

# Zero morphology and change-of-state verbs

Pavel Caha      Karen De Clercq  
Guido Vanden Wyngaerd

## Abstract

We present a theory of conversion in terms of phrasal spellout. In this approach, there are no zero morphemes. Instead, the ‘silent’ meaning components are pronounced cumulatively within overt morphemes. As an empirical case, we discuss adjective/verb ambiguity as in *narrow*. As verbs, these roots have both an inchoative and a causative sense. Following Ramchand (2008), we assume that such de-adjectival causatives contain three parts: the adjective denoting a state, a change-of-state component PROC, and a causative component INIT. Adopting a Nanosyntax approach, we propose that verbs like *narrow* spell out a complex node with all these abstract heads. The ambiguity between the inchoative, causative and adjective falls out as a consequence of the Superset Principle (Starke 2009), which states that a lexical entry can spell out any subtree it contains. Since both the inchoative sense and the adjective sense correspond to proper parts of the causative one, we derive these readings without the need to postulate zeroes. We show how these assumptions allow us to capture the different patterns of the inchoative/causative alternation that are known from the typological literature.

## 1 Introduction

Consider the case of adjective-verb conversion, as illustrated in (1a) vs (1b-c):

- (1) a. The road is narrow.

- b. The road narrowed.
- c. The workers narrowed the road.

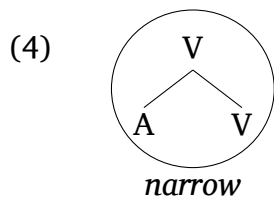
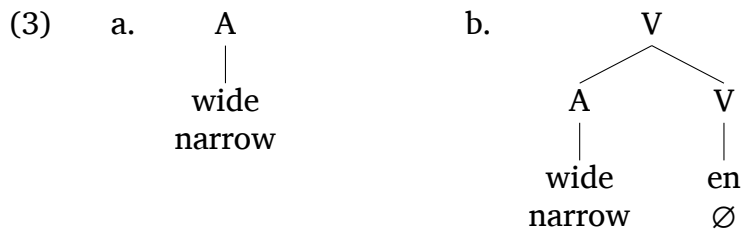
For reasons to be explained immediately, we take the verb *narrow* in (1b-c) to be based on the adjective. The verb can have either an inchoative (change-of-state) reading (1b), or a causative one (1c).

Depending on their formal marking, deadjectival verbs can be divided into two major types. The type seen in (1b-c) has no overt affix. The second type requires an overt affix. An example is in (2).

- (2) a. The road is wide.
- b. The road widened.
- c. The workers widened the road.

What is striking about this second type is that the verbs show the same ambiguity as the unsuffixed verbs between an inchoative and a causative reading.

Restricting our attention to the pair adjective–inchoative verb, the standard approach to the split between zero and overt marking attributes the exact same bi-morphemic structure to the examples, differing only in whether the verbalising suffix is overt or not. This is shown in (3b):



The idea that we pursue in this paper is that in a case like *narrow*, the apparent zero marking of the verb arises as a consequence of phrasal spellout, where the relevant phonology is attached to a complex syntactic object, as indicated by the circle in (4). In developing the analysis, we also show how

it accounts for the inchoative-causative ambiguity of the derived verbs, which we can observe in both types, the suffixless and the suffixed ones.

The paper is organised as follows. In section 2, we present some of the data that motivate the approach. Section 3 introduces the prerequisites for our analysis. The main proposal is described in section 4. Section 5 discusses suffixal marking, and ends with some predictions regarding the typology of marking in the triplet adjective-inchoative-causative. Section 6 examines how these predicted patterns are realised in Czech deadjectival verbs. Section 7 briefly touches upon the topic of anticausatives.

## 2 The data

We start out by presenting some basic data of English deadjectival verbs in Table 1.

Table 1: Deadjectival verbs in English

$\emptyset$	<i>-en</i>	<i>-ify</i>	<i>-ise</i>	<i>en-</i>
cool	tighten	solidify	generalise	enlarge
narrow	widen	prettify	formalise	enfeeble
open	shorten	simplify	americanise	enrich
thin	sharpen	humidify	sexualise	
dim	slacken	acidify	christianise	
tame	brighten	fluidify	commercialise	
blind	cheapen	falsify	conceptualise	
warm	coarsen	Frenchify	actualise	
clean	dampen	intensify	annualise	
empty	darken	uglify	grammaticalise	
clear	deaden	diversify	brutalise	
dry	deafen	greenify	centralise	
quiet	lighten	purify	criminalise	
brown	fasten	vivify	materialise	

In the first column, the table contains verbs that are zero-derived from adjectives. The other columns contain suffixed deadjectival verbs and one group of prefixed deadjectival verbs, as indicated in the column headings. The main point we want to make is that it cannot be predicted by looking

at the underlying adjective alone whether this adjective will form a zero-derived verb, or whether it will require a suffix, and if it requires an affix, which affix.

Let us start by noting that there are a couple of phonological restrictions to be observed. For instance, the suffix *-en* normally attaches to monosyllabic adjectives ending in a plosive, fricative or affricate (Plag 2003: 117-118, Carstairs-McCarthy 2002: 55-56). However, as noted by Carstairs-McCarthy (2002: 87), it is easy to come up with adjectives that obey the phonological requirement and nevertheless do not give rise to verbs ending *-en*. For example, the adjective *wet* is such a case, because *\*wetten* does not exist, but the zero-converted *wet* does. In sum, while the phonological rule can explain why *\*greenen* will never be formed (since this adjective does not end in a plosive or fricative), for adjectives that do satisfy the condition, additional factors are at play.

Something similar applies to the suffix *-ify*: this suffix attaches only to base words that are either monosyllabic, stressed on the final syllable or end in unstressed /ɪ/. However, this does not mean that *-ify* can attach to all adjectives that obey these phonological conditions. A case in point is the adjective *empty*, which allows for a zero-derived verb, contrasting with *pretty*, which does not. The suffix *-ise* attaches to adjectives ending in *-al* or *-an*.<sup>1</sup>

Similarly, it is not predictable which suffix will appear on a suffixed deadjectival verb. For instance, it is not clear why *-ify* can derive *falsify*, while *-en* cannot derive *\*falsen*, even though the phonological conditions would allow for either of these suffixes (compare *coarsen*).

In sum, even though there are some phonological conditions that restrict the formation of deadjectival verbs, this does not allow us to predict (by only looking at the adjective) which adjective will remain zero derived and which one requires a suffix. As a result, we conclude that which class an adjective belongs to is to a large extent unpredictable, and this information needs to be learned and stored for each adjective in the lexicon.<sup>2</sup>

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<sup>1</sup>The base alternations of adjectives to which *-ise* attach are complex and are beyond the space of this paper (see Plag 2003: 117-118, Plag 1999). There is also a fourth potential verbalising suffix *-ate*, which we leave out of consideration here. This suffix often attaches to truncated roots, especially if the base ends in two unstressed syllables. (Carstairs-McCarthy 2002: 55, Plag 2003: 117).

<sup>2</sup>*-ise/-ify/en-* can also turn nouns in verbs, as in *organise*, *beautify* and *empower*, respectively (Carstairs-McCarthy 2002: 55).

The second point we want to bring out is that all the affixes shown in the table show the inchoative–causative ambiguity, see (5)-(8):

- (5) a. Her stomach tightened.  
b. She tightened the lid.
- (6) a. The mixture solidified.  
b. The company solidified its position.
- (7) a. This solution generalises to all the relevant cases.  
b. We can generalise this solution to all the relevant cases.
- (8) a. Boys become fitter and stronger, the shoulders enlarge and the legs lengthen. (Lexico 2021)  
b. Family members continued to build up and enlarge the house over a period of 150 years. (Lexico 2021)

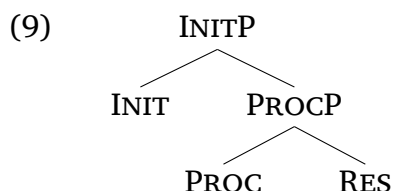
In this paper, we present a Nanosyntactic account of how the difference between zero derivation and suffixation could be encoded in the lexicon. Our main aim is to show that the Nanosyntactic framework, where zero-derivation is modeled by means of phrasal spellout, has the right properties to model this distinction in a way that allows us to provide an explanatory account not only for English, but also for other languages. Moreover, the very same type of account will allow us to explain the causative-inchoative ambiguity, which is found in English, but largely absent in Czech, and which we discuss in Section 6.<sup>3</sup>

### 3 Prerequisites

In this section, we lay out the prerequisites for our analysis. Specifically, we will construct our account around the structure of deadjectival verbs as proposed in Ramchand (2008). In Ramchand’s work, verbs in general are decomposed into a series of heads which she refers to as Initiation, Process, and Result. They are organised hierarchically as in (9):

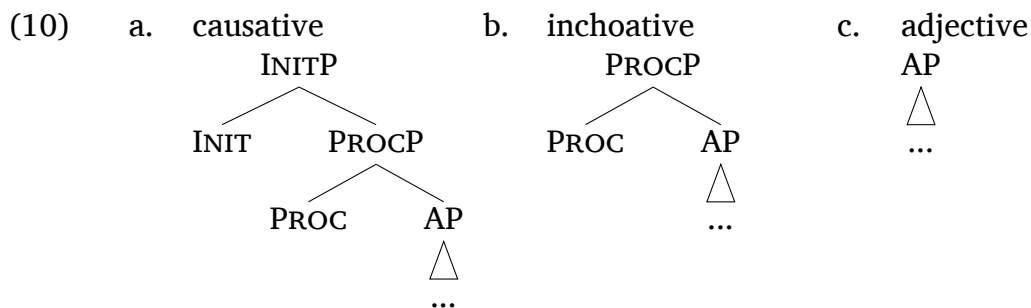
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<sup>3</sup>Since the main focus of this paper is on zero-derivation, we only want to capture the distinction between zero-derived adjectives and the rest. How to account for the distribution of the derivational affixes is a question which we shall not address in the present context (see Caha et al. 2019 and De Clercq and Vanden Wyngaerd 2019 for two different types of approaches, in terms of root size and pointers, respectively).



The INITP introduces the causation event. The PROCP specifies the nature of the change or process, whereas RES gives the result of the event. Each of these heads may license a specifier (not shown in (9)): the specifier of the causation event is the initiator, the specifier of the process is the undergoer, and the specifier of the result is the resultee (Ramchand 2008: 40). For example, in the sentence *Mary gave the book to Bill*, *Mary* is the initiator who brings the event about, *the book* is the undergoer of the Process (it changes possession) and ‘Bill having the book’ is the Result. The INIT and RES heads are optional in that some verbs lack them. For instance, the verb *get* in *Bill got the book* lacks the INIT component.

Against this general background, Ramchand (2008: 90,108) analyses deadjectival change-of-state verbs as in (10). The trees depict the structure of the causative verb, the inchoative verb, and the adjective, respectively.



Building on Hay et al. (1999), Ramchand (2008: 90) proposes that verbs like *dry* are “a special kind of process verb where the degree of verbal change is mapped onto a property scale of some sort (derived from a basic adjectival meaning). Thus, in their intransitive use, they are classic *proc* verbs, with the single argument being an UNDERGOER,” as shown in (10b). Relevantly for the topic of zero-derivation, the causative in (10a) would be derived by a zero INIT head in Ramchand’s system.

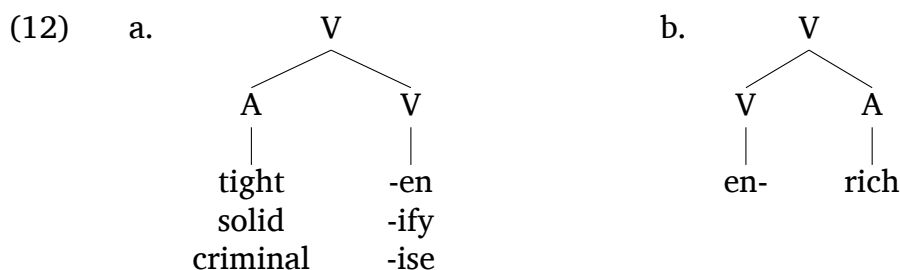
Note that like Ramchand, we understand the AP in the complement of PROC as representing not directly the positive-degree adjective, but rather

a scale on which both the inchoative and the positive adjective are based. We shall not go into this issue any further here, but we refer the reader to Vanden Wyngaerd et al. (2020) for a discussion of some interesting morphosyntactic facts concerning the relationship between scales and positive degree adjectives based on that scale.

In sum, the syntactic structures in (10) are based on two assumptions. The first assumption is that the causative verb contains the inchoative verb (compare (10a,b)). The second assumption is that the inchoative contains the adjective (compare (10b,c)), even though we add (as clarified above) that ‘containing the adjective’ is not necessarily the same as ‘containing the positive-degree adjective.’ These assumptions are summarised in (11):

- (11) a. The verb contains the adjective.  
 b. The causative contains the inchoative.

The evidence in support of these assumptions is both morphological and semantic. We start out, first, with morphological evidence in support of (11a), i.e., evidence suggesting that deadjectival verbs are structurally more complex than the adjectives they are based on. Some of this evidence was already discussed before, in Table 1, which showed how different suffixes can be attached to adjectives to derive verbs. The structural representation of these cases in (12) clearly shows how the verb is more complex than the adjective.



This type of evidence can be replicated for many languages, where verbs related to adjectives are typically morphologically more complex than the adjectives.

Semantically as well, the meaning of the verb contains that of the adjective. For example, the verb ‘to open’ means ‘to become open’, or ‘to cause to become open.’ This type of paraphrase generally works quite well for the verbs in Table 1. In some cases, a paraphrase containing a compar-

ative of the adjective is more appropriate. For instance, atelic sentences such *The soup cooled for hours* do not entail that the soup ultimately became cool, but they nevertheless entail a change along the relevant scale. As we have made it clear above, this is compatible with our proposal, since our AP at the bottom of the tree does not necessarily correspond to the positive degree, but rather to the scale along which the change proceeds.<sup>4</sup>

The second of our assumptions, which states that the causative contains the inchoative, is also supported by semantic evidence. Specifically, it seems clear that the causative contains the inchoative, in so far as *to open* in its causative sense means ‘to cause to open’ (with the second occurrence of *open* being the inchoative one). Lundquist et al. (2016: 2) put this more formally in what they call the *Causational Entailment*:<sup>5</sup>

- (13) Causational Entailment  
 $\forall x \forall y [\text{CAUSE}(x, \text{INCH}(\text{Pred}(y))) \rightarrow \text{INCH}(\text{Pred}(y))]$

This entailment is what accounts for the (semantic) deviance of (14).

- (14) #John broke the glass, but the glass didn’t break.

As far as the morphology is concerned, the picture is more complex. There are languages where the morphology supports the claim that the causative contains the inchoative. We reproduce some empirical evidence from (Haspelmath 1993: 91) in (15). The table shows cases where the causative is morphologically more complex than the inchoative. We refer to this as the transparent pattern.

- |      |        |                     |                         |         |        |
|------|--------|---------------------|-------------------------|---------|--------|
| (15) | a.     | Georgian            | duγ-s                   | ‘cook’  | (INCH) |
|      |        |                     | <b>a-duγ-<b>e</b>bs</b> | ‘cook’  | (CAUS) |
| b.   | French | fondre              | ‘melt’                  | (INCH)  |        |
|      |        | <b>faire</b> fondre | ‘melt’                  | (CAUS)’ |        |
| c.   | Arabic | darasa              | ‘learn’                 | (INCH)  |        |
|      |        | darrasa             | ‘teach’                 | (CAUS)  |        |

<sup>4</sup>This is not to say that the paraphrase always works. For example, the verbs with *-ise* in the final column of Table 1 generally have lexicalised meanings, which are not adequately captured by the paraphrase ‘(to cause) to become A’. We leave this matter aside here.

<sup>5</sup>We slightly changed the formulation, with a universal rather than an existential quantifier taking scope over the entire conditional, to match what we take to be the intention of the entailment.

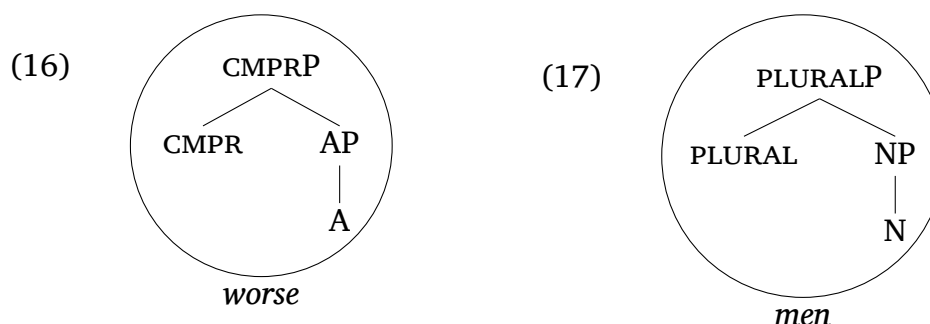


As the discussion unfolds, we will also get to see an inverse pattern, which is traditionally referred to as the *anticausative* (following Nedjalkov and Sil'nickij 1969), where the inchoative is morphologically more complex than the causative. We will come back to the anticausative in section 7 and elaborate a bit more on it. For now, we focus on the causative-inchoative entailment and the transparent morphological pattern as support for the structures in (10).

## 4 Zero-marking as phrasal spellout

As highlighted in the introduction, our main goal is to explore the idea that there are no zero morphemes used in the derivation of deadjectival verbs. Our claim is that zero morphemes are an illusion, arising when grammatical meanings expressed by the purported zeroes are actually realized (in a portmanteau fashion) by the root and/or other morphemes.

The idea that roots can (in addition to the conceptual meaning) also express adjacent grammatical categories, is perhaps best seen in cases of root suppletion (*bad–worse; man–men*). These cases can be understood as instances of a scenario where the suppletive root actually realizes both the lexical category (A or N) and the relevant grammatical category (CMPR or PLURAL). We show this in (16) and (17).



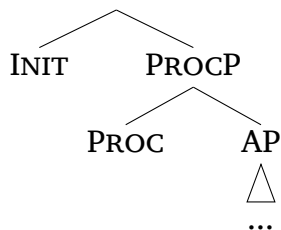
Note that in the trees given in (16) and (17), no independent marking of CMPR or PLURAL is found alongside the root. A possible description could conclude that the relevant grammatical categories in these forms have a “zero allomorph.” While we are aware of the fact that there is no direct link between suppletion and the absence of regular morphology, we think that the frequent absence of regular morphology with irregular roots such

as *worse* or *men* is not accidental. Therefore, the intuition we shall follow is that whenever regular markers are absent with particular roots (such as in (16) and (17)), this is because the root already realizes the relevant meanings, thereby blocking the appearance of regular morphology.<sup>6</sup>

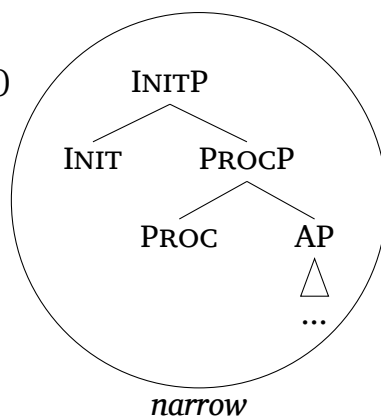
In the remainder of this paper, we extend the type of analysis in (16) and (17) to deadjectival verbs. In the technical implementation of this idea, we will follow the Nanosyntax approach (Starke 2009, 2018). Nanosyntax is a Late-Insertion theory of morphology, where the syntactic structure is assembled first, and then it is spelled out using lexical entries. In this conception, lexical entries are understood as stored links between syntactic representations on the one hand, and a phonology and a concept on the other hand. Crucially, the syntax part of the lexical entry consist of a full syntactic tree (rather than a terminal), similarly to what we saw in (16) and (17).

With this background in place, consider now the lexical entry for *narrow* in (18), which links the phonology /<sup>1</sup>næɪəʊ/ (represented by means of plain spelling) with a particular syntactic tree:<sup>7</sup>

(18) INITP  $\Leftrightarrow$  *narrow*



(19)



When syntax builds the structure of a causative verb, as in (19), the lexical tree in (18) is identical to it, and spellout is successful. We represent this by placing a circle around the syntactic structure in (19). Phrasal spellout

<sup>6</sup>In Caha et al. (2019), we address the issue of why suppletive roots are sometimes compatible with regular morphology, as in *better*. We do not discuss this here for reasons of space, our main point being to motivate the idea that roots can (at least sometimes) realise grammatical meanings.

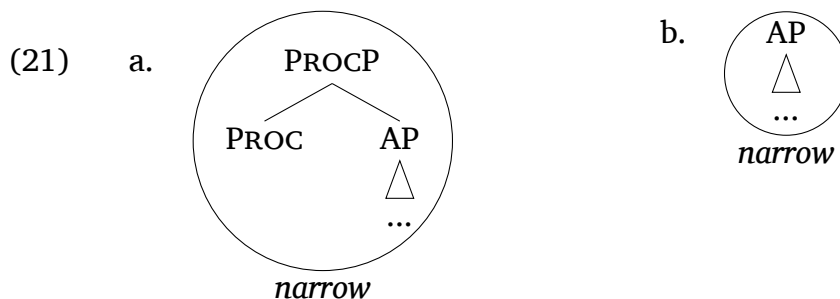
<sup>7</sup>Our entries in this paper systematically ignore the concept associated with the entry for *narrow*, since these are not relevant to the current discussion.

thus obviates the need for zero morphemes: the INIT and PROC heads do not dominate zero morphemes, but the lexical entry of *narrow* is such that it may cumulatively realise several heads, including INIT and PROC.

The next question that we need to address is how the lexical entry of *narrow* can also realise the syntactic structure of an inchoative verb and an adjective. The phrasal spellout model provides a means of accounting for this as an instance of the general phenomenon of syncretism, i.e. two different meanings expressed by the same form. Technically, this is achieved by proposing that lexical entries are not made for one function only, and they may in fact lexicalise multiple trees. The specific condition allowing this (partial) matching says that lexical items match the syntactic tree as long as the lexical entry contains a constituent that is identical to the syntactic tree. This condition is known as the Superset Principle:

- (20) *Superset Principle* (Starke 2009)  
 A lexically stored tree L matches a syntactic node S iff L contains the syntactic tree dominated by S as a subtree

The result of adopting the Superset Principle is that the entry for *narrow* in (18) also matches the inchoative and the adjectival structure, as shown in (21a) and (21b), because these trees are contained in (18):



In sum, the mechanism of phrasal spellout gives us an elegant way of representing two related phenomena: on the one hand, the zero marking of certain types of deadjectival verbs, and on the other hand the syncretism between the adjective, the inchoative verb, and the causative verb.

## 5 Suffixal marking

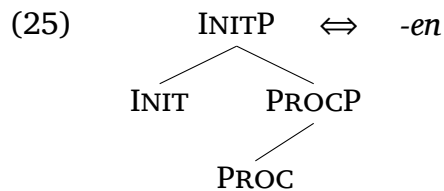
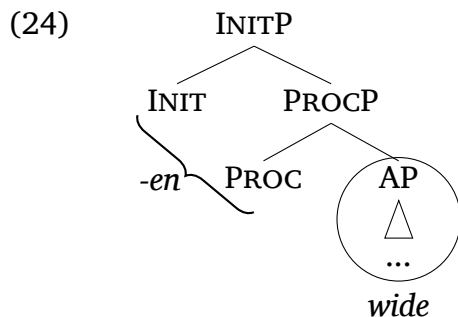
As we saw in Table 1, only the adjectives of the first column of the table allow zero marking of their corresponding verbs. A lexical item like *wide* contrasts with *narrow* in that *wide* is only an adjective and not a verb. The contrast is illustrated in (22).

- (22) a. The workers narrowed/\*wided the road.  
 b. The road narrowed/\*wided.

Recall that whether an adjective behaves like *narrow* or *wide* is a matter of lexical idiosyncrasy, i.e., it has to be learned (and stored) on an individual basis for each relevant lexical item. In the phrasal spellout model, this is achieved in a simple way by stating that the lexical tree associated with an adjective like *wide* is smaller in size, and it corresponds to AP only:

- (23) AP  $\Leftrightarrow$  *wide*  
 $\triangle$   
 ...

Since the lexical tree (23) does not contain the syntactic tree of a verb, such a lexical item will not be able to function as a verb: the root *wide* will need help from an additional morpheme to realise all meaning components, as informally shown in (24).

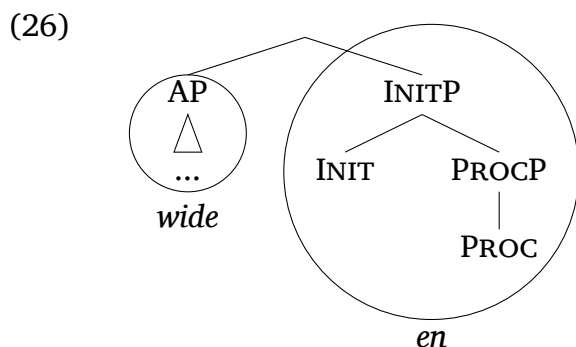


What is the lexical entry for *-en*? Recall that in Nanosyntax, lexical entries are understood as memorized links between syntactic structures (constituents) on the one hand, and phonology and/or concepts on the other. Therefore, by proposing that the suffix *-en* spells out the heads PROC and INIT, as shown informally in (24), we are led to assign to it the lexical entry

(25), which corresponds to a constituent containing these two features.

The geometry of the lexical entry reflects the structure (24): specifically, the entry (25) is identical to (24) minus the part of the structure that is spelled out as *wide*. In effect, the structure (24) literally divides into two parts, where one is spelled out by *wide* and the other by *-en*.

But now a problem arises. Specifically, the lexical tree in (25) does not contain the syntactic tree (24), nor any subpart of it, as a subtree. Therefore, the Superset Principle is not met, and the heads PROC and INIT cannot be spelled out by (25) as long as the structure is as given in (24). This problem is resolved by moving the AP node to the left of the PROC and INIT heads, yielding (26).

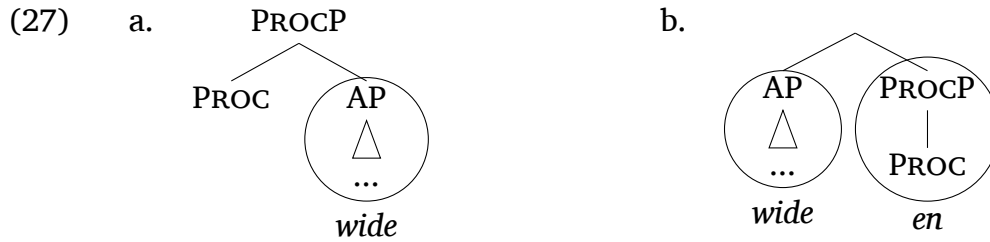


The INITP in (26) is now an exact match for the lexical entry of the suffix, and spellout is successful. Moreover, the affix *-en* now appears where we want it, namely as a suffix following the root.<sup>8</sup>

The inchoative version of *widen* works analogously, except that the syntactic derivation lacks the INIT head, as shown in (27a). Movement of the AP to the left yields (27b). Since the remnant PROCP is a subtree of (25), *-en* can spell out the PROCP in (27b).

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<sup>8</sup>In Nanosyntax, there is an algorithmic spellout procedure that enforces such movements when the process of matching a syntactic structure with a lexical entry fails. The motivation for these movements is to satisfy the needs of the Spellout process, and the movement is therefore called spellout-driven. While we will presuppose here the existence of such a spellout procedure, we will not go into its details in this paper, referring the interested reader to such sources as Starke (2018), Caha et al. (2019).



It will become relevant to note that if there was a suffix in the English lexicon that would only be specified for the circled PROCP, this suffix would also qualify as a match for (27b), and it would, in fact, take precedence over the ambiguous causative/inchoative *-en*, on the grounds that it is more specific. There is no such suffix in English, but we will be led to propose such a suffix in Czech in the next section.

To close off this section, we want to consider some implications of our theory for the typology of marking in the triplet adjective – inchoative – causative. So far, we have discussed two cases, instantiated by the English adjectives *narrow* and *wide*, respectively. However, the scenarios allowed for by the system just developed are wider. We show some of the predicted scenarios in Table 2.

Table 2: Five scenarios

	A	PROC	INIT	
1a.				labile pattern Eng. <i>wid-en</i>
1b.	root			
1c.		suffix		
2a.				equipollent pattern
2b.	root	suffix1		
2c.		suffix2		
3a.				causative pattern
3b.	root	suffix1		
3c.		suffix1	suffix2	
4a.				causative pattern
4b.				
4c.	root		suffix	
5a.				labile pattern Eng. <i>narrow</i>
5b.				
5c.	root			

This table should be read as follows. The top row of the table represents the features that are present in various forms. The scenario where the root is a syntactic adjective is characterised by the feature A. This scenario is represented on the lines numbered (a) of the table (i.e. 1a, 2a, etc.); the grey cells stand for heads which are not present in the derivation, namely PROC and INIT. To derive an inchoative verb, we add PROC to the adjectival structure, as shown on lines (b). The causative verbs add INIT (lines (c)).

The table also contains, in the final column, the names given in Haspelmath (1993) to various types of morphological marking of the causative-inchoative alternation in verbs. Since Haspelmath does not consider the derivational relation to the adjective, his classification deviates from ours in certain respects, but we include the terminology to show that we are dealing with well-established typological patterns. At the same time, we also refine Haspelmath's typology, in that we distinguish two different types of labile and two different types of causative patterns. The two labile patterns are the ones that we have discussed so far for English (the *narrow* and the *wide* type): these involve a syncretism between the causative and the inchoative verb. We return to the two causative patterns immediately.

The horizontal sections in the table (numbered 1-5) represent various root and suffix types predicted by our analysis, ordered according to root size, from the smallest roots in the top section to the largest roots in the bottom one. A lexically small root like *wide* is shown in section 1. It can realise no more than the adjective feature A. When it functions as a verb, a root like *wide* needs a suffix, as shown on lines 1b and 1c, which correspond to the derivations we have just seen. The suffix is the same for the causative and for the inchoative verb, giving rise to syncretism between the causative and the inchoative.

Moving on to the other type of root that we have already discussed, we have a maximally large root, like *narrow*, in section 5 of the table, which can realise each member of the triplet adjective-inchoative-causative, as shown on the lines 5a, 5b, and 5c, respectively. As explained above, the Superset Principle ensures that roots of this type are three-way syncretic. As we stated above, both type 1 and type 5 are classified as labile in Haspelmath's (1993) typology.

At least three additional patterns of marking are predicted by this system, shown in sections 2, 3, and 4 of the table. The first of these (section 2) is one where we have different suffixes for the inchoative and the causative, a possibility already pointed out in the discussion surrounding

(27). This is a scenario where one suffix (suffix1) lexicalises just PROC, whereas a different suffix (suffix2) lexicalises both INIT and PROC, such that suffix1 is replaced by suffix2 in the causative. This pattern is labelled the equipollent pattern in Haspelmath (1993), since it involves a common stem, to which different markings are added in the inchoative and the causative.

The second predicted pattern is in section 3 of the table. It differs from the one in section 2 in the size of the causative suffix, which here just lexicalises INIT, and not PROC. This will be visible in the marking, such that a causative verb will be derived by stacking a causative suffix on top of an inchoative one, as shown on line 3c of the table.

The third additional pattern (section 4) is one where the root is of size PROCP, i.e. larger than a mere adjective (like *wide*), but smaller than a causative verb (like *narrow*). Such roots are predicted to have a zero-derived inchoative, but a suffixed causative. Both pattern 3 and pattern 4 would be called causative patterns in Haspelmath (1993), since they involve a causative that is derived from the inchoative.<sup>9</sup>

Before going on to a more detailed discussion of the way this typology takes shape in Czech, we want to briefly consider another language, which provides evidence for all three of the predicted additional patterns of the typology in Table 2. This language is Turkish, and the relevant patterns are shown in Table 3 (the relevant suffix is in bold; the bracketed suffix is the infinitival ending).<sup>10</sup>

Table 3: Turkish patterns of causative-inchoative marking

	ADJ	INCH	CAUS	
Pattern 2	kir-li	kir-le- <b>n</b> -(mek)	kir-le- <b>t</b> -(mek)	‘dirty’
Pattern 3	iyi	iyi- <b>leş</b> -(mek)	iyi- <b>leş-tir</b> -(mek)	‘good’
Pattern 4	kuru	kuru-(mak)	kuru- <b>t</b> -(mak)	‘dry’

The Pattern 2 roots have different suffixes for the inchoative and the causative verb, with the causative *-t* replacing the inchoative *-n* in the

<sup>9</sup>Haspelmath distinguishes two further patterns: a suppletive pattern, of the *fall-drop* and *kill-die* type, which we take to be a subtype of the *narrow* pattern, and an anticausative pattern, to which we return in section 7.

<sup>10</sup>We are grateful to Ömer Demirok for pointing this out to us. Turkish also has an anticausative pattern, which is not shown in the table (see section 7).



causative.<sup>11</sup> Pattern 3 roots also have different suffixes for the inchoative and the causative verb, but here the causative suffix *-tir* stacks on top of the inchoative *-leş*. Pattern 4 roots have a zero-marked inchoative and the causative suffix *-t*. The particular interest of Turkish resides in the evidence it provides for pattern 3, which is one that Czech (to be discussed in detail in the next section) does not have.

In the remainder of this paper, we will focus on a discussion of different root types in Czech. We will argue that Czech is like English and Turkish, in that it does not fill the complete typological space sketched in Table 2. Instead, Czech instantiates the patterns 1, 2, and 4 of the table.

## 6 Three INCH/CAUS scenarios in Czech

We start out by describing causative verbs in Czech, because the picture here is rather simple: there is a single suffix *-i*, which derives causative verbs. We turn to inchoatives in Section 6.2.

### 6.1 The causative

Causatives are a relatively productive category in Czech. Using the Czech National Corpus (<https://www.korpus.cz>), where all our examples come from, we have collected causatives of about 250 different adjectival roots. An example of a causative is given in (28). (28a) is an adjective, (28b) a verb. The causative suffix triggers palatalisation of final velars in the root, as shown in (29).

(28)	a.	<i>tup</i>	- <i>ý</i>	blunt	-AGR	(29)	a.	<i>tich</i>	- <i>ý</i>	silent	-AGR		
	b.	<i>tup</i>	- <i>i</i>	- <i>l</i>	blunt	-CAUSE	b.	<i>tíš</i>	- <i>i</i>	- <i>l</i>	silent	-CAUSE	-PST

<sup>11</sup>There is a complicating factor in this pattern, which is that the adjective is itself denominal, i.e. the root *kir* ‘dirt’ takes an adjectivising suffix *-li* in the ADJ column, and a general verbalising suffix *-le* in the two verbal columns. This complication aside, the difference between the inchoative and the causative meaning does appear to reside in the different suffixes *-n* vs *-t*. We are grateful to Utku Turk for useful discussion of this issue.

A fact which we shall have nothing to say about is that many adjectives require a prefix in the causative, as illustrated by *snadn-ý* ‘easy’ in (30).

- |      |   |      |  |
|------|---|------|--|
| (30) | a. * <i>snadn -i -l</i><br>easy CAUSE -PST      | (31) | a. <i>tup -i -l</i><br>blunt -CAUSE -PST   |
|      | b. <i>u- snadn -i -l</i><br>UP easy -CAUSE -PST |      | b. <i>tup -í -m</i><br>blunt -CAUSE -1.SG  |
|      |   |      | c. <i>tup -e -ní</i><br>blunt -CAUSE -NMLZ |

Another property of the causative suffix is that it shows allomorphy, see (31). In the present tense, the vowel lengthens (31b), and in nominalisations, it is replaced by an *-e* (31c). We note the variation for the completeness’ sake, and we will only look at the past participle (31a) as the relevant form from now on. The other forms could be accounted for by assuming that in addition to the causative meaning, these morphemes also realise additional verbal categories such as tense and aspect.

## 6.2 The inchoative

Having discussed the formation of the causative, we now turn to the inchoative counterparts of the causative verbs. Here, the situation is more complex, in that at least four different classes may be distinguished. In this section, we shall focus on three of those classes, arguing that they instantiate three of the predicted patterns sketched in Table 2 above. Specifically, Czech exhibits causative-inchoative pairs belonging to Pattern 1, 2 and 4. The fourth verb class will be briefly discussed in section 7.

We repeat the table here as Table 4, but with the three Czech verb classes added.

The Czech Class I is characterised by the fact that both the causative and the inchoative are marked by the same suffix (namely *-i-*), which is analogous to the English *wid-en* class. An example is the verb derived from the adjective *levn-ý* ‘cheap’. In (32a), we give a causative sentence based on this verb, and in (32b) we present the inchoative counterpart.

- (32) a. *Škoda Auto z- levn -i -la své dva hlavní modely.*  
 Škoda auto PFX- cheap -CAUS -PST its two main models  
 ‘Škoda Auto has made its two main models cheaper.’

Table 4: Three verb classes in Czech

	A	PROC	INIT	
1a.				Eng. <i>wid-en</i> Czech Class I
1b.	root	suffix		
1c.				
2a.				Czech Class II
2b.	root	suffix1		
2c.		suffix2		
3a.				
3b.	root	suffix1		
3c.		suffix1	suffix2	
4a.				
4b.		root		Czech Class III
4c.			suffix	
5a.				
5b.		root		Eng. <i>narrow</i>
5c.				

- b. *Vodka z- levn -i -la.*  
 vodka PFX- cheap -INCH -PST  
 ‘Vodka got cheaper.’

Table 5 lists the roots in the Czech National Corpus showing this inchoative-causative syncretism.<sup>12</sup>

The analysis of this class is straightforward: the roots in this class are of the smallest size (AP, like English *wide*), and the suffix realises the heads INIT and PROC (as schematised in section 1 of Table 2). Put differently, the lexical entries for a root like *levn-* ‘cheap’ and the suffix *-i* are as indicated in (33). The (partial) derivation of the causative verb is shown in (34).

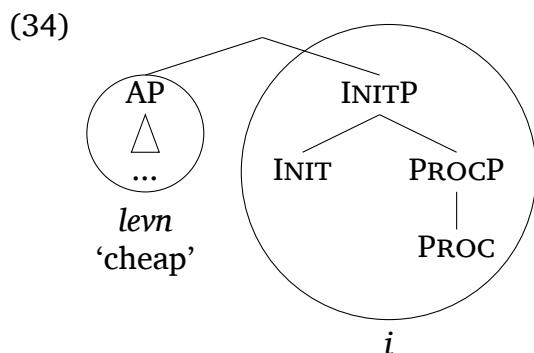
(33) a. AP  $\Leftrightarrow$  *levn*  
 $\triangle$   
 ...

b. INITP  $\Leftrightarrow$  *i*  
 $\swarrow$   $\searrow$   
 INIT PROC  
 |  
 PROC

<sup>12</sup>The tables of the Czech verbs list only those verbs which are transparently derived from adjectives.

Table 5: Class I verbs

gloss	adjective	inchoative/causative
expensive	drah-ý	z-draž-i-l
cheap	levn-ý	z-levn-i-l
firm	pevn-ý	z-pevn-i-l
slow	pomal-ý	z-pomal-i-l
fast	rychl-ý	z-rychl-i-l
weak	slab-ý	o-slab-i-l
calm	mírn-ý	z-mírn-i-l
intensive	intenzívn-í	z-intenzívni-l



Class II differs from Class I in that it has a dedicated suffix *-ě* for the inchoative. A case in point is the adjective *nejist-ý* ‘unsure’, illustrated in (35). Specifically, (35a) contains the causative verb with *-i*. Interestingly, the inchoative in (35b) no longer has *-i*, but *-ě*:

- (35) a. *Ten pohled ho z- ne- jist -i -l*  
 that look him PFX NEG certain CAUS PAST  
 ‘That look made him uncertain.’
- b. *Kapitán viditelně z- ne- jist -ě -l*  
 captain visibly PFX- NEG- certain -INCH -PAST  
 ‘The captain became visibly uncertain.’

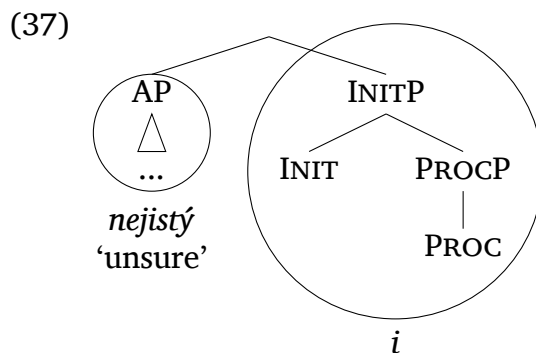
Table 6 lists all the roots that show the *-ě* suffix in the inchoative.

We analyse these roots as being of the same size as the Class I roots, i.e. they can realise an AP, see (36). As a result, they need the suffix *-i* to spell out the verbal heads PROC and INIT, see (37).

Table 6: Class II verbs

gloss	adjective	inchoative	causative
coarse	drsn-ý	z-drsn-ě-l	z-drsn-i-l
clear	jasn-ý	z-jasn-ě-l	z-jasn-i-l
smooth	jemn-ý	z-jemn-ě-l	z-jemn-i-l
compact	hutn-ý	z-hutn-ě-l	hutn-i-l
liquid	kapaln-ý	z-kapaln-ě-l	z-kapaln-i-l
bushy	košat-ý	košat-ě-l	roz-košat-i-l
beautiful	krásn-ý	z-krásn-ě-l	z-krásn-i-l
mighty	mohutn-ý	z-mohutn-ě-l	z-mohutn-i-l
dead	mrtv-ý	z-mrtv-ě-l	u-mrtv-i-l
affectionate	něžn-ý	z-něžn-ě-l	z-něžn-i-l
ugly	oškliv-ý	z-oškliv-ě-l	z-oškliv-i-l
alert	pozorn-ý	z-pozorn-ě-l	u-pozorn-i-l
transparent	průhledn-ý	z-průhledn-ě-l	z-průhledn-i-l
exact	přesn-ý	z-přesn-ě-l	z-přesn-i-l
strict	přísn-ý	z-přísn-ě-l	z-přísn-i-l
sad	smutn-ý	po-smutn-ě-l	roze-smutn-i-l
dark	temn-ý	po-temn-ě-l	za-temn-i-l
immobile	nehybn-ý	z-nehybn-ě-l	z-nehybn-i-l
unsure	nejist-ý	z-nejist-ě-l	z-nejist-i-l
uncalm	neklidn-ý	z-neklidn-ě-l	z-neklidn-i-l

(36) AP  $\Leftrightarrow$  *nejistý*  
 $\triangle$   
 ...



Different from the Class I verbs, however, these verbs make use of a specialised inchoative marker spelling out just PROC. We show the lexical entry of this marker in (38).

(38) PROC  $\Leftrightarrow$  -ě  
 |  
 PROC

(39)

AP  
 △  
 ...  
*nejistý*  
 'unsure'

PROCP  
 |  
 PROC  
 -ě

In the inchoative structure (see (39)), the marker -ě wins in competition against -i. The competition is regulated by the Elsewhere Principle, which favours the more specific marker over the more general one. Since -ě only applies in inchoative environments, and -i both in inchoative and causative ones, ě is more specific and wins the competition.<sup>13</sup> The representation for the adjective-inchoative-causative triplet for the Class II roots is therefore as shown on line 2 of table 2.

Finally, the Czech Class III is illustrated in (40) by verbs based on the adjective *slep-ý* 'blind.' This class is characterised by the fact that in the past participle, there is no marker for the inchoative at all, see (40b).

- (40) a. *Plyn Botonese o- slep -i -l*  
 gas.NOM Botonese.ACC PFX blind -CAUSE PST  
 'The gas made Botonese blind.'
- b. *Otec [...] téměř o- slep -∅ -l*  
 father ... almost PFX blind -INCH PST  
 'My father became almost blind.'

Table 7 lists the roots that have an unmarked inchoative.

One possible analysis of this class is shown in section 4 of Table 2, repeated here in line (41b): it takes the root to be of size PROCP, so that it can realise both an adjective and an inchoative verb. This means that it will need a suffix to spell out the INIT projection of the causative verb.

However, since we have seen above that the causative marker -i realises both PROC and INIT, there are in fact two ways of realising the PROC feature

<sup>13</sup>This does raise the question why we do not find -ě in the inchoative of the Class I roots. The basic idea is that -ě is for some reason inapplicable with these roots: it is not in the candidate set. A technical implementation for this idea can be developed in terms of pointers, but exploring this in detail here would lead us too far afield. See De Clercq and Vanden Wyngaerd (2019) for discussion.

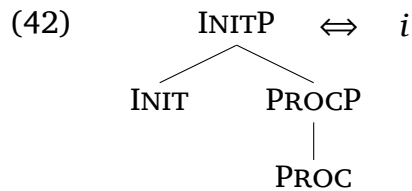
Table 7: Class III verbs

gloss	adjective	inchoative	causative
rich	bohat-ý	bohat-l	o-bohat-i-l
deaf	hluch-ý	o-hluch-l	o-hluš-i-l
brown	hněd-ý	hněd-l	za-hněd-i-l
weak	chab-ý	o-chab-l	o-chab-i-l
lame	chrom-ý	z-chrom-l	z-chrom-i-l
poor	chud-ý	z-chud-l	o-chud-i-l
blind	slep-ý	o-slep-l	o-slep-i-l
gray	šed-ý	šed-l	za-šed-i-l
silent	tich-ý	tich-l	tiš-i-l
dark	tmav-ý	tmav-l	tmav-i-l
bitter	trpk-ý	z-trpk-l	z-trpč-i-l
tough	tuh-ý	z-tuh-l	z-tuž-i-l
hard	tvrd-ý	tvrd-l	vy-tvrd-i-l
alive	živ-ý	o-živ-l	o-živ-i-l

in the causative, either by the root (as in line 4c of Table 2, repeated here in (41c')), or by the causative suffix, as shown in (41c''):

(41)

	A	PROC	INIT
a.	root		
b.		root	
c'.		root	-i
c''.	root		-i

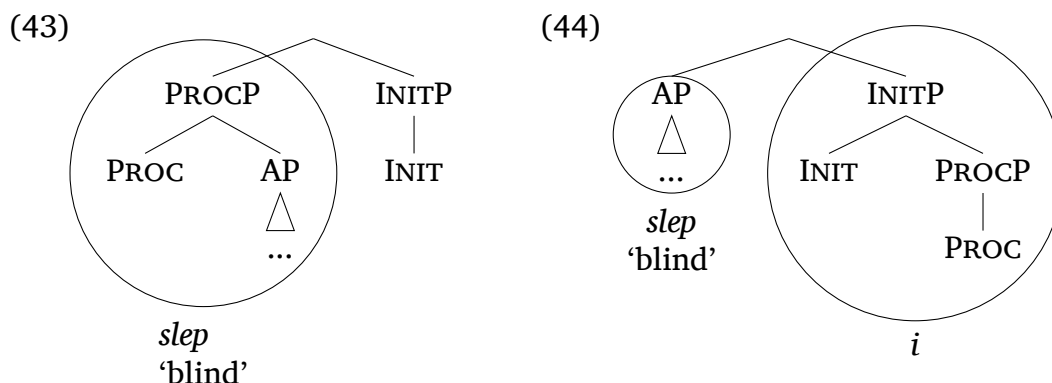


In both analyses, the root realises A in the adjective row, and A + PROC in the inchoative row, but they diverge in the representation of the causative. We shall argue, however, that only the analysis in (42c'') is the correct one, given what we have assumed so far about the causative suffix *-i* in Czech.

The empirical observation is that the verbal suffix that we find in the Class I verbs is identical to the one we find in the Class III verbs. This means that the same lexical item is involved, namely the one given in (33b) above, and repeated in (42).

The theoretical reason behind the necessity of the analysis in (41c'') is the Superset Principle. If the syntax creates a phrasal constituent INITP that contains just INIT but not PROC (which would correspond to (42c')),

then such a constituent could never be a subtree of the lexical tree of the *-i* suffix. The tree corresponding to such a (hypothetical) derivation is shown in (43):



Since the INIT feature fails to be lexicalised in this derivation, the causative must be derived in such a manner that the root does not reach its full lexicalisation potential, stopping at AP, just as it does in the simple adjective. This is shown in (44).

The suffix *-i* then lexicalises the same constituent INITP as with the Class I and Class II roots (see (34) above).<sup>14</sup> How this derivation works technically is through a derivation involving backtracking, the details of which we do not address here for lack of space. We refer the reader interested in the details of nanosyntactic derivations, including backtracking ones, to Vanden Wyngaerd et al. (2020).

What we do want to point out, however, is that there is some interesting evidence from root suppletion for the analysis just presented. Elsewhere, we have defended the view that suppletion involves roots of different sizes, e.g. in cases like *bad-worse*, the suppletive root lexicalises a bigger structure than its nonsuppletive counterpart (Caha et al. 2019; see also the discussion of (16) above). In order to see the relevance of the root suppletion facts, note that according to the analysis just presented, the root spells out the same features when used as an adjective, and when used in

<sup>14</sup>Note that there could be a hypothetical language Czech', identical to Czech, but with a lexical item that spelled out just INIT, in which case the derivation shown in (43) would be successful. But in Czech' the causative suffix in the Class I and Class II verbs would have to be different from the one in the Class III verbs.



the causative (namely A). This is different from the inchoative, where it spells out a bigger constituent, A + PROC.

This leads us to expect that, in cases where these differences in size correspond with a difference in form, as in the case of suppletive roots, the suppletive root will be found in the inchoative, and the nonsuppletive root in the adjective and the causative. Interestingly, there is a set of roots in Czech where exactly this type of root distribution is found. These are listed in Table 8.

Table 8: Adjectives with mildly suppletive forms in the inchoative

gloss	adjective	inchoative	causative
dense	hust-ý	z-houst-l	za-hust-i-l
dry	such-ý	sch-l	suš-i-l
young	mlad-ý	o-mlád-l	o-mlad-i-l
weak	slab-ý	ze-sláb-l	o-slab-i-l
golden	zlat-ý	zlát-l	po-zlat-i-l
yellow	žlut-ý	žlout-l	za-žlut-i-l

Summarising, Czech has provided us with two reasons for analysing zero marking as an instance of phrasal spellout. The first reason is that Czech fills two gaps in the predicted typology of marking. Most notably, it features a set of roots, which are of PROCP size, with an overt causative, but a zero inchoative (Class III). As we have seen, the same class is found in Turkish. The second reason has to do with the phenomenon of suppletion. The particular pattern of root suppletion exemplified in Table 8, as well as the absence of suppletion in the other verb classes, shows that the suppletive root goes together with the absence of regular marking, much as in the *bad-worse* case. Where the causative marking is such that it triggers a backtracking derivation, we get the smaller, nonsuppletive root again. These roots, then, clearly reveal that zero marking does not (always) come for free, and the root must do a part of the job.

## 7 The inverse pattern: anticausatives

As we have already mentioned earlier, in addition to the patterns depicted in Table 2 above, there is another, cross-linguistically common, pattern,

where the inchoative is formed on the basis of the causative through the addition of a marker, often a reflexive.

- (45) The inverse pattern  
 a. causative: V  
 b. inchoative: V + **aff**

Haspelmath calls this the anticausative pattern. This type of pattern is also found in Czech and it instantiates the fourth class of verbs, which was left undiscussed when we discussed the formation of the inchoative in Czech in section 6.2. In (46), we give an example of a causative derived from the adjective *dlouh-ý* ‘long.’ In order to express the inchoative reading (‘get long’), Czech must add a reflexive marker *se* to the causative, see (46b). There is no non-reflexive form that would be able to express this meaning.

- (46) a. *Doktor Proktor pro- dlouž -i -l žirafě nohy*  
 Doctor Proctor PFX long -CAUS -PAST giraffe.DAT legs  
 ‘Doctor Proctor lengthened the giraffe’s legs.’  
 b. *Jeho končetiny se pro- dlouž -i -ly*  
 His limbs REFL PFX long -CAUS -PAST  
 ‘His limbs lengthened.’

This pattern is apparently problematic in that a structure with fewer features (the inchoative structure) requires more markers than the semantically richer structure (the causative). In this section, we highlight two possible solutions. The choice between them is left for future research.

The first possible line of attack would capitalize on the fact that this type of anticausative marking involves a marker of reflexivity. Koontz-Garboden (2009: 80) observes that also cross-linguistically, reflexivisation and anticausativisation ‘seem almost always to be marked in a morphologically identical fashion’. Following Chierchia (2004), Koontz-Garboden (2009), Beavers and Koontz-Garboden (2011), one could analyse such cases to result from an anticausativisation strategy, where the reflexive-marked verb, like *prodloužil se* ‘lengthened’ in (46b), is a reflexivized version of the causative verb. We represent this schematically as in (47).

- (47)  $V_{\text{ANTICAUS}} = \text{CAUSE}(x, \text{INCH}(\text{Pred}(x)))$

This is different from a true inchoative verb, which we take to have a representation as in (48):

$$(48) \quad V_{\text{INCH}} = \text{INCH}(\text{Pred}(x))$$

Under this analysis, anticausatives like the one in (46b) are derivationally different from English-type inchoatives like *widen*. Koontz-Garboden (2009) support this by pointing to potential meaning differences between anticausatives and true inchoatives. Specifically, the reflexivization operation yields a predicate that is true if the single argument ( $x$  in (47)) is both the Effector and the Theme. That is, the single argument is not simply undergoing some change (as a Theme), but it is at the same time also somehow responsible (as an Effector) for its own undergoing of the change. A consequence of this is the the Causational Entailment (see (13) above) is predicted to not always be valid, as schematically shown in (49).

$$(49) \quad \text{No Causational Entailment with Anticausatives} \\ \neg(\forall x \forall y [\text{CAUSE}(x, \text{INCH}(\text{Pred}(y))) \rightarrow \\ \text{CAUSE}(y, \text{INCH}(\text{Pred}(y)))])$$

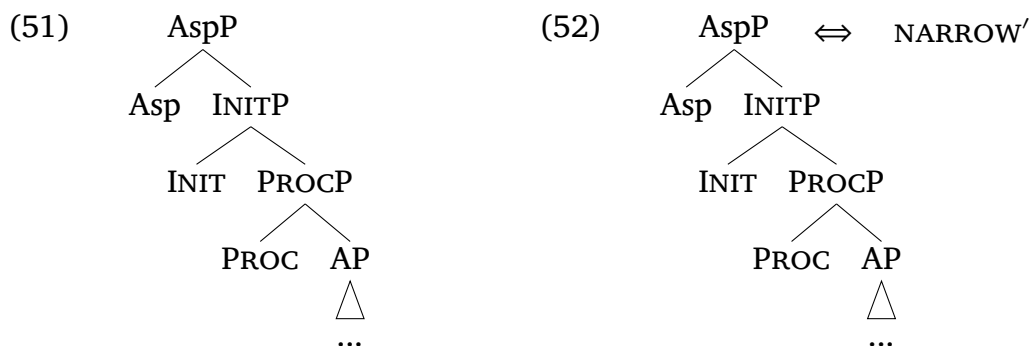
The example (50) (Koontz-Garboden 2009: 117) may clarify this. Spanish has both inchoative verbs like *empeorar* ‘worsen’, and anticausative ones like *romperse* ‘to break’ (with the reflexive *se*). With the inchoative, the Causational Entailment is valid, as shown by the deviance of (50a). But with the anticausative, speakers accept sentences like (50b), suggesting the the Causational Entailment is not always valid.

- (50) a. #*No empeoró ningún paciente. Los empeoró el*  
not worsened any patient them worsened the  
*tratamiento.*  
treatment  
‘No patient worsened. The treatment worsened them.’
- b. *No se rompió ningún vaso; los rompió Andrés.*  
not REFL broke any glass them broke Andrew  
‘No glass broke; Andrew broke them.’

However, there has been a debate as to whether this kind of approach is correct (Schäfer and Vivanco 2015), and even if it were, the question remains how it can be extended to languages where the anticausative marker differs from the reflexive marker. This is notably the case in such languages as Turkish (Key 2013), Hungarian (Márkus 2015), and Korean (Jeong 2018). Let us therefore sketch here an alternative approach to the

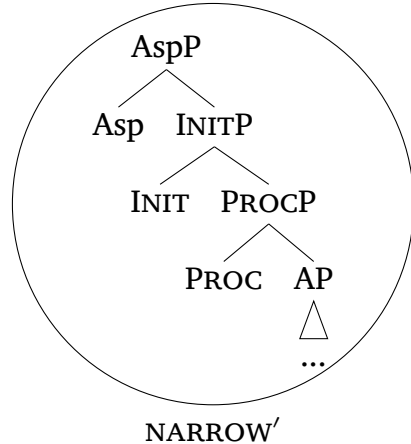
anticausative conundrum, explored in work by Márkus (2015).

The main idea of the alternative approach is that causative and inchoative structures do not live in a vacuum, so to speak. In syntax, argument structure projections are always embedded under aspectual and temporal projections, as shown in a simplified form in (51).

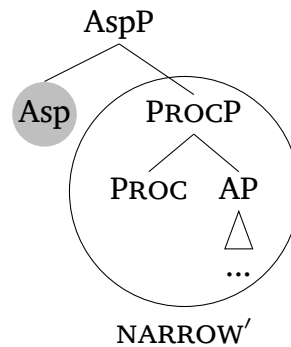


Suppose now that a language has a lexical entry like the one in (52). The lexically stored tree of this hypothetical entry does not only contain the argument structure projections, but also the aspectual projection Asp. This lexical entry can spell out all the projections in (51), see (53). However, the entry (52) cannot be used to spell out all the projections of the inchoative structure, as shown in (54). The reason is that the AspP given in (54) is not contained (as a constituent) inside the lexical entry (52). The lexical entry does contain the PROCP, so that PROCP can successfully lexicalise, as indicated by the circle in (54). But this leaves the Asp head without lexicalisation, which is marked by the grey circle in (54).

(53) The causative + aspect



(54) The inchoative + aspect



As a result, an additional morpheme must be used to spell out Asp, and the inchoative ends up needing more morphemes than the causative, which is the definitional property of the anticausative pattern. However, the higher number of morphemes in the inchoative is not caused by a reflexivisation operation: the inchoative in (54) is simply lacking INIT, as with all inchoatives that we have looked at so far. The reason for the extra morpheme is that the missing INIT head prevents constituent matching between the lexical tree of (52) and the syntactic structure. While we find this latter solution attractive, we shall not elaborate on it in any detail here, merely noting that the presence of the anticausative pattern of marking with non-reflexive markers may receive an explanation, even under the view - as presented here - that the structure of the causative always contains the structure of the inchoative.

## 8 Conclusion

In this paper, we have defended three analytical claims. The first is that conversion arises as an effect of phrasal spellout, and that derivational ‘zero affixes’ do not exist. The second claim states that causatives contain inchoatives, and the third that inchoatives contain adjectives. Empirically, we have shown how these assumptions work well for deadjectival inchoative and causative verbs in English. They also allow us to capture the different patterns of the inchoative/causative alternation that are known from

the typological literature, of which Czech represents a fair sample.

## Acknowledgement

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