

# The Case Hierarchy as Functional Sequence

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## Abstract

In this paper, I propose that Case decomposes into several privative features arranged in a universal hierarchy, the so-called functional sequence. Evidence is provided by the patterns of Case syncretism, morphological containment, cross-linguistic distribution of Case, and accessibility of a particular Case to agreement, extraction and relativization.

## 1. Introduction

Baerman et al. (2005), working with a sample of 200 languages, observe that it is relatively frequent that one core case (nominative/absolutive, accusative, ergative) is syncretic with another core case. Further, if one of the core cases is syncretic with an oblique case, it is typically the marked case (i.e., the accusative or the ergative). This suggests that there is a hierarchy of cases  $NOM/ABS > ACC/ERG > OBL$ , where only adjacent cases show non-accidental syncretism. The aim of the present paper is twofold. First, I pick up an old idea of Rasmus Rask (recently reviewed in Plank 1991 and defended in McCreight and Chvany 1991 and Johnston 1996) stating that the same “Law of Adjacency” governs syncretism among oblique cases as well; the demonstration involves unpacking the grab-bag category of oblique case and arranging the emerging cases along a hierarchy. Second, I suggest that the facts observed by Baerman et al. (2005) together with observations made for the oblique cases can be derived under a theory in which precedence on the hierarchy  $NOM/ABS > ACC/ERG > OBL$  is understood as (syntactic) containment, drawing on previous proposals in the generative literature and general guidelines of the cartography approach (Cinque 1999). In concrete terms, the features characteristic of nominative are a proper subset of the features corresponding to the accusative which in turn are a subset of the features characterizing obliques. Further, the relevant features are arranged in a

cross-linguistically unique functional sequence. With the proposal in place, I explore ways in which the hierarchy can be used to shed light on other empirical domains that involve virtually identical case hierarchies: compound case marking, extraction out of a DP, the distinction between a case-suffix and a preposition, agreement and relative-clause formation.

## 2. Syncretism in Czech (West Slavic), Slovene (South-Slavic) and Russian (East Slavic)

In this section, I would like to review (and illustrate on three Slavic languages) a hypothesis of Chvany (1982) and McCreight and Chvany (1991) that syncretism can be modeled as a total linear ordering. In the languages under consideration, the ordering is identical. I state the hypothesis below in (1).

(1) *The Law of Adjacency (Slavic):*

In the sequence: Nominative – Accusative – Genitive – Prepositional  
– Dative – Instrumental  
only adjacent cases can be expressed by an identical lexical entry.

The hypothesis requires some qualifications. Most importantly, the phrase “expressed by an identical lexical entry” is not synonymous with “syncretic,” or “homophonous.” This point is crucial; when two cases are syncretic, this can have at least three reasons. One, it can be an accident (“pure” homophony as in the case of the English word *bank*); two, there can be two distinct exponents, but due to the application of a phonological process (or a failure thereof), the surface forms look identical; and three, it can be an indication of some deeper regularity. Distinguishing successfully these options is necessary, should our conclusions have any bearing on the theory of case in general and syncretism in particular.

To distinguish what is accidental and what stems from a deeper regularity of the system, I take advantage of the fact that the languages under consideration exhibit a large degree of allomorphy. Specifically, I am going to consider as non-accidental instances where a given pair of cases is syncretic with respect to at least two markers. Hence, if nominative and genitive are syncretic, this will be considered non-accidental if such a syncretism can be observed in more than one paradigm, and only if the marker is different in each of the

paradigms. This heuristic is likely to miss some of the non-accidental cases; however, I stick to it for the lack of a better tool.<sup>1</sup>

Another issue that arises is whether the hierarchy is language particular or universal. While I would like to believe that it is universal, such a claim requires more work to be done. I turn to both supporting and challenging data once I go through the Slavic patterns. I add that I look at nouns, pronouns, adjectives and numerals, i.e. all categories marked for case; I leave vocative aside.

### 2.1. Nominative

In all three languages, nominative is quite often syncretic with accusative. This finding is completely in line with the observation by Baerman et al. (2005). In each language, there is a multiplicity of exponents that pick nominative and accusative to the exclusion of other cases. Further, all numbers, genders and (relevant) parts of speech seem to show this syncretism (with a notable exception of personal pronouns and masculine animate nouns). Nominative does not show any further non-accidental syncretisms. The following tables testify the state of affairs:

(2) *Non-accidental syncretism of nominative and accusative in Czech*

	machine	both	city	machine pl.	castl pl.	that fem., pl.
nom	STROJ	OB-A	MĚST-O	STROJ-E	KOST-I	T-Y
acc	STROJ	OB-A	MĚST-O	STROJ-E	KOST-I	T-Y
gen	stroj-e	ob-ou	měst-a	stroj-ů	kost-í	t-ěch
prep	stroj-i	ob-ou	měst-u	stroj-ích	kost-ech	t-ěch
dat	stroj-i	ob-ěma	měst-u	stroj-ům	kost-em / -ím	t-ěm
ins	stroj-em	ob-ěma	měst-em	stroj-i / -ema	kost-mi	t-ěmi

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<sup>1</sup>The same procedure is adopted by Johnston (1996). Another characteristic of non-accidental syncretism that it targets relatively large classes of items, and that it is distributed across various parts of speech, numbers etc. This criterion is used in e.g., Plank (1991).

(3) *Non-accidental syncretism of nominative and accusative in Russian*

	table, sg.	table, pl.	window, sg.	window, pl.	farmer du.
nom	STOL-Ø	STOL-Y	OKN-O	OKN-A	POL-E
acc	STOL-Ø	STOL-Y	OKN-O	OKN-A	POL-E
gen	stol-a	stol-ov	okn-a	okon-Ø	pol-ja
prep	stol-e	stol-ax	okn-e	okn-ax	pol-e
dat	stol-u	stol-am	okn-u	okn-am	pol-ju
ins	stol-om	stol-ami	okn-om	okn-ami	pol-em

(4) *Non-accidental syncretism of nominative and accusative in Slovene*

	table, du.	peach, sg.	peach, pl.	apple, sg.	farmer du.
nom	MÍZ-I	BRÊSKEV-Ø	BRÊSKV-E	JÁBOLK-O	KMÊT-A
acc	MÍZ-I	BRÊSKEV-Ø	BRÊSKV-E	JÁBOLK-O	KMÊT-A
gen	míz	brêskv-e	brêskv-Ø	jábolk-a	kmêt-ov
prep	míz-ah	brêskv-i	brêskv-ah	jábolk-u	kmêt-ih
dat	míz-ama	brêskv-i	brêskv-am	jábolk-u	kmêt-oma
ins	míz-ama	brêskv-ijo	brêskv-ami	jábolk-om	kmêt-oma

## 2.2. Accusative

Apart from nominative, accusative shows systematic syncretism with genitive. This syncretism involves (almost) all masculine animates in the singular (together with adjectives and demonstratives modifying them). Depending on the language, the same holds in plural as well.

(5) *Non-accidental syncretism of accusative and genitive in Czech*

	man	sir	that, masc. an.
nom	muž	pán	t-en
acc	MUŽ-E	PÁN-A	T-OHO
gen	MUŽ-E	PÁN-A	T-OHO
prep	muž-i	pán-ovi	t-om
dat	muž-i	pán-ovi	t-omu
ins	muž-em	pán-em	t-ím

(6) *Non-accidental syncretism of accusative and genitive in Russian*

	student, sg.	student,pl.	teacher, pl.
nom	student- $\emptyset$	student-y	učitel-ja
acc	STUDENT-A	STUDENT-OV	UČITEL-EJ
gen	STUDENT-A	STUDENT-OV	UČITEL-EJ
prep	student-e	student-ax	učitel-jax
dat	student-u	student-am	učitel-am
ins	student-om	student-ami	učitel-ami

(7) *Non-accidental syncretism of accusative and genitive in Slovene*

	farmer du.	I	he
nom	kmèt- $\emptyset$	jàz	òn
acc	KMÉT-A	MĚN-E	NJ-ĚGA
gen	KMÉT-A	MĚN-E	NJ-ĚGA
prep	kmêt-u	měn-i	nj-ěm
dat	kmét-u	měn-i	nj-ěmu
ins	kmét-om	men-ój	mâno nj-ím

In Czech, accusative also shows non-accidental syncretism with instrumental. This is the only problem for the hypothesis we saw in (1). I return to it later.

2.3. Genitive

Genitive shows syncretism with prepositional. For pairs of syncretic cases, the non-accidental nature of the syncretism can be shown only for Czech, see (8). The syncretism (in all languages) targets all adjectives in the plural, and also some demonstratives and numerals.

(8) *Non-accidental syncretism of genitive and prepositional in Czech*

	good, pl. m.	both, m.
nom	dobrý	ob-a
acc	dobrý	ob-a
gen	DOBRÝ-CH	OB-OU
prep	DOBRÝ-CH	OB-OU
dat	dobrý-m	ob-ěma
ins	dobrý-ma	ob-ěma

In Russian and Slovene, one could potentially argue that if the marking of the genitive plural is considered as a whole, *-ix* vs. *-ux* provides enough evidence that genitive and prepositional show non-accidental syncretism. However, I think that *-ux* and *-ix* are better seen as decomposing into *-i/-e-* and *-x*, and it is only the latter marker, which is shared between the genitive and prepositional, while the vocalic marker has wider distribution.

(9) *Syncretism of genitive and prepositional in Russian*

	big, pl. inan.	both, m. inan.
nom	bolʃš-ie	dv-a
acc	bolʃš-ie	dv-a
gen	BOLʃŠ-IX	DV-UX
prep	BOLʃŠ-IX	DV-UX
dat	bolʃš-im	dv-um
ins	bolʃš-imi	dv-umja

(10) *Syncretism of genitive and prepositional in Slovene*

	my, pl. m.	both
nom	mɔj-i	dv-â
acc	mɔj-i	dv-â
gen	MQJ-IH	DV-ĚH
prep	MQJ-IH	DV-ĚH
dat	mɔj-im	dv-ěma
ins	mɔj-imi	dv-ěma

However, the systematic nature of Gen – Prep can be shown on triplets of cases which embed the Gen – Prep syncretism as a proper subpart. In (11), I show syncretism of Acc – Gen – Prep, characteristic for 1st and 2nd person plural (and dual) pronouns. In (12), the Gen – Prep syncretism extends to include the dative.

(11) *Acc – Gen – Prep in Czech, Russian and Slovene*

	we Cz	we Rus	they Rus	we Slo	two of us, Slo
nom	my	my	oni	mî	mîdva
acc	NÁ-S	NA-S	ICH	NĀ-S	NÁ-JU
gen	NÁ-S	NA-S	ICH	NĀ-S	NÁ-JU
prep	NÁ-S	NA-S	(n)ICH	NĀ-S	NÁ-JU
dat	ná-m	nam	im	nàm	ná-ma
ins	ná-ma	nami	imi	nq̄mi	ná-ma

(12) *Syncretism of Gen – Prep – Dat*

	good, fem. Cz	bone, sg., CZ	5, Rus	thread, sg., Slo
nom	dobr-á	kost-ø	ɸjat-ɸ	nít
acc	dobr-ou	kost-ø	ɸjat-ɸ	nít
gen	DOBR-É	KOST-I	ɸJAT-I	NÍT-I
prep	DOBR-É	KOST-I	ɸJAT-I	NÍT-I
dat	DOBR-É	KOST-I	ɸJAT-I	NÍT-I
ins	dobr-ou	kost-í	ɸjat-ɸju	nít-jo

2.4. Prepositional

In (12), we could observe the Gen – Prep syncretism extending to the dative; this seems to be in line with the fact that Prep and Dat go together quite often independently. I show this in the next three tables for each of the languages. In Czech and Slovene, the syncretism targets all nouns in the singular, in Russian, it is somewhat more rare.

(13) *Non-accidental syncretism of prepositional and dative in Czech*

	man	sir	city	woman
nom	muž	pán	měst-o	žen-a
acc	muž-e	pán-a	měst-o	žen-u
gen	muž-e	pán-a	měst-a	žen-y
prep	MUŽ-I	PÁN-OVI	MĚST-U	ŽEN-Ě
dat	MUŽ-I	PÁN-OVI	MĚST-U	ŽEN-Ě
ins	muž-em	pán-em	měst-em	žen-ou

(14) *Non-accidental syncretism of prepositional and dative in Russian*

	book, sg.	bridge, sg.
nom	knig-a	most-ø
acc	knig-u	most-ø
gen	knig-y	most-a
prep (in)	KNIG-E	MOST-U
dat	KNIG-E	MOST-U
ins	knig-oj	most-om

(15) *Non-accidental syncretism of prepositional and dative in Slovene*

	peach, sg.	apple, sg.
nom	brêskv- $\emptyset$	jâbolk-o
acc	brêskv- $\emptyset$	jâbolk-o
gen	brêskv-e	jâbolk-a
prep	BRÊSKV-I	JÂBOLK-U
dat	BRÊSKV-I	JÂBOLK-U
ins	brêskv-ijo	jâbolk-om

## 2.5. Dative

Apart from prepositional, dative shows syncretism with instrumental. This syncretism was characteristic for the Old Slavic dual number; Slovene, the only of the three languages which has preserved the dual, preserved also the syncretism. In Czech, the syncretism targets numerals or quantifiers like ‘two’ or ‘both.’

(16) *Syncretism of dative and instrumental in Czech*

	both
nom	ob-a
acc	ob-a
gen	ob-ou
prep	ob-ou
dat	OB-ĚMA
ins	OB-ĚMA

(17) *Non-accidental syncretism of dative and instrumental in Slovene*

	apple, du.	table, du
nom	jâbolk-i	míz-i
acc	jâbolk-i	míz-i
gen	jâbolk- $\emptyset$	mîz
prep	jâbolk-ih	míz-ah
dat	JÂBOLK-OMA	MÍZ-AMA
ins	JÂBOLK-OMA	MÍZ-AMA

As before, it is possible to strengthen the Dat – Ins connection for the two languages where it is under-represented by additional patterns which have it as a sub-part. This is demonstrated in the table below.

## (18) Structural vs. oblique

	five, Cz	she, Cz	good, fem. sg., Rus	100, Rus
nom	pět	on-a	xoroš-aja	st-o
acc	pět	j-i	xoroš-uju	st-o
gen	PĚT-I	J-í	XOROŠ-EJ	ST-A
prep	PĚT-I	J-í	XOROŠ-EJ	ST-A
dat	PĚT-I	(n)J-í	XOROŠ-EJ	ST-A
ins	PĚT-I	J-í	XOROŠ-EJ	ST-A

## 2.6. The problematic case: accusative and instrumental

The only challenge to the hypothesis in (1) in the languages investigated is the syncretism of accusative and instrumental in standard literary Czech.

(19) *Non-accidental syncretism of accusative and instrumental in Czech*

	good, fem. sir, pl.	
nom	dobr-á	pán-i
acc	DOBR-OU	PÁN-Y
gen	dobr-é	pán-ů
prep	dobr-é	pán-ech
dat	dobr-é	pán-ům
ins	DOBR-OU	PÁN-Y

To account for this example, one can, of course, treat it as a multiple accidental homophony, and posit two entries for *-y* and *-ou*. But then it is no longer clear what exactly constitutes a counterexample to our hypothesis. However, there are reasons to doubt the reality of the connection between accusative and instrumental. The reason is that in colloquial Czech (despite normative pressure), the instrumental *-y* has been replaced by a marker taken from a different declension, specifically *-ama*.<sup>2</sup> This fact raises an important question: why was only the instrumental *-y* subject to replacement, while the accusative one still persists as the only option? At the same time, differences between colloquial Czech and its literary version in other cells of the paradigms are far less dramatic, resulting from phonological changes. Under the present setup,

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<sup>2</sup>In fact, it is not clear (to me) whether any replacement has taken place, or whether the instrumental always had the *-ama* option.

both of these facts look rather naturally, and they stem from the fact that the homonymy of accusative and instrumental has no possible grounding in the system of syncretism proposed in (1).<sup>3</sup>

## 2.7. Summing up

In this section, I have demonstrated that syncretism in Czech, Russian and Slovene obeys the law of adjacency. In fact, almost all of the predicted syncretisms are manifested in each of the languages. Further, there are no clear and systematic counterexamples to the proposed ordering. In the next section, I turn to the question of whether the Law of Adjacency (or something close to it) can be encoded, and how this is to be done.

## 3. Precedence as containment

The observation made in the preceding section led McCreight and Chvany (1991) to propose that the theory of Universal Grammar must embed a specific module, Paradigm Theory, where constraints on possible syncretisms can be stated over an independently established paradigm structure. Such a proposal conflicts directly with more reductionist theories of morphology that try to avoid making a direct reference to an independent notion of paradigm, and argue that paradigms arise from the interplay of independent mechanisms (see Bobaljik 2002, Calabrese 2008). While I am in complete agreement with the claim that paradigms have no independent place in the theory of grammar, it is fair to say that standard generative theories (e.g., the theory of Distributed Morphology) seem to have no obvious way of dealing with such observations. However, this holds not only of DM, but also of theories that explicitly or implicitly do incorporate some notion of paradigm structure, such as Williams (1981). To the extent that these theories make any prediction concerning the system of syncretism, the prediction is that there will be no linear order under which syncretism can be captured: The Law of Anti-Adjacency.<sup>4</sup>

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<sup>3</sup>Later, I come back to this example, and propose that it might involve a zero marker attached on top of the accusative: *-ou-φ*. This possible analysis removes the counterexample, but rises questions as to what the formal power of morphological zero is.

<sup>4</sup>Both in classical DM (e.g., Calabrese 2008), and under the lexicalist approach of Williams 1981, any pair of cases can be syncretic. Hence, these approaches require some form of restate-

In order for a theory to capture The Law of Adjacency without postulating paradigm structure, it needs to do three things. First, it needs to capture “natural classes” of cases by positing some kind of decomposition into more primitive features. Second, it needs to formalize a general process by which the proposed representations relate to phonological exponents. Third, it must be shown that the interplay of the decomposition and the mechanism of exponence yields the Law of Adjacency as a consequence. The goal of this section is to achieve this.

### 3.1. Decomposition

I start by decomposing the individual Cases. For many years now, the standard approach (going back at least to Jakobson 1962) has been to decompose individual cases into bundles of equipotent features. However, I am going to diverge from this tradition in two respects. First, I use privative features. The reason is that as far as I am aware, it is impossible to derive the Law of adjacency using equipotent features, unless additional constraints are added to different components of the theory.

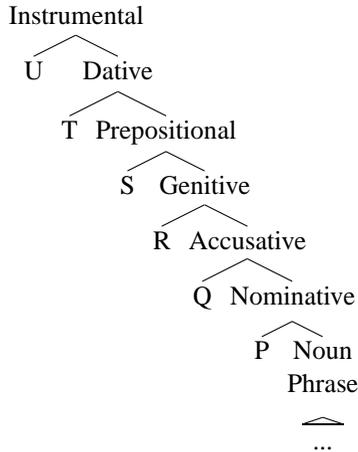
Second, I propose that the features do not form an unstructured bundle, but that they come in a hierarchy, where one feature dominates another. Specifically, I propose that precedence on the hierarchy relevant for the Law of Adjacency corresponds directly to the arrangement of such features in a syntactic hierarchy, the functional sequence. The proposal is depicted below:<sup>5</sup>

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ment even if the Law of Adjacency holds only for the limited domain of NOM – ACC – OBL, as observed by Baerman et al. (2005).

<sup>5</sup>Related proposals on which the present approach draws have been developed for independent domains by Starke (2006) and Bobaljik (2007). Starke observes that in the hierarchy PAST ACTIVE PARTICIPLE – EVENTIVE PASSIVE PARTICIPLE – RESULTANT-STATE PASSIVE PARTICIPLE AND TARGET-STATE PASSIVE PARTICIPLE, only adjacent terms can be syncretic. Bobaljik finds similar pattern in the domain of adjectives, looking at the positive, comparative and superlative. Both implement their observations in terms of similar hierarchies.

(20)



The tree encodes the proposal that nominative arises if the Noun phrase (with or without a determiner) is embedded under a feature P. Accusative corresponds to the Nominative, augmented by an additional feature; genitive arises if yet another feature is added. And similarly for the other cases.<sup>6</sup>

With the representation in (20) in place, we need a theory of lexicalization which will force that only cases adjacent on the hierarchy can be related to an identical lexical item.

### 3.2. Lexicalization

In this section, I sketch a theory of lexicalization, which derives the Law of Adjacency. In order to be as specific as possible, I will phrase my proposal in terms of a particular version of a realizational theory of morphology, although for reasons of space, I do not explicitly discuss which parts of this theory are essential, and which could be implemented in other ways. The specific archi-

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<sup>6</sup>An obvious question arises as to what is the nature of the features P, Q, R and others. In a nutshell, the idea is that these features are semantically contentful, and that the semantics of say, dative, is compositionally built on the semantics of the cases it contains. For instance, the fact that dative contains genitive can be understood if genitive denotes possession, and dative a change of possession. The additional features inside the dative (as opposed to the genitive) would then serve to bring about the change-of-state part of the meaning of the dative. At this point of investigation, however, even the rough outlines of such a theory are far from settled. Needless to say, questions concerning the semantics of case are hard to formalize under any theory.

ecture assumed here (due to Starke 2006) is that syntax combines individual features into phrase-structure trees, similar to the one in (20), which are the input to the lexicon. The lexicon contains lexical entries, pairings of features and pronunciation (ignoring conceptual information, irrelevant for the present purpose). By lexical access, features of the phrase-structure representation are mapped onto pronunciation, using lexical entries as instructions of how this is to be done. This conception is similar to the proposals made within the framework of Generative Semantics (e.g., McCawley 1968), or more recently within Distributed Morphology (Halle and Marantz 1993), but it differs from these theories in non-trivial ways.

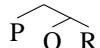
The major difference is that it is not assumed that there is a specific module of Morphology. The mapping from syntax onto pronunciation is direct, mediated solely by lexical access. This is achieved by allowing the lexicalization procedure to target both terminal and non-terminal nodes (as in McCawley 1968, Starke 2006, Caha 2007*b* or Neeleman and Szendrői 2007). Further, I assume that the lexicalization of syntactic structure is driven by some version of the Superset Principle (see Starke 2006, Caha 2007*b*, Caha 2007*a* Abels and Muriungi 2008, and Ramchand 2007 for various formal implementations of the idea).

- (21) *Superset Principle*: A phonological exponent is inserted into a node if its lexical entry has a (sub-)constituent that is identical to the node. If there are more such items, the one with least features not contained in the node gets inserted.

To illustrate how the principle works, consider the scenario below.

- (22) *Lexical entry A*: /a/ ⇒ 

- (23) *Syntactic structures*

- a. 
- b. 
- c. 

Assume that (22) is a Lexical entry, a spell out rule pairing syntactic structure with sound (in slashes). According to the Superset Principle (21), it is allowed

to spell out any structure which is identical to the lexical entry, i.e., (23-b), or any subconstituent, i.e., (23-a). In other words, syntactic structures (23-a) and (23-b) can be both spelled out using the same lexical entry – a case of non-accidental syncretism. However, the structure in (23-c) cannot be spelled out by the entry (22), since the entry does not match (23-c). (It matches only a subset of it.)

One possibility for a language to lexicalize (23-c) is to have a separate lexical entry (24) for the whole chunk (23-c):

(24) *Lexical entry B: /b/*  $\Rightarrow$  

In such case, the language simply spells out the structures (23-a) and (23-b) as /a/, while it realizes (23-c) as /b/.

This approach provides an explanation for why, in most cases, we do not see Case markers stack one on top of the other, despite the fact that individual syntactic cases are argued here to do so. In our toy example, the structure (23-a) is properly contained in (23-b), which is in turn properly contained in (23-c), but this is opaque at the surface, where none of the markers properly contains the other.

Note that the entry (24) can also (in principle) be used to spell out structures (23-a) and (23-b), since it represents a superset of these structures. But notice as well that according to the Superset Principle (21), such a situation is ruled out by competition (Elsewhere condition). So given that there is the entry A (22), the entry B (24) will not be allowed to spell out structures (23-a) or (23-b), because the rule B contains more superfluous features than the rule A. Given this reasoning, we derive the needed property of paradigms based on “nested” structures like (23-a), (23-b) and (23-c): the Law of Adjacency.

To sum up: the structures (23-a) and (23-c) will never receive an identical spell out /x/, if (23-b) is not spelled out by /x/ either. That is because for the structures (23-a) and (23-c) to receive an identical spell out, something like the spell out rule (24) has to be assumed. Furthermore, there can be nothing like the rule in (22), otherwise the structures (23-a) and (23-c) would receive a different spell out, in contradiction with the initial assumption. But in such case, the rule (24) also spells out the structure (23-b), and hence we get /x/ in all three cases.

### 3.3. Conclusion: Deriving the Law of Adjacency

The decomposition of cases and the insertion procedure outlined above derive the Law of Adjacency. In abstract terms, the law follows from the fact that the cases which show syncretism are adjacent in the syntactic decomposition, and the insertion procedure allows only adjacent nodes to be lexicalized by a single lexical entry.

The contribution of the present approach lies first in integrating the Law of Adjacency in a context of a theory that does not rely on the notion of paradigm as a primitive unit of grammatical organization. Second, I argue later that the scope of the case hierarchy is not limited to syncretism, but it plays an important role in other aspects of grammar. Hence, the advantage of the present approach over the one stated purely across paradigms, is that the same tool (the hierarchy, understood in terms of feature structure) can be used to explain phenomena in more than one domain of grammar. In fact, a theory which places the case hierarchy relevant for adjacency into a separate module, the Paradigm Theory, makes a completely opposite prediction to the one made here, namely that the hierarchy will not be relevant for anything else in the grammar, or at least, to anything which lies outside of the module of Paradigm Theory.

## 4. Looking outside Slavic

A question arises whether the Law of Adjacency holds outside of Slavic, and if it does, whether the ordering of cases differs from a language to a language, or whether it is identical across languages. The most constrained, yet the most interesting possibility is that the ordering of cases is not specific to the Slavic languages investigated here, but that it holds more broadly. In fact, one possibility is that this ordering is universal, reflecting a single underlying functional sequence, a part of Universal Grammar.

### 4.1. Johnston (1996)

Johnston (1996) investigated case-syncretism from the perspective of the Law of Adjacency in 8 languages (Arabic, Ancient and Modern Greek, German, Latin, Polish, Russian and Sanskrit). His results (summarised in his work on p. 108) show that in 7 of these languages, the ordering is compatible with

the sequence NOM – ACC – GEN – DAT – INS, arrived at on the basis of the languages investigated here.

The only problematic language in Johnston's sample, from our perspective, is Latin. Johnston (1996) argues that the only possible order for Latin involves the ordering NOM – ACC – ABL – DAT – GEN. Since in Latin, the syncretism between structural (NOM, ACC) and oblique cases is not widespread, the evidence for the order ACC – ABL is based primarily on the pattern found in the pronominal system in the singular, where ACC and ABL are syncretic for 1st, 2nd and reflexive pronouns (*m-ē*, *t-ē* and *s-ē* respectively). However, if this syncretism is treated as accidental (or somehow related to various "strange" effects that surround 1st and 2nd person pronouns), the Latin declension is compatible with the order NOM – ACC – GEN – DAT – ABL as well. Given that the Latin ablative has "primarily" an instrumental function (the ablative function is mostly restricted to ablative in connection with a preposition), such an ordering is perfectly in line with the strongest possible hypothesis, which attributes these facts to the underlying functional sequence, invariant across languages.

#### 4.2. Old English

Another language where the order NOM – ACC – GEN – DAT – INS can be established, is Old English, investigated in detail by Plank (1991). Let me first establish the predicted order. Plank (p. 171-173) observes the following syncretisms leading to it:

- (25) Syncretism in Old English (non-exhaustive)
- a. Nom – Acc (frequent)
  - b. Nom – Acc – Gen (plural of  $\bar{o}$ -nouns, feminine *i*- and *u*-nouns: ending *-a*; athematic feminine nouns in  $\bar{e}a$ , nouns 'brother, mother, daughter:' ending  $-\emptyset$ )
  - c. Gen – Dat (sg. of fem. *i*-nouns: ending *-e*, *u*-nouns: ending *-a*, neuter weak nouns: ending *-an*, and more)
  - d. Dat – Ins (almost all paradigms)

However, there are also syncretisms that go against the expected pattern. Specifically, accusative and dative show syncretism that excludes the genitive in 1st and 2nd person pronouns in all numbers. The offending forms are in small caps:

(26) *Accusative – Dative syncretism in Old English*

	I	Two of us	We	You (sg.)	You two	You (pl.)
nom	ic̄	wit	wē	þū	ġit	ġē
acc	MĒ,mec	UNC	ŪS	þĒ	INC	ĒOW
gen	mīn	<b>uncer</b>	ūre	þīn	<b>incer</b>	<b>ēower</b>
dat	MĒ	UNC	ŪS	þĒ	INC	ĒOW

If this pattern is to be taken at face value, it poses a serious threat to the Law of Adjacency. First, the pattern is at odds with the strong hypothesis that the ordering is universally NOM – ACC – GEN – DAT – INS; second, it also undermines a weaker version of the Law of Adjacency, which would claim that the order of cases is language particular, but consistent for all case-marked categories (nouns, pronouns, adjectives, etc.) within a language. That is because, as we have seen, nouns and adjectives in Old English point to an ordering which is exactly the same as the one assumed cross-linguistically.

However, if it is possible to show that the offending pronominal pattern arises for independent reasons, the hypothesis that predicts such a pattern to be impossible gains an additional support. I argue that this is the case, and that the “genitive” forms are in fact possessive pronouns.

The first observation that leads to this conclusion is that all of the “genitives” which intervene between the accusative and dative, can take further inflection (like strong adjectives) when they modify an overt noun. In this property, they contrast with regular genitives of nouns, which do not have this possibility. This contrast alone suggests that the “genitive” forms are better seen as possessive pronouns, standing outside of the case paradigm proper.<sup>7</sup>

Further, it can be observed that some of the “genitive” forms that give rise to the offending syncretism by “standing in the way” between accusative and dative, embed the accusative/dative form as their subpart. In the table, the ACC/DAT form contained inside the “genitive” is in boldface. This part is followed by an invariant *-er*. A possible interpretation of this pattern is that the forms *unc*, *inc* and *ēow* are syncretic among ACC, GEN and DAT. The presence of the additional *-er* in the genitive cell has nothing to do with case-marking of the pronoun per se, but it is present for other reasons, specifically to render the form possessive. Hence, the structure of the problematic genitives would be [[Pron GEN] poss *-er*]. Such an explanation can be extended

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<sup>7</sup>(Johnston, 1996, p. 49) argues that also the Latin forms *me-ī* ‘I, gen,’ *tu-ī* ‘you, gen,’ *nostr-ī* ‘we, gen,’ etc., are in fact genitive neuter forms of possessive pronouns *me-us* ‘my,’ *tu-us* ‘your’ and *noster-ø* ‘our’ respectively.

to the other forms, with the difference that these would be considered a portmanteaux morphemes related to the whole structure, without the possibility of segmentation into a genitive form and the “possessive” morpheme.

A situation similar to Old English holds for German (Johnston 1996, §2.2.6). The ordering of nouns and adjectives leads to the ordering NOM – ACC – GEN – DAT, but there is a syncretism of dative and accusative (to the exclusion of genitive) in 1st and 2nd person plural pronouns. At the same time, the (archaic) genitive forms such as *mein-er* ‘I, gen.’ are homophonous with genitive plural of the possessive *mein* ‘my.’

In Classical Armenian, the ordering for nouns and adjectives is compatible with NOM – ACC – (LOC–) GEN – DAT – (ABL –) INS, while pronouns require inverting the order of the GEN – DAT relation to DAT – GEN. Again, this is because the genitive stands in the way between accusative and dative in the paradigm of personal pronouns. At the same time, only pronominal “genitives” take further inflection to reflect case and number of the head-noun, while nouns do not have this possibility. It seems, then, that the class of exceptions to the proposed ordering is limited to the genitives of 1st and 2nd person pronouns (together with reflexive pronouns), which behave unlike genitives in several other respects. First, they are capable of bearing additional inflection, and second, they do not show syncretism with any other form in the paradigm.

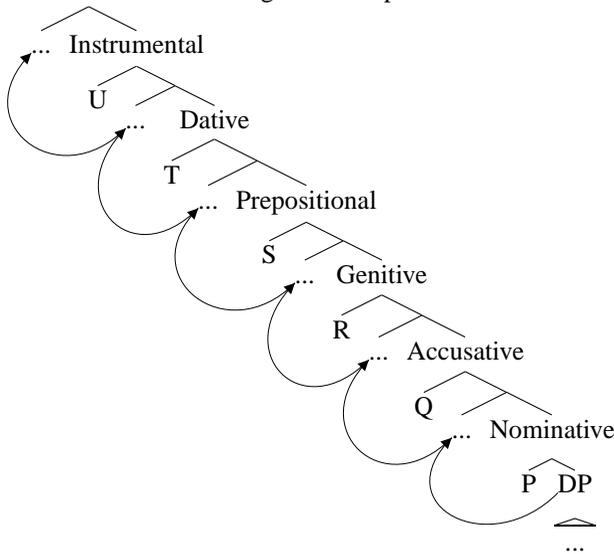
A possible conclusion is, then, that in some languages, there are no genitive forms of personal pronouns, and that their function is performed by possessive pronouns. To the extent that such an explanation of these problematic cases has some plausibility, it points to an approach to the Law of Adjacency that does not link it directly to a notion of paradigm based on the distribution of the forms. That is because the possessive forms resist a morphological integration into the paradigm of personal pronouns by rejecting to conform to the Law of Adjacency, although they belong there by their distribution.

## 5. The order of markers

In this section, I point to a quite unique prediction made by the present account of syncretism concerning the division of labour between prepositions and case-suffixes. Recall from section 3.1 that the case features are introduced structurally above the Noun-phrase (20) and hence, they c-command it. Under a conception of phrase structure going back to Kayne (1994), c-command maps directly onto precedence, and so nothing else said, one would expect that case markers precede the Noun phrase. While this holds for some lan-

guages (e.g., Tongan), it is not the only possibility. Specifically, the Slavic languages discussed above must be subject to an operation that has as its result that the case features are expressed as a suffix. This operation is movement. Specifically, I propose that in Czech, Russian and Slovene the Noun phrase moves in several steps to a position c-commanding the projection of the instrumental. For simplicity, I assume that each case feature makes available a Specifier position through which the DP moves on its way to the top of the hierarchy.

(27) DP movement can target various positions



As already suggested, languages differ whether they have movement all the way to the top of the hierarchy (Slavic) or no movement at all (Tongan), and that this difference corresponds to whether the case features are realized as a case prefix, or suffix. It is more realistic, however, that there is more variation.

Cinque (2005) looks at the order of Noun, Adjective, Numeral and a Demonstrative inside a Noun phrase, and proposes that all attested patterns can be derived by a couple of assumptions. The first assumption is that the basic order of the elements is DEM > NUM > ADJ > NOUN. The second assumption that variations are derived by leftward movement of the Noun to various heights in the base-generated sequence. Crucially, this way of doing things not only derives all the attested orders, but it does not lead to any unattested orders.

Using the Cinque-style approach to the typology of case marking leads to the expectation that the movement of the Noun phrase may in fact stop in any of the intermediate specifiers in the tree above (27). For instance, we may expect to find a language that only moves the Noun phrase as high as genitive, but no further. In such a language, we expect to find nominative, accusative and genitive as case suffixes, but all the other cases, notably dative and instrumental, have to be expressed by a preposition. An example of such a language would be, for instance, Arabic or modern Greek.

There are also languages with nominative, accusative, genitive and dative as a suffix, but need to make recourse to a preposition when expressing the instrumental case; e.g., German. This is implemented by letting the Noun phrase move as high as dative, but no further. The dative is spelled out on the Noun phrase, and the feature responsible for the instrumental interpretation as a preposition *mit* ‘with.’ Further, there do not seem to be languages that have nominative, accusative and dative/instrumental suffixes, but express genitive by a preposition. A general statement of the prediction is given below:

- (28) *The order of Case markers:* If a marking for a case X is suffixal, all markers higher on the hierarchy are suffixal as well.

Blake (1994) investigates case in a similar (but distinct) fashion. He proposes the hierarchy in (29), which is intended to encode an implicational hierarchy of availability of a particular case in a language. The hierarchy says that if a language L “has” a case X, it also “has” all the cases lower on the hierarchy. Comparing the two hierarchies, we see that Blake’s cases for which there is a match in our hierarchy (in boldface) follow exactly the same order as the order established on the basis of syncretism patterns. This clearly supports the particular implementation proposed here; in fact, something like Blake’s hierarchy is a consequence of the representation proposed and the theory of ordering outlined in Cinque (2005).

- (29) *Blake’s hierarchy:*  
**NOM** > **ACC** / **ERG** > **GEN** > **DAT** > **LOC** > **ABL** / **INS** >  
 COM > others

Blake’s hierarchy has number of surface counterexamples. However, as far as I know, none of them violates the formulation in (28). As an example, consider Hungarian. Hungarian has nominative, accusative, dative, instrumental and a number of spatial cases, but no genitive. Hence, we have a surface counter-example to Blake’s hierarchy. However, it is not the case that possessor inside a Noun phrase is expressed by a pre/postposition. Rather, it is

expressed as a dative, or nominative, depending on word-order, among other things.<sup>8</sup>

To sum up: the approach to syncretism taken here, combined with standard generative accounts of word-order variation, predicts that lack of Case will be compensated for by a prepositional marking. It seems to be clear that if there is such a connection between the syncretism hierarchy and the suffix/preposition hierarchy, we want them to be captured at the same time. This requirement puts pressure on theories that try to isolate the case hierarchy from syntax, into a separate module.<sup>9</sup>

## **6. Morphological Containment (Compound Case Marking)**

The proposed hierarchy can be also used to capture patterns of morphological containment. In the languages under consideration, cases higher on the hierarchy can properly include cases lower on the hierarchy, but never the other way round. This type of marking is more common in agglutinative languages, particularly with spatial cases, but it seems to occur even in the languages under consideration.

Of course, a caveat is in place concerning zero morphology. Specifically, much depends on whether the lack of marking is understood as a specific formative,  $-\emptyset$ , or rather a lack of one. If the first option is on the right track, it is very hard to find out if any overtly marked form is based on the unmarked form (i.e. whether it contains the  $-\emptyset$  formative apart from the overt one), or whether it is not. To avoid making arbitrary decisions, I side-step these issues, and argue on the basis of forms where a non-zero marked case is subject to further affixation.

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<sup>8</sup>Blake himself suggests that the counterexamples are superficial, and are basically due to two factors: systematic syncretism (perhaps as in the case of Hungarian which uses dative to express possessor), or applicative morphology (perhaps as in the case of nominative possessor, accompanied by “applicative” agreement on the possessed noun). That seems reasonable to me, and in fact, if one combines the approach to syncretism taken here, the statement (28) and his hierarchy come quite close. However, the formulation (28) is inactive in languages that distinguish between a case-suffix and a postposition, while his formulation is. I leave a more precise comparison of the approaches for future work.

<sup>9</sup>This observation, of course, points to a weakness in the “Paradigm Module” approach of McCreight and Chvany (1991), but also to a more recent “Morphology module” approach proposed by Calabrese (2008).

6.1. Instrumental and accusative in colloquial Czech

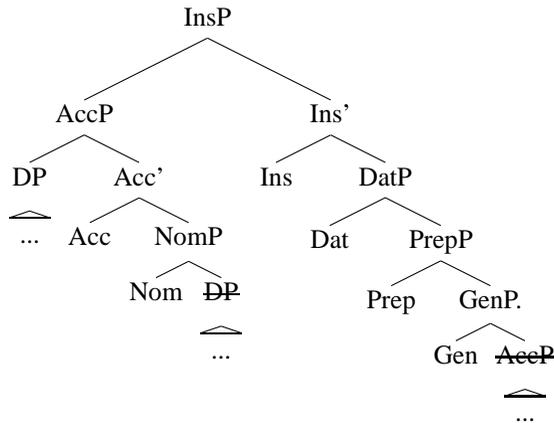
Looking at the instrumental plural forms in colloquial Czech, it can be observed that they all share a common component, *-ma*, preceded by a vowel. In the paradigms displayed, the quality of the vowel is identical to the accusative marker.

(30) *Acc – Ins containment in coll. Czech*

	'man'	'chicken'	'eye'	'building'	'good' (adj.)
Nom	muž-i	kuřat-a	oč-i	staven-í	dobr-ý
Acc	muž-E	kuřat-A	oč-I	staven-í	dobr-Ý
Gen	muž-ů	kuřat	oč-í	staven-í	dobr-ých
Prep	muž-ích	kuřat-ech	oč-ích	staven-ích	dobr-ých
Dat	muž-ům	kuřat-ům	oč-ím	staven-ím	dobr-ým
Ins	muž-E-ma	kuřat-A-ma	oč-I-ma	staven-í-ma	dobr-Ý-ma

A straightforward account of this paradigm is provided under the decomposition proposed here. Recall that instrumental case literally contains the accusative case. The idea is that when the Noun phrase raises to the top of the case features, it has the option to take along a lower part of the case hierarchy together with it. This option is traditionally called pied-piping, and I show the derivation below in (31). Here, the Noun phrase first moves (cyclically, which is not shown in the tree) to the specifier of the accusative case, and then takes the whole projection with it when it moves higher up in the tree:

(31)



As we sketched above, only constituents (non-terminal nodes) are subject to spell-out. When the tree above is subject to spell out, first the accusative marker is used to express the features corresponding to the accusative (the Acc'). The additional *-ma* expresses the remaining features (Ins').

Here I wish to come back to the offending pattern of singular nouns. In 2.6, we have seen that accusative and instrumental were syncretic to the exclusion of the intervening cases. Starting from the observation that instrumental is built on top of the accusative in the plural, it can be proposed that this is the case in the singular as well. In the singular, however, the additional piece of morphology, analogous to the plural *-ma*, is a zero morpheme. Be it as it may, reflecting theoretically upon such a solution gives us a grasp on the formal power of zero morphology. In general, we can observe that the power of introducing a zero morpheme in the system under discussion increased the number of possible syncretisms by 1.<sup>10</sup>

### 6.2. Dative and instrumental in Russian

In Russian, it seems that the instrumental plural form is systematically based on the dative form by the addition of an additional *-i*. This pattern lends itself to a similar explanation: first, the Noun phrase moves to the specifier of the dative, and then the whole constituent raises to Spec,Ins. The Ins feature is spelled-out as *-i*, while the dative case (in the spec of Ins) is spelled out in the same way as an ordinary dative case.

(32) *Containment relation of dative and instrumental (Russian)*

	we Rus	they Rus	all, pl.	the very, pl.	two, m./n.
nom	my	oni	vse	samye	dva
acc	na-s	ix	vse	samye	dva
gen	na-s	ix	vsex	samyx	dvux
prep	na-s	nix	vsex	samyx	dvux
dat	NAM	IM	VSEM	SAMYM	DVUM
ins	NAMI	IMI	VSEMI	SAMYMI	DVUMJA

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<sup>10</sup>For instance, in a language like Czech, there are six cases (apart from vocative). In principle, there could be 15 different syncretisms of pairs. The adjacency requirement brings it down to 5. The introduction of a zero morpheme increases this number by 1 for each such morpheme.

### 6.3. Conclusion

Here, I brought to the attention two patterns of morphological containment and analysed them using tools which were already in place: movement of the Noun phrase to the top of the instrumental (with the possibility of pied-piping), and spell out of phrasal constituents. As a general point, it can be noted that at the beginning of the hierarchy (nom, acc, ...), cases are frequently morphologically undecomposable, while at the other end (ins, dat, ...), they frequently are. This makes sense under the proposal put forth here: the more features a case has, the more likely it becomes that more than one morpheme will be necessary to express these features.

## 7. A brief look at further interactions

In this section, I introduce further domains where case hierarchy is implicated. I suggest ways of looking at these phenomena such that they become the result of interaction between various syntactic processes and the syntactic implementation of the case hierarchy argued for here.

### 7.1. Extractions

It has been observed in the literature (e.g., in Müller 1995, Starke 2001) that structural cases, nominative and accusative, are (in principle) transparent for extractions, while oblique cases are islands. I demonstrate this for Czech:<sup>11</sup>

- (33) a. Kterého herce to byla [chyba t]?  
 whose actor it was mistake-nom  
 ‘Which actor was it a mistake of?’
- b. Od kterého autora sis četl [článek t]?  
 By which author did-you read paper-acc  
 ‘Which author did you read a paper by?’

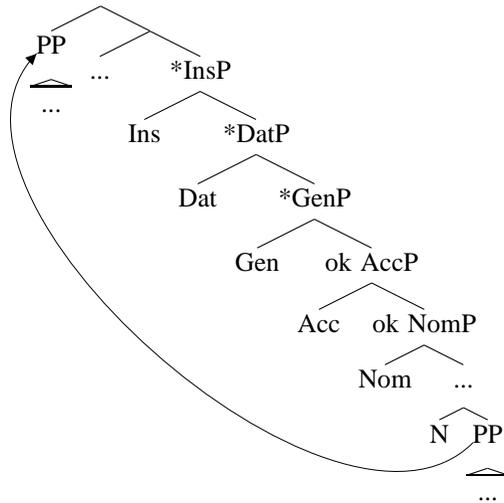
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<sup>11</sup>Starke 2001 shows that extractions from DPs in nominative and accusative degrades under conditions that need not concern us here. Hence, I speak of extractability in principle, leaving aside intervening factors like specificity and word-order which bring additional complications into the picture. Further, I leave the prepositional case aside, since it only occurs in PPs, so additional factors play a role there.

- c. \*Od kterého autora se bojíš [článků t]?  
By which author refl are-you-afraid of-papers  
'Papers by which author are you afraid of?'
- d. \*Od kterého autora věříš [článkům t]?  
By which author trust-you to-papers  
'Papers by which author do you trust?'
- e. \*Z jakého kovu po tobě stříleli [kulkami t]?  
Out-of which metal after you did-they-shoot bullets-ins  
'Bullets made of which metal were they shooting at you?'

Starke (2001) integrates this observation into a relativized-minimality framework by proposing that oblique cases differ from structural cases by the presence of an additional functional projection,  $\theta$ , which blocks extractions. (The relativized blocking effect arises due to the fact that overt movement is necessarily likewise a  $\theta$  movement.) Under the present theory with more articulated case structure above the Noun phrase, we can identify this projection as the projection of the genitive case. Other oblique cases, since they also contain this projection, predictably block extractions as well.

(34)



Again, it seems that the extraction hierarchy, though much less articulate, introduces a split between two groups of cases, such that the split brings together cases that are grouped together on other grounds as well. Such interac-

tion of the hierarchy with core syntactic processes is expected, if the hierarchy lives in syntax in the form of the functional sequence.

## 7.2. Agreement

Bobaljik (to appear), building on previous work (for references see Bobaljik's work) presents the following hierarchy (35), which is to be read as follows: If a language allows the verb to agree with an argument marked X, it also allows the verb to agree with all arguments higher on the hierarchy. Bobaljik's contribution to the understanding of the generalization is the proposal that if we want the hierarchy to be valid for both ergative and absolutive languages at the same time, it has to be stated in terms of case, not grammatical function. That is because ergative case is less likely to agree with the verb than absolutive, despite the fact that it marks subjects.

- (35) *Agreement hierarchy*: Unmarked Case (Nom/Abs) > Dependent Case (Acc/Erg) > Oblique Case

Under the assumption that agreement involves a relation between the person/number features of the Noun phrase, located structurally below the case features, and some element in the projection of the verb, it seems natural to expect that this relation is subject to some notion of locality. The existence of the Agreement hierarchy suggests that the amount of case structure intervening between the Noun phrase, hosting agreement features, and the agreeing verb plays an important role in determining whether agreement can be established. Specifically, if some case layer presents a barrier to the establishment of an agreement relation, all cases that embed this layer will likewise be inaccessible for agreement.

What is important from the current perspective, is that the Agreement hierarchy is identical to other hierarchies discussed so far; hence, a unified approach is called for. The present proposal allows to capture the hierarchy by making recourse to a locality condition imposed on agreement, specifically, that one of the case layers functions as a barrier for agreement, rendering a particular argument inaccessible.

## 7.3. Keenan-Comrie relativization hierarchy

Keenan and Comrie (1977) present a hierarchy pertinent to accessibility of a particular argument to relativization. The hierarchy allows them to formu-

late a generalization that a given “relativization strategy” is available for a contiguous sequence on the hierarchy. This is intended to capture two main observations.

First, relativization strategies that do not reflect the case of the “gap” (the argument relativized on) occur from the extreme left of the hierarchy (subjects) and either go all the way, or stop somewhere on the way to the Object of comparison. On the other hand, strategies that do reflect the case of the gap (prototypically resumptive pronouns) are most likely to occur on the right (Object of comparison) and either go all the way to the left, or stop somewhere on the way to subjects.

The hierarchy is given below and it is stated in terms of grammatical function, rather than case.

(36) SU > DO > IO > OBL > POSS > Object of Comparison

However, as Keenan and Comrie point out, some ergative languages (e.g., Tongan) present a counterexample, because ergative subjects and oblique NPs can be relativized on using a resumptive pronoun strategy to the exclusion of absolutive objects, which require a gap. This provides evidence for stating the hierarchy in terms of case ABS > ERG, rather than in terms of grammatical function SUBJ > OBJ (a point discussed in Bobaljik (to appear) and demonstrated for wide range of ergative languages in Polinsky (2008)). Below, I restate the hierarchy in terms of case, translating subject onto nominative (/absolutive), direct object onto accusative (/ergative), indirect object into dative, and possessor into genitive. I leave out the Object of Comparison since there is no direct match for it in the hierarchy we have been working with so far.

(37) nom > acc > dat > oblique > gen

Seen this way, the hierarchy looks rather similar to the previous ones; however, the position of the genitive in the Keenan-Comrie hierarchy and the hierarchy investigated here is obviously different. However, there seems to be an independent reason for why that should be so. Whereas subjects, objects and all sorts of obliques Keenan and Comrie tested were dependents of the verb, the genitives were possessors, i.e. genitives embedded inside a Noun phrase. This introduces an asymmetry in the hierarchy that is orthogonal to the overall pattern conditioned by case. To get equal testing conditions for genitives and the remaining cases, one would have to either test accessibility for relativization on the dependents of verbs only (adverbial genitives), or on dependents of nouns only (adnominal PPs). For noun dependents, such a study is impossible, since nouns usually take only a subset of dependents

compared to verbs (e.g., it is impossible to conduct a cross-linguistic study concerning accessibility of nominative/absolutive dependents of nouns). For dependents of verbs, such a study is unavailable, hence, I exclude the genitive from further considerations, focussing only on the part of the hierarchy where asymmetries are due to case.

In the current setup, the question takes the following shape: why do we get a gap, when there is relatively little case structure, and why do we get a pronoun, when there is a relatively big amount of case structure. Clearly, the way the questions come out makes sense; however, what the precise implementation should be, and where the source of variation resides is somewhat unclear. I leave the investigation of this problem for some other time.

## 8. Conclusions

In this paper, I suggested a possible interpretation of the Law of Adjacency which takes it away from morphology and ties it to the existence of an underlying syntactic hierarchy of case, the functional sequence. The plausibility of this interpretation has been supported by looking at empirical domains where the interaction of such an underlying hierarchy and independently needed syntactic mechanisms yields interesting predictions.

I considered patterns of cross-linguistic distribution of case, Blake's hierarchy, which seems to replicate relevant parts of the syncretism hierarchy. The patterns of morphological containment, extractability, accessibility for relativization and agreement seem to ply along the same rules as well. The reason why this should be so is that all of these phenomena reflect the interaction between an underlying hierarchy of features and principles that govern syntactic computation and pronunciation.

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