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# The Jungle of the Czech Local Cases: Where Semantics and Morphology Meet

## 1 Introduction

Put broadly, one of the goals of linguistic theory is to uncover the underlying primitives of linguistic structures, and determine their internal organization (see, e.g., CINQUE & RIZZI 2010 for a recent discussion). This paper contributes to this program by looking at the category of case. In particular, the goal is to argue for a fine-grained syntactic decomposition of case with relevance for both morphology and semantics.

### 1.1 The general background

In executing such a program, linguists usually draw on two sources of evidence: overt morphological and syntactic distinctions, and linguistically relevant meaning. Sometimes, the two go together; for instance, number distinctions in Slavic are both morphologically expressed, and semantically relevant. This can be taken as evidence for the existence of an independent Number projection inside the extended NP, the locus of the relevant morphemes, and the source of the perceived meaning.

For other categories in the extended NP, the situation may be less clear for essentially two reasons. First, there can be a clear meaning distinction, but no overt morphology to come along, as in the case of definiteness across a number of Slavic languages (excluding, of course, those languages that actually show definite articles, like Bulgarian). Consequently, there is an ongoing debate whether definiteness (D) is actually projected in the syntax of such languages or not (see, e.g., PERELTSVAIG 2007 and BOŠKOVIĆ 2008 for recent contributions to the debate, arguing each for a different conclusion).

The second (converse) case is a situation where we do have a morphological distinction, but an apparent lack of a clear meaning contribution. The category of gender is often mentioned in this connection (but see FERRARI-BRIDGERS 2008 for arguments against this view), and case is usually next in line. For instance, faced with an apparently meaning-independent distribution of case, a strand of research proposes that there are no case features (or projections) in syntax, and takes the relevant morphological distinctions to arise at PF only (MARANTZ 1991,

McFADDEN 2004, SIGURDSSON 2008). On an abstract level, this is comparable to approaches such as BOŠKOVIĆ (2008), where definiteness is understood as a purely LF level property, with no syntactic correlate.

In this broad context, the present paper provides empirical evidence for believing that case is a regular part of the extended projection of an NP, just like number, and it is relevant not only to PF, but also for formal aspects of linguistic meaning (LF). I add, however, that I am going to discuss a specific empirical domain, and the reader should not expect an overarching theory of case. Yet, the data I discuss show that there are reasons to believe that a theory with ‘syntactic case’ has interesting consequences that cannot be captured by its ‘morphological alternative.’

## 1.2 The empirical domain in focus: a first glimpse

I base my argument on case selection in locative PPs. I argue that the facts reveal an intimate connection between the feature make-up of a given case as manifested in syncretism, and its semantic contribution. The argument that builds on this observation is that such a correlation can be explained only if the phonological realization of a case and its semantic contribution both derive from a single abstract representation: the syntactic structure.<sup>1</sup>

To get a more concrete idea of where we are going, consider the following example.

- (1) v {aut-ě / \*aut-o / \*...}  
       in car-PREP      car-ACC  
       ‘in the car’

The example shows that a preposition in Czech requires the noun to appear in a particular case, the prepositional case in (1). Any other case is ungrammatical.

At the same time, there are several cases locative prepositions govern: apart from the prepositional (1), there is the genitive (2a), instrumental (2b), and accusative (2c).

- (2) a. u                      aut-a  
       at/next-to      car-GEN  
       ‘at/next to/close to the car’

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<sup>1</sup> This is virtually the same argument for the unification of morphology and syntax/semantics as BAKER’S (1985) Mirror Principle.

- b. pod            aut-em  
     under        car-INS  
     ‘under the car’
- c. v    pátek-ø  
     in    Friday-ACC  
     ‘on Friday’

In all of these examples, there are no alternative possibilities (just like in (1) above), keeping the meaning constant. ‘Car’ in (2a) has to be in the genitive, and ‘Friday’ in (2c) has to be in the accusative, even though the same preposition (*v*) requires a different case in (1). It is also interesting to note that in spite of the large variety of cases, the dative is never found in Czech locative PPs.

The main descriptive goal of the paper is to show that there is a rigid system underlying the surface diversity, and that this underlying system is related to the morphology of case.

The organization of the paper is as follows. In section 2, I focus on both spatial and temporal locatives, and argue that case selection reflects an abstract spatial meaning of the PP. In particular, I will draw on notions such as projectivity, dimensionality and orientation of the Ground argument. Once these abstract meanings of cases are recognized, the question arises whether these meaning components correspond to something independently motivated. In order to get a handle on this issue, section 3 introduces a case decomposition proposed by CAHA (2009) on grounds of case syncretism. Once the two systems are juxtaposed (i.e., the semantic one and the morphological one), it becomes clear that there is a neat correlation between them; case features needed for syncretism are identical to the elements of meaning identified in the analysis of examples (1–2). Section 4 sums up the argument, and section 5 offers an appendix with an explanation for the absence of the dative case in locative PPs.

## 2 The semantics of cases

This section highlights the empirical facts and generalizations concerning case selection in Czech locatives, and proposes an account in terms of semantic characterization of individual cases. The presentation focuses primarily and systematically on spatial PPs, with temporal uses of particular items mentioned where relevant. The table below gives the set of spatial prepositions that I will be concerned with here. These correspond to the so called ‘primary prepositions’ in the Czech grammatical tradition (see, e.g., PETR 1986).

**Tab. 1:** Czech primary spatial prepositions

Preposition	Gloss	Case
u	at	GEN
v	in	PREP
na	on	PREP
po	all over (surface)	PREP
pod	under	INS
před	in front of	INS
za	behind	INS
nad	above	INS

As apparent from the table, these prepositions assign three distinct cases, the prepositional, the genitive and the instrumental. A fourth case will emerge when we consider temporal uses of some of these prepositions. In particular, the preposition *v* ‘in’ requires in certain contexts the accusative case, absent in the domain of spatial locatives.

## 2.1 Defining the group

The table above does not represent an exhaustive list of all Czech prepositions, but rather a linguistically defined sub-group, representing the core of the prepositional system. Specifically, the prepositions above are distinguished from other items that can be classified as prepositions by the characteristics in (3):

- (3) Primary prepositions
  - a. morphologically simplex
  - b. appear as verbal prefixes
  - c. historically underived
  - d. have a canonical prosodic shape (a syllable, epenthesis aside)

On the basis of the criteria in (3), I set aside a large group of complex prepositional expressions, a representative of which is in (4).

- (4) na-spod-u                      krabic-e  
       on-bottom-PREP            box-GEN  
       ‘on the bottom of the box’

Such complex Ps as *našpodu* ‘on the bottom’ differ from the core prepositions by all the criteria in (3). They are complex, derived, phonologically heavy, and cannot occur as verbal prefixes. The first three properties are illustrated in (4), the last property is shown in (5):

- (5) a. na-skočit  
       on-jump  
       ‘jump on’
- b. pod-skočit  
       under-jump  
       ‘jump under smthng.’
- c. \*na-spod-(u)-skočit  
       on-bottom- PREP-jump

The decision to put such items aside in our investigation is supported by the observation that case selection in fact applies internally to these complex prepositional expressions. As apparent from the glosses in (4), the last part of the complex preposition *našpod-u* is a morpheme that corresponds to the prepositional case, regularly required by the initial member of the complex preposition, *na* ‘on’ in this particular case. This suggests that the element *špod* ‘bottom,’ acts like a noun, carrying the case marker selected for by the initial preposition, despite the fact that there is no noun *špod* ‘bottom’ in Czech.<sup>2</sup>

Related to this is the observation that the Ground argument (box) of such complex prepositions, if possible at all, is uniformly marked by the genitive case. I find it plausible that this genitive has the same source as the adnominal genitive; for instance, TERZI (to appear) and PANTCHEVA (2008) analyze such Grounds as actual possessors of the space denoted by the nominal-like element (‘bottom’ in (4)). Hence, on the basis of such considerations, I set these examples aside as irrelevant for the investigation at hand.

Perhaps more controversially, the criteria in (3) are also not met by a small group of prepositions that appear morphologically simplex from the synchronic

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<sup>2</sup> This analysis is further supported by the fact that in the directional counterpart of (4), given in (i) below, the *-u* disappears:

- (i) Dal                   to na-spod-∅       krabice.  
       Put.PAST.3.SG it on-bottom-ACC box.GEN  
       ‘He put it on the bottom of the box.’

This effect follows from the assumption that the *-u* is a prepositional case ending, because in directional contexts, the preposition *na* ‘on’ requires the accusative in Czech, and not the prepositional.

point of view, even though historically, they can be broken down into pieces. Crucially, apart from being historically derived from nouns, these prepositions fail to occur as prefixes, and do not meet the canonical prosodic shape. The prepositions under discussion are *mezi* ‘between’ (INS), *mimo* ‘outside of, apart from’ (ACC) and *proti* ‘opposite’ (DAT). I leave their analysis for future work.

## 2.2 Prepositions with the instrumental

Having established the data set on the basis of (3), I start with the group of the four prepositions taking INS (these are ‘above,’ ‘below,’ ‘in front of’ and ‘behind’). The relevant characteristic of this group has been noted in GEHRKE (2008), who points out that all these prepositions are “projective” (see ZWARTS & WINTER 2000 for the notion, and also EMONDS 2007 for similar observations pertaining to Czech). Projectivity means that in order for the PP denotation to be computed, a system of coordinate axes (front/back, up/down) must be projected, and anchored in the Ground argument in accordance with a frame of reference (see, e.g., LEVINSON 2003). Note that prepositions that do not require INS (‘at,’ ‘in,’ ‘on’) do not require such axes, and hence, we arrive at a defining characteristic of all and only those primary prepositions that require INS.

The presence/absence of axial information correlates with the acceptability of measure phrases (ZWARTS & WINTER 2000). Thus, all and only prepositions with INS allow for measure phrases:

### (6) Measure phrase availability

a. 3 metry {nad / pod / za / před } krabic-í  
 3 meters above / under / behind / in front of box-INS  
 ‘3 meters {above / under / behind / in front of} the box’

b. \*3 metry {v / na / po } krabic-i  
 3 meters in on all over box-PREP  
 Intended: ‘in the box, 3 meters deep’ etc.

c. \*3 metry u krabic-e  
 3 meters at box-GEN  
 intended: ‘at the box, 3 meters away from it’

(6a) shows that all prepositions with INS combine with a measure phrase. (6b, c) then show, respectively, that prepositions with PREP and GEN do not combine with measure phrases.

Repeating what is relevant, all and only prepositions with the instrumental require a system of axial coordinates to be projected, and anchored in the Ground argument. This state of affairs requires that the relation between the four projective prepositions and the case they select be stated in semantic terms, rather than on an item per item basis. In the latter case, there would simply be no way of accounting for the observation that projectivity requires the instrumental case.

In addition, it is possible to construct minimal pairs that differ in terms of projectivity alone, and the case varies accordingly. To show that, I turn to the fact that Czech (like English) allows for a non-projective use of certain prototypically projective prepositions. An example from English is the preposition *under*: apart from *under the table*, the temporal use *under the reign of X* is also an option. This latter use is clearly non-projective: it expresses a simultaneous location of two eventualities on the temporal axis, and disallows measure phrases.

In Czech, the preposition *za* ‘behind’ has very much the same non-projective use (and shows a rather similar restriction on the character of its complement, clearly preferring long intervals to shorter periods). The interesting fact from the current perspective is that when used in its latter sense, the instrumental following *za* ‘behind’ becomes ungrammatical:<sup>3</sup>

- (7) \**za*        *vlád-ou*        X  
       behind *reign-INS*    X  
       ‘under the reign of X’

If we would state the selection for case on an item per item basis, (7) represents a puzzle that calls for yet another stipulation (*za* assigns instrumental, unless used as a non-projective preposition). Under the alternative approach, the ungrammaticality of (7) follows directly: since there is no projectivity, there can be no instrumental.

Finally, let me mention for the purpose of the discussion to come one last thing. The general conclusion that projectivity plays a role in the grammar of prepositions is not surprising: projective prepositions form a grammatical class in more languages than just Czech (and related Slavic languages). Let me illustrate the point by an example discussed in ZWARTS (2008).

ZWARTS (2008) focuses on the question how directionality is expressed across a number of languages, keeping the locative configuration fixed. The following table (adapted from Zwarts’ work) shows source marking in English (goal marking will be discussed shortly):

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<sup>3</sup> In this use, the preposition requires the genitive. I return to this fact later on and skip giving an example here.

Tab. 2: Source marking in English

	AT	IN	ON	BEHIND	FRONT	OVER	UNDER
LOC	at	in	on	behind	in front	over	under
SOURCE	from	out of	off	from behind	from in front	from over	from under

The first line of the table lists abstract spatial configurations, rendered by English items on the second line. The bottom line of the table shows the expression of a source path originating at a particular location, e.g., *off* for FROM ON. What is relevant in the current perspective is that English shows a neat split between projective and non-projective prepositions in this domain. While projective locations require a complex expression (the prefixation of *from*), non-projective locations show a suppletive form (shaded).

To sum up, there are a number of reasons to believe that the instrumental in Czech locative PPs is responsible for the projective meaning of the PP, and, conversely, that projectivity requires the instrumental. We have also seen that the notion of projectivity figures in the grammar of other languages than Czech, and is thus a good candidate for a grammatically relevant meaning element (as opposed to the distinction between ‘cat’ and ‘dog,’ which is presumably purely conceptual and has no grammatical consequences).

### 2.3 The genitive and the prepositional

Setting aside the projective prepositions, we are left with two groups in Table I: *v* ‘in,’ *na* ‘on’ and *po* ‘all over,’ which assign the prepositional, and *u* ‘at,’ which assigns the genitive.<sup>4</sup> What is the source of the difference? Is it semantic, or does it need to be specified by an arbitrary stipulation in the lexical entry of these prepositions?

Relevant in this context is again the study by ZWARTS (2008), mentioned above. The first point to make is that Zwarts finds a number of languages which are similar to Czech in making a grammatically relevant cut between ‘at’ on the one hand, and ‘on’ and ‘in’ on the other. One such language is German, which

<sup>4</sup> The preposition *po* is used in Czech spatial locatives as a “plural” version of *na* ‘on’, meaning something like ‘at multiple places on’. For this reason, I treat *na* ‘on’ and *po* ‘all over’ as identical as far as the formal properties of the locative configuration are concerned, and simply stop mentioning *po* at all, with the understanding that whatever considerations apply to *na* apply to *po* as well.



actually shows a double contrast. First, while the goal version of the German ‘at’ (*bei*) assigns dative, the goal directional rendering of ‘in’ and ‘on’ (*in* and *auf*) require the accusative. Second, ‘at’ (*bei*) has a suppletive goal directional counterpart *zu* ‘to,’ while items for ‘in’ and ‘on’ remain unchanged (*in* and *auf*).

Similar situation concerning suppletion arises in English goal marking, as shown in the following table that extends the observations made in the preceding subsection:

**Tab. 3:** Source and Goal marking in English

	AT	IN	ON	BEHIND	FRONT	OVER	UNDER
LOC	at	in	on	behind	in front	over	under
SOURCE	from	out of	off	from behind	from in front	from over	from under
GOAL	to	in(to)	on(to)	behind	in front	over	under

As can be seen in Table III, only AT has a suppletive form for the expression of a goal path. English suppletion thus seems to make the same cuts as Czech case marking: one distinction runs between projective prepositions and the rest, and another dividing line separates AT from the rest of the items.

Even if subtle, the correlation suggests that the difference between ‘in/on’ on the one hand, and ‘at’ on the other is likely to be more interesting than a lexical diacritic. Arbitrary diacritics simply do not make the same cuts across two independent lexicons.

In what follows, I am going to adopt Zwarts’ proposal for the distinction between the prepositions under discussion. In his analysis, AT corresponds to a “general, unspecified location near, on, or in a reference object, in contrast to the more specific location that one finds with IN and ON, that necessarily refer to parts of the reference object (its interior or surface).” Thus, for Zwarts, “AT is relevant with objects that have no interior or surface, or for which these spatial parts are not relevant.” Putting the pieces together, we arrive at the picture in (8), which introduces an additional property, namely dimensionality. The property reflects Zwarts’ proposal that IN and ON locations require the Ground object to have an interior or surface; if an object has at least one of the two, it must extend in at least two dimensions.

- (8) a. projectivity = instrumental  
 b. dimensionality = prepositional  
 c. simple location = genitive

The general conclusions of (8) can be supported by further data and observations. For example, in Czech, the claim that *u* ‘at’ occurs with simple ‘underspecified’ co-location of two objects receives support from the following fact: only *u* ‘at’ allows that the Figure and Ground are reversed without a change in truth conditions. Thus, for instance, if the house is *u* ‘at’ the barn, then also the barn is *u* ‘at’ the house. However, reversing the Figure and Ground with other prepositions necessarily changes the truth conditions. If the tree is in the barn, it cannot be the case that the barn is in the tree.

This can be understood under the proposal (8). Specifically, if prepositions other than *u* ‘at’ presuppose a certain dimensionality or orientation of the Ground argument (as revealed by the case marking), then the reversal of the Figure and Ground automatically leads to different truth conditions. That is because after the reversal, the dimensionality/orientation applies to a different object. Complementarily, since the genitive case says nothing of this kind, the Figure and Ground may be reversed.

Temporal PPs provide further evidence supporting the approach. We have seen in the preceding subsection that the spatial adposition *za* means ‘behind’ and selects the instrumental (9a). In the temporal domain, however, it means ‘during’ and selects the genitive (9b).

(9) the ambiguity of *za* ‘behind, during’ (colloquial Czech)

a. Karel se za komunist-ama schovával.  
 Karel REFL behind communists-INS hide-PAST  
 ‘Karel was hiding behind communists.’

b. Karel se za komunist-ů schovával.  
 Karel REFL under communists-GEN hide-PAST  
 ‘Karel was hiding under the communist regime.’

As highlighted in the previous subsection, (9b) is perhaps closest to the temporal use of English *under* as in *under the reign of... or under such conditions*, etc. What is relevant for our concerns, is that the temporal use of *za* in (9b) is abstractly like AT, because the two events are cotemporaneous. If that is so, the switch of the complement to genitive marking follows.

To spell out the conclusion explicitly: taking abstract semantics (the dimensionality of the reference object) to be the factor responsible for case selection gives us a neat explanation for why ‘in’ and ‘on’ behave as a group to the exclusion of ‘at;’ and the same explanation extends to the non-projective use of *za* seen in (9). If, on the other hand, we encoded the selection of the prepositional case by a diacritic, there would be no story to tell.

## 2.4 *v* as ‘AT’ and an additional case

Further, if the fact that *v* ‘in’ and *na* ‘on’ select the prepositional case was a matter of a lexical diacritic, we would wrongly predict that the prepositional case is going to show up also in examples where the preposition ‘in’ combines with a complement that has no dimension. Such combinations arise regularly in Czech in the expressions of a punctual location on the temporal axis. As an example, consider the expression *at noon*, expressed literally as *in noon* in Czech. As the next example shows, the prepositional case is ungrammatical in this context:

- (10) \**v*      *poledn-i*  
       *in*      *noon.PREP*  
       ‘*at*    *noon*’

Once again, this is unexpected if case selection is stated in the lexical entry of an adposition. On the other hand, the explanation of case selection in semantic terms predicts this effect; since the noun *poledne* ‘noon’ denotes a point on the temporal axis (12 o’clock), it makes no sense to talk about its dimensionality. The prepositional is thus correctly ruled out in (10).

Another relevant fact concerning the temporal use of *v* ‘in’ concerns its combination with the noun *hodina*. This Czech noun is ambiguous, and denotes either a point (the equivalent of the English ‘o’clock’) or an interval, corresponding to the English ‘hour’. Interestingly, when the noun bears the prepositional case following *v* ‘in,’ it necessarily switches to the interval reading (‘hour’), and the whole example expresses a containment within a three hour long interval. The point like reading is unavailable.

- (11) *ve*            *tř-ech*        *hodin-ách*  
       *in*            *three*        *hour-PREP*  
       ‘*within* *three*    *hours*’  
       \*‘*at* *three* *o’clock*’

This is predicted if the prepositional case contributes dimensionality. Since the noun *hodina* has a reading under which it can act as a dimensional object (container), this reading is forced when it is marked by the prepositional case, and the point-like reading must be discarded.

Summing up the discussion so far: as (10) and (11) show, the expression of a point-like location on the time axis is incompatible with the prepositional case. This follows from the characterization of the prepositional as a case that intro-

duces the dimensionality of the Ground as a part of its meaning. If that is so, it cannot apply to points, and the facts fall out neatly from this analysis.

Finally, let me turn to an interesting new aspect of the temporal data. Given all that has been said up to now, we would expect the genitive case to appear instead of the prepositional for the ‘point-like’ reading in examples such as (10) and (11). However, this is not the case; instead, the accusative case must be used:

- (12) a. v poledn-e  
       in noon-ACC  
       ‘at noon’
- b. ve tř-i            hodin-y  
       in three-ACC   hour-ACC  
       ‘at three o’clock’

Why is that so? What I suggest is that the explanation for this fact lies in the nature of the complements. Specifically, all the nouns that can be used this way (apart from hours also days) denote conventional points (locations) on the temporal axis.

Why should that be relevant? The reason is that across a number of languages, a class of nouns denoting ‘conventional locations’ are independently known to behave in a special way. For example, in Latin, names of cities, towns and small islands (i.e., names of locations) do not require a preposition in locative contexts, while other nouns do. Similarly in Modern Greek, there is a class of common nouns denoting locations (such as ‘house,’ ‘cinema,’ or ‘beach’) which allow for their preposition to be absent, while other nouns in the same context require it (see DEN DIKKEN & IOANNIDOU 2006).

Hence, the idea to be developed below in more detail is that due to the fact that the nouns in question denote ‘conventional locations,’ they are allowed to stay ‘bare’, i.e., without the expected genitive marking.

## 2.5 The argument so far

To sum up the results of the discussion: there are a number of reasons to believe that the distribution of case in Czech spatial locatives is governed by a couple of semantic notions: (i) presence/absence of axial information (instrumental vs. the rest), and (ii) in the absence of axial information, the presence/absence of dimensionality (prepositional vs. genitive). Further, within the non-dimensional

domain, a particular class of nouns (names of temporal locations) are special, and surface in the accusative.

- (13) preposition: a. projective → INS  
                   b. non-projective    i) dimensional       → PREP  
   ii) non-dimensional → GEN  
   iii)temporal locations → ACC

Set against a broad background of approaches to nominal architecture, I take this to be an indication that case has relevance for both interfaces, and hence, that it has a regular syntactic status comparable to number.

## 2.6 Two open issues

As things stand, there are two issues left open: an empirical one, and a theoretical one. I introduce them in turn.

The empirical issue is this: why does the dimensional/non-dimensional opposition in (13) apply only in the class of non-projective prepositions? In this context, it is worth pointing out that the issue is in fact broader: when it comes to projective locations, the dimensionality of the Ground does not play a role in any language I know. For example, as ZWARTS (2008) has observed, English goal suppletion (see table III) distinguishes between dimensional and non-dimensional Grounds in non-projective locations (*at* is suppletive, *in(to)* and *on(to)* are not). But such a bifurcation is not replicated within the class of projective locations, and one would like to know why.

The theoretical issue is the following: even on an account where case distinctions arise at PF only, PF is still derived on the basis of syntactic structure. Hence, it is enough if the relevant semantic notions are somehow present in syntax, because then case on the nominal can be constructed at PF according to simple translation rules. For example: if the preposition is projective mark its DP complement by the instrumental. Consequently, there is still no argument for the syntactic status of case.<sup>5</sup>

The reason I have brought up these issues simultaneously is that the answer to the empirical question will ultimately provide reasons to doubt that case arises as a result of mapping rules like the one given above. I present the reasoning in the next sub-section, and elaborate on it in the remainder of this paper.

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<sup>5</sup> This point is discussed in detail by MCFADDEN (2010).

## 2.7 The semantic hierarchy

The simplest answer as to why dimensionality of the Ground is not relevant for the projective locatives under discussion is that all Grounds in such PPs are uniformly either dimensional, or non-dimensional. If that is so, it follows that dimensionality cannot produce any differential behaviour in this particular class of locations.

This conclusion can be independently supported by semantic considerations. The starting point is the fact that all the items under discussion allow for a reading that LEVINSON (2003) calls an intrinsic frame of reference. This means that in order “[t]o lock [the coordinate axes] to a ground object, the *front* or *back* of that object must be found, together with the centroid of the mass which will form the origin X of the coordinate system” (LEVINSON 2003:41). If that is correct, then the Ground argument must be sufficiently structured in space in order for these parts to be determined. In other words, it must be dimensional.

The outcome is that we now have two independent reasons to believe that the Ground arguments of the relevant class of projective prepositions are dimensional, and hence, that the best way to characterize the original set of prepositions is as follows:

**Tab. 4:** Czech primary spatial prepositions and their characteristics

Preposition	Gloss	Case	Axis	Dimension
<i>u</i>	at	GEN	no	no
<i>v</i>	in	PREP	no	yes
<i>na</i>	on	PREP	no	yes
<i>po</i>	all over (surface)	PREP	no	yes
<i>pod</i>	under	INS	yes	yes
<i>před</i>	in front of	INS	yes	yes
<i>za</i>	behind	INS	yes	yes
<i>nad</i>	above	INS	yes	yes

Such a characterization of the cases implies increasing semantic complexity: a simple region for *u* ‘at’, a dimensional region for *v* ‘in’, *na* ‘on’ and *po* ‘all over’, and finally, a dimensional oriented region for the rest of the items. Such an organization of the system of locative expressions can be straightforwardly understood in terms of a fine-grained semantic decomposition, where individual cases correspond to syntactic/semantic structures of increasing complexity:

## (14) The increasing complexity of Grounds

- a. GEN = [ region of [ Ground ] ]
- b. PREP = [ dimensional [ region of [ Ground ] ] ]
- c. INS = [ oriented [ dimensional [ region of [ Ground ] ] ] ]

The characteristics in (14) should be understood as characteristics of the Ground arguments, rather than characteristics of the PP as a whole. Thus, the claim is that the role of the genitive case is to apply to the denotation of the DP and deliver its region (cf. WUNDERLICH 1991 for the notion of Eigenspace, see also SVENONIUS 2008 who proposes that case has precisely the function of converting an object to its region). The preposition *u* ‘at’ applies to the denotation (14a), and produces an outcome that is distinct from (14a); to be *u* ‘at’ the Ground is not the same as to be (in) its region (it means being close to this region). Similarly, the prepositional case produces a region of the Ground that is sufficiently structured for ‘in’ and ‘on’ to apply, picking the interior or surface as the relevant parts of the dimensional region delivered by the prepositional marking.

This way of understanding cases allows us to incorporate the insight that nouns denoting conventional locations are special. In particular, since these nouns denote locations as part of their lexical meaning, they do not need to be mapped onto locations by the addition of the genitive case. Under this line of reasoning, the accusative case emerges as a form of the bare Ground, without any additional (locative) layers of meaning, see (15a). This analysis of the accusative as essentially a ‘bare’ DP directly corresponds to the observed facts: in a number of languages, conventional locations transparently lack a part of the structure characteristic for the elsewhere class.

## (15) The increasing complexity of Grounds

- a. ACC = [ Ground ]
- b. GEN = [ region of [ Ground ] ]
- c. PREP = [ dimensional [ region of [ Ground ] ] ]
- d. INS = [ oriented [ dimensional [ region of [ Ground ] ] ] ]

The outcome of the discussion, as summarized in (15), is thus the conclusion that the semantic characterization of individual cases in locative PPs reveals the existence of a structured set of meaning primitives. These primitives apply to DPs in a fixed sequence, constructing spatially more and more elaborate regions.

The question I turn to now is how the (de)compositional picture to the right of the equation sign in (15) translates onto the form of the case that appears on the left side of the equation. For example, in (15), the semantics of the prepositional includes the semantics of the genitive, which in turn includes the semantics of the accusative. Is there an independent evidence for such a conclusion?

In the next section, I introduce the proposal of CAHA (2009) who presents morphological evidence from syncretism for exactly the same containment relations that we have constructed in (15). The result is then a perfect match between semantic and morphological feature structures.

If correct, this conclusion is out of reach for the PF approach to case. The reasoning is this: recall that if case is a PF phenomenon, it can still reflect the syntactic/semantic structure as long as the mapping to PF has an access to this structure. But it is a plain mystery why the translation rules that introduce case features should produce an exact copy of the original syntactic/semantic structure. Under the alternative, advocated here, the isomorphism between meaning and morphology is the consequence of there being just one structure to begin with: a fine-grained syntactic/semantic structure which underlies both the meaning and the form of case marking.

### 3 Morphological evidence for case containment

This section looks at the morphology of case in Czech, and argues that it reflects the same abstract containment as the one arrived at in section 2. The section begins by introducing a restriction on non-accidental syncretism in Czech, and shows how it follows from a model where the feature decomposition of one case may contain another case.

#### 3.1 A linear contiguity constraint on syncretism

Building on previous work by, a.o., MCCREIGHT & CHVANY (1991) and JOHNSTON (1997), CAHA (2009) proposes that syncretism in case is restricted by an abstract linear contiguity requirement. The constraint says that there is a particular linear order of cases such that only contiguous regions show syncretism. For Czech, as well as other Slavic languages, the sequence is given in (16); see CAHA (2009: ch. 8).

(16) NOM – ACC – GEN – PREP – DAT – INS



I illustrate the generalization (16) on a sample of paradigms:

**Tab. 5:** A fragment of the Czech declension

	two, n.	peach, sg.	apple, sg.	Charles, sg.	You	us	our, pl.m.
NOM	dv-a	broskev-∅	jablk-o	Karel-∅	ty	my	naš-i
ACC	dv-a	broskev-∅	jablk-o	Karl-a	teb-e	ná-s	naš-i
GEN	dv-ou	broskv-e	jablk-a	Karl-a	teb-e	ná-s	naš-ich
PREP	dv-ou	broskv-i	jablk-u	Karl-ovi	tob-ě	ná-s	naš-ich
DAT	dv-ěma	broskv-i	jablk-u	Karl-ovi	tob-ě	nám	naš-im
INS	dv-ěma	broskv-í	jablk-em	Karl-em	teb-ou	námi	naš-imi

In the table, cases are ordered top-down according to the sequence (16). The shaded cells show syncretisms of pairs of adjacent cases, and move gradually one notch down as we go in the table from left to right, and then from right to left again. Most allowed syncretisms of adjacent cases are illustrated by two paradigms, except for DAT – INS, attested (as a pair) only in one paradigm (the numeral two). Crucially, there are no syncretisms that skip across cells.<sup>6</sup>

Clearly, the linear contiguity constraint is something that our theory should capture. I tackle this in the next sub-section.

### 3.2 Case decomposition

Syncretism is traditionally taken as evidence for the claim that cases are not primitive entities, but they decompose into features (see, e.g., the seminal work by JAKOBSON 1962). This has the immediate advantage that natural classes of cases can be referred to with the help of such features, and syncretism can be restricted to these classes. In this respect, the linear contiguity constraint (16) is a valuable generalization, because it helps us select the right type of feature representation; in particular, we want a decomposition that allows us to derive (16).

<sup>6</sup> I note only briefly that in Czech, there are apparent counterexamples to this ordering once the complete declension system is taken into consideration. However, these cases can be shown to arise due to regular phonological processes. In other words, we need to make a distinction between syncretism that is grammatically relevant (two cases expressed by the same morpheme), and syncretism which arises due to the phonological conflation (two distinct morphemes). Since the counterexamples have been exhaustively discussed in ČAHA (2009: ch. 8), I refer the reader to the quoted work for discussion.

With such a goal in mind, it can be shown that any decomposition that uses Jakobsonian cross-classification by equipollent (+/–) features is incapable of delivering the constraint (see CAHA 2009: ch. 1 for a detailed reasoning). What we need instead is a system where individual cases are characterized by a monotonically increasing number of privative features. I call such decomposition ‘cumulative:’

(17) A cumulative decomposition of case

- a. NOM = [A]
- b. ACC = [A,B]
- c. GEN = [A,B,C]
- d. PREP = [A,B,C,D] etc.

Let me now informally illustrate how the cumulative decomposition (17) derives the constraint (16). The main idea, shared among various frameworks, is that lexical entries are not tailor made for one representation only, but they can be associated to a larger number of representations. Syncretism is then a surface effect of this situation.

What is crucial in such a setting is the following. Assuming that a lexical entry may have a specification that makes it suitable for a non-trivial set of cases, (16) follows if an entry may only target a set of cases that forms a contiguous region in (16). That may be achieved by the proposal that any lexical entry which applies to a given case, say GEN in (17), applies automatically also to all cases contained in GEN, i.e., NOM and ACC. If that is the case, no entry can apply to a discontinuous region in (16), say GEN and NOM only. (This proposal is called the Superset Principle, see STARKE 2009.)

The theory sketched in the previous paragraph thus constrains syncretism to contiguous regions in (16), but it is as yet incapable to deal with syncretisms that do not include NOM. Thus, recall that the entry for any case will automatically apply in all cases contained in it, leading only to syncretisms that stretch from the given case to NOM. This apparent problem disappears once competition among entries is taken into consideration, and the Elsewhere Condition is adopted to regulate it.

Thus, almost any theory where entries are associated to a non-trivial set of cases meets with a situation where more than one entry is applicable in a given case. Suppose, for example, that there are two entries, A and B. A is specified for GEN, applying automatically also in ACC and NOM, and B is specified for NOM only. The result is that in NOM, both rules may apply. In such cases, a competi-

tion arises with the result that the most specific entry wins over the others (the Elsewhere Condition, see KIPARSKY 1973). In our example, the entry B, associated to the features of NOM only, takes precedence over its competitor A, specified for NOM, ACC, GEN. The result of the competition is that A surfaces in GEN and ACC only, a contiguous region that does not include NOM. Hence, when we introduce the Elsewhere Condition, the generative capacity of the system is increased to yield also contiguous syncretisms beyond NOM.

Note that even after competition is introduced, there is still no way to derive non-contiguous syncretism. Suppose, for example, that we would like to encode a syncretism of NOM and GEN to the exclusion of ACC. That would first require an entry that can apply in NOM and GEN. Such an entry, let me call it X, would be specified as [A,B,C], applying automatically in GEN, ACC and NOM. Then, we need an entry Y that applies in ACC only. If we come up with such an entry, it will restrict the application of the entry X to GEN and NOM only, which is a non-contiguous region. However, in the system proposed, there can be no such entry Y. That is because any entry that applies in ACC, applies automatically also in any case contained in it, i.e., in NOM. Hence, any entry that wins over X in ACC, will win also in NOM, restricting the application of X to GEN.

To sum up, the theory of CAHA (2009) derives the constraint (16) from the proposal that there is a containment relation among cases, as has been indicated in (17).

### 3.3 The syntactic structure of case

The reader will have observed by now that there is a correlation between the case representations established on grounds of syncretism and the elements of meaning established for cases in locative PPs. To make that explicit: in (17), the prepositional differs from the genitive by an additional feature (D). In the semantic representations established earlier, the prepositional adds the meaning of dimensionality to the region denoted by the genitive. Similarly, according to both analyses, the instrumental contains the prepositional, etc. It is then clear where the discussion proceeds from now on; the goal is to unify these two representations into one.

However, under standard assumptions, there is at least one theoretical obstacle for the unification. Traditionally, case features are considered to be bundled under one terminal node in syntax (see e.g., EMBICK & NOYER 2007, CALABRESE 2008). This view is not directly compatible with the way semantic composition works. In this domain, the standard assumption has been that semantic composition proceeds by functional application where both the function and its argu-

ment correspond to a dedicated node in the structure (e.g., HEIM & KRATZER 1998; see also, e.g., SVENONIUS 2008 for the application of this logic to prepositional phrases in a decompositional perspective).

There is independent evidence suggesting that the latter ('semantic') view is correct in the case at hand, and that case features are in fact syntactic heads, ordered in a functional sequence. The proposal is depicted in (18), and I spend the rest of the section presenting an argument in its favor.

(18) [<sub>ins</sub> F [<sub>dat</sub> E [<sub>prep</sub> D [<sub>gen</sub> C [<sub>acc</sub> B [<sub>nom</sub> A DP ]]]]]]]

Starting with preliminaries: in the tree, each case feature identified on the basis of syncretism is granted a head status, with individual cases corresponding to phrasal constituents built out of these features. For example, the genitive case corresponds to a syntactic constituent, where the DP is embedded under the features A, B, and C, added in this order.

Note that under this view, individual case morphemes correspond to whole phrasal constituents, or stretches of the functional sequence (see, e.g., NEELEMAN & SZENDRŐI 2007, STARKE 2009, CAHA 2009). For example, the instrumental morpheme spells out a constituent (or a stretch of the functional projection) from A-F. Since phrasal lexicalization obscures the underlying syntactic complexity, finding arguments for syntactic decomposition within a single language may be difficult (though see CAHA TO APPEAR for an attempt).<sup>7</sup> Yet cross-linguistic comparison provides evidence for the existence of an elaborate structure.

The argument builds on the independent observation that languages differ in the height of NP movement within a fixed functional sequence (see, e.g., CINQUE 2005). If in the functional sequence, there was a single head dedicated to case (hosting all the features postulated in (17)), we would expect only two classes of languages: languages where all overt case marking precedes the DP (no movement across K), and languages where all case marking follows the DP (movement across K; see BITTNER & HALE 1996).<sup>8</sup>

As an example of such languages, one may look at the marking of English nouns for grammatical role. Here we find the morphemes *of*, *to* or *with*. These correspond (meaning-wise) to Czech case markers (GEN, DAT and INS respectively),

<sup>7</sup> Recall though, that the lack of direct evidence only applies to the presence of structure; the actual features are diagnosed by looking at syncretism.

<sup>8</sup> This approach thus treats case suffixes as equivalent to case prefixes, as well as case pre-/post-positions). See MORAVCSIK (2009) for a discussion of case along these lines. For her, case marking is a means to mark a grammatical or semantic role of a noun, and I adopt this approach here as well.

and are therefore taken to spell out the same structural ingredients (the case features). The fact that they precede the DP is a consequence of no DP movement. In Hungarian, on the other hand, all case markers are suffixal – a consequence of the DP moving across K.

However, there are languages where some marking is prefixal, and some suffixal. For example, Icelandic express the instrumental meaning by a preposition and a dative case suffix, while other cases on the hierarchy are expressed by a suffix only (i.e., NOM, ACC, GEN, DAT). Icelandic would be problematic for the ‘single K’ theory: under such an approach, there is no position in the tree such that some case features precede (INS), and some follow (DAT) the noun. In the decomposed system presented in (18), Icelandic may be easily captured by proposing that the DP moves above the feature E only, and F has to be expressed by a preposition. A detailed empirical discussion of the logical possibilities and example languages is presented in CAHA (2011); what is crucial for now is that the decomposed K model has the capacity to account for languages where some case marking precedes, and some follows the noun; this is difficult to achieve if there is just a single position for case features.

In fact, the argument is even stronger. Based on the same reasoning, we not only predict that certain languages are attested, but we also predict that languages are rather restricted when it comes to the variation between what case is expressed as a suffix, and what case needs a preposition. Specifically, the two distinct marking strategies are predicted to occupy contiguous regions on the syncretism hierarchy (16), repeated below as (19). That is because once we establish the highest landing site of the DP in (18), all case functions higher up than the landing site need a preposition. All cases lower are expressed as a suffix.

(19) NOM – ACC – GEN – PREP – DAT – INS

Before we have a look at whether this is correct or not, I will remove the prepositional case from the scale. I do this for purely practical reasons. In particular, our investigation has now reached a stage where we would like to investigate certain predictions on cross-linguistic grounds. For that reason, we need to work with notions that have a wide cross-linguistic applicability. This is true for all of the cases, with the exception of the prepositional. If the present paper is on the right track, then the prepositional in fact means something like “dimensional, non-projective region”. But descriptive grammars usually have no term like this, and it would be too simplistic to equate the prepositional with the locative case of other languages, simply because “locative” is a too coarse a notion.

With this issue clarified, we then predict the following generalization to be true:

(20)a. In the sequence of case-functions (20b), suffixal/prepositional marking occupies a contiguous region on the scale.

b. NOM – ACC – GEN – DAT – INS

As far as I know, (20) is a correct statement that describes the set of possible and impossible languages. I do not provide a detailed empirical discussion here; note, however, that the correctness of (20) has been observed independently. In particular, a generalization along the lines of (20) has been independently proposed by BLAKE (1994). Specifically, Blake observes that case suffixes in a language form a contiguous region on a scale that subsumes (20b), starting from the NOM.

Summing up: we have seen that case syncretism in Czech leads to a particular case decomposition, such that features characteristic for each case monotonically grow. There are a number of ways to understand this theoretically; either all the features are located inside a single terminal, or they are each a separate terminal, or any mixture of the two extremes. This section has argued that the features-as-heads approach not only fits well with standard ideas concerning semantic composition, but also leads to interesting (and correct) empirical predictions. In particular, the case features under discussion interact with the height of DP movement, yielding an accurate view on the position of case marking with respect to the noun phrase. If this is correct, and the features do indeed interact with syntactic movement, it follows that these features must be terminals on their own, rather than form a syntactically opaque bundle.

### 3.4 Where syncretism and PP semantics meet

The point which the discussion leads to should be obvious by now: PP semantics and case syncretism both point to the conclusion that INS contains PREP, PREP contains GEN, and GEN contains ACC.

In particular, looking at the semantics of PPs, we were led to conclude that the case marking of the Ground reveals the existence of discrete layers of meaning. We start from the bare Ground (ACC), map it on the region occupied by it (GEN), and enrich the region successively by adding information about its dimensionality (PREP) and axial orientation (INS).

(21) a. ACC = [ Ground ]

b. GEN = [ region of [ Ground ] ]

- c. PREP = [ dimensional [ region of [ Ground ] ] ]  
 d. INS = [ oriented [ dimensional [ region of [ Ground ] ] ] ]

The same underlying organization of case is revealed by the patterns of syncretism. In (22), I apply the logic of (18) to the cases at hand, ignoring structure (but not features) immediately relevant to present concerns.

(22) Morphology

- a. ACC = [ B,A [ DP ] ]  
 a. GEN = [ C [ B,A [ DP ] ] ]  
 b. PREP = [ D [ C [ B,A [ DP ] ] ] ]  
 c. INS = [ E,F [ D [ C [ B,A [ DP ] ] ] ] ]

The correlation between (21) and (22) is directly captured under the proposal that each case feature needed for syncretism contributes semantic information, leading to an increasingly complex specification of the NP. The bare bones of how (21) and (22) can be brought together are given as the numbered paragraphs (i)-(iv):

- (i) I assume that accusative has a very general ‘bleached’ meaning, and consequently, its denotation can be simplified to the denotation of the embedded DP itself. If that DP denotes a region, an adposition may apply to this denotation.
- (ii) The feature C maps an object denoted by the DP onto its region (it takes, e.g., a box as an input, and produces the region occupied by the box as the output). As noted above, this is similar to the role for case in general as proposed in SVENONIUS (2008), and this function also corresponds to a type-shifting function called *loc* in ZWARTS & WINTER (2000). Following further ZWARTS & WINTER (2000), the preposition *u* ‘at’ applies to this region, and produces a set of ‘short’ vectors (in a technical sense made explicit in ZWARTS & WINTER’s (2000) account); the Figure is located at the end of one such vector.
- (iii) The feature D that derives the prepositional from the genitive adds the aspect of dimensionality: the region becomes structured, and its interior and/or surface are determined. In ZWARTS & WINTER’s (2000) approach, the denotation of IN is defined on the basis of vectors projected from the so-called ‘boundary points’ (points that form the boundary of the object). It may then well be the case that the meaning of the feature D is such that it applies to the set of points occupied by the reference object, and provides a set of the

boundary points. The prepositions *v* ‘in’ or *na* ‘on’ apply to such a denotation, and project ‘boundary vectors’ (vectors originating at the boundary points) picking out the relevant part of the object where the Figure is located.

- (iv) The combination of the features E and F delivers an object that is oriented in space – with its front, back, top and bottom determined. How exactly this happens is a task I leave for future research. The preposition applies to this denotation, and picks the relevant axis (i.e., an axis that goes through the relevant part) along which the Figure is located.<sup>9</sup>

### 3.5 Conclusions

In this section, I have introduced a linear restriction on syncretism in Czech, and I have provided an explanation for it in terms of a particular decomposition of case into features. Specifically, the proposal says that features characteristic for each case grow monotonically.

I have further noted that under standard assumptions, case features are all located inside a single terminal. There are, however, two reasons which favour an alternative where case features are each located under a separate terminal. The first reason is that such a structure is directly compatible with standard mechanisms of compositional semantics. The second reason is that such a structure may then interact with DP movement (on a cross-linguistic basis), and leads to correct empirical predictions.

In the last part, I have informally sketched the semantic contribution of individual features.

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<sup>9</sup> A speculation concerning the fine-grained composition of *INS* follows. The first ingredient of a potential account is the observation that in a number of languages (e.g., Latin), *INS* is a source type of case (correlating with the interpretation of the instrument as a source of an event). The second ingredient is the fact that in some languages (e.g., Serbian or Persian), source morphology is an essential ingredient of projective adpositional phrases (lit.: *the boy is front from the house*). It could then be that the Czech *INS* with projective adpositions is a source type of case. This fits well with the argumentation of the appendix, where I suggest that *DAT* is a change-of-state case, with the feature E contributing goal directionality. We can then understand the role of the feature F in the light of Pantcheva’s (2011) analysis where source meaning (*INS*) is derived from a goal denotation (*DAT*) by an operation of ‘reversal’ (feature F).



## 4 Summary and conclusions

This paper started from the observation that case government by Czech prepositions is semantically determined. Projective locations require the instrumental, dimensional locations take the prepositional, and a non-specific collocation of objects is accompanied by the genitive. I have argued that this situation reveals the existence of a set of meaning primitives, such as dimensionality or orientation, which are hierarchically organized, leading to various degrees of semantic complexity.

These observations receive support from the behaviour of temporal PPs; there we can observe that it is the type of abstract meaning, rather than the actual preposition, what determines the case of the Ground argument. The accusative has emerged as the fourth case, and I have portrayed it as corresponding essentially to the form of a bare DP.

These findings were juxtaposed to the observation that the actual morphology of Czech case points to the same type of hierarchical organization, leading to an interesting parallel between the microscopic world of morphological features and the semantic composition operating on their basis.

The general conclusion is that the correlation between morphological and semantic decomposition provides evidence for the syntactic status of case: the proposal says that case features are meaningful elements, each harboured by a separate functional projection. This unique representation maps both on meaning and form. The null hypothesis is the correct one.

## 5 Appendix: The dative

What follows is an appendix to the theoretical debate on the status of case. Its purpose is to answer a question that remains concerning the empirical domain under discussion. The investigation will concern the role of the dative case, in particular, the observation that dative is absent in Czech locatives (EMONDS 2007). I propose that the reason for this is that dative (in Czech) is “directional.” More precisely, it denotes a change of state leading to the denotation of its complement. If that is so, its absence in stative locatives follows.

To briefly illustrate the idea on examples, consider the data below. The data are intended to show that in stative sentences, such as (23), possession is expressed by the genitive, and the dative is unavailable.

- (23) To auto je {Petr-a/ \*Petr-ovi}  
 the car is Peter-GEN Peter-DAT  
 ‘This car belongs to Peter.’

However, with dynamic verbs the facts are the exact opposite: in (24), Peter’s (resultant) possession of the theme argument is expressed by the dative, and the genitive is disallowed.

- (24) Dej to {\*Petr-a / Petr-ovi}  
 Give it Peter-GEN Peter-DAT  
 ‘Give it to Peter.’

These facts follow if dative is a change-of-state case, incompatible with stative verbs (23), but required by dynamic ones (24).

The change of state characteristic of the dative can be strengthened further. For instance, dative arguments of certain verbs, like ‘award’ illustrated in (25a), are possible in eventive passives (25b), but impossible in stative passives (25c):<sup>10</sup>

- (25) a. Udělili Karlovi medaili  
 awarded.3PL Karel.DAT medal.ACC  
 ‘They awarded the medal to Karel.’
- b. Karlovi byla udělena medaile.  
 Karel.DAT was awarded medal.NOM  
 ‘The medal was awarded to Karel.’
- c. \*Karlovi je udělená medaile.  
 Karel.DAT is awarded medal.NOM  
 Intended: ‘The medal has been awarded to Karel.’

Again, the contrast between (25b,c) follows if DAT denotes a change of state, and is incompatible with stative environments.

The observation that dative (in Czech) is impossible in sentences expressing states may be used to explain its absence in (static) locative PPs: since such PPs denote a state, they likewise exclude DAT.<sup>11</sup>

<sup>10</sup> See VESELOVSKÁ & KARLÍK 2004 for the discussion of Czech stative vs. eventive passives.

<sup>11</sup> See ftn. 9 concerning a possible explanation for why the instrumental – required by projective adpositions – should be built on top of the dative.

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