP complements of a null P. And it would ascribe the optionality of Ezafe with P₂s to the optionality of N-incorporation, an operation presumably unavailable to P₃s as a matter of the lexical properties of their relational noun heads.

Nonetheless, however attractive these proposals might seem as an account of the PP-internal distribution of Ezafe, observe that they are clearly not adequate for explaining the PP-external distribution of Ezafe. On the structures proposed in (48)-(50), iPersian PPs of all types are headed by an overt or null P, which is [-N] by assumptions and whose projection is [-N] by assumptions. This predicts neither the optional occurrence of Ezafe with P₁Ps (29a) nor the obligatory occurrence of Ezafe with P₂Ps and P₃Ps, whether these show internal Ezafe or not (29b-d). So a synchronic analysis mimicking the common developmental account of prepositions from relational nouns (47) will not suffice as it stands.

¹⁶We remain neutral in this discussion as to whether incorporation occurs syntactically as in Baker (1988) or whether it is a word formation process as in Rosen (1989). For us the key point is that incorporated nominal material, like *jelo* in (50b), does not bear case features like argumental nominals.

Nevertheless, although the proposals in (48)-(50) are not successful, we think the relational noun “core” observed within iPersian P₂Ps and P₃Ps is the key to a more adequate account. A striking difference between iPersian and English is the sheer productivity of the P-RN patterning. In English the set of prepositions having active relational noun counterparts is confined to the forms *inside/outside*. Overwhelmingly, the set of English locative prepositions deriving from relational nouns (*around, atop, behind, below, beneath, beside, between, beyond, underneath, etc.*) no longer have transparent relations to grammatically independent relational nouns. In iPersian, by contrast, the pattern is highly regular. This suggests that what we are seeing in iPersian P₂Ps and P₃Ps might represent a kind of “projection” of the [N] feature present in their core relational noun to higher levels of structure. We now turn to an account that has these properties, beginning with a closer look at PP itself.

3 The structure of PP

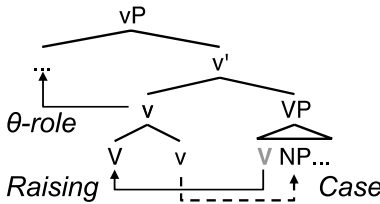
In the first systematic study of prepositional phrase structure in generative grammar, Jackendoff (1973) demonstrated a basic parallelism in selection and complementation between verbs and prepositions. In brief, for verb classes with complement type X (51a-d), Jackendoff exhibited a corresponding prepositional class with complement type X (52a-d):¹⁷

- (51) *Verbal complementation*
- | | | |
|----|---|------------------------|
| a. | [_{VP} V] | Intransitive V |
| | e.g., John [_{VP} laughed/fell] | |
| b. | [_{VP} V NP] | Transitive V |
| | e.g., John [_{VP} hit [_{NP} the wall]] | |
| c. | [_{VP} V PP] | PP Complement-taking V |
| | e.g., John [_{VP} dug [_{PP} through his coins]] | |
| d. | [_{VP} V NP PP] | Ditransitive V |
| | e.g., John [_{VP} put [_{NP} salt] [_{PP} on the fish]] | |
- (52) *Prepositional complementation*
- | | | |
|----|---|------------------------|
| a. | [_{PP} P] | Intransitive P |
| | e.g., John went [_{PP} out/inside] | |
| b. | [_{PP} P NP] | Transitive P |
| | e.g., John went [_{PP} through the wall] | |
| c. | [_{PP} P PP] | PP Complement-taking P |
| | e.g., John jumped [_{PP} up [_{PP} from the floor]] | |
| d. | [_{PP} P NP PP] | Ditransitive P |
| | e.g., John traveled [_{PP} from [_{NP} Kyoto] [_{PP} to Tokyo]] | |

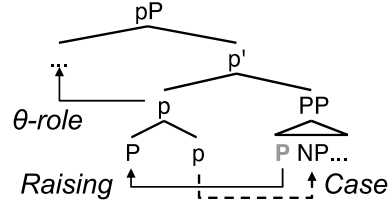
¹⁷Jackendoff 1973 did not consider sentential complement-taking verbs [_{VP} V CP], which, as later noted by Emonds (1976), are matched by clause-taking prepositions like *before, after, while, because* and *although*—so-called “subordinating conjunctions.” An anonymous *NLLT* reviewer also notes the clause-taking P in (*Reading is a skill, in that we need to practice it*). The core VP complementation patterns not apparently matched in PP appear to be: double objects ([_{VP} V NP NP]; *give John a peach*), double PPs ([_{VP} V PP PP]; *talk to John about Max*) and object control structures ([_{VP} V NP CP]; *urge John to eat*).

These parallels have been further developed in more recent work. Chomsky (1995) (expanding ideas by Larson 1988) proposes a “split” or “shelled” structure for VP as in (53a), which includes a light verbal head that Chomsky labels “v”. Little *v* is understood as the source of the subject thematic role, as well as the source of accusative case in a transitive structure. In the course of derivation, the lexical verb (*V*) raises to little *v* adjoining to it. Van Riemsdijk (1990) conjectures the existence of a functional little *p* head in prepositional phrases in certain cases and Svenonius (2003) integrates this idea into a picture of PP structure fully parallel to that of vP/VP under Chomsky (1995) (53b). If PPs are thought of as determining Locatum and Location roles (*John* (Locatum) *is in the office* (Location)), then little *p* can be analyzed as the source of the Locatum role, as well as the source of case for the P object. In the course of derivation, the lexical preposition (*P*) raises to little *p* adjoining to it, fully in parallel to what occurs in vP/VP.

(53) a. VP structure

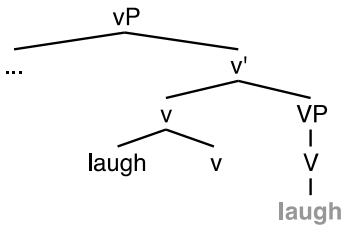


b. PP structure

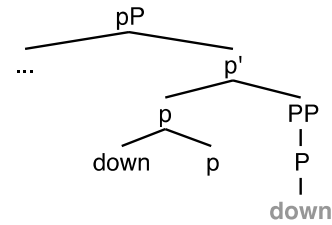


Adopting Svenonius’ proposal, we may represent the VP/PP complementation parallels identified by Jackendoff as in (54a-d). Note the non-vacuous nature of lexical head raising in (54d)/(54d’), which achieves the correct ordering of complements.¹⁸

(54) a. [vP V]



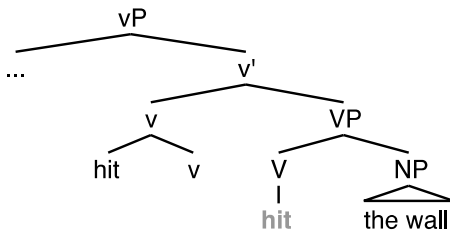
a'. [pP P]



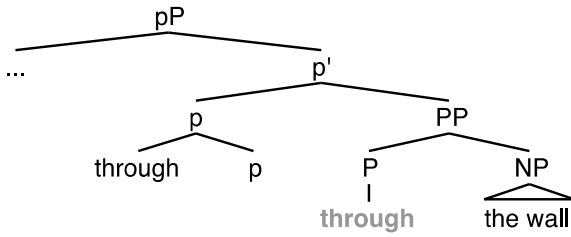
¹⁸One of Jackendoff’s (1973) striking demonstrations is that expressions like *from Kyoto to Tokyo* can function as a single constituent (54d’) and not simply as a sequence of two PPs. Jackendoff establishes this with classic constituency tests and examples like (ia-c):

- | | | | |
|-----|----|--|------------------------------|
| (i) | a. | [From Kyoto to Tokyo] is a long way. | Subject position |
| | b. | It was [from Kyoto to Tokyo] that John traveled. | Cleft position |
| | c. | [From where to Tokyo]/[from Kyoto to where] did John travel? | Pied-piping with <i>wh</i> - |

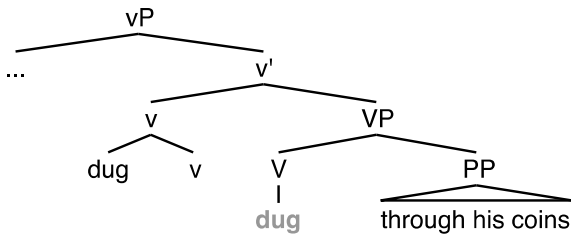
b. [VP V NP]



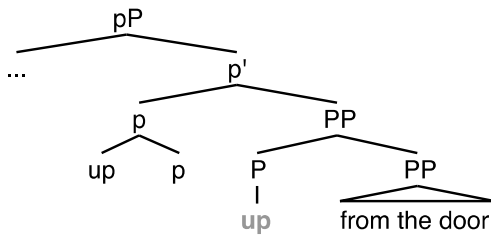
b'. [PP P NP]



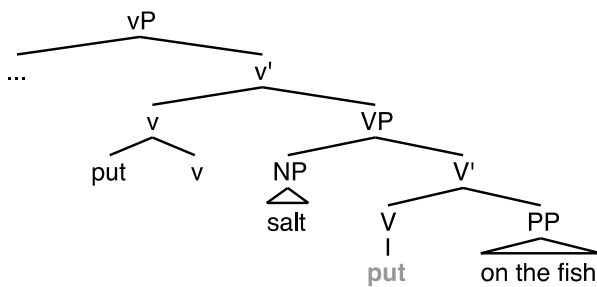
c. [VP V PP]

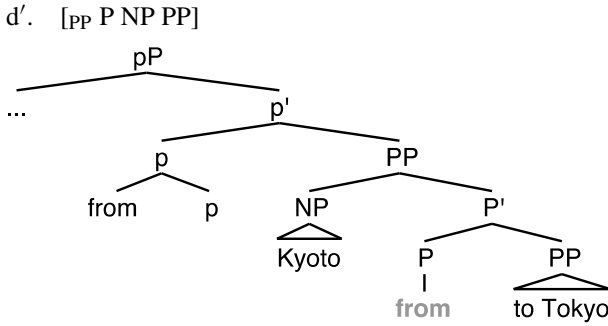


c'. [PP P PP]



d. [VP V NP PP]





4 VPs, gerunds and derived nominals

With these results in place, consider now the external and internal distribution of the boldfaced VPs and nominals in (55a-d):¹⁹

- (55)
- | | | | | | | |
|----|-------------------|---------|-----------|--------------------|------------------------|-----------------------|
| a. | [VP V | NP] | John will | destroy | the evidence | <i>of</i> -forbidden |
| b. | [NP V- <i>ing</i> | NP] | John 's | destroying | the evidence | } <i>of</i> -optional |
| c. | [NP V- <i>ing</i> | of NP] | John 's | destroying | of the evidence | |
| d. | [NP N | of NP] | John 's | destruction | of the evidence | <i>of</i> -required |

Informally, one might describe the verb phrase *destroy the evidence* in (55a) as “externally verbal” insofar as it combines with the modal *will* and also as “internally verbal” in showing an accusative object. By contrast, the verbal gerund *destroying the evidence* in (55b) is “externally nominal” insofar as it combines with a possessive determiner, but it remains “internally verbal” in continuing to show an accusative object. The nominal gerund *destroying of the evidence* in (55c) is “externally nominal” in combining with a possessive determiner; but it is also “internally nominal” in showing an *of*- complement in place of an accusative object. Finally, the derived nominal *destruction of the evidence* in (55d) is both externally and internally nominal.

Compare now the external and internal distribution of the boldfaced iPersian phrases in (56a-d), where we take the presence of Ezafe as an indicator of nominality in its flanking phrases, as discussed in Sect. 2:

- (56)
- | | | | | | | |
|----|------------------------|------|----------|----------------|----------------|---------------------------------|
| a. | [PP P ₁ | NP] | shâm | bâ | Hasan | EZ-forbidden (P ₁) |
| | | | dinner | with | Hasan' | |
| b. | [NP P ₂ | NP] | divâr -e | jelo | Ali | } EZ-optional (P ₂) |
| c. | [NP P ₂ -EZ | NP] | divar -e | jelo | -ye Ali | |
| | | | wall | before | Ali' | |
| d. | [NP P ₃ -EZ | NP] | miz -e | baqal-e | Hasan | EZ-required (P ₃) |
| | | | table | near | Hasan' | |

¹⁹The characterization of *of* and EZ as “optional” in (55b,c) and (56b,c) (resp.) is purely descriptive. As we argue below, the two pairs have different structures.

Again we might informally describe the P₁ prepositional phrase *bâ Hasan* in (56a) as “externally prepositional” in showing no Ezafe on the preceding N and also as “internally prepositional” in showing no Ezafe between P and its object. By contrast, the P₂ prepositional phrase *jelo Ali* in (56b) is “externally nominal” in requiring Ezafe on the preceding N, but still “internally prepositional” in showing no Ezafe between P and its object. The P₂ prepositional phrase *jelo-ye Ali* in (56c) is “externally nominal” in requiring Ezafe on the preceding N; but it is now also “internally nominal” in showing Ezafe between P and its object. Finally, the P₃ prepositional phrase *baqal-e Hasan* in (56d) is both externally and internally nominal in requiring Ezafe both before PP and within it.

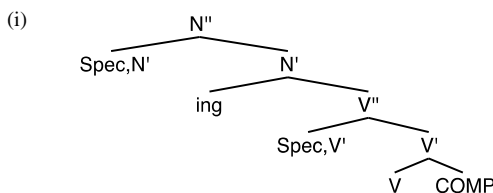
The parallelism between (55) and (56) is striking.²⁰ iPersian P₁s pattern like “true prepositions” heading “true prepositional phrases.” By contrast, iPersian P₃s pattern like nouns heading noun phrases. And iPersian P₂s pattern like non-nominal and nominal “gerunds” derived from prepositions.

4.1 Gerund formation as “scopal nominalization”

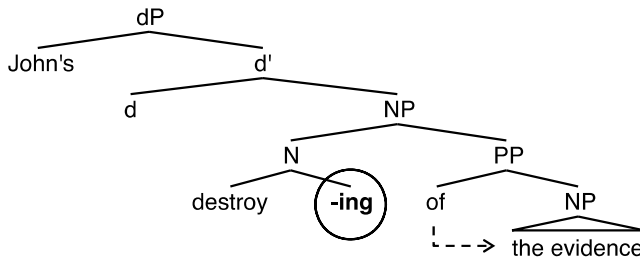
Jackendoff (1977) makes the interesting proposal that status as a nominal versus a verbal gerund in English reflects the scope of *-ing*, which he analyzes as a nominalizing morpheme.²¹ Specifically, Jackendoff proposes that when *-ing* combines with a verbal head directly (57a), it converts the latter to a noun, projecting nominal structure from the converted head up. The nominal gerund *destroying* thus becomes comparable to the derived nominal *destruction*, which also projects nominal structure from the head up (57b).

²⁰An anonymous *NLLT* reviewer questions the parallelism between (55a-d) and (56a-d) based on presumed thematic differences. Specifically, in (55a-d) *John('s)* is claimed to be an argument of the boldfaced phrases that follow it whereas in (56a-d) the boldfaced phrases constitute adjunct modifiers of the preceding N-EZ. While it is true that *John('s)* functions as a semantic argument in (55a-d), in at least (55b-d) it is dubious that *John('s)* is in fact a syntactic argument. As discussed in detail by Grimshaw (1991) in all of such cases, the genitive nominal is optional and replaceable by a simple determiner (*the destroying/destruction*), behavior quite uncharacteristic of a true argument. More plausible, as Grimshaw discusses, is that gerunds and derived nominals contain covert subjects and that the genitive-marked nominal has the status of an adjunct that, when present, is bound to the covert subject. If so, then the fundamental relation between *John('s)* and the boldfaced phrases in (55b-d) and N-EZ and the boldfaced phrases in (56b-d) (resp.) is not fundamentally different, presumably interpreted by predicate conjunction in both cases, a symmetric relation. Furthermore we note that the parallelism that truly matters in (55) and (56) is exactly between (55b-d) and (56b-d) since (56b-d) are precisely the cases where presence of Ezafe is unexpected and in need of explanation. In short then, where parallelism in (55)/(56) truly matters, it does indeed appear to obtain, including with respect to thematic relations.

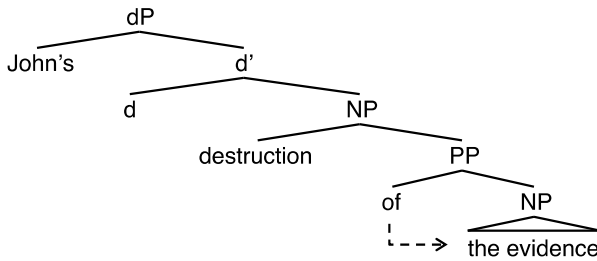
²¹Jackendoff (1977) builds on Horn (1975), who was the first (to our knowledge) to propose that *-ing* can function to nominalize a verbal projection. Horn (1975:363) offers a general structure for verbal gerunds as in (i), utilizing X-bar theory:



(57) a. **N gerund** (Nominalized V)

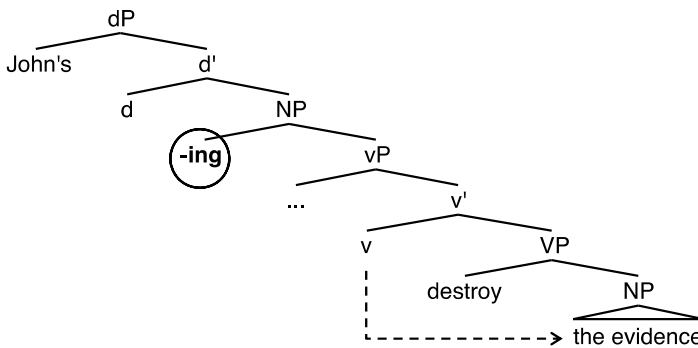


b. **Derived nominal** (Deverbal N)



By contrast, when *-ing* combines with a verb phrase (here vP) (58a), the result is nominal structure only from the phrase level up. Beneath the nominalizer the expression continues to have the status of a true vP, comparable to (58b).^{22,23,24}

(58) a. **V gerund** (Nominalized vP)



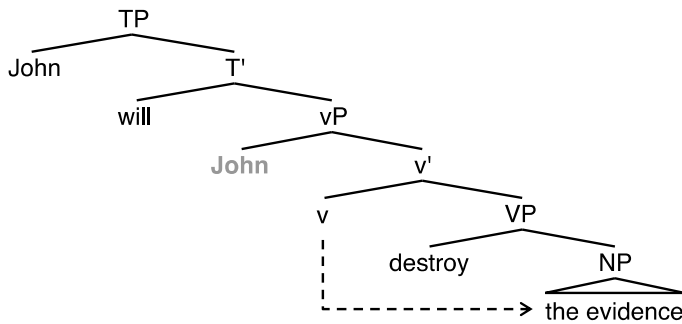
²²As is well known, verbal gerunds also allow aspectual verbs (ia) and negation (ib). In the first case, *-ing* would be assumed to attach to the corresponding projections above vP, e.g., PerfP. The second case appears to be a negative verbal gerund and raises an interesting word order problem for Jackendoff that we discuss below:

- (i) a. John's [_{NP} **having** destroyed the evidence] (was problematic).
- b. John's [_{NP} **not** destroying the evidence] (was fortunate).

²³Abney (1987) and Kratzer (1996) adopt variants of Jackendoff's scopal nominalization; cf. also Borsley and Kornfilt's (2000) analysis of "mixed categories." See Sect. 7 for more discussion.

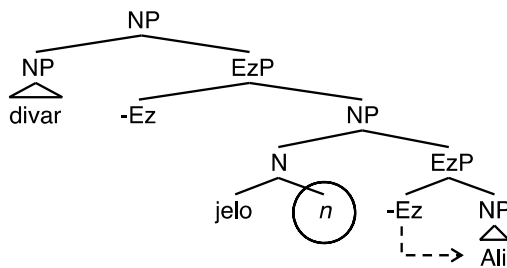
²⁴As noted in fn. 16, the genitive subjects of gerunds and nominals do not behave as true syntactic subjects in being optional; we follow Grimshaw (1991) in taking these genitives to be adjuncts, bound to a covert pronominal subject (represented in (58a) by "...") that remains within vP.

b. **True vP**

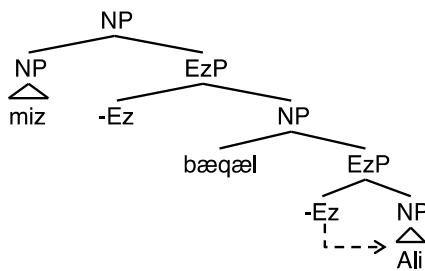


Consider now Jackendoff's proposals extended to iPersian PPs, where we understand P_1 s as "true prepositions" heading "true prepositional phrases," where we understand P_3 s as "de-prepositional nouns," and where we understand P_2 s as the counterparts of nominal and non-nominal gerunds. Specifically in regard to the latter, suppose iPersian has a null nominalization morpheme (n) counterpart to Jackendoff's *-ing* that can combine either with a lexical P head or with a pP projection. When n combines with a prepositional head directly (59a), it converts the latter to a noun projecting nominal structure from the converted head up. The nominalized P_2 *jelo* thus becomes comparable to the "de-prepositional" noun *baqal*, which also projects nominal structure from the head up (59b).

(59) a. **P_2** (Nominalized P) ('wall before/in front of Ali')

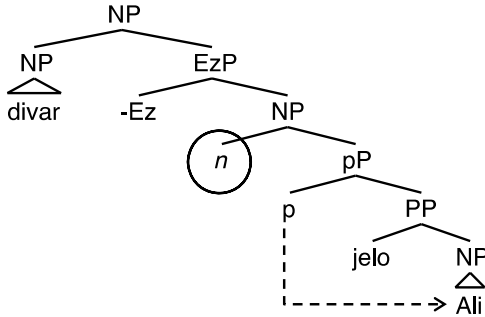


b. **P_3** (De-prepositional N) ('table near Ali')

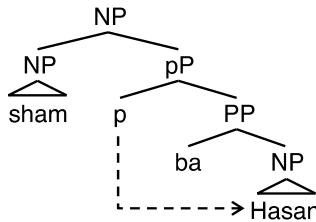


By contrast, when *n* combines with a prepositional phrase (pP) (60a), the result is nominal structure only from the phrase up. Beneath the nominalizer, the expression continues to have the status of a true pP comparable to (60b).

(60) a. **P₂** (Nominalized pP) ('wall before/in front of Ali')



b. **P₁** (True p) ('dinner with Hasan')



4.2 iPersian P₁Ps again

Scopal nominalization, as sketched above, appears to offer an attractive account of the internal and external occurrence of Ezafe with respect to iPersian PPs and the key distributional claim (13). But it leaves an important factual point unaccounted for.

We have characterized iPersian P₁s like *az* 'from', *bâ* 'with', *be* 'to' and *dar* 'in/at/on' as "true prepositions" heading "true prepositional phrases," a view consistent with the fact that they never take Ezafe before their objects. However, as first observed by Samvelian (2007), and as noted in (22a), Ezafe does occur between iPersian P₁Ps and a nominal it modifies; (61a) is from Samvelian (2007, ex 27), and (61b-e) are drawn from the Bijan Khan online corpus:^{25,26}

(61) a. *sobh-hâ-ye* [P₁P *bâ* *mâdar*]
 morning-PL-EZ with mother
 'mornings with mother'

²⁵We are grateful to Nazila Shafiei for assistance with corpus research.

²⁶In (61c-e), the preposition *be*, *bar* and *az* are optional with Ezafe present. With Ezafe absent, *be*, *bar* and *az* become obligatory. The meaning is the same in all cases.

- b. sherkat-(e) [P_{1P} dar entexâbât] (BK#25)
participation-EZ in election
'participation in the election'
- c. dar pasox-(e) [P_{1P} be in porsesh] (BK#56)
in response-EZ to this question
'in response to this question'
- d. savâr (-e) [P_{1P} bar asb-e zarin zin] (BK#86)
riding -EZ on horse-EZ golden saddle
'riding on a horse with a golden saddle'
- e. davat (-e) [P_{1P} az aziz. ân] (BK#94)
invitation -EZ from loved.ones
'invitation of loved ones'

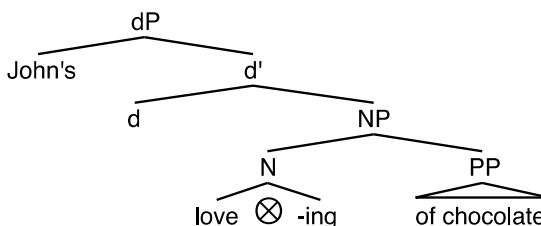
What can be said about the optionality of EZ on P₁Ps despite its exclusion after P₁s (28a)?

Pursuing the general analogy with gerund and derived nominals, we propose that this situation with iPersian P₁s is analogous to what one sees in English with gerund examples like (62). Whereas action verbs (*destroy, borrow*) typically allow both nominal and verbal gerund formation (62a,b), stative verbs (*hear, know, love*) typically permit only the latter (62c-e). Nominal gerund formation with stative verbs is sharply degraded in comparison to action verbs.

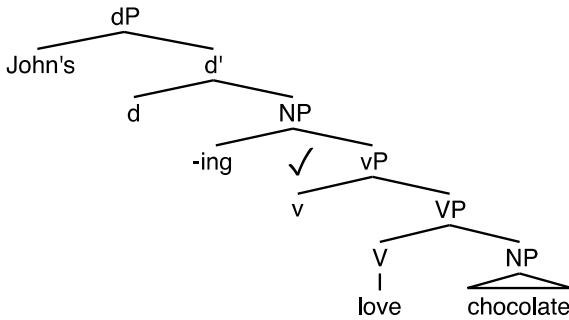
- (62) a. John's **destroying** (of) the evidence (was illegal).
- b. John's **borrowing** (of) the tools (was frowned on).
- c. John's **hearing** (*of) the noise (was unexpected).
- d. John's **knowing** (*of) French (was not taken for granted).
- e. John's **loving** (*of) chocolate (was a drawback).

Jackendoff's (1977) scopal analysis provides a direct way of understanding the greater restrictiveness observed with nominal gerund formation. If the latter involve nominalizing a lexical V, then we might expect the inherent lexical properties of V to play a role in determining acceptability (63a). By contrast, if verbal gerund formation involves nominalizing a whole verbal phrase (vP), then lexical properties will be inaccessible at that point and the only constraints should involve those on the phrase as a whole (63b).

- (63) a. *Nominalized Stative V

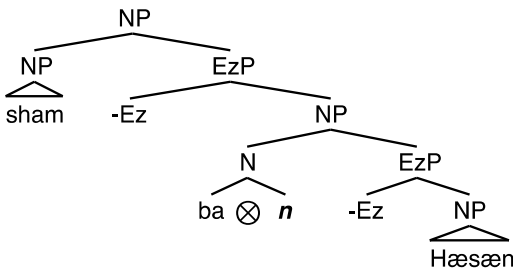


b. **OK** Nominalized Stative vP

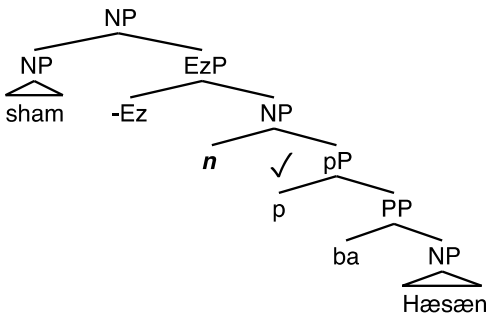


We propose to extend this basic logic to iPersian PPs. Specifically, we suggest that true prepositions (P_1 s) reject nominalization as a lexical matter (64a), but accept nominalization of the larger pP phrase in some cases (64b) because lexical constraints don't apply at that point.

(64) a. *** P_1** (Nominalized P)



b. **OK P_1** (Nominalized pP)



What lexical factors might be at work in excluding (64a)? In the case of verbal gerunds the factors seem to be semantic. As Vendler (1967) notes, nominal gerunds appear to involve reference to actions whereas verbal gerunds involve reference to “facts” or “states of affairs.”²⁷ Compare Vendler’s (65a,b).

²⁷For developments of, and alternatives to, Vendler’s proposals about gerunds, see Hamm and van Lambalgen (2002), Milsark (2005), Grimm and McNally (2015).

- (65) a. John's playing *(of) poker is sloppy. Vendler (1967:125)
 b. John's playing (?of) poker is unlikely. Vendler (1967:126)

Intuitively, actions can be sloppy, but facts or states of affairs cannot. As Vendler notes, this is reflected in the felicity of the nominal gerund in (65a) versus the infelicity of the verbal gerund. By contrast, states of affairs can be unlikely but actions in themselves cannot (although it can be unlikely that they will be undertaken). This tracks the felicity of the verbal gerund in (65b) versus the relative infelicity of the nominal gerund. Given this view, the unacceptability of (62c-e) is straightforward: hearing a noise, knowing French and loving chocolate are not naturally construed as actions, as required by the nominal gerund.

Extending Vendler's general view to prepositions and prepositional phrases, what lexical property of iPersian P₁s might be responsible for their resisting nominalization as depicted in (64a)? Here we suggest a formal syntactic property noted above, namely, that unlike iPersian P₂s and P₃s, iPersian P₁s lack a syntactic "core" based on a relational noun. Put differently, we suggest that iPersian P₂s and P₃s can be lexically nominalized because of an intrinsic nominality they possess through their contained relational noun. Nominalization in this sense represents a kind of wide scoping of the nominal feature born by this element. By contrast, iPersian P₁s do not have a relational noun core and hence no contained nominal feature, hence the only way they can become nominal is through the phrasal nominalization mechanism (64b) available to all pPs/PPs. We develop this proposal and make it formally precise in the next section.²⁸

²⁸Our analysis makes the general prediction that Ezafe should be optional before P₁Ps. We are aware of only two counter-examples from the literature, viz., (ia) from Samvelian (2007) and (ib) from Khanemouyepour (2014). In addition, the Bijan Khan corpus of 103 items contains one such item (BK#27), reproduced in (ic).

- (i) a. sob.hâ *(-ye) [P₁P bâ mâdar]
 mornings -EZ with mother
 'mornings with mother'
 b. aks *(-e) [P₁P dar ganje]
 picture -EZ in closet
 'the picture in the closet'
 c. goruh *(-e) [P₁P dar shahr]
 group -EZ in town
 'the group in town'

Interestingly, the three P₁Ps in (i) behave differently than P₂Ps and P₃Ps despite requiring a preceding Ezafe like the latter. With the P₃ *kenar* 'beside' in (iia) and the P₂ *tu* 'inside' in (iib), we can have an Ezafe requiring modifier before PP and a possessive after.

- (ii) a. xune-ye tâbestuni *(-ye) [P₃P kenâr-e daryâ-ye] Hasan
 house-EZ summer -EZ next-EZ ocean-EZ Hasan
 'Hasan's summer house on the beach'
 b. ketab-â-ye zabânshenâsi *(-ye) [P₂P tu-(ye) ganje-ye] Hasan-o dâd-am be ketâbxune
 book-PL-EZ linguistics -EZ inside-EZ closet-EZ Hasan-ACC gave-1SG to library
 'I gave Hasan's linguistics books in the closet to the library.'

However, with *goruh-e dar shahr* 'the group in town' a preceding modifier is acceptable only if the Ezafe before P₁P is omitted (iia,b).

5 Nominalization as feature-separation

As noted above, the core of Jackendoff's analysis of gerunds is scope. Nominal and verbal gerunds differ insofar as a "nominalizing" element (*ing*) receives lexical versus phrasal scope, respectively. This prompts two simple, very natural questions. What is a nominalizing element in the first place? What is the nature of nominalization scope?

5.1 Nominalizers and the feature [N]

The nature and status of nominalization and nominalizers is a topic of enduring interest in theoretical linguistics (for recent studies see Alexiadou 2001; Baker 2011; Comrie and Thompson 2007; Harley 2009; Lieber 2016, 2018; Kornfilt and Whitman 2011a,b; Reuland 2011; Roy and Soare 2011). It is well known that nominalizers appear to associate with specific lexical categories insofar as there are verbal nominalizers (*employ-ing*, *employ-er*, *employ-ee*), adjectival nominalizers (*happi-ness*, *complex-ity*), etc. Nominalizers also seem to associate with specific phrasal categories as in the case of clausal nominalizers like *no* in Japanese and *kes* in Korean (Simpson and Wu 2001). In some cases, these are associated with specific semantic contributions; in many other cases the semantic content is broad and vague. At base, however,

-
- (iii) a. goruh-e zabânsheⁿnâsi (*-ye) [P1P dar shahr]
 group-EZ linguistics -EZ in town
 'the linguistics group in town'
- b. goruh-e zabânsenâs-an (*e) [P1P dar shahr]
 group-EZ linguist-PL -ez in town
 'the group of linguists in town'

Similarly with *sob.ha-ye ba madar* 'mornings with mother' (iva-c)

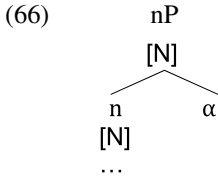
- (iv) a. sob-hâ-ye zud (*-ye) [P1P bâ mâdar]
 mornings-EZ early -EZ with mother
 'summer mornings with mother'
- b. sob-hâ-ye Maryam (*-e) [P1P bâ mâdar]
 mornings-EZ Maryam -EZ with mother
 'Maryam's mornings with mother'
- c. *sob-hâ-ye [P1P bâ mâdar-e] Maryam
 mornings-EZ with mother-EZ Maryam
 'Maryam's mornings with mother'

Similarly with *aks-e dar ganje* 'picture in the closet' (va-c).

- (v) a. aks-e jaleb (*-e) [P1P dar ganje]
 picture-EZ interesting-EZ in closet
 'the interesting picture in the closet'
- b. aks-e Hasan (*-e) [P1P dar ganje]
 picture-EZ Hasan -EZ in closet
 'the picture of Hasan in the closet'
- c. aks (*-e) [P1P dar ganje-e] Hasan
 picture-EZ in closet-EZ Hasan
 'the picture in the closet of Hasan's'

We conjecture that the examples in (ia-c) cannot be broken up by other modifiers. If so, the obligatory Ezafe found with them is not the productive Ezafe found elsewhere, and is not a counterexample to the generalization made here.

as the very title suggests, the core of a “nominalizer” *n* must surely be the syntactic feature [N]. Whatever other semantic and/or selectional features might accrue to *n* historically, its key feature must be [N], since this is what characterizes the larger projection as nominal after composition (66).

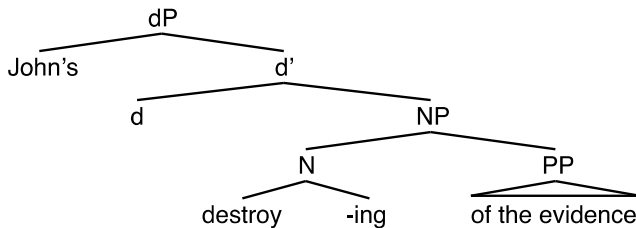


Thus when we talk of nominalizers, we seem at minimum to be talking about the distribution of the feature [N].

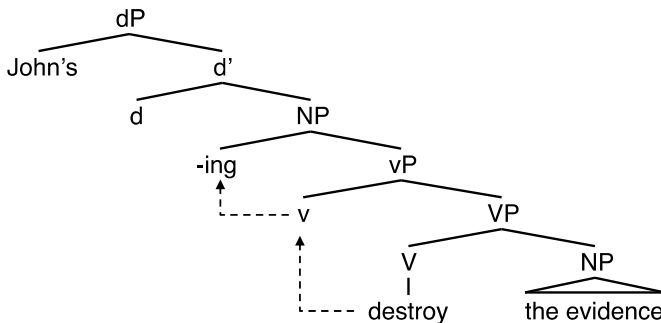
5.2 Nominalizers and scope

What sense does it then make to talk about ‘scope’ of nominalizers? In Jackendoff’s (1977) analysis of gerunds, the answer is straightforward: the *-ing* nominalizing element attaches at various bar levels of V projections. In the case of nominal gerunds, it attaches to V, hence morphological constituency and scope coincide (67a). With verbal gerunds, *-ing* attaches to vP. Here morphological constituency and scope do not coincide, hence some form of raising operation must be assumed to bring the two elements together (67b).

(67) a. **N gerund** (Nominalized V)



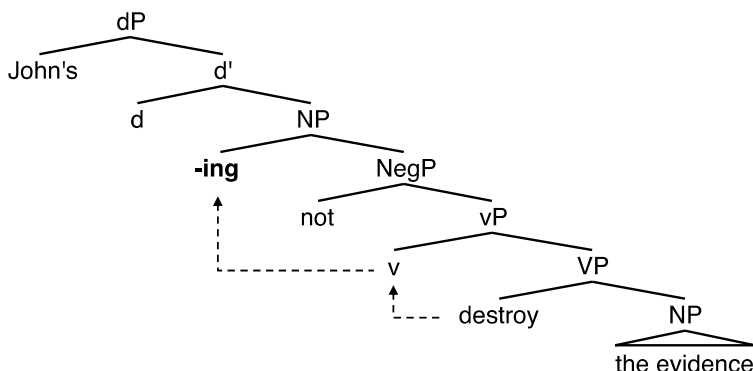
b. **V gerund** (Nominalized vP)



In this account, scope is a matter of derivational attachment, plus movement in the case where scope and morphology do not coincide.

Although simple and straightforward, the picture of nominalization scope in (67) is not without problems. Consider the verbal gerund in (68a). Intuitively, (68a) is a nominalized version of (68b);²⁹ that is, (68a) is the nominalization of a negation (and not, for example, the negation of a nominalization, which would not make sense semantically). On a Jackendoff 1977-style analysis, this would imply a structure for (68a) as in (68c), where *-ing* takes scope over NegP, and where V raises to it.

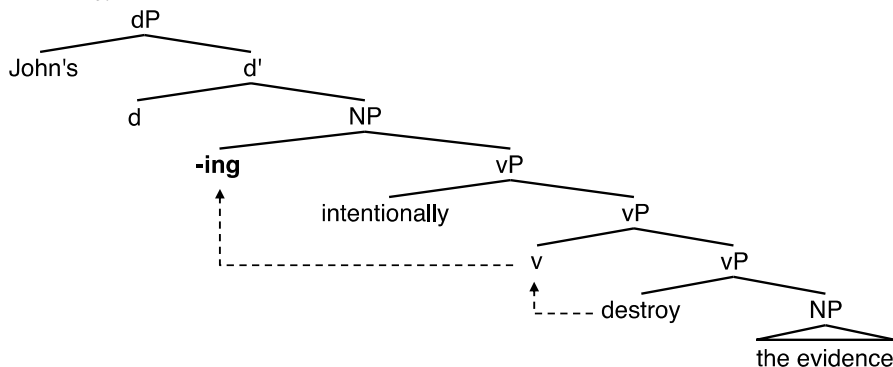
- (68) a. John's not destroying the evidence (is problematic).
- b. John didn't destroy the evidence.
- c.



Interestingly, this structure derives the wrong constituent order after raising (**John's destroying not the evidence*). Scope and position of the gerund do not coincide.

The same issue arises with examples involving preverbal adverbs. (69a) is the nominalization of an adverbially modified vP; that is, (69a) is the nominalized version of (69b). But attaching *-ing* with the required scope and raising V will again yield the wrong word order (**John's destroying intentionally the evidence*) (69c).

- (69) a. John's intentionally destroying the evidence (is problematic).
- b. John intentionally destroyed the evidence.
- c.



²⁹Note that the truth of (68a) presupposes the truth of (68b). Similarly for (69a-b) below.

Evidently, a simple attachment theory like (67), which aligns scope directly with the surface position of the gerund, is not adequate across the full range of cases. A more abstract view seems to be required: one separating the “spelled out” position of nominalization—its exponence—from the position where nominalization is interpreted. Furthermore, as we noted above, this view should be linked to the categorial feature N, which is the core of nominalization in the first place.

5.3 Separating categorial features

Our proposal involves a reconceptualizing of nominalization in grammar that embraces both of the points just stated. In brief, we suggest that nominalization is not a specific grammatical operation performed by a specific class of morphemes—e.g., “nominalizers” like *-ing* or *-e*—but rather represents something much more general following from the basic theory of features, namely, from the separation of features into interpretable and valued instances.

Modern syntactic thinking has imported the familiar LF/PF distinction into features, typically assuming a 2-fold distinction between interpretable/unvalued [iF] instances of features versus uninterpretable/valued [Fv] instances (Chomsky 1995). In a derivation, the first probes the second under c-command and the two agree (70):



An interpretable instance of a feature ([iF]) is LF-legible. A valued instance of a feature ([Fv]) is PF-legible. When the two instances of a feature undergo agreement, they form a single syntactic object that is visible at both interfaces, as required of all syntactic objects under full interpretation (Chomsky 1995).

Pesetsky and Torrego (2007) argue that [iF] and [Fv] are not the only possibilities for features and that indeed the full space of options made available by the distinctions [\pm interpretable] and [\pm valued] must be countenanced by grammatical theory (71):

(71)

	+ interpretable	– interpretable
+ valued	iFv	Fv
– valued	iF	F

Thus, on Pesetsky and Torrego’s proposal, it should also be possible for features to be both interpretable and valued [iFv] and to be neither interpretable nor valued [F].^{30,31}

³⁰For what it means for an N or V feature to be interpretable see Panagiotidis (2014) for extensive discussion. Regarding valuation, note that in this theory features do not have or assume different values; they simply are valued or not. To be valued is thus simply to be PF-interpretable.

³¹Pesetsky and Torrego (2007) generalize the scheme in (70) so that any unvalued feature may probe and agree with a local, c-commanded matching feature. This allows for potential probe-goal relations as in (i), where “ \Rightarrow ” indicates agreement. By contrast, potential probe-goal relations as in (ib) are excluded since they involve a valued probe:

- (i) a. iF \Rightarrow Fv, F \Rightarrow Fv, F \Rightarrow Fi, F \Rightarrow F.
- b. Fv \nRightarrow Fi, Fv \nRightarrow Fv, Fv \nRightarrow F

The former option ([iFv]) appears to represent the typical case of category features. For example a lexical item like *destroy* is identifiable both in form and in meaning as a verb ([iVv]). Likewise a lexical item like *destruction* is identifiable in form and meaning as a noun, however we regard the relevant items as being constructed morphologically. Hence it must also involve interpretable and valued [N].³²

5.4 Gerunds in English

With these ideas in mind, consider what might one say about the featural composition of gerund forms like *destroying* (72), which, in the theory of Jackendoff (1977), involve either nominalization of a word or nominalization of a phrase.

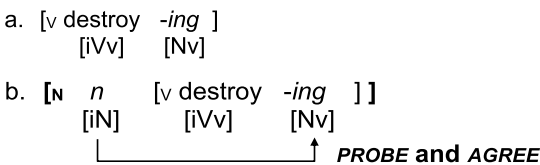
(72) *destroying* [_N_]?

We suggest that gerund formation represents a case where the two featural components of N—[iN] and [Nv]—are separated and realized independently in structure. Specifically, we propose that in gerunds:

- the valued, PF-legible instance of [N] is instantiated by *-ing*.
- the interpretable, LF-legible instance of [N] is instantiated by an abstract element *n* that can attach at different levels of structure.
- when (and only when) *n* and *-ing* are present and joined by agreement, the item they “enclose” is categorized as a nominal.

To illustrate these proposals with our example *destroy*, nominal gerund formation will involve attachment of *-ing* to the verb (73a), followed immediately by attachment of *n* to the result (73b), with agreement between the two instances of [N]. The outcome is an N projection derived directly from the lexical verb, which it encloses.³³

(73) **Nominal gerund formation**



Furthermore, as a condition on legibility at the PF-LF interfaces, Pesetsky and Torrego require each feature to have both an interpretable and a valued instance joined by agreement. Hence feature structures like (ii) will constitute legible objects since they contain instances of both kinds, but those in (iib) will not, because of lack of interpretable F, valued F, or both:

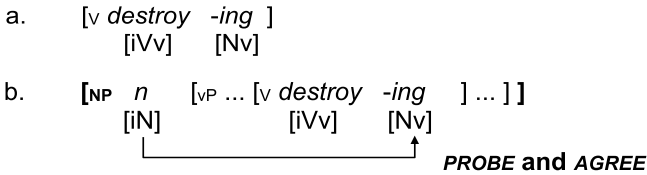
- (ii) a. iFv, iF ⇒ Fv, iF ⇒ F ⇒ Fv, iF ⇒ F ⇒ F ⇒ Fv, F ⇒ iF ⇒ Fv
 b. iF, Fv, iF ⇒ F, F ⇒ Fv, F ⇒ F, iF ⇒ F ⇒ F, F ⇒ F ⇒ Fv, F ⇒ F ⇒ F

³²See Sect. 5.5 below for more about the feature structure of derived nouns like *destruction*.

³³An anonymous *NLLT* reviewer inquires whether so-called zero-derived nominals like *love* in *John’s love of chocolate* can be handled in this account; e.g., would they be analyzed like nominal gerunds, with [iN] and [Nv] features that are both unrealized phonetically. If so, why is the equivalent of a verbal gerund excluded (**John’s love chocolate*), etc. Briefly, we do think this analysis extends to zero-derivation, but that extension involves additional issues of PF feature visibility that carry us outside the scope of this paper. Hence we postpone development to a later occasion.

Verbal gerund formation will also involve attachment of *-ing* to the lexical verb (74a). But in this case attachment of *n* will occur at a later stage to a projection of V (74b), again with agreement between feature instances. The result is an NP projection derived from a verb phrase (vP).

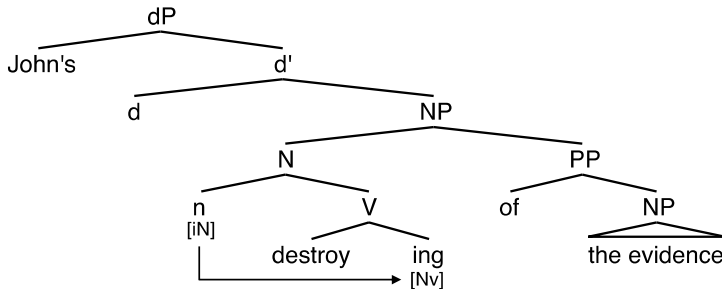
(74) **Verbal Gerund Formation**



Note carefully that since *destroying* carries [NV] in (74b), its projection must ultimately contain an agreeing [iN] for well-formedness; that is, *destroying* must be licensed by a nominal projection at some point in the derivation. However, since the N feature on *destroying* is merely valued, and since *destroy* itself carries an interpretable and valued V feature, the projection will remain verbal until *n* enters the structure. *Destroying* is thus something like a “noun-to-be,” behaving as a verb until its nominality is syntactically established by (and at the point of) agreement.³⁴

Under this picture, the Jackendovian structures (57a)/(58a) are recast as in (75a-b), where [iN] and [NV] undergo agreement in both cases. In effect, *-ing* now marks the exponence of nominalization whereas *n* marks the scope of nominalization.³⁵

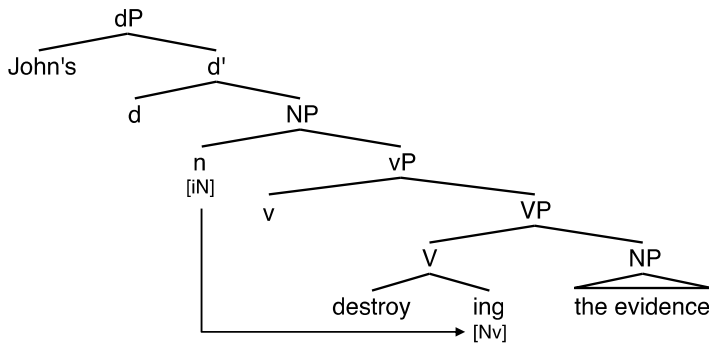
(75) a. **N gerund (Nominalized V)**



³⁴Thus the general labeling convention is that [_{αP} ...] will only project the categorial features of a head that is both valued and interpretable. In [*destroy -ing*], *destroy* bears interpretable and valued V, but only valued N, hence it is projected as V. By contrast in [*n [destroy -ing]*], *n* bears both interpretable and (by agreement) valued N, hence it is projected as N. Likewise in [*n ... [destroy -ing]*], all projections up to *n* will be projected as V since N is not interpretable until that point. Note carefully that in this discussion we are talking about categorial projection in terms of whether features are interpretable and valued, not the lexical items bearing them. This allows for the fully licit projection of elements with no semantic features, such as expletives or a purely grammatical preposition. See below.

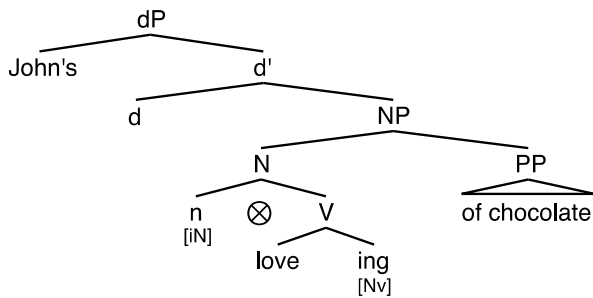
³⁵We assume *of* to be a categorial P that enters the numeration like other prepositions. It is distinguished only in bearing no inherent semantic features, being a “purely grammatical” P in this sense.

b. **V gerund** (Nominalized vP)

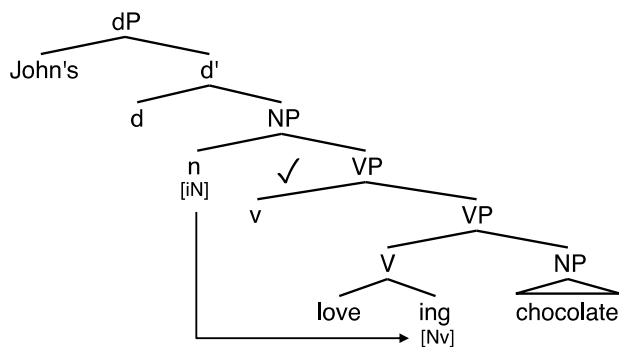


Recalling the discussion in Section 4.2, we may further stipulate that in certain cases, when lexical semantics forbids it, *n* is excluded from attaching directly to V (76a), even when verbal gerund formation remains permitted (76b) (cf. 63a-b).³⁶

(76) a. ***N gerund** (Nominalized V)



b. **OK V gerund** (Nominalized vP)



³⁶An anonymous *NLLT* reviewer asks about the precise semantics of nominalization that would block (76a). For interesting discussion on this point, see Grimm and McNally (2015).

5.5 Derived nominals in English

Our proposal regarding derived nominals is based on our account of nominal gerunds. According to the preceding discussion, the nominal gerund *destroying* has the morphosyntax and feature structure in (77a). We take the derived nominal *destruction* to be similar (77b), but with a key difference. Whereas *destroy*, to which *-ing* attaches, is a “fully categorial verb,” *destruct-*, to which *-ion* attaches, is not.

- (77) a. **Nominal gerund**
- $$\begin{array}{c}
 [N \quad n \quad [\bar{v} \text{ destroy} \quad -ing]] \\
 [iN] \quad [iVv] \quad [Nv] \\
 \underbrace{\hspace{10em}} \uparrow \text{PROBE and AGREE}
 \end{array}$$
- b. **Derived nominal**
- $$\begin{array}{c}
 [N \quad n \quad [\text{destruct} \quad -ion]] \\
 [iN] \quad [iV] \quad [Nv] \\
 \underbrace{\hspace{10em}} \uparrow \text{PROBE and AGREE}
 \end{array}$$

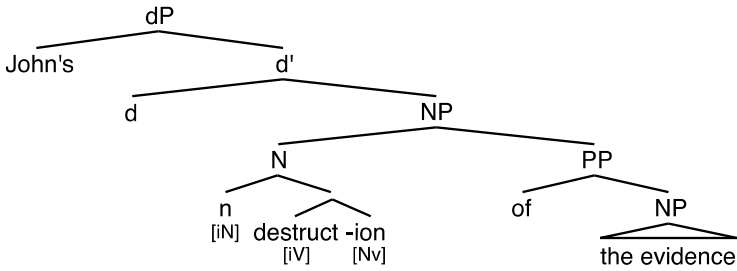
Destroy bears a verbal feature that is both interpretable and valued ([iVv]). By contrast, *destruct-* bears a verbal feature that is only interpretable ([iV]). Intuitively, this corresponds to the fact that whereas *destruct-* is verbal in meaning, it is not verbal in form. This leaves *destruct-ion* “defective” as a potential head since one of its features (V) is interpretable but not valued and the other feature (N) is valued but not interpretable. Lacking full specification for either category, we suggest this entails that *destruct-ion* cannot be projected as a verb, like *destroying* and cannot be projected as a noun either (78).

- (78)
- $$\begin{array}{c}
 [V]/[N]?? \\
 \swarrow \quad \searrow \\
 [\text{destruct} \quad -ion] \quad \dots \\
 [iV] \quad [Nv]
 \end{array}$$

The consequence, we propose, is that an interpretable noun feature ([iN]) must be added immediately in morphological derivation and cannot be delayed as in the case of verbal gerunds. Derived nominals thus behave, in effect, like “obligatorily nominal gerunds”.³⁷

³⁷Note that whereas we can resolve projection of the defective [*destruct -ion*] by adding an interpretable noun feature ([iN]), creating [_N n [*destruct -ion*]], we cannot do so by adding valued verbal feature ([Vv]), creating [_v v [*destruct -ion*]]. Since valued features do not probe in this theory (see fn. 25 above), [Vv] and [iV] could not come into agreement in this configuration. A question arises regarding the residual [iV] feature on *destruct-*, which does not undergo agreement with any [Vv] feature in the course of derivation and hence isn't PF-visible—i.e., not fully interpretable. We assume that this is acceptable in the case of roots contained within larger lexical expressions that are fully interpretable heads. This corresponds to our informal intuition that lexemes can have subparts with notional categorial contribution (verbal, nominal, adjectival) even without ever being formally of that category at any stage of derivation.

(79)

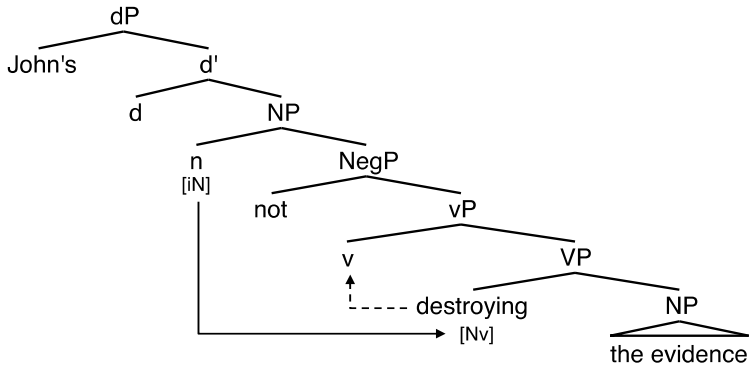


In general derived nominals must therefore behave as nouns at all levels of structure in virtue of their “defective” feature structure.

5.6 More scope and exponence

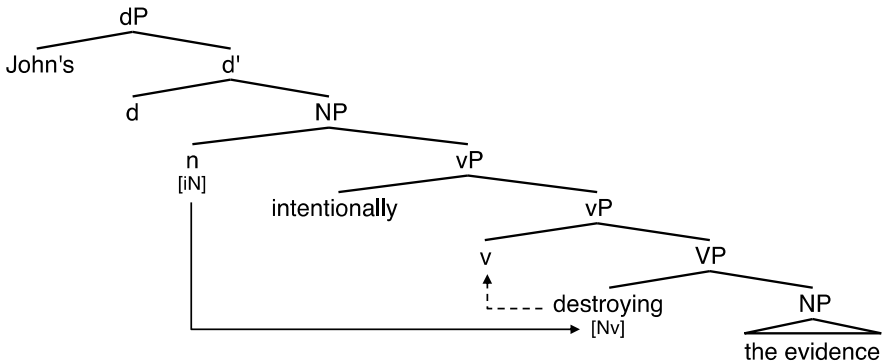
The proposals offered above have the general properties we sought in an account of nominalization. They associate nominalization crucially with the distribution of the feature N. Furthermore, they separate scope and exponence of nominalization, assimilating this to the general separation of features into interpretable and valued instances, respectively. These moves permit a straightforward account of examples like (68a) and (69a), which proved problematic for a Jackendoff 1977-style “direct attachment” account. In both cases, scope is represented by positioning of the unpronounced interpretable instance of N ([iN]), not by the position of the gerund itself. No word order issues therefore arise; see (80)/(81).³⁸

- (80) a. John’s not destroying the evidence (is problematic).
- b.



³⁸Note in (77)/(78) that since *destroying* bears only unagreed [Nv] at the point where vP is composed, its feature structure is as in (73a)/(74a); i.e., it is still formally a verb. This entails that it will undergo raising to v.

- (81) a. John's intentionally destroying the evidence (is problematic).
 b.

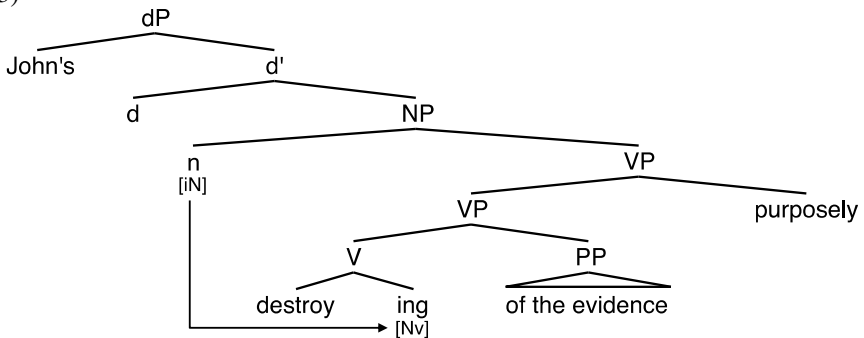


Separation of scope and exponence in nominalization as proposed here also illuminates other interesting cases that have been observed in the literature. Fu et al. (2001) note that English nominal gerunds accept verb phrase-final adverbs in some instances, a fact that would seem to clash with their nominal constituency (82a-b). Fu et al. attribute this possibility to the presence of verbal structure, even in nominal gerunds.

- (82) a. Kim's explaining of the problem to the tenants **thoroughly** (didn't prevent a riot). (adapted from Fu et al.'s (1a))
 b. John's destroying of the evidence **purposely** (surprised us).

These facts are accommodated straightforwardly under the proposals offered above if the interpretable N feature can adjoin to VP, above the V level but below the vP level, as in (83). This represents an “intermediate scope” for nominalization.³⁹

- (83)



Since *v* and vP are absent in (83), the preposition *of* will be required to case-mark the object as in nominal gerunds generally, despite the verbal nature of the projection

³⁹Presumably the marginality that some speakers perceive in examples like (82a-b) can be linked to the marginality of VP as an adverbial attachment site.

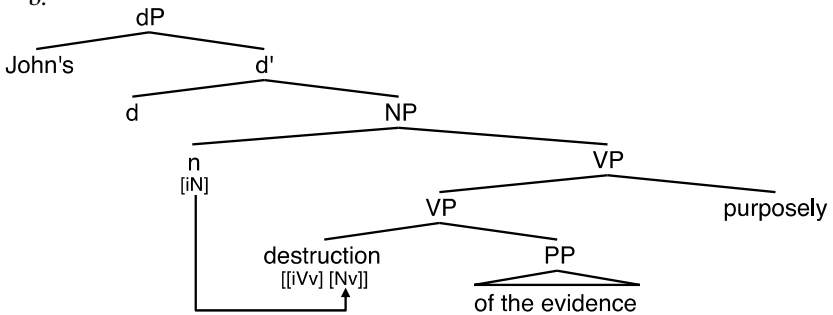
structure (cf. 75a).⁴⁰ At the same time, presence of VP provides an attachment site for the adverb *purposefully*.

Consider now a related and more striking observation by Fu et al. (2001), namely, that process-derived nominals accept final VP adverbs in the same circumstances that nominal gerunds do (84a-b), again raising an apparent problem for the idea that derived nominals are strictly nominal in structure:

- (84) a. Kim's explanation of the problem to the tenants **thoroughly** (didn't prevent a riot). (Fu et al.'s 1a)
- b. John's destruction of the evidence **purposefully** (surprised us).

Note now that if process nominalizations are optionally allowed to carry a feature structure similar to nominal gerunds as a lexical matter—i.e., (85a)—there will be no barrier to generating a structure as in (85b). Presumably, the valued status of V in derived nominals of this kind—the fact *destr-* bears identical feature structure of the lexical verb *destroy* within *destroying*—would be linked to the process understanding of the nominalization and the explicitly more verbal character of the latter.⁴¹

- (85) a. *destruction* [[iVv] [Nv]]
- b.



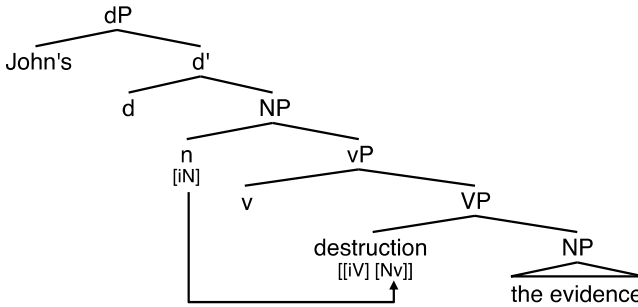
Since *destruction* (bearing [[iVv][Nv]]) now contains an interpretable, valued instance of V, it can generate a verbal projection up to the VP level, where the interpretable N feature is supplied. The resulting structure will provide a site for adverb attachment, just as in the gerund case.

Note that we are obliged to address why phrasal nominalization at the vP level will be unavailable in such cases, given the possibility of a feature structure for *destruction* equivalent to *destroying*. How, for example is (86), with no *of* present, to be ruled out?

⁴⁰In this we follow the line of explanation in Carnie (2011), who attributes the occurrence of genitive in certain Irish verbal noun constructions to the absence of a specific accusative case-assigning element, rather than to the presence of nominal vs. verbal projection *per se*.

⁴¹In the analysis of Panagiotidis (2014), items bearing an interpretable V feature are taken to denote entities extended in time. Being both interpretable and valued *destr-* would thus be treated as a full fledged verb. This would also presumably link to the fact, noted by an anonymous *NLLT* reviewer, that derived nominals with a result meaning resist adverbs e.g., *I held the translation of the poem (*quickly) in my hand*. Since such nominals precisely do not denote entities extended in time, they might be analyzed as bearing a valued V feature, but not an interpretable one.

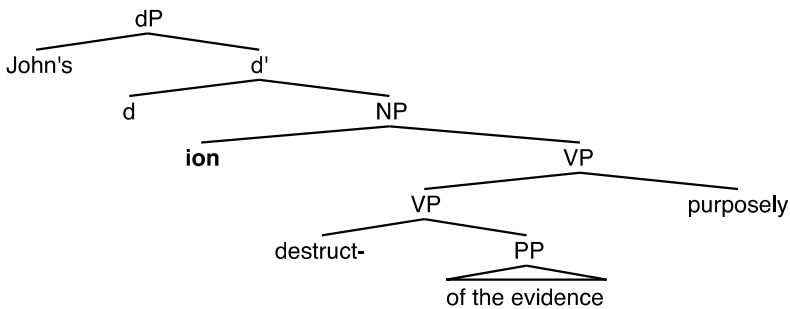
(86) *



Here again one might appeal to the proposals of Vendler (1967). If gerundive nominals like *destroying* denote eventualities and not propositional entities (states of affairs), and if process derived nominals like *destruction* have the same denotations as gerundive nominals, then we expect process derived nominals to reject the propositional denotation that is associated with vP nominalization, and hence to reject the structural possibility represented in (86).

The account of adverbials in gerundive and derived nominals in (83) and (85) shows another important difference between the “split-feature” approach to nominalizing morphology and a Jackendoff 1977-style proposal where scope of nominalization directly reflects attachment site for the morpheme *-ing*. Extending this picture to process derived nominals like *destruction* would require a similar decompositional treatment of *-ion*. Compare (85b) to (87).⁴²

(87)



While syntactic decomposition is certainly plausible for productive inflectional morphemes like *-ing*, it is far less so for derivational morphemes like *-ion*, *-al*, *-ence*, etc., for reasons originally discussed in detail by Chomsky (1970). In the account proposed here, which separates nominal feature valuation (by *-ing*, *ion*, *-al*, *-ence*, etc.) from nominal feature interpretation (by *n*), syntactic decomposition like that implied by (87) is not required.

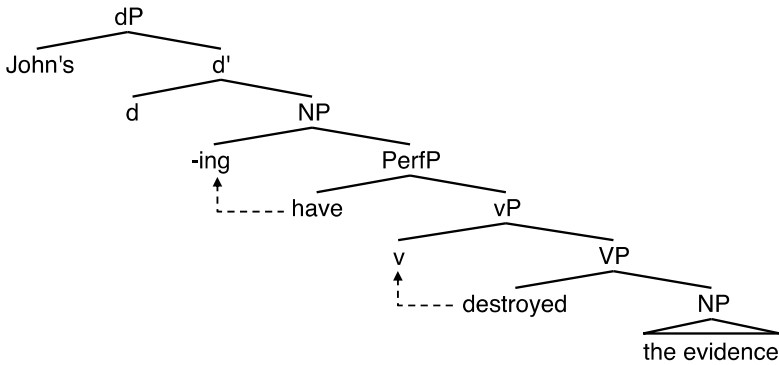
We briefly note two further points about the separation of scope and exponence posited in our theory of nominalization.⁴³ First, although a Jackendoff 1977-style, di-

⁴²See Fu et al. (2001) for an analysis similar in spirit to (53).

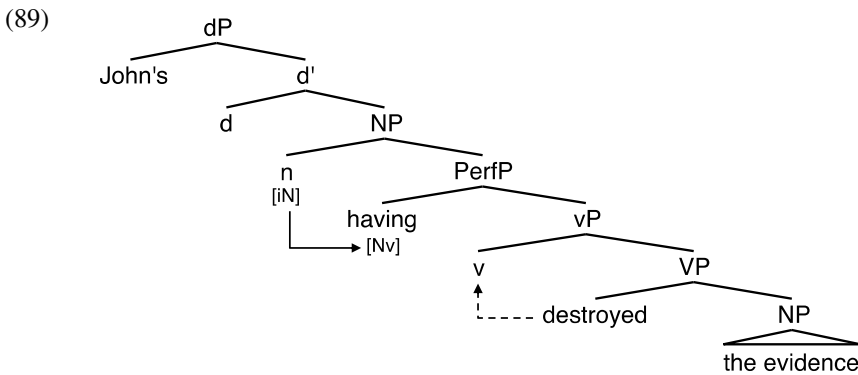
⁴³We are grateful to an anonymous *NLLT* reviewer for pointing out the examples discussed in (88)-(93) and the issues they raise.

rect attachment theory fails to predict that scope of nominalization can extend above the position of the gerund, it correctly predicts that nominalization will never extend below the gerund site. Consider the contrast in (88a-b), for example, involving gerunds with an aspectual verb. Evidently, when the aspectual verb is nominalized, the gerund is strictly verbal in character: modifiers appear in their adverbial form (*quickly*) and objects are case-marked by little *v* and not by *of*. Assuming aspectual verbs like *have* head projections above vP, this contrast will follow in the direct attachment theory as shown in (88c). Nominalization “starts” at the level of PerfP and no lower, correctly predicting the gerund to be strictly verbal in character.

- (88) a. John's **having** quickly destroyed the evidence (is problematic).
- b. *John's **having** quick destroyed of the evidence (is problematic).
- c.



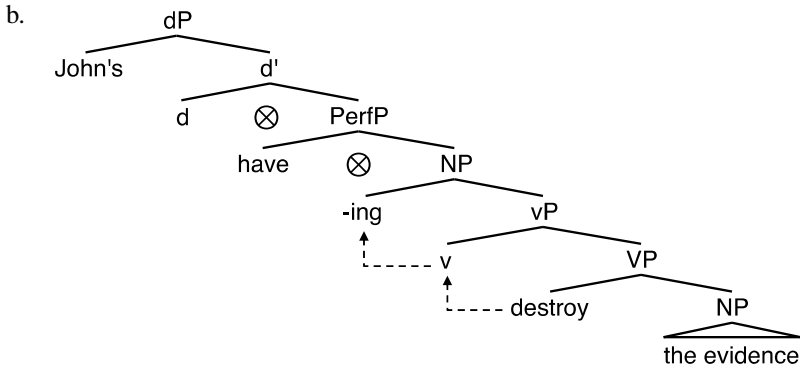
Our theory makes exactly the same prediction regarding the minimum scope of nominalization, positing the very similar structure (89). In the probe-goal relation between [iN] and [Nv], *-ing* is the surface exponence of the latter and constitutes the lowest point in structure where nominalization effects can be instantiated. We thus also predict that verbal gerunds like (88a) should indeed show only verbal properties below the level of the aspectual verb, equivalently to the direct attachment theory.



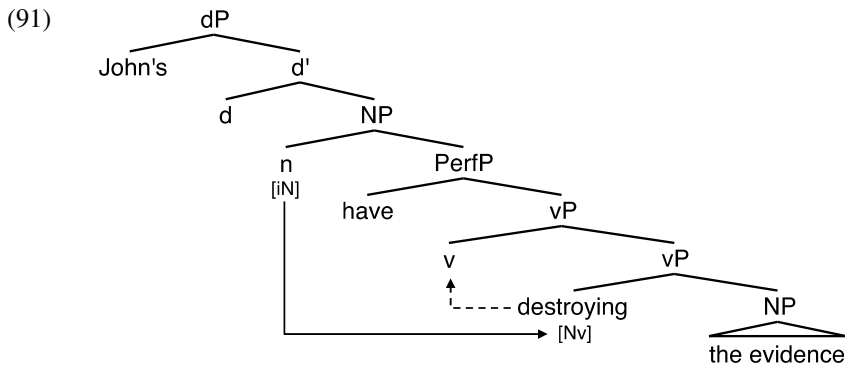
Now consider once again the question of the maximum scope of nominalization with respect to its exponence. We noted that in a direct attachment theory scope of nom-

inalization does not extend above the position of the gerund and that this prediction fails in a variety of examples. Nonetheless it does appear to yield a correct prediction for cases like (90a). If nominalization extends no higher than the *ing*-marked form, then (90a) will be correctly ruled out: PerfP will not be nominal, which is required for complements of *d*; furthermore *destroying the evidence* will be nominal, which is forbidden for complements of *have*; see (90b).⁴⁴

(90) a. *John's have destroying the evidence (is problematic).



Interestingly, on our account this result is not equally straightforward. Potentially we could assign a structure for (90a) as in (91), where covert [iN] attaches above PerfP, agreeing with the lower [Nv] and apparently incurring none of the problems of (90b).



What would rule out such a structure?

We propose that the principle excluding (91), and thus (90a), is the same one excluding forms like (92a) and requiring (92b).⁴⁵

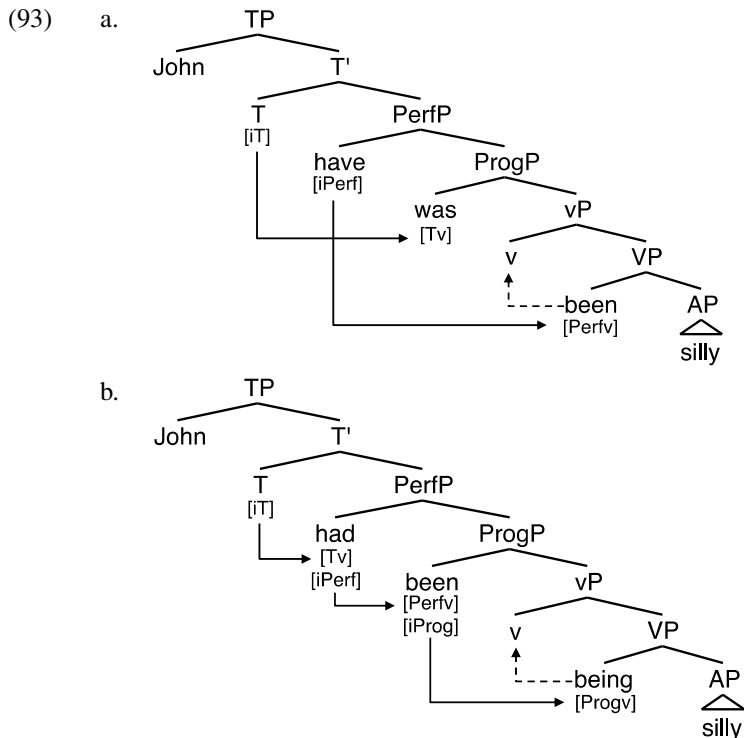
⁴⁴An anonymous *NLLT* reviewer observes that the ungrammaticality of (90a) cannot simply be ascribed to the lack of expression of participial morphology associated with *have* since “*do*-support” does not save the example (i):

(i) *John's have **done** destroying the evidence (is problematic).

⁴⁵Note here again that the ungrammaticality of (92b) cannot simply be ascribed to the lack of expression of participial morphology associated with *be* since “*do*-support” does not save the example (i):

- (92) a. *John have was been silly.
- b. John had been being silly.

The feature agreement relations required for (92a) are as in (93a). The feature agreement relations for (92b) are as in (93b):



In (93a) the interpretable tense feature on T ([iT]) probes past *have*, a closer potential bearer of [Tv], in finding its actual goal (progressive *be*). Likewise, the interpretable perfective feature on *have* ([iPerf]) probes past progressive *be*, a potential bearer of [Perfv], in finding its actual goal (main verb *be*). By contrast, in (93b) each interpretable feature finds its corresponding valued feature on the closest potential bearer of that feature.

Relations like those in (93a) are excluded by Minimality (Chomsky 1995), which requires probes to find goals on their closest potential agreeer, as in (93b). We propose that the same principle excludes (91), where the interpretable nominal feature on *n* ([iN]) probes past perfective *have*, a closer potential bearer of [Nv], in finding its actual goal (*destroying*). Under Minimality (90a) is correctly excluded, as indeed are all other examples involving [N] agreement relations that would be “non-local” in the relevant sense.⁴⁶

(i) *John have was been **doing** silly.

⁴⁶Note in (80b) and (81b) above that the items *not* and *intentionally* (respectively) are not potential bearers of *-ing* ([Nv]), and hence are not barriers to the indicated probe-goal relations under Minimality.

6 iPersian prepositions and nominalization

With these proposals in place, we now return to iPersian prepositions, developing our main idea that iPersian P₁s are counterpart to true verbs, P₃s are counterpart to derived nouns, and P₂s are counterpart to gerunds.

6.1 Feature structure of iPersian prepositions

In featural terms, our proposal amounts to analyzing the three prepositional classes as shown in (94a-c), where we compare to the corresponding verbal forms.⁴⁷

(94)	a.	P ₁ :	<i>bâ</i>	‘with’	[iPv]
			<i>destroy</i>		[iVv]
	b.	P ₃ :	<i>baqal</i>	‘near’	[[iN] [[iP] [Nv]]]
			<i>destruction</i>		[[iN] [[iV] [Nv]]]
	c.	P ₂ :	<i>jelo</i>	‘before’	[[iPv] [Nv]]
			<i>destroying</i>		[[iVv] [Nv]]

Thus P₁ *bâ* is a basic preposition, analogous to a basic verb like *destroy*. The latter bears an interpretable and valued V feature ([iVv]); correspondingly, *bâ* bears an interpretable and valued P feature ([iPv]).⁴⁸

By contrast, P₃ *baqal* is a “de-prepositional noun,” analogous to a de-verbal noun like *destruction*. We have proposed that the latter are formed on a verbal root that is featurally [iV] by addition of interpretable and valued N feature. Here we likewise propose that *baqal* is formed on a prepositional root by addition of interpretable and valued N features. As discussed in Sect. 5.5, the “defective” status of the verbal root in derived nominals forces an interpretable N feature to be composed immediately, and hence in general ensures an obligatorily nominal character to derived nouns. We draw the same conclusion about P₃s, viz., that they are formed on a defective prepositional root—one that is only [iP]. This forces an interpretable N feature to be composed immediately, and hence ensures an obligatorily nominal character for P₃s.

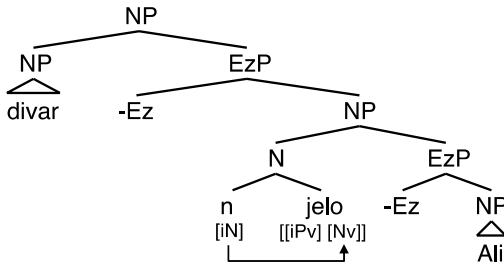
Finally, P₂s like *jelo* we analyze analogously to gerund forms. On our account, gerunds contain a fully verbal core ([iVv]) and a valued N feature ([Nv]). The corresponding interpretable N feature ([iN]) is then added derivationally, either to the lexical head or to the vP phrase. Correlatively, we take *jelo* to involve a fully prepositional core ([iPv]) and a valued N feature ([Nv]). The corresponding interpretable N feature ([iN]) is then added derivationally, either to the lexical P head (95a) or to pP

⁴⁷As noted by an anonymous *NLLT* reviewer, an important difference between the prepositional and verbal forms is that the latter derive morphologically from a verbal root and hence any verb with appropriate meaning can occur with each class. By contrast, the iPersian P₂ and P₃ forms have their nominal content lexically, derived only in a historical sense.

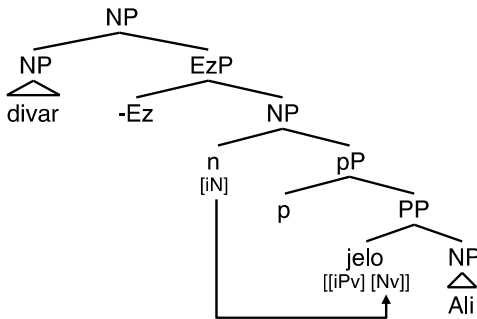
⁴⁸See 6.3 below for additions. [P] is treated here as a basic category for convenience. Nothing hangs on this. “P” could as easily be analyzed as a combination of [-v,-n], as in Chomsky (1974) or the more elaborate system in Jackendoff (1977). Similarly for the treatment of [V] and [N] in the text.

phrase (95b). In the former case, *jelo*'s projection is fully nominal in character. In the latter case, it is prepositional below the point in structure where n is composed.⁴⁹

(95) a. **P₂** (Nominalized P)



b. **P₂** (Nominalized pP)



6.2 Nominal valuation in iPersian prepositions

With English deverbal nouns like *destruction* and gerunds like *destroying*, the overt sign of nominal valuation is the specific morphology that each bears: *-ion* and *-ing*, respectively. The latter thus constitutes “nominalizing morphology.” With iPersian P₃s and P₂s no such affixal signal is present and this might appear to be a flaw in the basic analogy. In the absence of overt nominalizers, in what sense is this nominalization and

⁴⁹There is an interesting historical correlate to the hypothesized difference between the “defective” P feature of P₃s ([iP]) versus the interpretable, valued feature of P₂s ([iPv]). Middle Persian, the historical antecedent of iPersian, exhibits P₁s and P₃s in examples like (1a-b):

- (i) a. andar mân i âtaxshân (Pn. 26₁₄₋₁₅)
inside house Ez fire
‘in the temple of fire’
- b. miyân i shmâh ut oshân (Kn. II.15₁₈)
between EZ you and them
‘between you and them’

By contrast, P₂s appear to be absent from Middle Persian and to represent a recent development. Resuming earlier discussion, we propose below in 6.2 that P₂s and P₃s derive by incorporating a relational noun into a covert preposition. A natural conclusion from these historical facts is that this incorporation process took place only recently with P₂s. This appears compatible with the idea that P would have a more independent, less root-like nature in P₂s versus P₃s, given their more recent development.

These points serve to emphasize the important difference between our account of nominalization as reflecting the general separation of N into interpretable and valued instances (however these might be realized) and accounts that posit specific nominalizing morphemes to convert some category into a nominal. Our account accommodates the iPersian P₂/P₃ data in a natural way that other accounts of nominalization do not.

6.3 Nominalization in P₁s

The discussion of features above still leaves one element undiscussed, namely iPersian P₁s. We proposed earlier that P₁s have the option of phrasal nominalization but not lexical nominalization, which we analyzed extending ideas by Vendler (1967). Under the current proposal to say that P₁s are optionally nominalizable must mean that P₁s may optionally bear the feature specification [Nv]. In other words, the full picture must be as in (100a-c), where the P₁ *bâ* can have either of the feature specifications shown, but where lexical nominalization is excluded with P₁s on independent grounds.

(100)	a.	P ₁ :	<i>bâ</i>	‘with’	[iPv]	or	[[iPv],[Nv]]
	b.	P ₃ :	<i>baqal</i>	‘near’	[[iN] [[iP] [Nv]]]		
	c.	P ₂ :	<i>jelo</i>	‘before’	[[iPv] [Nv]]		
	d.		<i>destruction</i>		[[iN] [[iP] [Nv]]]	or	[[iPv],[Nv]]

This view essentially claims that all P₁s have the option of behaving like P₂s, up to lexical constraints. This situation is roughly comparable to what we were led to assume with English process derived nouns like *destruction* given the observations Fu et al. (2001). Whereas *destruction* is normally fully nominal in behavior, reflecting its feature status as [[iN] [[iV][Nv]]], in certain structures it behaves like a phrasal gerund (101d) (recall 85a-b). Similarly, whereas *bâ* is normally fully prepositional in behavior, reflecting its feature status as [iPv], in certain structures it behaves like a phrasal P₂ (recall 64b).

7 Our account versus “contextual nominalization”

As we have observed, our analysis ties nominalization specifically to the presence of the feature N, but allows its separation into interpretable and valued instances. This view contrasts subtly with another view that has gained popularity in the literature.

In an influential study of clausal projections with nominal properties, Borsley and Kornfilt (2000) propose that varying degrees of “nominality” be analyzed in terms of where nominal-associated functional categories are introduced in derivation. This analysis implies, in effect, a “contextual definition” of nominality in that a projection is understood as nominalized by combining with a noun-associated functional element—one that selects Ns.⁵⁰

⁵⁰This view is conceptually similar to Distributed Morphology (Halle and Marantz 1993) wherein category-less roots receive their syntactic category by combination with “categorizers.”

With cases like Polish, we might either regard the complementizer as fully nominal itself (105a), essentially following Manzini's (2010) proposals for Romance, or as nominalized in the course of derivation (105b).

- (105) a. **to** [_{NP} ze Maria zmienia pracę]
 [iNv]
 b. **to** [_{NP} n [ze Maria zmienia pracę]]
 [iN] [...[Nv]]

On all of these proposals, our view differs from Borsley and Kornfilt in attributing the shift to nominal character in a derivation to the presence, not simply of “nominal functional categories,” but of the specific [N] category feature, either in total ([iNv]) or separated into interpretable ([iN]) and valued ([Nv]) instances.⁵¹

8 Conclusion

In this article we have proposed that nominalization, a syntactic phenomenon widely assumed to apply to verbs and their projections, in fact applies to “non-nominals,” where the latter crucially includes prepositions and prepositional phrases. Specifically, we have argued that in its PP domain Iranian Persian exhibits items with the same distribution as English gerunds and derived nominals. This distribution is revealed by the iPersian Ezafe element, argued by Samiiian (1983, 1994) to be a case-marker and hence a probe into nominal status. Our analysis crucially implements observations by Jackendoff (1973), van Riemsdijk (1990) and Svenonius (2003), who demonstrate the compelling parallelism of VP and PP structure, and hence the naturalness of syntactic proposals that would apply equally to both.

We furthermore proposed that nominalization is not a specific syntactic process or operation, or the product of specific nominalizing morphemes, but rather an instance of a much broader notion in modern syntactic theory: the factorization of features into interpretable and valued instances, corresponding to their LF and PF contributions, respectively. On this picture, nominalizing morphology (*-ing*, *-tion*, *-er*) can be understood as contributing valuation—“PF visibility”—for the N feature, while interpretability is provided by an abstract element *n*, that can take scope at various levels of structure, following original insights by Jackendoff (1977). This proposal was shown to account for a wide and interesting range of cases where exponence of nominalization and scope of nominalization do not coincide.

Acknowledgements For helpful comments and clarifying questions we thank audiences at CLS54, Tehran University and Stony Brook University, where earlier versions of this material were presented. We are also grateful to Xuhui Freddy Hu, Anna Maria Di Sciullo, Jim Wood and four anonymous *NLLT* reviewers for comments and suggestions that have substantially improved this manuscript.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

⁵¹In an interesting extension of Borsley and Kornfilt (2000), Cole and Hermon (2011) analyze nominative-genitive alternation in the subject marking of Quechua relative clauses as reflecting scope of nominalization. We believe our approach can be extended directly to Cole and Hermon's data, along the lines of our analysis of gerunds and hope to pursue these ideas in separate work.

Appendix: A partial list of iPersian prepositions

P1: Forbids Int. EZ Allows Ext EZ	P2: Allows Int. EZ Requires Ext EZ	P3a: Requires Int. EZ Requires Ext. EZ	P3b: Requires Int. AZ Requires Ext. EZ	P4 (Compound Ps): Allows Int. EZ if ending in [+N]; Allows Ext. EZ
[az] 'from' [dar] 'in' [bar] 'on/at' [bā] 'with' [be] 'to' [bi] 'without' [tā] 'until' [barāye/bare] 'for'	[bālā] above 'on top of' [tu] inside [ru] on top of [jelo] in front of [pahlū] 'next to'	[atrāf] 'around' [aleyh] 'against' [baqal] 'next to' [beyn] 'between' [birun] 'outside' [dāxel] 'inside' [darun] 'inside' [dowr] 'around' [kenar] 'next to/by' [miyān] 'between/among' [mesl] 'similar to' [nazd] 'at/near' [nazdik] 'near' [posht] 'behind' [pāin] 'below' [pā] 'foot of' [pish] 'beside/at' [sar] 'head of/at' [taraf] 'side of' [tavasot] 'by (agent/instrument)' [zir] 'under' [vasat] 'between/middle [taraf] 'in the vicinity of (temporal)' [mābeyn] 'among' [hamrāh] 'along with'	[bad az] after [pas az] after [pish az] before [qabl az] before [qeyr az] except for	[rāje-be] 'about' [nesbat-be] 'w. respect to' [ru-be] 'facing' [banā-bar] 'according to' [az-taraf-e] 'from/on behalf of' [az bahr-e] 'for, for the sake of' [alā,raqm-e] 'despite' [ba-vojud-e] 'in spite of' [be-joz] 'except for' [be-raqm-e] 'according to' [be-jā-ye] 'instead of' [be-taraf-e] 'towards' [be-su-ye] 'in the direction of' [bar-aks-e] 'opposite to' [bar-zed-e] 'against' [bar-mabnā-ye] 'on the basis of' [bar-asās-e] 'based on' [dar-bāre-ye] 'about' [dar-moqābel-e] 'against' [dar-pey-e] 'following' [dar-zenn-e] 'in the midst' [dar-hin-e] 'at the time of' [dar-tul-e] 'during'

References

- Abney, Steven. 1987. The English noun phrase in its sentential aspect. PhD diss., MIT.
- Alexiadou, Artemis. 2001. *Functional structure in nominals: Nominalizations and ergativity*. Amsterdam: Benjamins.
- Baker, Mark. 1988. *Incorporation*. Chicago: University of Chicago Press.
- Baker, Mark. 2011. Degrees of nominalization: Clause-like constituents in Sakha. *Lingua* 121: 1164–1193.
- Borsley, Robert, and Jaklin Kornfilt. 2000. Mixed extended projections. In *Syntax and semantics 22: The nature and function of syntactic categories*, ed. Robert Borsley, 101–131. San Diego: Academic Press.
- Carnie, Andrew. 2011. Mixed categories in Irish. *Lingua* 121: 1207–1224.
- Chomsky, Noam. 1970. Remarks on nominalization. In *Readings in English transformational grammar*, eds. Roderick Jacobs and Peter Rosenbaum, 184–221. Boston: Ginn.
- Chomsky, Noam. 1974. The Amherst lectures. Ms., MIT.
- Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.
- Chomsky, Noam. 1994. *Bare phrase structure. MIT occasional papers in linguistics*. Cambridge: MIT Department of Linguistics and Philosophy, MITWPL.
- Chomsky, Noam. 1995. *The minimalist program*. Cambridge: MIT Press.
- Cole, Peter, and Gabriella Hermon. 2011. Nominalization and case assignment in Quechua. *Lingua* 121: 1225–1251.
- Comrie, Bernard, and Sandra Thompson. 2007. Lexical nominalization, 2nd edn. In *Language typology and syntactic description. Vol. 3, Grammatical categories and the lexicon*, ed. Timothy Shopen, 334–381. Cambridge: Cambridge University Press.
- Emonds, Joseph. 1976. *A transformational approach to English syntax: Root, structure-preserving, and local transformations*. New York: Academic Press.
- Fu, Jingqi, Thomas Roeper, and Hagit Borer. 2001. The VP within process nominals: Evidence from adverbs and the VP anaphor *do-so*. *Natural Language and Linguistic Theory* 19: 549–582.
- Gagnon, Michael. 2013. Part and parcel of eliding partitives. *Semantic and Linguistic Theory (SALT)* 23: 316–335.
- Girbau, Núria Martí. 2010. The syntax of partitives. PhD diss., Universitat Autònoma de Barcelona.
- Grimm, Scott, and Louise McNally. 2015. The *-ing* dynasty: Rebuilding the semantics of nominalizations. In *Semantic and linguistic theory (SALT)* 25.
- Grimshaw, Jane. 1991. *Argument structure*. Cambridge: MIT Press.
- Grimshaw, Jane. 2005. Extended projection. In *Words and structure*, ed. Jane Grimshaw, 1–74. Stanford: CSLI.
- Haig, Geoffrey. 2011. Linker, relativizer, nominalizer, tenseparticle: On the Ezafe in West Iranian. In *Nominalization in Asian languages: Diachronic and typological perspectives*, eds. Foong Ha Yap, Karen Grunow-Härsta, and Janick Wrona, 363–390. Amsterdam: John Benjamins.
- Halle, M., and A. Marantz. 1993. Distributed morphology and the pieces of inflection. In *The View from Building 20*, eds. K. Hale and S. J. Keyser, 111–176. Cambridge, MA: MIT Press.
- Hamm, Fritz, and Michiel van Lambalgen. 2002. Formal foundations for semantic theories of nominalisation. *ZAS Papers in Linguistics* 27: 1–21.
- Harley, Heidi. 2009. The morphology of nominalizations and the syntax of VP. In *Quantification, definiteness, and nominalization*, eds. Anastasia Giannakidou and Monica Rathert, 321–343. Oxford: Oxford University Press.
- Hazout, Ilan. 2001. Predicate formation: The case of participial relatives. *The Linguistic Review* 18: 97–123.
- Horn, George. 1975. On the non-sentential nature of the POSS-ING construction. *Linguistic Analysis* 1: 333–387.
- Ionin, Tania, Ora Matushansky, and Eddy G. Ruys. 2006. Parts of speech: Toward a unified semantics for partitives. In *North East linguistic society (NELS) 36*, eds. Christopher Davis, Amy Rose Deal, and Youri Zabbal, 357–370. Amherst: GLSA.
- Jackendoff, Ray. 1973. The base rules for prepositional phrases. In *A festschrift for Morris Halle*, eds. Stephen R. Anderson and Paul Kiparsky, 345–356. New York: Holt, Rinehart & Winston.
- Jackendoff, Ray. 1977. *X-bar syntax*. Cambridge: MIT Press.
- Karimi, Simin, and Michael Brame. 1986/2012. A generalization concerning the Ezafe construction in Persian. *Linguistic Analysis* 38: 111–143.

- Kahnemuyipour, Arsalan. 2014. Revisiting the Persian Ezafe construction: A roll-up movement analysis. *Lingua* 150: 1–24.
- König, Ekkehard, and Bernd Kortmann. 1991. On the reanalysis of verbs as prepositions. In *Approaches to prepositions*, ed. Gisa Rauh, 109–125. Tübingen: Narr.
- Kornfilt, Jaklin, and John Whitman. 2011a. Introduction: Nominalizations in syntactic theory. *Lingua* 121: 1160–1163.
- Kornfilt, Jaklin, and John Whitman. 2011b. Afterword: Nominalizations in syntactic theory. *Lingua* 121: 1297–1313.
- Kortmann, Bernd, and Ekkehard König. 1992. Categorical reanalysis: The case of deverbal prepositions. *Linguistics* 30: 671–697.
- Kratzer, Angelica. 1996. Severing the external argument for its verb. In *Phrase structure and the lexicon*, eds. Johan Rooryck and Laurie Zaring, 109–137. Dordrecht: Kluwer.
- Krause, Cornelia. 2001. On reduced relatives with genitive subjects. PhD diss., MIT.
- Larson, Richard. 1988. On the double object construction. *Linguistic Inquiry* 19: 335–391.
- Larson, Richard. 2018. Zazaki ‘double Ezafe’ as double case-marking. Manuscript, Stony Brook University.
- Larson, Richard, and Vida Samiiian. 2020, to appear. The Ezafe construction revisited. In *Advances in Iranian linguistics I*, eds. Richard Larson, Sedigheh Moradi, and Vida Samiiian. Amsterdam: Benjamins. <https://doi.org/10.1075/CILT.351>.
- Larson, Richard, and Hiroko Yamakido. 2008. Ezafe and the deep position of nominal modifiers. In *Adjectives and adverbs: Syntax, semantics and discourse*, eds. Louise McNally and Chris Kennedy, 43–70. Oxford: Oxford University Press.
- Libert, Alan. 2013. *Adpositions and other parts of speech*. Bern: Peter Lang.
- Lieber, Rochelle. 2016. *English nouns: The ecology of nominalization*. Cambridge: Cambridge University Press.
- Lieber, Rochelle. 2018. Nominalization: General overview and theoretical issues. In *Oxford research encyclopedia, linguistics*. Oxford: Oxford University Press.
- Manzini, Rita. 2010. The structure and interpretation of (romance) complementizers. In *The complementiser phase: Subjects and operators*, ed. Phoevos Panagiotidis, 167–199. New York: Oxford University Press.
- Marvin, Tatjana. 2003. Past participles in reduced relatives: A cross-linguistic perspective. *Linguistica* 47: 141–160.
- Matthewson, Lisa. 2001. Quantification and the nature of crosslinguistic variation. *Natural Language Semantics* 9: 145–189.
- Milsark, Gary. 2005. Gerundive nominalizations. In *The Blackwell companion to syntax*, eds. Martin Everaert and Henk van Riemsdijk, 436–458. New York: Blackwell.
- Ogawa, Yoshiki. 2014. Grammaticalization of *near* from adjective to preposition via head-movement, gradability declination and structural reanalysis. *Interdisciplinary Information Sciences* 20(2): 189–215.
- Panagiotidis, Phoevos. 2014. *Categorial features*. Cambridge: Cambridge University Press.
- Pantcheva, Marina. 2008. The place of PLACE in Persian. In *Syntax and semantics of spatial P*, eds. Anna Asbury, Jakub Dotlačil, Berit Gehrke, and Rick Nouwen, 305–330. Amsterdam: Benjamins.
- Pesetsky, David, and Esther Torrego. 2007. The syntax of valuation and the interpretability of features. In *Phrasal and clausal architecture*, eds. Simin Karimi, Vida Samiiian, and Wendy Wilkins, 262–294. Amsterdam: Benjamins.
- Quirk, Randolph, and John Mulholland. 1964. Complex prepositions and related sequences. *English Studies* 45(Suppl.): 64–73.
- Reuland, Eric. 2011. What’s nominal in nominalization? *Lingua* 121: 1283–1296.
- Sarah Thomas Rosen. 1989. Two types of noun incorporation: A lexical analysis. *Language* 65: 294–317.
- Roy, Isabelle, and Elena Soare. 2011. Nominalizations: New insights and theoretical implications. *Recherches Linguistiques de Vincennes* 40: 7–23.
- Samiian, Vida. 1983. Structure of phrasal categories in Persian, an X-bar analysis. PhD diss., UCLA.
- Samiian, Vida. 1994. The Ezafe construction: Some implications for the theory of X-bar syntax. In *Persian studies in North America*, ed. Mehdi Marashi, 17–41. Bethesda: Iranbooks.
- Samvelian, Pollet. 2007. A (phrasal) affix analysis of the Persian Ezafe. *Journal of Linguistics* 43: 605–645.
- Sauerland, Uli, and Kazuko Yatsushiro. 2004. A silent noun in partitives. In *North East linguistic society (NELS) 34, Vol. 2*, eds. Keir Moulton and Matthew Wolf, 505–516. Amherst: Graduate Linguistic

- Student Association.
- Siloni, Tal. 1995. On participial relatives and complementizer *do*: A case study in Hebrew and French. *Natural Language and Linguistic Theory* 13: 445–487.
- Simpson, Andrew, and Zoe Wu. 2001. The grammaticalization of formal nouns and nominalizers in Chinese, Japanese and Korean. In *Language change in East Asia*, ed. Thomas McAuley, 250–283. London: Routledge Curzon.
- Sleeman, Petra. 2019. Participial relative clauses. In *Oxford research encyclopedia, linguistics*. Oxford: Oxford University Press.
- Stickney, Helen. 2009. The emergence of DP in the partitive structure. PhD diss., University of Massachusetts, Amherst.
- Stowell, Timothy. 1981. Origins of phrase structure. PhD diss., MIT.
- Svenonius, Peter. 2003. Limits on P: Filling in holes vs. falling in holes. *Nordlyd: Tromsø Working Papers on Language and Linguistics* 31(2): 431–445. Proceedings of the 19th Scandinavian Conference of Linguistics.
- Svenonius, Peter. 2006. The emergence of axial parts. *Nordlyd: Tromsø Working Papers on Language and Linguistics* 33(1): 49–77. Special Issue on Adpositions, eds. Peter Svenonius and Marina Pantcheva, Tromsø: University of Tromsø.
- Svenonius, Peter. 2012. Structural decomposition of spatial adpositions. Ms., CASTL, University of Tromsø.
- van Riemsdijk, Henk. 1983. The case of German adjectives. In *Linguistic categories: Auxiliaries and related puzzles*, eds. Frank Heny and Barry Richards, 223–252. Dordrecht: Springer.
- van Riemsdijk, Henk. 1990. Functional prepositions. In *Unity in diversity*, eds. Harm Pinkster and Inge Genée, 229–241. Dordrecht: Foris.
- Vendler, Zeno. 1967. *Linguistics in Philosophy*. Ithaca, New York: Cornell University Press.
- Waters, Cathleen. 2009. The preposition cycle in English. In *Cyclical change*, ed. Elly van Gelderen, 287–300. Amsterdam: Benjamins.