

Synchronic evidence of grammaticalization and lexicalization processes in Czech aspectual prefixes

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ABSTRACT. This study examines the semantic and distributional properties of Czech predicates with aspectual prefixes. It analyzes four aspectual prefixes *za-*, *na-*, *po-* and *do-* in order to establish a semantic classification of predicate types in which these prefixes occur. The semantically defined predicate types are used to conduct a distributional analysis of predicate type and token frequencies in the Czech National Corpus and to make conclusions about the developmental stages of aspectual prefixes. The present paper provides evidence that aspectual prefixes in Czech exhibit different degrees of grammaticalization and lexicalization in relation to predicate types. Furthermore, the distribution of predicate types provides evidence of synchronic layering of aspectual prefixes and indicates that they share a common path of development.

Keywords: aspectual prefixes, development, semantic classification

1. INTRODUCTION. The main goal of this study is to define the semantic properties of predicates with aspectual prefixes and to identify their distribution in the Czech National Corpus. The analysis presented in this paper shows that aspectual prefixes share a common path of development in relation to grammaticalization and lexicalization processes that are argued to have taken place.

For a number of decades, linguistic studies on tense and aspect have been concerned with the idiosyncratic nature of Slavic aspect (Bybee & Dahl 1989, Dahl 1985, Dickey 1995, 2000, Eckert 1985, Hewson & Bubenik 1997, Janda 1985). Many studies on grammatical aspect in Slavic languages focus on the meaning of aspectual prefixes, e.g. recent studies on Russian aspect propose a semantic model of aspectual clusters (Janda 2007:607, Janda et al. 2013). Unlike previous research on the semantics of Slavic aspect, the present study investigates the path of development of Czech aspectual prefixes. It attempts to identify the relation between the type and token frequencies of PREFIXED PERFECTIVE (PP) predicates, i.e. predicates with aspectual prefixes that carry perfective meaning (see 1 and 2 below), and the semantics of PP predicates, i.e. their characteristic degrees of semantic compositionality.

- (1) *na-koupit* ‘to buy (PERF)’
- (2) *na-značit* ‘to indicate (PERF)’

The present analysis uses semantic criteria to propose a semantic classification of PP predicates and uses the defined semantic categories to investigate the distributional properties of these prefixed predicate types in relation to their occurrence with specific prefixes as well as their overall type and token frequencies in the Czech National Corpus.

It is proposed here that the semantically defined PP predicate types represent distinct stages of development of aspectual prefixes that are characteristic of grammaticalization and

lexicalization processes. Consequently, this study proposes a general path of development of aspectual prefixes based on the semantic and distributional properties of prefixes in PP predicates.

2. DATA COLLECTION AND METHODOLOGY. An extensive corpus study was conducted to analyze the semantics and frequency distribution of four aspectual prefixes in Czech: *za-*, *na-*, *po-*, and *do-*. These prefixes were selected because they have high token frequencies and appear to be in different stages of development (as attested by the data collected from the Czech National Corpus (CNC), SYN 2010, a corpus of written texts that contains more than 100 million words). They occur in a variety of PP predicates, and their semantic range varies from concrete to highly grammaticalized or lexicalized predicates.

This study analyzes fifty of the most frequently occurring predicates for each prefix from the Czech National Corpus. A list of perfective predicates was created for each aspectual prefix in order to examine semantic relations between prefixes and predicates.

The issue of semantic classification is approached from a usage-based perspective, i.e. tokens are classified in terms of their most frequent predicate type construals. Although the semantic analysis acknowledges the existence of multiple predicate type construals, it is outside of the scope of this paper to analyze in detail all the possible construals in the corpus. The goal of this analysis is to analyze tokens for recurring semantic patterns of Prefixed Predicates in order to understand grammaticalization and lexicalization processes. In order to identify a predicate's most frequent construal, a random selection of 20-40 instantiations of each token in the Czech National Corpus was analyzed.

The main criterion used for the semantic classification of predicate types was their degree of SEMANTIC COMPOSITIONALITY (Waugh 1994:64). Semantic compositionality was determined

to be an essential property to analyze as it is informative about the idiosyncratic properties of PPs and can be used to distinguish between PP types that have undergone grammaticalization as opposed to lexicalization processes. Specifically, this study argues that low semantic compositionality is indicative of PPs that are lexicalized as highly entrenched lexicalized predicates become more idiosyncratic, and their semantic compositionality is thus less transparent (see 3) than can be observed in grammaticalized predicates (see 4). Although grammaticalization processes are also argued to affect the lexical meaning of aspectual prefixes, the semantic compositionality of grammaticalized predicates remains transparent. This assumption poses a clear distinction between grammaticalization and lexicalization processes in aspectual prefixes.

- (3) A tuto tradici si chtějí **za-chovat**.
 And this tradition REF want.1PL.PRST **preserve (PERF)**.

‘And they want to preserve this tradition.’

- (4) Stavbu plánuje město dokončit v říjnu letošního roku a
 construction plan.3sg.PRESENT city to finish in October this year and

za-platí za ni zhruba 70 milionů korun.
pay (PERF) for it roughly 70 million crowns.

‘The city is planning to finish the construction in October of this year and pay for it roughly 70 million crowns.’

Examples of PP predicates in 3 and 4 demonstrate distinct degrees of compositionality and their relation to lexicalization and grammaticalization processes. This paper shows that lexicalization processes are accompanied by the loss of semantic compositionality, which affects the idiosyncratic properties of Prefixed Predicates. Highly entrenched lexicalized predicates become

more idiosyncratic and their semantic compositionality less transparent. In 3, the PP predicate *zachovat* ‘to preserve’ consists of the prefix *za-* ‘for’ and the predicate *chovat* ‘to raise.’ As can be seen from the meaning of the PP in this sentence, the semantics of the predicate became lexicalized to the extent that its meaning is now noncompositional, i.e. the relations between the parts that form the predicate do not yield a predictable meaning (see Waugh 1994:64 for a discussion on lexicalization and compositionality). However, the predicate in 4 clearly shows that the meaning of the PP is derivable from its parts, i.e. the meaning of *zaplatit* ‘to pay/to pay for’ is predictable from the prefix *za-* ‘for’ and *platit* ‘to pay’.

Considering that the notion of compositionality is essential for this analysis as it presents two semantically distinct predicate constructions which are characteristic of lexicalization and grammaticalization processes, the following discussion of predicate types adopts the terms **SIMPLEX** and **COMPLEX** predicates to refer to predicates that are lexicalized and grammaticalized respectively.

3. SEMANTIC CLASSIFICATION OF PREFIXED PERFECTIVES. The classification of predicate types explores the semantic properties of aspectual prefixes in predicates. This study introduces six distinct predicate types and divides them into complex and simplex predicates.

3.1. COMPLEX PREDICATE TYPES. Complex predicates are classified into three types based on the semantic relation between a prefix and a simplex predicate. Complex predicate types are categorized as **SPECIALIZED PERFECTIVES**, **NATURAL PERFECTIVES**, and **COMPLEX ACT PERFECTIVES** (after Janda et al. 2007). There is a derivational relationship between the aspectual prefix and the simplex predicate from which the complex predicate is derived. Aspectual prefixes in **Specialized Perfectives** add the most lexical content, while **Natural Perfectives** have no

transparent lexical content and appear to be inflectional morphemes encoding perfectivity.

Complex Act predicates comprise a relatively small group of complex predicates since only a limited number of prefixes encode a delimitative time boundary on simplex predicates; thus, being derivational in their own kind. The following paragraphs discuss the predicate types in more detail and provide examples to demonstrate the degree of semantic compositionality based on the semantic relations between prefixes and simplex predicates; as follows:

SPECIALIZED PERFECTIVES (SPs) are complex predicates in which an aspectual prefix adds meaning to the simplex predicate to which it is attached. The newly derived perfective complex predicate preserves the ‘original’ simplex predicate’s meaning, at least in part if not in full. In other words, the prefix adds a lexical meaning that can be identified as belonging to a cluster of meanings that are based around a prototype (see Janda et al. 2013 for a discussion of radial categories of Russian prefixes). Although the meaning of a prefix may not always be transparent, nonetheless, the meanings of complex predicates remain related to the meaning of the ‘original’ simplex predicate. Some examples of Specialized Perfectives that demonstrate this prefix-predicate relationship are: *dojít* ‘to walk to’ from *jít* ‘to go/to walk’, *poslechnout* ‘to listen’ from *slyšet* ‘to hear’, and *naznačit* ‘to indicate, to suggest’ from *značit* ‘to mark, to signal’.

NATURAL PERFECTIVES (NPs) are complex predicates in which aspectual prefixes appear to have inflectional properties: they do not add any lexical meaning to simplex predicates other than perfectivity. Such prefixes are frequently identified in the literature as “semantically empty” (Deo 2012:163). Alternatively, it is argued that their non-transparent lexical semantics are a result of a meaning overlap with a simplex predicate (Janda et al. 2013:9). My study considers the lexical contribution of the prefix minimal (whether it is due to a semantic overlap or as a result of semantic generalization of the prefix due to semantic overlap). Both positions would be

consistent with my hypothesis. For this reason, conclusions about emptiness versus overlap are not within the scope of this study. Claims about emptiness are currently inconclusive assumptions; however, my claim that aspectual prefixes in Natural Perfectives are semantically generalized is plausible. Examples of Natural Perfectives are: *naučit* ‘to learn, to teach’ from *učit* ‘to learn, to teach’ and *podívat* ‘to watch, to look’ from *dívat* ‘to watch’.

COMPLEX ACT PERFECTIVES (CAPS) are complex predicates in which an aspectual prefix encodes a time boundary onto the simplex predicate, i.e. it adds the meaning of completion and usually encodes the duration ‘for a while’ or delimits an event (Dickey 2007, Dickey & Hutcheson 2003, Filip 2003, Flier 1985). Only the prefixes *po-* and *za-* in my study of four aspectual prefixes derive Complex Act Perfectives. Examples of Complex Act Perfectives are: *pomyslet* ‘to think (for a while with an end point)’, *zasmát* ‘to laugh (for a short period of time)’. There is a limited number of prefixes that can function in Complex Act Perfective constructions. They are restricted to aspectual prefixes that frequently occur in highly grammaticalized constructions.

3.2. SIMPLEX PREDICATE TYPES. Simplex predicates are grouped together based on their semantic properties that suggest diachronic development involving lexicalization processes. Semantic properties of simplex predicate types indicate that they exhibit different degrees of compositionality along a continuum from less compositional to noncompositional. That is, their semantics are not completely derivable or predictable from the constituents that form them. Simplex predicates in Czech exhibit different degrees of internal constituency and semantic compositionality. This study classifies simplex predicates into three types based on their degree of lexicalization and semantic compositionality.

NEW PREFIXED PERFECTIVES (NPPs) are simplex predicates in which aspectual prefixes substantially change the meaning of the original simplex predicate. The prefix and simplex predicate are entrenched as a single lexical unit and form a new simplex predicate. The use of the original simplex predicate is not limited to the Prefixed Predicate construction. It may function as an imperfective in other constructions, or may occur in Prefixed Predicate Constructions with other aspectual prefixes. That is, the imperfective simplex predicate may derive Specialized Perfectives in constructions with other aspectual prefixes. Some examples of NPPs are: *zaměřit* ‘to concentrate’ from *měřit* ‘to measure, to gauge’, *povědět* ‘to tell’ from *vědět* ‘to know’, *napadnout* ‘to occur (in mind), to attack (in battle)’ from *padnout* ‘to fall.’

PERFECTIVES WITHOUT VERBAL ROOTS (PWVRs) are simplex predicates that are not associated with any imperfective simplex predicate. Although their form clearly developed from Prefixed Predicate constructions through lexicalization processes, the verbal root has lost its independent lexical status. If verbal roots of PWVRs are attested in the lexicon, they have very low frequencies, as they are usually restricted to archaic/idiomatic expressions in the corpus. Similar findings of such predicates are attested in Russian. Braginsky (2008:8) finds that the prefix *za-* derives perfective predicates “from presumably imperfective base verbs that do not have an autonomous lexical meaning of their own.” Moreover, he claims that the prefix *za-* “serves as a word-formation tool, capable of introducing new verbal predicate into the lexicon” (Braginsky 2008:8). Generally, Czech PWVRs include simplex predicates that are conceptually basic and are thus among the most frequent lexical items in the corpus. Examples of PWVRs are: *zapomenout* ‘to forget’, *zavřít* ‘to close, to shut (the door)’, and *nabídnout* ‘to offer’.

PREFIXED IMPERFECTIVES (PIs) are imperfective simplex predicates. Predicates of this type have low type frequencies but high token frequencies in the corpus. The present analysis

accounts for their status in the lexicon and suggests their development. PIs have a lot in common with NPPs and PWVRs insofar as they often occur in prefixed simplex predicate constructions. The only transparent difference that sets them apart is their imperfective aspectual nature. PIs frequently encode concepts, such as undirected activities or states. This study argues that lexicalization processes of complex predicates are a plausible explanation for the emergence of PIs. That is, assuming that complex predicates lexicalize into simplex predicates (NPPs and PWVRs) that come to denote states, or activities, the most plausible hypothesis would be that such predicates become semantically reanalyzed as imperfective. Many of the imperfectives that were analyzed in this study have the imperfective suffix *-at/-ovat*. It remains unclear how the present PIs came to be lexicalized to incorporate the imperfective suffix. Given the evidence of lexicalization patterns in NPPs and PWVRs, the present analysis suggests that the imperfective suffix on PIs is a result of aspectual reanalysis. Some examples of PIs from the Czech National Corpus are: *počítat* ‘to count’, *poslouchat* ‘to listen, to obey’, and *považovat* ‘to consider’.

4. SYNCHRONIC DISTRIBUTION OF PREFIXED PERFECTIVE PREDICATE TYPES. A semantic analysis of the synchronic layering of aspectual prefixes in predicates establishes grounds for the distributional analysis of Prefixed Perfective predicates in the corpus. Since grammaticalization and lexicalization processes have been argued to take place within specific constructions (Bybee & Hopper 2001), this study attempts to capture the development of aspectual prefixes in terms of their relation to predicate types and their distribution in the corpus.

In particular, the distribution of predicate types is predicted to reflect patterns of SYNCHRONIC LAYERING. This term is used in Hopper and Traugott (1993:94) to refer to the gradualness of grammaticalization processes that result in multiple stages of development occurring in languages synchronically. Applied to the analysis in this study, simplex predicates,

which are hypothesized to have undergone lexicalization processes, are expected to demonstrate higher token frequencies in the corpus as a result of their higher degree of entrenchment than complex predicates. Since the processes of lexicalization in constructions usually affect lexical items of high token frequencies and are not directly linked to high type frequencies (Trousdale 2008:163, from Lipka 2002), this study proposes that simplex predicates will have higher token frequencies and lower type frequencies than complex predicates.

Distinct stages of grammaticalization in complex predicate constructions are also expected to show clear distributional patterns in the data sample. Assuming that grammaticalization processes are unidirectional processes (Bybee et al. 1994:13), concrete lexical meanings of aspectual prefixes in complex predicates are predicted to show lower degrees of grammaticalization than semantically generalized prefixes that appear to have inflectional properties. This study hypothesizes that less grammaticalized predicates have lower token frequencies in the corpus than more grammaticalized predicates. Lower token frequencies are usually indicative of forms that have high content-specificity and, as a result, have a limited range of use in constructions. Therefore, the hypothesis about the distributional patterns in complex predicates is that Specialized Perfectives and Complex Act Predicates have lower token frequencies than Natural Perfectives.

4.1. DISTRIBUTION OF TOKEN FREQUENCIES IN PREDICATE TYPES. The distribution of token frequencies of predicates contributes to our understanding of grammaticalization and lexicalization processes in relation to predicate types. The distributional analysis of token frequencies demonstrates that PP types are associated with different token frequencies in the corpus. The following discussion presents quantitative data that supports the semantic findings

that predicate types reflect distinct stages of grammaticalization and lexicalization of aspectual prefixes.

Median values of token frequencies were collected for each predicate type in order to determine the distributional patterns of token frequencies of predicates in the data sample. The following graph in Figure 1 presents median values of token frequencies for each predicate type.

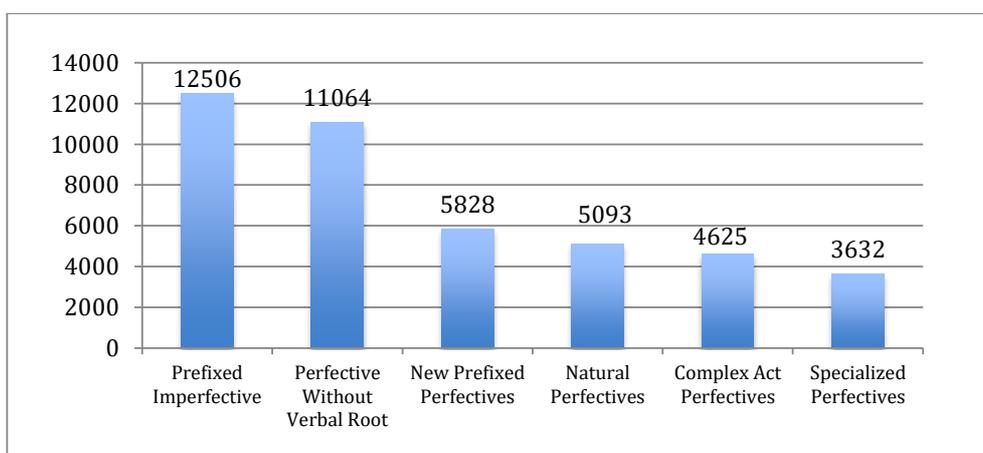


FIGURE 1. Median Values of Token Frequencies of Predicate Types

The median values of token frequencies in Figure 1 suggest that there are general trends in the distribution of token frequencies that correspond to predicate types and their distinct stages of grammaticalization and lexicalization. The most obvious patterns that are essential to the present hypothesis are revealed in the token frequencies of predicate types in complex predicates and simplex predicates. The graph in Figure 1 suggests that simplex predicates have higher token frequencies than complex predicates. A one-tail t-test shows that token frequencies of simplex and complex predicate categories are significantly different from each other ($p < 0.05$).

Token frequencies of predicate types in Figure 1 suggest that predicate types within simplex and complex predicate categories show distinct token frequencies. Specifically, the distribution of token frequencies in simplex predicates shows that Prefixed Imperfectives and

Perfectives Without Verbal Roots have significantly higher token frequencies than New Prefixed Perfectives in the complex predicate category ($p < 0.05$). The distribution of token frequencies in complex predicates shows that lower token frequencies are characteristic of Specialized Perfectives and Complex Act Perfectives, while higher token frequencies correspond to Natural Perfectives ($p < 0.05$).

These results indicate that higher token frequencies reflect a higher degree of lexicalization in simplex predicates and a higher degree of grammaticalization in complex predicates. High token frequencies of Prefixed Imperfectives and Perfectives Without Verbal Root suggest their high degree of entrenchment and contrast with less lexicalized New Prefixed Perfectives. As would be expected of more grammaticalized forms, Natural Perfectives demonstrate higher token frequencies than Specialized Perfectives and Complex Act Perfectives. The overall patterns of token frequencies of predicate types reveal distinct stages of lexicalization and grammaticalization.

4.2. THE DEVELOPMENTAL CONTINUUM. The semantics and distributional patterns of complex and simplex predicate types indicate that aspectual prefixes show different degrees of grammaticalization and lexicalization, respectively. Furthermore, the variation in token frequencies and the semantics of aspectual prefixes in complex and simplex predicate types suggest that grammaticalization and lexicalization processes are gradual. Although this study employs semantic categorization to identify major stages on the path of development of aspectual prefixes, it argues that both grammaticalization and lexicalization processes in aspectual prefixes form a continuum. As can be seen in 4, the semantics of prefixes is gradient and shows variation in their semantic contributions to predicates.

The Natural Perfective in 4 is clearly derived from the aspectual prefix *za-* and the simplex predicate *platit* ‘to pay’. Although the prefix *za-* does not seem to add any lexical properties besides its grammatical function, its original meaning ‘for’ is transparent in the formation of the Natural Perfective. The notion that one ‘pays for’ something clearly follows the grammaticalization processes that lead to the development of a Natural Perfective. Although *zaplatit* ‘to pay’ is a Natural Perfective due to the degree of entrenchment of the predicate construction and its frequency in the lexicon, the example demonstrates the gradient nature of lexical properties in the semantics of aspectual prefixes.

GRAMMATICALIZATION AND LEXICALIZATION CONTINUA. The semantics and distributional patterns of complex predicate types indicate that aspectual prefixes in Natural Perfectives are more grammaticalized than Specialized Perfectives and Complex Act Perfectives. In order to map the development of aspectual prefixes, this section presents grammaticalization and lexicalization continua as unidirectional paths that show PP types in relation to their proposed stages of development.

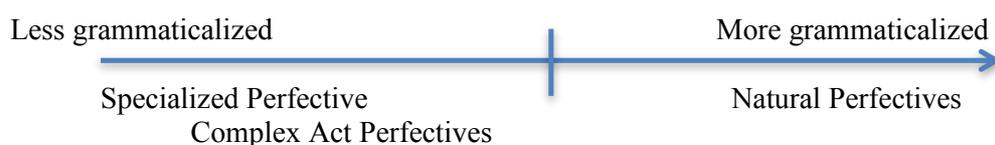


FIGURE 2. Grammaticalization Continuum in Complex Predicates

Figure 2 illustrates the unidirectional path of grammaticalization of aspectual prefixes with highly frequent Natural Perfectives on one end of the continuum and Specialized Perfectives with concrete lexical prefixes on the other end of the continuum. The token frequencies of Complex Act Perfectives suggest that they occupy a similar spectrum of the aspectual continuum

as Specialized Perfectives. The patterns of distribution of Complex Act Perfectives suggest that they are less grammaticalized than Natural Perfectives.

The distributional patterns of simplex predicates indicate that Prefixed Imperfectives and Perfectives Without Verbal Roots are more lexicalized than New Prefixed Perfectives.

Furthermore, the semantic and distributional properties of simplex predicate types suggest that lexicalization processes are unidirectional, as was shown for grammaticalization processes in complex predicates.

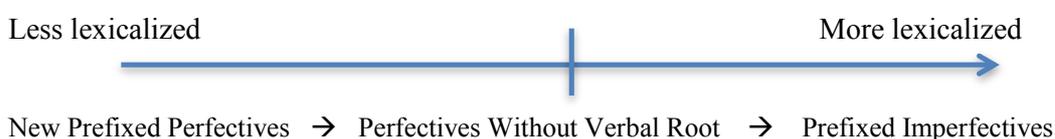


FIGURE 3. Lexicalization Continuum in Simplex Predicates

The unidirectional path of lexicalization processes is illustrated in Figure 3. The lexicalization processes that are apparent from the semantic and distributional analyses suggest that New Prefixed Perfectives present lower stages of lexicalization as opposed to Prefixed Imperfectives and Perfectives Without Verbal Roots, which display more advanced stages of lexicalization.

Although more lexicalized predicate types of simplex predicates appear to have similar distributional properties, the default imperfective semantics of Prefixed Imperfectives suggest that they undergo additional derivational processes.

MAPPING GRAMMATICALIZATION AND LEXICALIZATION PROCESSES. Identifying distinct developmental stages of complex and simplex predicates on the grammaticalization and lexicalization continua allows for a more elaborate mapping of the PP predicate types in relation to each other. The following graph in Figure 4 illustrates how grammaticalization and

lexicalization processes are assumed to interact in the development of aspectual prefixes in Czech.

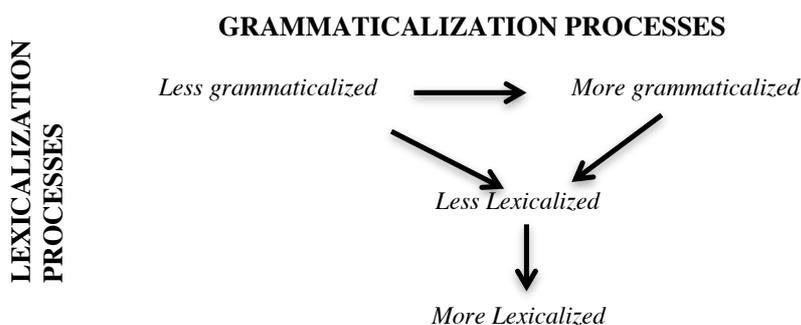


FIGURE 4. Continuum of Grammaticalization and Lexicalization Processes

The distribution of simplex predicates in the data sample suggests that lexicalization processes are characteristic of predicates of high token frequencies and are independent of their degree of grammaticalization. Although high token frequencies are representative of more grammaticalized complex predicates, this paper argues that lexicalization processes are not dependent on the degree of grammaticalization of predicates but on high token frequencies of predicates in the corpus. Figure 4 illustrates this point by drawing unidirectional arrows from both ‘ends’ of the grammaticalization continuum (i.e. *less grammaticalized* and *more grammaticalized*) to the less lexicalized end of the lexicalization continuum. The directions of arrows symbolize the unidirectional processes in grammaticalization and lexicalization. Less lexicalized predicates may undergo advanced lexicalization processes.

The development of aspectual prefixes is best explained by their occurrence in predicate types as they are representative of different stages of grammaticalization and lexicalization. PP predicate types can be mapped onto the grammaticalization and lexicalization continuum laid out

in Figure 4. The relation between predicate types and the proposed developmental path of aspectual prefixes can be mapped onto the unidirectional processes, as illustrated in Figure 5.

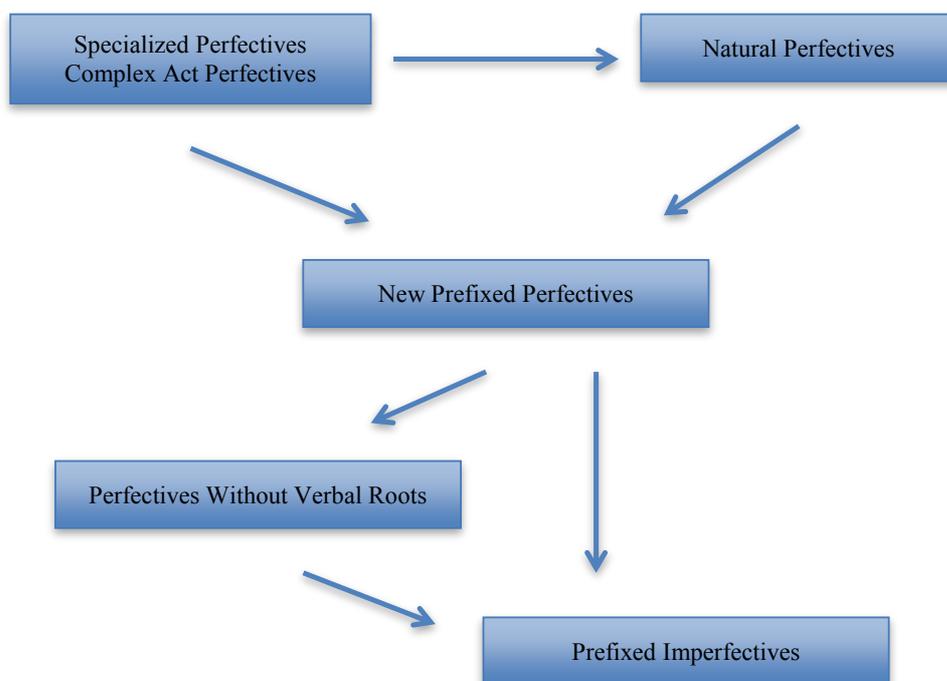


FIGURE 5. Path of Development of Aspectual Prefixes in PP Constructions

The graph in Figure 5 shows the unidirectional path of grammaticalization which has two distinct stages that contain less grammaticalized complex predicates, i.e. Specialized Perfectives and Complex Act Perfectives, on one end of the spectrum and more grammaticalized complex predicates, i.e. Natural Perfectives, on the other end of the spectrum. High token frequencies of complex predicates allow for lexicalization processes to take place, which first lead to the formation of New Prefixed Perfectives and may advance to Perfectives Without Verbal Roots or Prefixed Imperfectives. Lexicalization processes in Figure 5 illustrate that Prefixed Imperfectives can be formed from New Prefixed Perfectives or Perfectives Without Verbal Roots. Although most Prefixed Imperfectives in the data sample have limited references to the base verb from

which they originally developed, some have compositional transparency, similar to New Prefixed Perfectives. Thus, the present analysis argues that Prefixed Imperfectives undergo advanced lexicalization processes in simplex predicates, i.e. New Prefixed Perfectives or Perfectives Without Verbal Root, of high token frequencies. Both unidirectional arrows originating from New Prefixed Perfectives and Perfectives Without Verbal Root present possible lexicalization processes that involve semantic reanalysis that led to the derivation of Prefixed Imperfectives. Low type frequencies of predicate types that are associated with the highest stages of lexicalization attest to the relatively rare occurrence of such processes in the lexicon.

The following discussion of predicate type frequencies with individual aspectual prefixes corroborates this hypothesis and further develops the assumption that prefixes are at distinct developmental stages.

5. DISTRIBUTION OF PREDICATE TYPE FREQUENCIES WITH ASPECTUAL PREFIXES. This section discusses the patterns of distribution of predicate types with four aspectual prefixes *za-*, *po-*, *na-*, and *do-*. It proposes that type frequencies of predicates with aspectual prefixes reveal distinct grammaticalization and lexicalization processes.

PREDICATE TYPE	Number of Tokens				TOTAL
	PO-	ZA-	NA-	DO-	
Prefixed Imperfective	9	2	0	3	14
Perfective Without Verbal Root	5	4	3	1	13
Natural Perfective	12	12	17	0	41
New Prefixed Perfective	16	13	12	25	66
Specialized Perfective	6	13	18	21	58
Complex Act Predicates	4	6	0	0	10

TABLE 1. Distribution of Prefixes in Predicate Types

The analysis of the distribution of prefixes in predicate types in Table 1 suggests that prefixes *za-* and *po-* are semantically most productive in the data sample. Both prefixes occur in simplex as well as complex predicates. The frequency of predicate types with *za-* and *po-* in the corpus correlates with the varying degrees of grammaticalization and lexicalization in predicate types. Considering that only a small number of PPs undergo more advanced lexicalization processes, Prefixed Imperfectives and Perfectives Without Verbal Roots have lower type frequencies in the data sample in comparison to New Prefixed Perfectives. Although New Prefixed Perfectives are hypothesized to have undergone lexicalization processes, they display distinct distributional patterns in the lexicon. As opposed to PIs and PWVRs, they are less lexicalized, and thus have higher type frequencies in the data.

The relatively high frequency of Complex Act Predicates with the prefix *za-* and *po-* is associated with their semantic properties, i.e. the meaning of ingression with prefix *za-* and delimitative semantics with prefix *po-* (Dickey & Hutcheson 2003:23-24). The distributional analyses did not find *na-* or *do-* to be productive in the formation of Complex Act Predicates in the given data sample.

The distributional pattern of the prefix *na-* demonstrates lower degrees of lexicalization. Although the semantic analysis provides evidence that *na-* occurs in both simplex and complex predicate types, *na-* does not occur in Prefixed Imperfectives. The absence of Prefixed Imperfectives in the data sample suggests that *na-* has different patterns of synchronic layering from *za-* and *po-*. This variation is assumed to be the result of *na-* predicates being in a different stage of lexicalization. Since Prefixed Imperfectives are hypothesized to have originated during the last stages of lexicalization, their absence in the distribution of predicate types with *na-* suggests that the prefix is less lexicalized than *za-* and *po-*. The absence of Complex Act

Predicates is not given any major implications since only a limited number of prefixes yield the formation of Complex Act Predicates in Czech.

Predicate types with *do-* show distinct patterns of distribution along the grammaticalization and lexicalization continuum. The overwhelming number of Specialized Perfectives and New Prefixed Predicates presents a new pattern of distribution that is not found with the other three aspectual prefixes in this study. The absence of Natural Perfectives and a high type frequency of New Prefixed Perfectives suggest that lexicalization processes are dominant in the distribution of perfective predicates with *do-*. Moreover, the presence of all types of simplex predicates confirms that lexicalization processes are not dependent on grammaticalization processes. The patterning of *do-* with simplex predicate types suggests that lexicalization patterns are not related to any specific complex predicate type (i.e. Natural Perfectives, Specialized Perfectives, or Complex Act Perfectives). Instead, they are related to high token frequencies in the corpus. Thus, high token frequencies of all complex predicates can yield lexicalization processes.

6. PATH OF DEVELOPMENT. The data analysis provides strong evidence that, although aspectual prefixes develop along the same path, they reflect different stages of development. As discussed above, the distributional patterns of predicate types in aspectual prefixes suggest that they occupy different portions of the grammaticalization and lexicalization continuum.

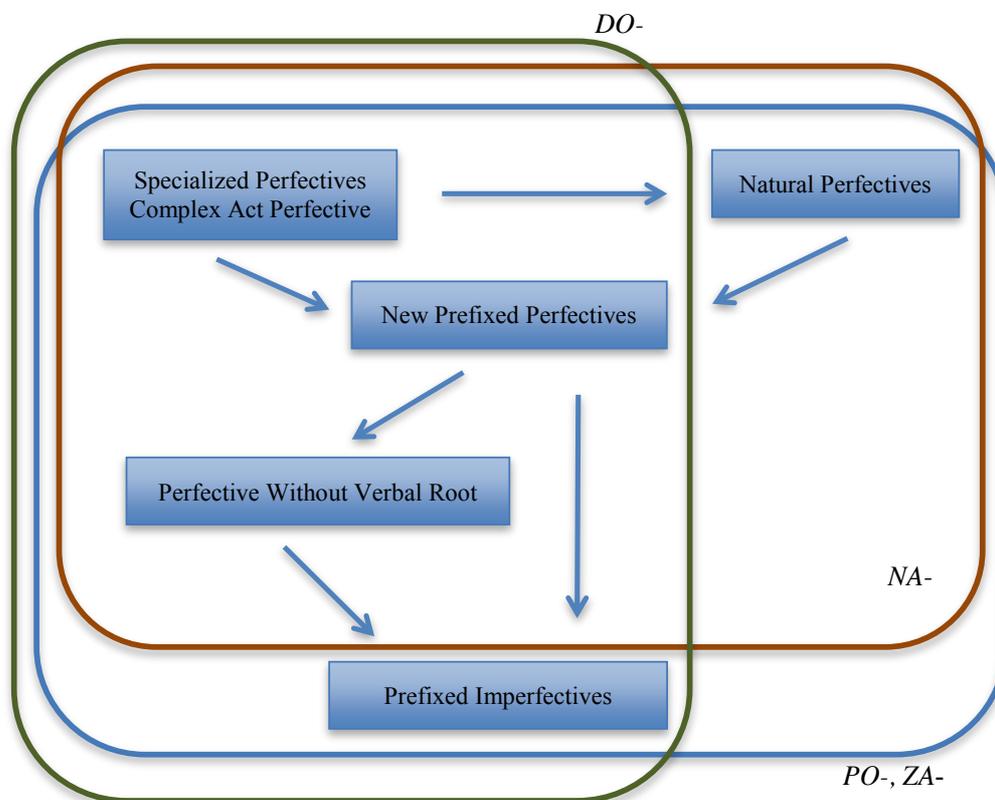


FIGURE 6. Mapping the Distribution of Aspectual Prefixes onto the Path of Development

Figure 6 illustrates the different stages of development that each aspectual prefix occupies on the path. It demonstrates that more developed aspectual prefixes occupy all spectrums of the grammaticalization and lexicalization continuum, while less developed prefixes either display lower degree of lexicalization or lower degree of grammaticalization. Specifically, *na-* and *do-* are less developed than *po-* and *za-*. *Na-* exhibits a lower degree of development because it does not favor the formation of Prefixed Imperfectives, which indicates a lower degree of lexicalization. *Do-* also exhibits a lower degree of development but presents different patterns of

distribution than *na-*. It does not form Natural Perfectives, which indicates a lower degree of grammaticalization.

The mapping of prefix distributions on the path of development presents evidence that prefixes develop along a continuum of grammaticalization and lexicalization processes. It confirms that there is a general path of development of aspectual prefixes that relates to their lexical and grammatical properties, instantiated by specific predicate types. Predicate types exhibit semantic properties characteristic of different stages of development.

7. CONCLUSION. This study analyzed four aspectual prefixes in Czech: *za-*, *na-*, *po-*, and *do-* in order to establish a semantic classification of predicate types in which these prefixes occur. The semantically defined predicate types were used to conduct a distributional analysis of predicate type and token frequencies in the Czech National Corpus and to make conclusions about the developmental stages of aspectual prefixes.

The present paper shows that aspectual prefixes in Czech exhibit different degrees of grammaticalization and lexicalization in Prefixed Perfective predicate types. It provides evidence that predicate types have distinct patterns of distribution and that their distribution is representative of varying developmental stages in relation to grammaticalization and lexicalization processes. Furthermore, the distribution of predicate types provides evidence of synchronic layering of aspectual prefixes and indicates that their development followed a common path that can be mapped onto predicate types.

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