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Number/aspect interactions in the syntax of nominalizations: A Distributed Morphology approach[1]

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In this paper we focus on the ability of ARGUMENT SUPPORTING NOMINALIZATIONS (ASNs) to realize morphological plural. We think that this aspect of their behavior is instrumental in our understanding of their properties and their syntax within one language and across languages. Our factual investigation deals with Romanian, English, German and Spanish, as well as Polish and Bulgarian ASNs. We show that the interplay between the aspectual properties – either inner or outer aspect – and the nominal/verbal characteristics, as justifying the internal structure of ASNs, allows us to characterize the ability of ASNs to accept plural marking across languages. We further argue for a flexible syntactic theory that enables us to capture the mixed properties of ASNs. We provide evidence for two parameters of variation. The first parameter is whether ASNs involve a nominalizer or not. If a nominalizer is not included, ASNs lack nominal internal properties. If a nominalizer is included, the second parameter comes into play and allows for language variation with respect to the height of attachment of the nominalizer. Specifically, a nominalizer can attach to (and thus nominalize) distinct layers of syntactic structure (VP vs. AspectP).

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1. INTRODUCTION

ARGUMENT SUPPORTING NOMINALIZATIONS (ASNs) are deverbal nominals which express events and preserve (parts of) the argument structure of the original verb, thereby exhibiting an ambivalent categorial behavior. Their mixed categorial properties are enlightening for understanding the parallelisms and the interactions between nominal and verbal categories.

ASNs have been analyzed in a variety of ways in the literature. We can identify two main lines of investigation: (i) lexical, e.g. Grimshaw 1990, Giorgi & Longobardi 1991 and, more recently, Lieber 2004; and (ii) syntactic, e.g. Picallo 1991; Borer 1993, 2003, 2005; Marantz 1997; Harley & Noyer 1999; Alexiadou 2001 and Fu, Roeper & Borer 2001. In this paper, we investigate the properties of ASNs by adopting a syntactic approach.[2]

Despite the differences among the various syntactic approaches, they all share the assumption that the internal structure of words is created by the same mechanisms of construction as the internal structure of sentences. This is different from the early transformational approach to word formation, in that it is no longer assumed that words are formed by sentence-reduction (as was the case in Lees 1960). Instead, words and sentences are both created in the syntax.

Our contribution to this topic, couched within the DISTRIBUTED MORPHOLOGY framework (Marantz 1997, Harley & Noyer 1999, Alexiadou 2001), is to provide a detailed cross-linguistic investigation of the (in)ability of ASNs to realize (nominal) morphological plural. We relate the (un)availability of morphological plural to the internal structure of ASNs, which is the result of the interaction between their aspectual properties and their primarily verbal/nominal behavior. While far from accounting for all the properties of ASNs and all the functional projections that their internal syntax may host, we consider this aspect of their behavior to be instrumental in understanding their properties and their syntax.

Why should that be so? In the semantic literature, the mass/count distinction in the nominal domain is often compared to the aspectual specification in the verbal domain (Mourelatos 1978; ter Meulen 1984; Bach 1986; Krifka 1986, 1992; Jackendoff 1991; to mention just a few). The general consensus is that count nouns are similar to telic and perfective events in being BOUNDED, and mass nouns to atelic and imperfective events in being UNBOUNDED. Syntactic approaches posit a NUMBERP projection as responsible for the number morphology in the nominal domain and an ASPECTP projection for the aspectual information in the verbal domain (see e.g. Cinque 1999, Borer 2005, Alexiadou, Haegeman & Stavrou 2007).

[2] This does not mean that the properties discussed here could not be explained in a lexicalist framework. A detailed comparison between syntactic and lexicalist approaches, however, would take us too far afield. For a comparison of the two systems, the reader is referred to Alexiadou, Haegeman & Stavrou 2007.

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Importantly, only count nouns project (singular/plural) Number and only verbal constructions introducing ASPECT SHIFT (de Swart 1998), independently of the inner aspect/Aktionsart of the verb, realize (perfective/imperfective) AspectP. Thus it is the outer/grammatical aspect information that is projected as AspectP above the VP level, where the inner aspect is composed. We use 'Number' and 'Aspect' to refer to the functional projections that host the semantic 'number' and 'aspect' contribution of an ASN in the syntax. While all ASNs carry some (possibly, default) number/aspect semantic information, we will argue that not all of them project Number/Aspect.

In the general setting of the noun vs. verb contrast, NumberP and AspectP exclude each other (see Rouveret 1994, Alexiadou 2001, Rijkhoff 2002, Fassi-Fehri 2005 and others). However, ASNs preserve several verbal properties (argument structure, event interpretation) in combination with a nominal external distribution. The question is how (the semantics of) number and aspect interact in ASNs, and whether their internal syntax hosts NumberP or AspectP, or maybe even both.

In Grimshaw's 1990 seminal study, plural marking is an important parameter distinguishing ASNs from Referential Nominals (RNs), to the extent that only the latter allow plural.[3] The verbal character of the former explains, in Grimshaw's view, their incompatibility with plural morphology, a fully nominal characteristic:

(1) (a) The assignments were long. (RN)
(b) *The assignments **of the problems** took a long time. (ASN)

For Grimshaw, all ASNs are mass nouns in this respect. In a syntactic approach, this would correlate with stating that ASNs have a mainly verbal internal structure (most likely including AspectP), and thus insufficient nominal structure to host NumberP.

Recent research on ASNs provides cross-linguistic counterevidence to Grimshaw's claim, which from a syntactic point of view indicates that the verbal properties of the ASN may sometimes be embedded in a nominal structure rich enough to permit the realization of plural under NumberP (see Roodenburg 2006 for French and Italian; Iordăchioaia & Soare 2008, 2009 for Romanian; Sleeman & Brito to appear and references therein for Dutch, German and Portuguese; and Alexiadou, Iordăchioaia & Soare to appear b for Romance and Germanic).

In this paper we investigate pluralization with various patterns of ASNs in three language families: Romance, Germanic and Slavic. We will discuss

[3] Here, following Borer (2003), we use the terms 'argument supporting nominals' and 'referential nominals' instead of Grimshaw's (1990) 'complex event nominals' and 'result nominals'.

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Romanian infinitive and supine ASNs, the Spanish nominal infinitive, the English nominal and verbal gerund, German *-ung*, Polish *-nie*/*-cie* and Bulgarian *-ne* ASNs. We will show that the ability to pluralize correlates with other nominal properties like adjectival modification, gender features and case inflection. We take these properties to be hosted by a Class(ifier)P where n (the site of the nominalizer, according to Marantz 2001) moves to check its nominal features (Picallo 2006). Importantly, we follow Picallo in assuming that the presence of ClassP is also obligatory for a further NumberP projection.

The inability to allow morphological plural sometimes correlates with the lack of these nominal properties and the corresponding projections, as in the Romanian supine and the English verbal gerund. We show that these two ASNs project AspectP. But there are ASNs which exhibit nominal properties, i.e. nP and ClassP are present in their syntax, but they do not pluralize, i.e. NumberP is absent. This is the case in most English nominal gerunds and German *-ung* ASNs, and Spanish nominal infinitives. We will show that the reason why they do not pluralize is their atelic inner aspect inherited from the verb. Such ASNs are telic or atelic depending on the inner aspect of the original verb, so there is no evidence for aspect shift and AspectP. The telic pattern realizes plural, the atelic one does not, thus confirming previous predictions in the literature, according to which bounded entities/events can be pluralized, while unbounded ones cannot (see, for instance, Mourelatos 1978, Jackendoff 1991, Borer 2005, vol. 2). To account for this contrast, we posit a [±count] feature on ClassP which 'agrees' with the inner aspect of the VP. ASNs with telic inner aspect have ClassP [+count] and project NumberP, while ASNs with atelic inner aspect have ClassP [–count], which blocks the realization of NumberP.

The common assumption that verbal (outer) Aspect is in complementary distribution with nominal Number – also evidenced here by some ASN patterns – is challenged by Polish *-nie*/*-cie* and Bulgarian *-ne* ASNs, which despite carrying verbal aspectual morphology can surface with plural. This suggests that they realize both AspectP and NumberP. We will show that these ASNs can be integrated in our account if we assume that the AspP is embedded in a nominal structure introduced by the nominalizer, i.e. the nominalizer attaches to AspP (see Schoorlemmer 1995, Rozwadowska 1997 for a similar claim). This contrasts with the other nominal ASNs realizing plural (e.g. Romanian telic infinitives), where the nominalizer attaches to VP.

We thus provide further evidence for the view that nominalizers can nominalize various layers of structure (VP vs. AspP) (see Abney 1987; Borer 1993; Alexiadou 2001, 2009, to appear). The nominalizer, which we take to be the head of nP (Marantz 2001), introduces a nominal internal structure and leads to the projection of ClassP and NumP. We will show that these ASNs contrast with the ASNs that lack nominalizers and include a verbal structure simply embedded under D (e.g. supines and verbal gerunds).

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In this paper we will not be concerned with a detailed event decomposition of the VPs (Borer 2005, Alexiadou, Anagnostopoulou & Schäfer 2006, Ramchand 2008). Our focus is rather on their aspectual properties and, in relation to them, the layers above VP, namely AspectP, nP, ClassP and NumP, and how they interact with one another.

The paper is organized as follows. In Section 1 we present the two Romanian ASNs which confirm the generalization that Number is in complementary distribution with (outer) Aspect. The contrast between the nominal and the verbal gerund in English supports our conclusion from Romanian. In Section 3, we discuss the nature of the Aspect projection in ASNs, by focussing on the different levels where the aspectual properties of the nominal gerund and the verbal gerund become relevant in the syntax. In Section 4 we investigate the relationship between the classifier projection and aspect. To this end, we also examine Spanish nominal infinitives and German *-ung* ASNs. We will then, in Section 5, address the challenges Slavic ASNs pose to our analysis and formulate further refinements that rely on the idea that nominalizers may nominalize different layers of structure (VP vs. AspP). Our conclusion is in Section 6.

2. Number vs. Aspect: Romanian infinitive and supine ASNs

2.1 *Nominalization patterns*

Romanian is the first language we address concerning the interaction between verbal and nominal categories in ASNs, as it enables us to propose a measure of comparison for the other languages. Romanian has two productive deverbal nominals: the infinitive and the supine. Both can appear as ASNs; for a comprehensive demonstration and specific tests we refer the reader to Cornilescu 2001. We concentrate here on the contrast in (2), which shows that the infinitive realizes morphological plural, while the supine does not.[4]

(2) **demolă-r-i-le/*demola-t-uri-le** frecvente ale cartierelor
demolish-INF-PL-the/demolish-SUP-PL-the frequent.PL of quarters.GEN
vechi de către comunişti
old by to communists
'the frequent demolitions of old quarters by the communists'

We will argue that the plural morphology is favored by the nominal properties of the infinitive which indicate the presence of an nP level, ClassP

[4] In this paper we use the following abbreviations in glosses: ADJ 'adjective', ADV 'adverb', F 'feminine', GEN 'genitive case', IMPF 'imperfective', IND 'indicative', INF 'infinitive', INS 'instrumental case', ITR 'intransitive', M 'masculine', N 'neuter', NOM 'nominative', PF 'perfective', PL 'plural', RF 'reflexive', SG 'singular', SUP 'supine'.

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and NumP. By contrast, the supine lacks an nP level, but projects AspP. NumP is thus blocked.

The infinitive and the supine ASN are derived on the verbal stem of the infinitive and on the participial stem, respectively. The forms are given in (3).

(3)

THE INFINITIVE	THE SUPINE
a cînta: cînta-**r-e**/cîntă-**r-i**	a cînta: cînta-**t**/#cînta-**t-uri**[5]
to sing: sing-INF-F.SG/sing-INF-PL	to sing: sing-SUP/sing-SUP-PL
a conduce: conduce-**r-e**/conduce-**r-i**	a conduce: condu-**s**/#condu-**s-uri**
to drive: drive-INF-F.SG/drive-INF-PL	to drive: drive-SUP/drive-SUP-PL

The morphology of these two nominals introduces a first difference. The infinitive involves a specific affix, *-re*, which exclusively derives this nominalization. It does not occur in any verbal form. Soare (2007) argues that *-re* is a true NOMINALIZER. The supine in turn does not present a nominalizer; it is the 'bare' nominalization of a verbal participial stem. Nothing in the morphology indicates the nominal status of the supine, except for the determiner and the genitive case assigned to complements.[6] The supine is thus a syntactic nominalization in the sense of Chomsky (1970) and Picallo (1991): the layer bringing the nominal status is the DP that embeds a verbal structure.

2.2 *Nominal properties*

The contribution of a nominalizer is to assign the category 'n(oun)' either to a simple root or roots that have already been categorized as e.g. verbal (Marantz 2001). Picallo (2006) argues that gender and declension information, typical to nouns, is hosted by another category – called Classifier (Class) – which is obligatory once n is projected and to which the n head moves to check its class information. The projection of further nominal categories is conditioned by the projection of ClassP. Picallo shows that the gender features encoded in the Class are a precondition for Number. It turns out that the infinitive and the supine ASN display different behavior with respect to gender features and the nominal properties connected to n and Class.

The morphology clearly indicates that infinitive ASNs have [+fem] gender, as they have the same singular–plural endings *-e* vs. *-i* just as feminine common nouns:

(4) (a) cînta-**r-e**/cîntă-**r-i**
sing-INF-F.SG/sing-INF-PL

(b) floar-**e**/flor-**i**
flower-F.SG/flower-PL

[5] The plural ending *-uri* is associated with the supine by analogy with lexicalized nouns originating from the supine/past participle, e.g. *tuns – tunsuri* ('haircut' – 'haircuts'). See Iordăchioaia & Soare 2008.

[6] In this paper we will not be concerned with case assignment in ASNs, but see Cornilescu (1995) for some insights on genitive case assignment.

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Supine ASNs are traditionally considered to have neuter gender: they have a null ending for singular (like masculine nouns) and *-uri* in the plural (like some feminine nouns). But as Iordăchioaia & Soare 2008 show, the ending *-uri* in supine ASNs is not the effect of neuter gender features, but a default gender marking. Recent borrowings like that in (5a) also receive this ending in Romanian, but once they are completely integrated into the nominal system, this can change. Compare (5b) to (5c):

(5) (a) weekend – weekend**-uri**
weekend – weekends
(b) verb/verb**uri** (19th-century Romanian)
(c) verb/verb**e** (present-day Romanian)
verb.N.SG/PL

If this is correct, the two Romanian ASNs differ with respect to gender features that are present in the infinitive but absent in the supine ASN. An important argument for this position comes from anaphoric relations: the infinitive ASN successfully establishes anaphoric relations with the feminine demonstrative *aceasta*, as illustrated by (6b), while the supine rejects the masculine/neuter syncretic form *acesta* in (6c) and can only be referred to by the genderless form *asta*, the common anaphor for CPs in Romanian, as illustrated in (6a).

(6) (a) Că Ion a venit, **asta** ştiu.
'That Ion came, I know it.'
(b) Am vorbit despre **interpretarea rolului Hamlet** în general.
'We spoke about the interpretation.INF of the role of Hamlet in general.'
Se pare ca **aceasta**/??**asta** îi consacră indubitabil pe actorii tineri.
'Apparently, this.F/??it undoubtedly validates the young actors.'
(c) Am vorbit despre **interpretatul rolului Hamlet** în general.
'We spoke about the interpretation.SUP of Hamlet in general.'
Se pare ca ***acesta**/**asta** îi atrage pe toţi actorii tineri.
'Apparently *this.M.N/it attracts all the young actors.'

In addition to gender, the supine also has a defective case declension, since unlike the infinitive ASN in (7a), it is usually unnatural with the dative-genitive case inflection in comparison to the nominative-accusative one:

(7) (a) Alunecările de teren apar din cauza
flows.the of terrain occur from cause
tăierii/***tăiatului** pădurilor.
cut.INF.GEN/cut.SUP.GEN woods.GEN
'Mudflows occur because woods are being cut down.'

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(b) **Tăierea/tăiatul** pădurilor provoacă
cut.INF.NOM/cut.SUP.NOM woods.GEN brings.about
alunecări de teren.
flows of terrain
'Cutting down the woods brings about mudflows.'

The nominal properties present in the infinitive ASN and absent in the supine ASN point to a (structural) defectiveness of the supine, which appears to be 'less nominal' than the infinitive. As a matter of fact, modification further confirms this hypothesis. Most adjectives are only allowed with the infinitive.[7] In the example in (8b), *atent* can only appear postnominally, which is an indication of its adverbial status.[8]

(8) (a) studierea **atentă/atenta** studiere a detaliilor
study.INF.the careful.ADJ/careful.ADJ.THE study.INF of details.GEN
(b) studiatul **atent/*atentul** studiat al detaliilor
study.SUP.the careful.ADJ.ADV/careful.ADJ.the study.SUP of details.GEN

We conclude for now that the nominal properties justifying the projection of nP and ClassP are motivated for the infinitive ASN, but not for the supine ASN.[9]

2.3 *Plural marking and determiner selection*

The nominal properties encoded under ClassP directly explain the most striking difference between infinitive and supine ASNs, namely the availability of plural marking. As we saw in (2), only the infinitive ASN displays morphological plural (cf. also (3) and (9a)). Even if some nouns homophonous with the supine can display plural marking, the presence of an

[7] Some relational adjectives seem to be grammatical with the supine, but we think that this has to do with the nature of these adjectives as substituting arguments of the original verb. Thus they cannot modify purely nominal categories, but most likely are DP-modifiers. This, however, is a topic for future research.

[8] We note that adverbs in Romanian are usually homophonous with adjectives and can only be distinguished from the latter due to their position. See also the discussion with respect to example (24).

[9] A *JL* referee mentions that the supine combines with the negative prefix *ne-*, which is a nominal property, as is shown in (ia). This, however, cannot be right, since fully verbal non-finite forms like the present participle (*gerunziu*) in (ib) also combine with the prefix *ne-* and assign (verbal) accusative case at the same time.

(i) (a) **ne**plecatul la gară la timp
NEG.leave.SP.the to station in time
(b) **Ne**găsind soluţia perfectă, Ion a fost foarte dezamăgit.
NEG.finding solution.the perfect Ion has been very disappointed

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argument is not allowed, which indicates that these nouns are not ASNs (see (9b)).

(9) (a) Numeroasele **interpretări** **ale** **acestui** **rol** de către
numerous interpret.INF.PL of this role.GEN by to
diverşi actori i-au schimbat stilul iniţial.
various actors it-have changed style initial
'The numerous interpretations of this role by various actors changed its original style.'
(b) tunsul (ierbii) – tunsurile (*ierbii)
cut.SUP.the grass.GEN – cut.SUP.PL.the grass.GEN

Moreover, as (10) illustrates, the infinitive combines with discrete quantifiers, whereas the supine only accepts mass quantifiers.

(10) (a) **Multe** spălări/**o** spălare a(le) rufelor
many wash.INF.PL/one wash.INF of laundry.GEN
distrug(e) ţesătura.
destroy(s) fabric.the
(b) **Prea** **mult**/***un** spălat al rufelor distruge ţesătura.
too much/one wash.SUP of laundry.GEN destroys fabric.the

The infinitive thus resembles count nouns which project Number and the supine resembles mass nouns which do not project Number.

Following Picallo's (2006) insight that the gender features under Class are a prerequisite for the Number projection, and considering the evidence for Class in infinitive ASNs and the lack of it in supine ASNs, we take the infinitive to project ClassP and NumP. In the following section, we will investigate the aspectual properties of the two ASNs, while seeking to determine which syntactic categories are projected in the supine.

2.4 *Aspectual properties*

Another important difference between the infinitive and the supine ASN concerns aspectual information. Cornilescu 2001 argues that infinitives are telic and supines atelic and that this information is carried by the two suffixes: *-re* (telic) and *-t*/*-s* (atelic). Although we agree that this aspectual contrast exists, we argue that the explanation is more complex and the two suffixes do not play similar roles in it. The aspectual information of the infinitive ASN is simply an inner aspect specification inherited from the VP (the original verb). The supine ASN, however, contributes outer aspect to the extent that it triggers aspect shift. Thus only the supine projects AspP.

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First, Cornilescu (2001: 489) notes that the infinitive is sensitive to the root to which it attaches and can only be derived from verbs that project their internal argument, (11). Thus unergative verbs can build supine ASNs, but not infinitive ASNs.

(11)

UNERGATIVE VERB	INFINITIVE	SUPINE
a locui 'to live'	*locuire	locuit
a munci 'to work'	*muncire	muncit
a rîde 'to laugh'	*rîdere	rîs

Second, the infinitive ASN must project its internal argument: it cannot project only the external argument like the supine does. (12a) contrasts with (13), where the presence of the theme allows the realization of the external argument in a 'by'-phrase.

(12) (a) *Infinitive + Subject*
*cîntarea lui Ion (only RN)
sing.INF.the the.GEN Ion

(b) *Supine + Subject*
cîntatul lui Ion
sing.SUP.the the.GEN Ion

(13) cîntarea imnului de către Ion
read.INF.the hymn.GEN by to Ion
'the singing of the hymn by Ion'

The supine *cîntatul* in (12b) allows the projection of the external argument in the absence of the theme. We can be sure that it is not an RN, because the supine generally cannot turn into an RN, unlike the infinitive. As Cornilescu shows, locative PPs that modify common nouns in Romanian must be preceded by the preposition *de* 'of', as in (14a). The same condition holds of infinitival RNs, (14b), and this is explained by the fact that RNs behave like common nouns, in that they no longer have verbal properties. But the supine can only be modified by the locative PP alone, (14c), as in the case of verbs, (14d). This indicates that the supine in (14c) is an ASN and not an RN.

(14) (a) oglinda *(**de**) la baie
mirror.the of at bathroom
'the mirror in the bathroom'

(b) cântarea lui Ion *(**de**) la baie
sing.INF.the the.GEN Ion of in bathroom

(c) cîntatul lui Ion (***de**) la baie
sing.SUP.the the.GEN Ion of in bathroom

(d) Ion cîntă (***de**) la baie.
Ion sings of in bathroom
'Ion is singing in the bathroom.'

These properties led Cornilescu to conclude that the infinitive carries telic aspect (see Cornilescu 2001: 484–490 for details). However, it seems that

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although most verbs that project their internal argument are telic, this is not always the case. The infinitive can be built from atelic verbs as long as they have an internal argument:

(15) urmărirea suspectului **timp de 3 zile /*în 3 zile**
follow.INF.the suspect.GEN time of 3 days/in 3 days
'the following of the suspect for 3 days/*in 3 days'

The grammaticality of the *for*-PP and the ungrammaticality of the *in*-PP indicate that the infinitive ASN in (15) is atelic, just like the original VP. This means that the infinitive does not contribute telic aspect; it simply inherits the telic/atelic specification of the VP, and it can be derived from any verb that has an internal argument.[10]

The aspectual contrast between the infinitive and the supine ASN can, however, be observed if we compare the two ASNs derived from a telic verb. To simplify the discussion, we use Jackendoff's (1991) feature [±b] (BOUNDEDNESS) to characterize both nominal and verbal entities with respect to number and aspect. Under the assumption that [+b] events can be located in space/time, while [−b] ones cannot, the contrast in (16) below shows that the infinitive ASN preserves the telic/[+b] aspect of the verb, while the supine ASN changes this specification to [−b] (Iordăchioaia & Soare 2008).

(16) Citirea/*cititul cărţii a avut loc **ieri/în sala**
read.INF.the/read.SUP.the book.GEN has had place yesterday/in
de lectură.
room of reading
'The reading of the book took place yesterday/in the reading room.'

Jackendoff argues that *until* is a function that binds [−b] events with a time to return [+b] events. Thus the supine, but not the infinitive, is expected to be compatible with *until*, as illustrated in (17). Given that pluralization turns [+b] entities into a [−b] multiplicity of entities, the plural infinitive is also grammatical with *until*, as confirmed below:

(17) (a) arestările/#arestarea lui Miron Cozma **pînă** la
arrest.INF.the.PL/arrest.INF.the the.GEN Miron Cozma until at
schimbarea guvernului
changing government.GEN
'Miron Cozma's arrestings until the government changed'
(b) cititul benzilor desenate **pînă** la vîrsta de 16 ani
read.SUP.the strips.GEN drawn until at age of 16 years
'reading comic strips until the age of 16'

[10] We thank an anonymous *JL* referee for drawing our attention to the fact that this property may be independent of the telic aspect argued for in Cornilescu (2001).

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2.5 *Aspect shift, pluractionality and AspectP*

In this section we address this aspectual difference in relation to the structural make-up of the two ASNs. We will show that unlike the infinitive, which preserves the inner aspect of the VP, the supine interacts with telic/[+b] verbal bases and imposes its own [−b] specification on them. Thus the supine nominal introduces ASPECT SHIFT (de Swart 1998). Consider the interaction between the supine and various verbal classes below.

With verbal bases denoting achievements, which are [+b], the supine is grammatical and expresses habituality, a semantic effect of a [−b] plurality of events (see also Lasersohn 1995):

(18) sositul lui Ion cu întîrziere la toate întîlnirile
arrive.INF.the the.GEN Ion with delay at all meetings
importante
important
'Ion's (habit of) arriving late at all important meetings'

With states, known as [−b], the supine usually requires a bounding function like *until* to turn the unbounded event into [+b]. In (19) *pînă* 'until' is obligatory and, in this case, the supine expresses a plurality of bounded states and habituality.

(19) statul lui Ion la Maria/dormitul lui
stay.SUP.the the.GEN Ion at Maria/sleep.SUP.the the.GEN
Ion *(**pînă** după-amiaza tîrziu)
Ion until afternoon late
'Ion's (habit of) staying at Maria's/sleeping until late in the afternoon'

I-level predicates are impossible to locate in space and time (Kratzer 1995), so they never become [+b]. Consequently, they are also excluded in the supine:

(20) ***cunoscutul** limbilor străine/***descinsul** omului
know.SUP.the languages.GEN foreign/descend.SUP.the man.GEN
din maimuţă
from monkey

Accomplishments, punctual events and semelfactives pattern with achievements as [+b] and activities with states as [−b] (see Iordăchioaia & Soare 2008: 205–208).

Iordăchioaia & Soare (2008) argue that the aspectual contribution of the supine resembles that of PLURACTIONAL OPERATORS (POs) in polysynthetic languages (see Lasersohn 1995, Van Geenhoven 2004). To confirm this, note the similarity between the Romanian supine in (21c) and the West Greenlandic PO *qattaar* 'again and again' in (21a) and (21b) in

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exhibiting DISTRIBUTIVITY EFFECTS WITH PLURALS, a property typical of POs (Laca 2006):

(21) (a) ?**Qaartartoq** sivisuumik qaa**qattaar**poq.
bomb.ABS.SG lengthy.INS explode.again.and.again.IND.ITR.3SG
'?A bomb exploded again and again for a long time.'
(b) **Qaartartut** sivisuumik qaa**qattaar**put.
bombs.ABS.PL lengthy.INS explode.again.and.again.IND.ITR.3PL
'Bombs exploded again and again for a long time.'
(c) ucisul **jurnaliştilor/*jurnalistului** de către
kill.SUP.the journalists.GEN/journalist.the.GEN by to
mafia politică
mafia political
'the killing of journalists/*the journalist by the political mafia'

The PO *qattaar* in (21a) and (21b) turns the [+b]/telic event of 'explode' into [−b] and suggests a plurality of explosions. The singular theme 'a bomb' in (21a) is only grammatical if it is understood as a 'magic bomb' that explodes more than once (Van Geenhoven 2004). No problem arises with the plural 'bombs' in (21b), since the multiple explosions are distributed over the various bombs, each involved in one explosion. The same explanation applies to the supine in (21c). The supine contributes a PO which suggests a plurality of killing events. Since the same journalist cannot be killed more than once, the singular theme is ungrammatical. The plural is fine, as it is distributed over the plurality of events.

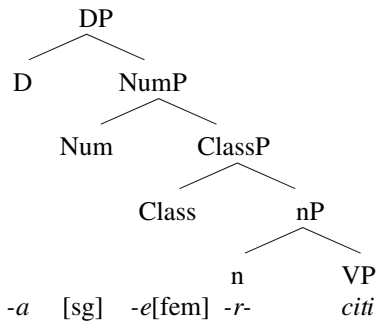
Since the supine contributes intrinsic [−b] aspect by pluralizing bounded events and thus triggering aspect shift, Iordăchioaia & Soare (2008, 2009) argue that this specification should be correlated with an Aspect projection in the syntax, in the same way the grammatical aspect contributed by particular verb forms is captured by such a projection (see also Section 3 below). Aspect shift motivates an AspP in the syntax.

2.6 *The functional structure of Romanian ASNs*

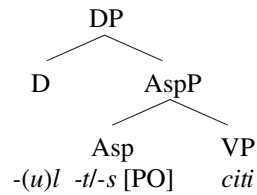
On the basis of the observations above, we conclude that the two Romanian ASNs realize two different syntactic ways of expressing plurality/unboundedness. There is, on the one hand, a nominal pattern projecting NumP which hosts morphological plural. This is the pattern of the telic infinitive ASN and is represented in (22). On the other hand, there is a verbal pattern where plural is expressed semantically under AspP [−b] via a PO. This is the structure of the supine ASN in (23).

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(22) *The infinitive*



(23) *The supine*



In (23) we place the supine suffix *-t/-s* under the Asp head as contributing the [−b] PO, as this suffix is also responsible for perfective/[+b] aspectual information in the structure of past participle verbal forms. Thus *-t/-s* is underspecified for the context of insertion. It can realize pluractional aspect as well as perfective aspect depending on the syntactic context in which it appears, either nominal or verbal. In this we follow Halle & Marantz (1993), but see also Embick (2004) for an analysis of English participles based on underspecification and Ippolito (1999) for Italian nominalizations ending in *-ata*, which resemble Romanian supines in having a participial-like structure. In Section 3 we will discuss another case with the English suffix *-ing* which occurs in the verbal progressive, the verbal gerund and the nominal gerund.

The projection of an AspP in the supine ASN is also supported by the compatibility with aspectual adverbs like *constantly* (see Alexiadou 1997, Cinque 1999). Infinitive ASNs disallow aspectual adverbs and much prefer the corresponding adjectives, see (24b, c). Aspectual adjectives are ungrammatical with the supine, as the contrast between (24c) and (24d) with a prenominal adjective shows.

(24) (a) cititul (**constant** al) ziarelor (**constant**)
read.SUP.the constantly of newspapers.GEN constantly
'constantly reading newspapers'
(b) omiterea (***constant** a) unor informaţii (??**constant**)
omit.INF.the constantly of some information.GEN constantly
(c) ***constantul** citit al ziarelor
constant read.SUP of newspapers.GEN
(d) **constanta** omitere a informaţiilor
constant omit.INF of information.GEN

Assuming the structures in (22) and (23) above, the two ASNs in Romanian confirm the idea of a complementary distribution between

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nominal NumP and verbal AspP. The presence of morphological plural in ASNs depends on the projection of these categories.

2.7 *English verbal vs. nominal gerund*

In this section we show that the distinction between verbal and nominal gerunds in English provides further support for the verbal vs. nominal patterns that we identified with respect to the supine and the infinitive ASNs in Romanian.

Depending on the possibility of assigning accusative case to the theme argument, we distinguish between the verbal and the nominal gerund: the former assigns accusative case, as in (25a), the latter realizes its theme as an *of*-PP (see Lees 1960, Chomsky 1970).

(25) (a) Emma's **reading the poem**.
(b) Emma's **reading of the poem**.

Further properties correlate with this distinction: the subject of the verbal gerund cannot be replaced by a determiner, but this is possible with the nominal gerund, (26); the verbal gerund only allows adverbial modifiers, the nominal gerund only allows adjectives, (27).

(26) (a) ***That**/***The** criticising the book annoyed us.
(b) **The** jumping of the cows annoyed us.
(27) (a) Pat disapproved of my **quietly**/***quiet** leaving the room.
(b) The **careful**/***carefully** restoring of the painting took six months.

Under the standard assumption that adverbs modify verbal structures and adjectives nominal structures, this contrast suggests that the verbal gerund contains a verbal internal structure (Abney 1987, Borer 1993, Kratzer 1994 and others), while the nominal gerund has a nominal internal structure. This difference is maintained with respect to aspectual modifiers, as illustrated in (28).

(28) (a) I am sick of her **constantly**/***constant** criticizing me.
(b) He could not tolerate her **constant**/***constantly** criticizing of him.

Following Alexiadou (1997) and Cinque (1999), this suggests that, like the Romanian supine, the verbal gerund hosts an AspP which is absent in the nominal gerund.[11] For now, we assume with Pustejovski (1995) and

[11] There are of course differences between the English verbal gerund and the Romanian supine concerning their internal syntax. As an anonymous *JL* referee has pointed out, the English verbal gerund assigns accusative, while the Romanian supine assigns genitive case. We will not provide a complete comparative analysis of the two ASNs in this paper; our main concern is to point out the similarities that indicate the presence of outer aspect in both. See Alexiadou et al. (to appear a) for some preliminary thoughts on that issue.

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Alexiadou (2001) that the verbal gerund *-ing* suffix carries imperfective aspect. We will return to this in Section 3.

The general consensus with respect to the structure of verbal gerunds is that they lack nominal internal properties. As a consequence, they also lack plural morphology:

(29) *He could not stand her **criticizings** me.

In view of the parallelism between the Romanian supine/infinitive ASNs and the English verbal/nominal gerunds, we expect the nominal gerund to allow plural and to project NumP. As we will see, plural is indeed possible with some nominal gerunds, but it is impossible with others, a fact for which we offer a detailed explanation below.

3. The nature of the Aspect projection in ASNs

3.1 *The English nominal gerund*

The data in (30)–(31) illustrate the interaction between the nominal gerund and plural morphology. Some gerunds allow plural, (30), others disallow it, (31a), but in some cases, the nominal gerund is excluded in favor of some other nominalizer, (31b).

(30) I heard of repeated **killings** of unarmed civilians.
(31) (a) *The repeated **fallings** of the stock prices induced their further decline.
(b) The frequent late **arrivals**/***arrivings** of the train made me take the bus.

We believe that the explanation of these facts lies in the sensitivity of the nominalizer *-ing* (different from the verbal gerund suffix *-ing*) to the INNER ASPECT of the original verb and its competition with other deverbal nominalizers.

This was noted in Borer (2005, vol. 2: 239–245), who claimed that the nominalizer *-ing* is ungrammatical with telic events like the achievements in (32), but is fine with atelic events (activities and semelfactives), as in (33).

(32) (a) *the arriving of the train
(b) *the erupting of Vesuvius
(c) *the exploding of the balloon
(33) (a) the sinking of the ships
(b) the falling of the stock prices
(c) the jumping of the cows

Other affixes, (34a), the verbal gerund, (34b), and the progressive, (34c), accept telic verbs.

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(34) (a) the arrival of the train
(b) The train arriving at 5 pm is unlikely.
(c) The train is arriving.

We previously said, following Jackendoff (1991), that only [+b] entities may pluralize. If the nominalizer *-ing* tends to select atelic events, which are [−b], we expect it to reject plural. This explains the example in (31a) above in contrast with (33b). The ungrammaticality of (31b) is a consequence of the incompatibility of the nominal gerund with telic verbs, so the nominalizer *-al* is preferred (see also (34a)).

However, note that the inner aspect sensitivity of the nominalizer *-ing* also has to do with the availability of other nominal suffixes for the same structure. For instance, with respect to *arrive*, the nominalizer *-ing* loses the competition with the suffix *-al*. But given that there is no other ASN available for *kill* (another telic verb), the nominalizer *-ing* is grammatical and it may mark plural, as expected (see (30) above).

We conclude that Number is projected only in nominal gerunds from telic verbs, which are rare.[12] With the Romanian infinitive ASN the situation is different because most of the verbs they derive from are telic, so NumP and plural are usually available.

3.2 *Inner vs. outer aspect*

So far, we have concluded that the verbal gerund projects Aspect, while the nominal gerund usually requires atelic aspect. In this section, we investigate the nature of the aspectual specification in the two ASNs, in particular, whether the nominal gerund projects the same kind of AspP as the verbal gerund, a different one, or none at all.

Telicity is a property usually associated with the inner aspect/Aktionsart, i.e. an aspectual value lexically determined and composed within the VP. Verkuyl (1993), Borik (2002) and others distinguish between INNER ASPECT (or Aktionsart) and OUTER (or grammatical) ASPECT. The latter is usually associated with the notion of perfectivity and is a functional projection above the VP. Here, we make use of telicity and perfectivity as referring to inner

[12] An anonymous *JL* referee has given us several counterexamples, as in (i), to the claim that nominal *-ing* rejects telic bases. As mentioned in the main text, this idea was argued for in Borer (2005, vol. 2) and we have provided counterexamples to it as well (see (30)). What is important for our purposes is that telic nominal gerunds can pluralize, as is shown (ii).

(i) (a) the **crossing of the street** three times
(b) the **reading of the book** several times
(ii) (a) On his frequent **crossings** of the Atlantic he has often be accompanied by his wife.
(b) In my many/frequent **readings** of this book I failed to see its structure.

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and outer aspect, respectively, while boundedness is a term that covers both, as well as the mass–count distinction in the nominal domain.

The projection of AspP in Romanian supine ASNs has to do with outer aspect, since the supine imposes its own [−b] aspectual value independently of the inner aspect of the verb. The same may be noticed with the progressive form, a typical outer aspect specification, and the verbal gerund in English. In (34b, c) above we saw that the two are compatible with telic events, but they are just as fine with atelic ones. Moreover, a telic event in the verbal gerund can be modified by a *for*-PP (36).[13]

(35) (a) John **is working** now.
(b) John's **reading books** until late in the night worries his mother.
(36) (a) John wrote the letter **in 3 days/*for 3 days**.
(b) John's writing the latter **for 3 days** annoyed everybody.

We thus conclude that the structure of the verbal gerund resembles the one of the Romanian supine, with the suffix *-ing* contributing and realizing imperfective outer aspect (see also Alexiadou 2005).[14,15] The only nominal layer

[13] A *JL* referee has expressed doubts concerning our claim that the verbal gerund *-ing* contributes imperfective aspect like the progressive *-ing*. They argue that two progressives, like those in (ib), are incompatible, while the verbal gerund is fine with the progressive, which may indicate that the two *-ing*s in (ia) contribute different information.

(i) (a) He recollects his hav**ing be**en runn**ing** for two hours.
(b) *He is be**ing** runn**ing**.

We believe that (ia) is grammatical because the verbal gerund *-ing* turns the perfective/bounded *have been running* into imperfective/unbounded. In (ib) the progressive/unbounded *-ing* cannot attach to another unbounded form. But note that the verbal gerund *-ing* is just as ungrammatical with a progressive form, shown in (ii). This indicates that, like the progressive, the verbal gerund *-ing* is imperfective/unbounded.

(ii) *his be**ing** runn**ing** for the whole afternoon

We agree, however, that the nature of the imperfectivity/unboundedness in the gerund *-ing* may be different from that in the progressive *-ing*, but this is an issue we have to leave for future research.

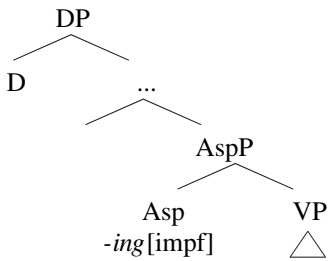
[14] But see footnote 11.

[15] As correctly pointed out by a *JL* referee, matters are not that simple when it comes to the internal syntax of English gerunds. First, we have not discussed subtypes of the verbal gerund, e.g. Acc-ing, PRO-ing, and Poss-ing, and how these differ (see Abney 1987, Siegel 1998). Second, it has been pointed out in the literature that the verbal gerund is interpreted as an assertion of a fact (e.g. Fraser 1970, Zucchi 1993). This indicates that the verbal gerund might internally be more like a clause than is suggested here. This does not undermine our point that the verbal gerund contains an AspectP. Third, the referee is also correct in pointing out that the *-ing* affix does not strictly express progressive aspect (see also Siegel 1998), and nor does it introduce pluractionality. Following Siegel, we assume that the verbal gerund contains an AspectP which (i) is insensitive to inner aspect, and (ii) modifies the inner aspect of the predicate. As we are more interested in establishing cross-linguistic patterns, we leave a more detailed discussion of all the issues raised by the referee for future research.

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in the verbal gerund is the DP which explains its nominal external syntax (see Borer 1993). We do not exclude the presence of possibly other verbal layers between the DP and the AspP, (see footnote 15).

(37) *The verbal gerund*



In contrast to the verbal gerund, the nominal one inherits the inner aspect of the verb: if the verb is [+ b], the plural is available, as in (30) above; if the verb is [− b], the plural is unavailable, as in (31a) above.[16] This also means that the nominal gerund does not trigger aspect shift. In this situation, a syntactic Aspect projection is unmotivated, just as in the Romanian infinitive.

3.3 *English verbal gerund vs. Romanian supine*

Let us make a short digression to compare the English verbal gerund with the Romanian supine. The two ASNs differ in two important respects which are related to each other and reflect language-specific properties. First, in Romanian, the enclitic definite article realizes D. In English, no determiner is present and the subject moves from its base position to SpecDP (Borer 1993, Kratzer 1994). This correlates with the properties of the DP projection across languages. DP is an A-position in English (Abney 1987) and rather similar to a CP projection (subordinator) in Romanian.[17]

[16] The strong unbounded character of the nominal gerund is reminiscent of the feature [–perf] of the progressive *-ing*. Note that the nominalizer *-ing* has some properties of the progressive, but not all. There is a complex diachronic relationship between the two. The modern English progressive derives from a structure of the following form: *I am on hunting*, i.e. the progressive is a nominal construction embedded in a locative PP (see also Bolinger 1971).

[17] In English, Abney (1987) argues in detail that SpecDP can license thematic arguments and thus is an A-position. However, Horrocks & Stavrou (1987) point out that languages differ as far as the status of SpecDP is concerned: in other languages, it functions as an A'-position enabling extraction out of the DP.

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Moreover, if we are right in analyzing the verbal gerund as lacking ClassP and more importantly NumP, we also expect that no definite determiner will appear in English. This is especially clear in systems like the one put forth by Borer (2005, vol. 1), who argues that the definite determiner in English can be merged lower than D in projections that correspond to our ClassP and NumP. Importantly, the definite article can merge as low as Class. If gerunds lack NumP as well as ClassP, there is no position for the definite article to merge. This means that the English definite article is not only a form to lexicalize definiteness but can also lexicalize Class, in the absence of other class marking in the language. We will encounter this case with nominal gerunds in Section 4.

The definite article in Romanian is different. According to Dobrovie-Sorin 1987 and Giusti 1995, the Romanian definite determiner lexicalizes D, i.e. it is merged directly under D. The article itself cannot be a Classifier or a Number marker in Romanian, as also suggested by the fact that the language makes use of distinct exponents to realize these categories (see our remarks on class/gender marking in Section 2.2 above). These are absent in the supine, so the structure of this ASN involves only a D head. As D must be licensed, the definite article is inserted in D.

The second important difference between the English gerund and the Romanian supine concerns the case of the internal argument. In the supine, it bears genitive case; in the gerund, accusative case. We believe that this is related to the first property. Because of its properties, the affixed article in the supine creates a nominal environment, albeit a defective one, hence the case that appears is the one found in nominal environments.

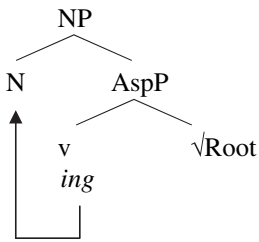
4. The Classifier projection and aspect

Returning to the nominal gerund, the question that arises is how to represent its inner aspect specification in the syntax, so that we allow a Number projection only with telic verbs. In other words, do we need an inner Aspect projection?

If inner aspect can be derived from the properties of the VP within the ASN, ideally we do not need such a projection in the syntax. In her decomposition of verbal structure, Borer (2005, vol. 2) argues that *-ing* realizes one of the inner aspect heads, namely the so-called 'process head'. Her analysis is as follows: *-ing* is first projected within the domain of inner aspect realizing Process and then moves to N (our n), as it is inherently nominal and needs to check N features. This is illustrated in (38).

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(38)



We believe that such an analysis cannot work for the following reason: It has been argued that English has special affixes realizing Process (e.g. *-ify* in (39) below) and these appear inside the nominalizer (Alexiadou 2009, Harley 2009). On a strong decomposition view, *-ing* should realize some other, additional, head.

(39) humid-if-y humid-if-ying

We agree with Borer that the inner aspect of an event is compositionally derived from its lexical specification and its (non)quantized arguments, within the VP (see Verkuyl 1993). We thus propose that the nominalizers *-ing* and *-re* in Romanian infinitives do not contribute anything to the inner aspect. Instead they simply select a VP with atelic or telic aspectual properties.

4.1 *The [±count] feature on ClassifierP*

For Romanian infinitives, we showed that a Classifier projection is motivated to host the nominal properties of the ASN (gender features and/or general declension information) and as the input for a further Number projection (see Picallo 2006). Given the parallelism between the verbal inner aspect and the nominal classifier as set out by Fassi Fehri (2005), we propose to express the telic inner aspect of Romanian infinitives under a [+count] feature on ClassP.

Picallo (2006) does not address the technical details of how ClassP is meant to 'feed' nominal Number. But given that NumP hosts the plural marker and that only bounded entities may be pluralized, the Classifier should provide some information about the (un)bounded character of the nominal. The feature [+count] is meant to provide precisely the syntactic specification of a nominal as being [+b]. We take this feature to be available for both events and common nouns: it is thus present on telic ASNs and on count nouns, both [+b] and capable of undergoing pluralization. In these terms, ClassP [+count] may be viewed as the input for NumP, as Picallo argues.

Within this picture, mass nouns should have a ClassP [−count], since they are uncountable and thus exclude the projection of NumP. Note that a

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ClassP is still motivated for mass nouns, if we think of Class as hosting the nominal information of a noun. Mass nouns do have all the nominal properties that count nouns have, the only difference is that they are unbounded and thus lack Number. We express this property by appealing to a ClassP [−count] feature, which blocks the projection of NumP.

The same feature [−count] can be taken to supply the information that the English nominal gerund from atelic verbs is unbounded and thus does not allow pluralization. The nominal features we included under the Classifier for Romanian infinitive ASNs are hard to verify in English, since inanimate nouns are all neuter and there is no case declension. But the literature has already argued for a Classifier projection in English nouns (e.g. Kratzer 2005). In order to show that the feature [−count] is motivated in atelic ASNs with nominal properties, as in the English nominal gerund (see Section 2.7 above), we provide evidence from a similar ASN in Spanish, a language that clearly expresses gender features on nominals (Picallo 2006).

4.2 *Spanish nominal infinitives* (*SNIs*)

De Miguel (1996) distinguishes between verbal and nominal infinitive ASNs in Spanish. These differ primarily in the way they realize their external argument: either with nominative case or with *de* 'of', respectively:[18]

(40) (a) el murmurar **la gente**
the murmur.INF the people.NOM
'the murmuring of the people'
(b) el murmurar **de** las fuentes
the murmur.INF of the fountains
'the murmuring of the fountains'

Here, we are concerned with the nominal pattern in (40b). De Miguel (1996), Demonte & Varela (1997) and Fábregas & Varela (2006) show that SNIs carry atelic/unbounded aspect, since they systematically reject telic verbs. They are ungrammatical with achievements and accomplishments, as seen in (41a, b). But a typical accomplishment that becomes atelic due to a bare plural argument, as in (41c), is fine. As expected, SNIs also reject plural, in (41d).

(41) (a) ***El llegar** tardío **de Ju**an nos preocupó a todos.
the arrive.INF late of Juan us worried to all
(b) ***El comprar una casa de Juan** nos alegró.
the buy.INF a house of Juan us made.happy

[18] The internal argument receives accusative case in the verbal infinitive and can only surface as an incorporated bare noun (cf. the theme *casas* 'houses' in (41c)) in the nominal infinitive.

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(c) el constante **construir** **casas** de los albañiles
the constant build.INF.SG houses of the workers
(d) *los (constantes) **construires** casas de los albañiles
the constant build.INF.PL houses of the workers

In this respect, SNIs resemble English nominal gerunds. Likewise, SNIs are known to allow only adjectival modifiers: either manner, as in (42a), or aspectual, (42b).

(42) (a) el andar **errabundo**/***errabundamente** de Juan
the go.about.INF aimless/*aimlessly of Juan
(b) el **constante** temer (***constantamente**) de Juan
the constant fear.INF constantly of Juan

Unlike English nominal gerunds, SNIs can be tested for gender features. De Miguel (1996) shows that SNIs carry masculine gender which, although not visible in the nominalizer *-r*, becomes obvious in anaphoric contexts, in which an SNI can be referred to only by the masculine pronoun *él* and not by the default neuter pronoun *ello*, usually employed with CPs. In this respect, SNIs are similar to the Romanian infinitive in (6b):

(43) Accostumbrado al dulce mirar de su amada, ya no
used.to to.the sweet gaze.INF of his beloved now not
podía vivir sin **él**/***ello**.
could live without him/it
'Used to the sweet gaze of his loved one, he could no longer live without it.'

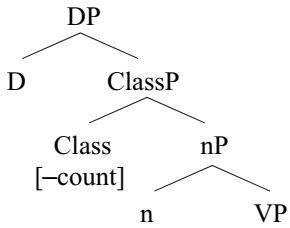
Thus there is clear evidence that SNIs, like Romanian infinitives, project a ClassP which hosts their gender features. Since the nominalizer *-r* only selects atelic verbs, the Classifier in SNIs should carry a [−count] specification which, just as in the case of mass nouns, blocks a further NumP. We take the syntactic structure in (44) to be available for SNIs and for most English nominal gerunds, i.e. the atelic ones.

For the few English nominal gerunds which are available with telic verbs (e.g. (30), see also footnote 12), we assume the syntactic structure in (45), the same as for the Romanian telic infinitive in (22), now including the feature [+count] on the Classifier. The D head hosts the determiner, Num the plural marker, Class carries nominal features and the [±count] feature, and n hosts the suffix that nominalizes the VP.[19]

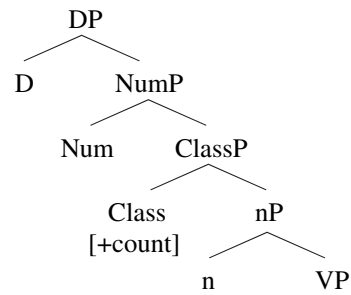
[19] This analysis crucially requires for the ClassP to see the features within the VP domain, which can be formalized in terms of an Agree relationship: the specification of ClassP concerning singularity, division and homogeneity (Borer 2005, vol. 1: ch. 4) has to Agree with the specification of the predicate via probing into the VP (see Alexiadou to appear). This is possible irrespectively of whether or not nP is a phase, as Agree is not subject to the Phase-Impenetrability Condition and intervention effects; see Bošković (2007).

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(44) *Atelic nominal ASNs*



(45) *Telic nominal ASNs*



4.3 *German* -ung *ASNs*

The clear sensitivity of an ASN nominalizer to the inner aspect of the verb, as is the case with SNIs, is not always given. We have seen that ASNs that have been considered to be inner-aspect sensitive are in fact more flexible. The Romanian infinitive is mostly derived from telic VPs, and the nominal gerund from atelic ones, but the other option is also available in either case. These ASNs are ambiguous between the two structures in (44) and (45).

Another case is given in Alexiadou et al. (to appear a), who show that German *-ung* ASNs are ambiguous with respect to inner aspect. They may be derived from both telic and atelic verbs, but plural is only available for the former, see (46a, b) and (46c, d).

(46) (a) die **Beobachtung** von Vögeln
the observe.UNG of birds
'the observation of the birds'

(b) *die **Beobachtungen** von Vögeln
the observe.UNG.PL of birds

(c) die gezielten **Tötungen** der politischen Führer durch
the targeted kill.UNG.PL the.GEN political leaders by
die Armee
the army
'the targeted killings of the political leaders by the army'

(d) seine zahlreichen **Erfindungen** von Sportspielen
his numerous invent.UNG.PL of sport.games
'his numerous inventions of sport games'

The atelic ASN in (46a) does not maintain its ASN status when pluralized. The plural nominal *Beobachtungen* in (46b) may only be interpreted as an RN and, in this case, the theme in (46a) is understood as an agent, a role

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incompatible with the non-human property of the noun *Vögeln*.[20] With telic ASNs, the plural is available, as seen in (46c, d); the theme is also present, so there is no doubt as to the ASN status of these nominals.

In conclusion, German *-ung* ASNs are also ambiguous between the syntactic patterns in (44) and (45). In the following section, we will summarize the results on the internal structure of ASNs and its relation to the availability of morphological plural.

4.4 *Pluralization patterns in ASNs*

On the basis of the interaction between the aspectual properties of ASNs and their nominal/verbal properties, we have identified four syntactic projections relevant for the (un)availability of morphological plural in ASNs: Asp, Num, Class and n. The first two are directly related to boundedness and plural marking; the last two encode nominal properties with significant implications for plural marking. The table in (47) summarizes our results on ASNs in Romanian, English, Spanish and German:

(47) *Plural marking and functional projections in ASNs*

ASN	ASPECT [±BOUNDED]	PLURAL	FUNCTIONAL CATEGORY	SUFFIX & ITS POSITION	
ROMANIAN	+	+	Number	*-re*:	n
INFINITIVE	−	−	Classifier[−count]	*-re*:	n
ROMANIAN SUPINE	−	−	Aspect	*-t*/*-s*:	Aspect
VERBAL GERUND	−	−	Aspect	*-ing*:	Aspect
NOMINAL	+	+	Number	*-ing*:	n
GERUND	−	−	Classifier[−count]	*-ing*:	n
SNI	−	−	Classifier[−count]	*-r*:	n
GERMAN	+	+	Number	*-ung*:	n
-UNG ASNs	−	−	Classifier[−count]	*-ung*:	n

[20] In Grimshaw (1990) the impossibility of projecting the theme argument indicates that the nominal is not a complex event (ASN, in our terms). The agent, if projected, is an adjunct and not an argument.

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Given that plural marking is a nominal characteristic, ASNs allowing morphological plural are first of all nominal, a fact confirmed by the presence of n, Classifier and Number, all of which are nominal projections. This is the case with most Romanian infinitives and other telic ASNs. Despite the nominal properties hosted by the n and Classifier heads, in Spanish nominal infinitives and other atelic ASNs, Number is blocked by the atelic inner aspect encoded under Class [−count].

The nominal character of the morphological plural already anticipates the unavailability of plural with ASNs exhibiting verbal properties for which projections higher than the VP are responsible. In particular, the presence of an AspectP has long been argued in the literature to be in complementary distribution with a NumberP (see Fassi Fehri 2005 for an overview). This is confirmed by the Romanian supine and the English verbal gerund, both carrying verbal aspectual properties and lacking the nominal features usually apparent with other (rather nominal) ASNs. Importantly, both the supine and the verbal gerund lack a nominalizer, their suffix expressing aspectual information. It is only the D head that makes these ASNs behave like nominals with respect to their external syntax. The internal structure is verbal. We come back to this issue in Section 5.

5. Challenges and refinements: Slavic ASNs

The ASN data in Romanian, English, Spanish and German we have discussed confirm two important generalizations in the literature concerning the relation between pluralization and boundedness on the one hand, and their syntactic representation on the other. One of them says that only bounded entities may be pluralized (Mourelatos 1978, Jackendoff 1991). The other concerns the mutual blocking effect between verbal Aspect and nominal Number in the syntax (Rouveret 1994, Alexiadou 2001).

The aspectual properties of the ASNs play a fundamental role in our argumentation. However, none of the above-documented languages preserves clear verbal aspectual morphemes in the structure of the ASNs. Note that the past perfect (i.e. bounded) *-t/-s* suffix actually contributes unboundedness in the supine. The verbal gerund *-ing* maintains its unbounded value, but it is homonymous with the nominalizer *-ing*. Moreover, despite their aspectual contribution, neither of the two verbal ASNs exhibit aspectual pairs (i.e. bounded vs. unbounded), as is usually the case in the verbal domain.

In this section, we present data from Slavic languages known to exhibit a very rich morphology that carries aspectual information. Polish *-nie/-cie* ASNs and Bulgarian *-ne* nominals preserve unambiguous aspectual morphemes from the verbal domain. In addition, in Polish, aspectual pairs of ASNs with perfective vs. imperfective value are available. These two kinds of ASNs allow us to test our generalizations and to propose

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further refinements to our analysis and the ASN patterns established thus far.

5.1 *Polish* -nie/-cie *ASNs*

Polish *-nie/-cie* ASNs inherit the full aspectual specification of their related verbs, as is shown by the verbal patterns in (48a, b) and the corresponding ASNs in (49a, b).[21]

(48) (a) Jan **przeczytał/*czytał** gazetę **w** dwie godziny.
Jan read.PF/read.IMPF newspaper in two hours
'Jan read the newspaper in two hours.'
(b) Jan **czytał/*przeczytał** gazetę **przez** dwie godziny.
Jan read.IMPF/read.PF newspaper for two hours
'Jan read newspapers for two hours.'

(49) (a) **przeczyta-nie/*czyta-nie** gazety **w** dwie godziny
read.PF-NIE/read.IMPF-NIE newspaper.GEN in two hours
(b) **czyta-nie/*przeczyta-nie** gazety **przez** dwie godziny
read.IMPF-NIE/read.PF-NIE newspaper.GEN for two hours

The Polish 'in'-PP in (48a) and (49a), which is known to modify bounded events, is only grammatical with the perfective form of the verb or the ASN; the imperfective forms are excluded. By contrast, the Polish 'for'-PP in (48b) and (49b) is compatible with the imperfective forms and incompatible with the perfective ones in both verbs and ASNs.

The aspectual similarity between ASNs and verbs indicates that these ASNs project an AspectP in the syntax (see also Schoorlemmer 1995, Rozwadowska 1997). Along with maintaining verbal aspectual morphology, the *-nie/-cie* ASNs also exhibit aspectual pairs perfective vs. imperfective, in our terms bounded vs. unbounded.

5.1.1 *Plural morphology*

An important generalization we highlighted in the first part of this paper is that the projection of Aspect blocks Number. Given that Polish *-nie/-cie* ASNs project Aspect, we expect them to block Number, and thus to disallow plural marking. However, the data in (50) below clearly indicate that this is not the case:

(50) (a) częste opóźnione **przyby-cia/odejś-cia** pociągu
frequent delayed arrive.PF-CIE.PL/depart.PF-CIE.PL train.GEN

[21] Polish does not have a determiner system, but we include determiners in our English translations where appropriate to convey the intended meaning.

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(b) Częste **odkry-cia** nowych terapii raka
frequent discover.PF-CIE.PL new treatments cancer
przyniosły naukowcom międzynarodową sławę.
brought researchers international fame
'The frequent discoveries of cancer treatments brought the researchers international fame.'

(c) częste **wyjś-cia** Jana przez tylne drzwi w
frequent exit.PF-CIE.PL Jan.GEN through back door in
celu uniknięcia spotkania z szefem
order avoiding meeting with boss

The above ASNs have both aspectual and plural marking. The former is a verbal characteristic, the latter a nominal one. This is a pattern we did not encounter in the languages we investigated earlier in this paper: the supine ASN and the verbal gerund disallow plural.

A first important fact to notice about the ASNs in (50) is that their corresponding imperfective pairs are ungrammatical with plural marking. This means that our second generalization is respected: only bounded (perfective) ASNs allow plural, the unbounded (imperfective)[22] ones, in (51), do not.

(51) (a) *częste opóźnione **przybywania/odjeżdżania** pociągu
Frequent delayed arrive.IMPF.NIE.PL/depart.IMPF.NIE.PL train.GEN

(b) *Częste **odkrywania** nowych terapii raka
frequent discover.IMPF.NIE.PL new treatments cancer
przyniosły naukowcom międzynarodową sławę.
brought researchers international fame

(c) *częste **wychodzenia** Jana przez tylne drzwi w
frequent exit.IMPF.NIE.PL Jan.GEN through back door in
celu uniknięcia spotkania z szefem
order avoiding meeting with boss

Second, if we compare *-nie*/*-cie* ASNs with the Romanian supine and the verbal gerund, the other two ASNs which project an AspP, we note that the suffixes *-t*/*-s* and *-ing* that we associate with the supine and the gerund are not nominalizers, but rather aspect markers. Polish ASNs, however, bear both an aspectual affix and a nominalizing suffix. The aspect comes with the verbal root (e.g. the perfective prefix *prze-* in (48), (49), the imperfective suffix *-wa-* in (51), etc.), but the nominalizer is either *-cie* or *-nie* and it does not carry

[22] The imperfective of these ASNs is formed with the suffix *-nie*, substituting *-cie*. The two suffixes are not in complementary distribution (i.e. the former attaching only to imperfective roots and the latter only to perfective ones), since *-nie* may attach to both forms in (49). It would, however, be worth investigating whether *-cie* requires perfective roots. This, too, is a topic that we must leave for future research.

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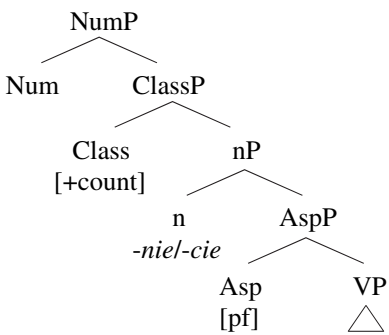
any aspectual information. In conclusion, Polish *-nie/-cie* ASNs provide morphological evidence for the presence of both an Aspect and an n head.

5.1.2 *Co-occurrent AspectP and NumberP*

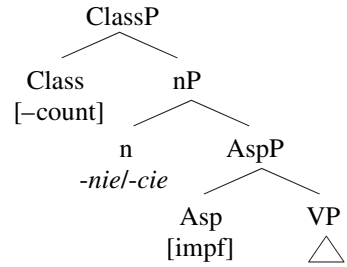
In view of the evidence for both an AspP and an nP, we follow Schoorlemmer (1995) and Rozwadowska (1997), and propose that *-nie/-cie* ASNs are nominalizations of AspP. That is, n nominalizes the AspP layer, and not the VP layer, as was the case before.

If an n head is present in the syntax, in our approach, a Classifier is the next projection (Picallo 2006). The aspectual properties of *-nie/-cie* nominals may be encoded on the [±count] feature under Classifier, just as in the ASNs that host a nominalizer. Perfective *-nie/-cie* ASNs thus resemble other telic ASNs in hosting a Class [+count]. The presence of ClassP [+count] supports the projection of Number and explains the grammaticality of plural in (50). Imperfective ASNs resemble SNIs and other atelic ASNs in hosting a Class [−count] which blocks plural in (51). Assuming that Polish does not project a DP, *-nie/-cie* ASNs are either NumPs or ClassPs:[23]

(52) *Perfective* -nie/-cie *ASNs*



(53) *Imperfective* –nie/-cie *ASNs*



The difference between *-nie/-cie* ASNs and the other ASNs discussed here is that the Classifier encodes outer aspect in the former and inner aspect in the latter. But considering that the feature [±count] is meant to accommodate verbal aspect/boundedness within a nominal structure and that both inner and outer aspect are the verbal manifestations of boundedness, nothing prevents us from treating inner and outer aspect similarly when it comes to their interaction with nominal features.

If Polish lacks a DP (but see footnote 23), the NumP and the ClassP are responsible for the nominal external syntax of the *-nie/-cie* nominals. Supine

[23] The presence of a D layer in languages without overt determiners has been controversially discussed in the literature (see Alexiadou et al. 2007 for an overview). If Polish is assumed to have a DP layer, then Polish ASNs are DPs. Our argumentation remains unaffected.

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ASNs and verbal gerunds do not have an nP above AspP, but they do have a DP layer.

A further piece of evidence for this analysis comes from the compatibility of *-nie*/*-cie* ASNs with adjectival modifiers, including the aspectual adjectives in (54b):

(54) (a) Janka **ciche** wyjś-cie z pokoju pozostało
Janek.GEN quiet exit.PF-CIE from room remained
niezauważone.
unnoticed

(b) **Nieustanne**/**Ciągłe** pomija-nie szczegółów przez Janka
constant omit.IMPF-NIE details.GEN by Janek.ACC
zmusiło jego szefa do zwolnienia go.
made his boss to fire.PF.NIE.GEN him
'The constant omitting of details by Janek made his boss fire him.'

In contrast to supine ASNs and verbal gerunds, which exclusively allow aspectual adverbs, it can only be the ClassP that the aspectual adjective in (54b) modifies. On the assumption that aspectual adverbs modify AspP and that ClassP encodes the aspectual properties of the ASN, an aspectual adjective must modify ClassP in the structure of an ASN.[24] Supines and verbal gerunds host AspP, but no ClassP, so they allow only aspectual adverbs. The suffix *-nie*/*-cie* ASNs in Polish have both ClassP and AspP, so they allow both aspectual adjectives and adverbs:

(55) ?Pomijanie **nieustannie/ciągle** szczegółów przez Janka
omit.IMPF.NIE constantly details.GEN by Janek
zmusiło jego szefa do zwolnienia go.
made his boss to fire.PF.NIE.GEN him

The fact that the aspectual adverb in (55) is less natural than the adjective in (54b) indicates that the higher functional layer is more salient, so *-nie*/*-cie* ASNs are more nominal than verbal despite the AspP. This is expected, if we consider that their internal syntax is actually closer to that of the nominal ASNs (Romanian infinitive, English nominal gerund, etc.) than to that of the verbal ones (supine and verbal gerund).

5.2 *Bulgarian* -ne *ASNs*

In the previous section, we presented Polish ASNs that seemed to challenge our generalization that Number and Aspect exclude each other. As we have

[24] An exhaustive analysis of aspectual adjectives as modifying the ClassP should also take into account the fact that this kind of modification is only possible in the presence of an event (i.e. a VP layer) in the nominal. This condition will exclude aspectual adjectives modifying all nouns that project Class.

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shown, Number and Aspect may co-occur if they target different categorial levels in the structure.

Bulgarian *-ne* ASNs pose a challenge for our second generalization, according to which only bounded entities may be pluralized. These nominals are known to attach exclusively to imperfective verbal stems as the data below indicate (see also Popova 2006, Markova 2007 and references therein):

(56)

ASPECT	VERB	*-NE* ASN	INTERPRETATION OF THE ROOT
PERFECTIVE	zamestja	*zamest-ne	'act as a deputy', 'replace'
IMPERFECTIVE	zamest**va**m	zamest-**va**-ne	
PERFECTIVE	prepisha	*prepisa-ne	'copy'
IMPERFECTIVE	prepis**va**m	prepis-**va**-ne	

Although they preserve the imperfective morpheme from the verb, *-ne* ASNs in Bulgarian easily accept morphological plural, as (57) indicates:

(57) (a) Chestite **razrushavanija** na grada ot vragovete go
frequent-the destroy.IMPF.NE.PL of city.the by enemies-the it
promeniha napulno.
changed completely
'The frequent destructions of the city by the enemies changed it completely.'

(b) Chuh za mnogo **ubivanija** na grajdani po vreme
heard of many kill.IMPF.NE.PL of civilians during time
na vojnata.
of war.the
'I heard of many killing of civilians during the war.'

(c) chestite kusni **pristiganija/otputuvanija** na
frequent.PL.the late arrive.IMPF.NE.PL/depart.IMPF.NE.PL of
vlaka
train.the
'the frequent late arrivals/departures of the train'

On the assumption that the *-ne* ASNs in (57a, b) carry verbal imperfective aspect, they challenge our claim that [−b] ASNs disallow pluralization. We argued that this is the case even if [−b] Aspect is embedded in a nominal structure: see the imperfective Polish ASNs which disallow plural (51). But we will see in the next section that *-ne* nominals FAIL to exhibit the properties we usually associate with an Aspect projection, even if they morphologically inherit the imperfective morpheme.

5.2.1 *The lack of imperfective Aspect in* -ne *ASNs*

Schoorlemmer (1995) argues that despite the aspectual morpheme and unlike Polish *-nie/-cie* ASNs, Russian nominals lack Aspect. A similar claim has

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been made by Popova (2006) with respect to Bulgarian *-ne* nominals. In this section, we argue for the same idea.

First of all, it should be noted that the incompatibility of *-ne* nominals with perfective morphology leads to the absence of aspectual pairs with such ASNs, which contrasts with the situation in Polish, in which the verbal aspect in ASNs is preserved with both values. This casts doubt on the projection of Aspect in *-ne* ASNs.

Second, *-ne* nominals are compatible with 'in'-PPs, as shown in (58a). If they carried imperfective/unbounded aspect, they should be ungrammatical with 'in'-PPs because these PPs indicate perfective/bounded aspect. Crucially, the imperfective verb form in (58b) corresponding to the ASN in (58a) disallows 'in'-PPs.

(58) (a) **pisaneto** na statijata ot Ivan **za 30 minuti/30 minuti**
write.IMPF.NE.the of article.the by Ivan in 30 minutes/30 minutes
'Ivan's writing of the article in/for 30 minutes'
(b) Ivan **pisheshe** statiata **30 minuti/*za 30 minuti**.
Ivan wrote.IMPF article.the 30 minutes/in 30 minutes
'Ivan wrote the article for 30 minutes.'

The aspectual value of the *-ne* nominal as reflected in its ability to be modified by 'in'- or 'for'-PPs apparently comes from the inner aspect of the VP. For instance, the achievement verb *otkriva* 'discover' is telic/bounded, so it only accepts *in*-PPs. The same holds of the corresponding *-ne* ASN, despite the imperfective morphology:

(59) otkrivaneto na **novite** lechenija **za dve godini/*dve godani**
discover.IMPF.NE.the of new.the treatments in two years/two years
'the discovery of the new treatments in two years'

If the *-ne* ASN carried outer imperfective aspect like the verbs, this unbounded value should be imposed independently of the inner aspect, so the 'for'-PP should be allowed. The Romanian supine in (60) allows both 'in'- and 'for'-PPs, but the former refers to the singular event of discovering a treatment that takes two months, (60a), while the latter refers to the ([−b]) plurality of discovering events spread over two years, (60b).

(60) descoperitul unor tratamente noi **în două**
discover.SUP.the some.GEN treatments new in two
luni/timp de doi ani
months/time of two years
'the discovery of some new treatments in two months/for two years'
(a) each discovery took two months, but there were more of them
(b) the various discoveries spread over two years

The incompatibility of the Bulgarian *-ne* ASN with a 'for'-PP, in contrast to the Romanian supine, indicates that the former does not carry

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imperfective/unbounded outer aspect. Rather, it only maintains the inner aspect of the verb. Thus the plural *-ne* nominals in (57) above do not contradict our generalization that unbounded entities cannot be pluralized, because those ASNs do not have imperfective aspect. The morphological plural is available for them, because the bounded inner aspect of the accomplishments in (57a, b) and the achievements in (57c) allows for pluralization. As expected, the unbounded *-ne* ASN derived from an activity verb like *raboti* 'work' rejects plural marking:

(61) *Ivanovite narochni **rabotenija** do kusno s
Ivan's intentional work.IMPF.NE.PL until late in
cel da jadosa jena si
order to annoy wife his

In conclusion, we consider Bulgarian *-ne* ASNs to be ambiguous between the internal structures in (44) and (45), without AspP. The presence of the nominalizer *-ne* (cf. Markova 2007) is a further confirmation of the nominal status of these ASNs.

5.2.2 *Perfective prefixes in* -ne *ASNs*

The only *-ne* nominals which we think project (outer) Aspect in Bulgarian are the ones derived from verb forms which contain a perfective prefix. According to Markova (2007) and references therein, perfective affixes turn the imperfective basic verb into a perfective one, most of the times also involving a slight change in the lexical meaning. For instance, from the imperfective verb *pisha* 'write', we can form the perfective *prepisha* 'copy', from *melja* 'grind', we get *smeljam* 'grind up'. These perfective forms can further become imperfective by means of the morpheme *-(v)a*. The result is the stem for the *-ne* nominals *prepisvane* and *smilane*.

Unlike the imperfective forms of these verbs, which clearly display unbounded aspect in (62a), note that the corresponding *-ne* nominals are only compatible with the 'in'-PP indicating bounded aspect in (62b) (see also Markova 2007).

(62) (a) Ivan **pre-pisvashe** statiata/**s-mila** kafeto
Ivan PF-copied.IMPF article.the/PF-ground.IMPF coffee.the
30 minuti.
30 minutes
'Ivan copied the article/ground the coffee for 30 minutes.'

(b) **prepisvaneto** na statiata/**smilaneto** na
PF.copy.IMPF.NE.the of article.the/PF.grind.IMPF.NE.the of
kafeto ot Ivan **za 30 minuti/*30 minuti**
coffee.the by Ivan in 30 minutes/30 minutes
'the copying of the article/the grinding of the coffee in 30 minutes'

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Comparing the role of the imperfective morpheme *-va* with that of the perfective prefixes *pre-* and *s-* in the ASNs in (62b) leads us to conclude that only the aspectual value of the latter is maintained. These nominals have a bounded aspect, as do the corresponding perfective verb forms in (63). If the imperfective morpheme contributed aspect in these nominals, we would expect similarity with (62a) and not with (63).

(63) Ivan **prepisa** statiata/**smlja** kafeto **za**
Ivan PF.copied article.the/PF.ground coffee.the in
30 minuti/***30 minuti**.
30 minutes/30 minutes
'Ivan copied the article/ground the coffee in 30 minutes.'

The prefixed perfective *-ne* nominals in (62b) also contrast with the corresponding non-prefixed *-ne* nominals with respect to aspect. While the prefixed *prepisvane* is clearly perfective, the non-prefixed *pisaneto* in (58a), derived from the imperfective verb form, is neutral to aspectual PP-modification, so it does not carry imperfective aspect (cf. also the corresponding imperfective verb in (58b)).

These facts show that in Bulgarian the perfective prefix contributes perfective aspect even in *-ne* ASNs. As expected in our analysis, these nominals freely pluralize (see (64) below). Syntactically, they are characterized by the internal structure of the Polish perfective *-nie*/*-cie* ASNs in (52), the only difference being that Bulgarian ASNs also project a DP hosting the enclitic definite article or the possessive NP (see (61) above, for example).

(64) (a) Chestite **smilanija** na kafe ot Ivan v tazi staja
frequent PF.grind.IMPF.NE.PL of coffee by Ivan in this room
ja pravi da mirishe tolkova hubavo
her makes to smell so good
(b) Povtarjashtite se **napisvanija** na
repeated RF PF.write.down.IMPF.NE.PL of
stihotvorenieto ot Ivan
poem.the by Ivan

In conclusion, in Bulgarian *-ne* ASNs the only outer aspect information is contributed by the perfective prefix. The obligatory imperfective morpheme seems to have lost its original aspectual meaning and to have been grammaticalized for ASNs. The (un)availability of plural marking with these ASNs confirms our findings on the basis of the ASNs patterns we have determined for the other languages.

6. Conclusion

In this paper we have developed a flexible syntactic account that captures the mixed behavior of ASNs across languages. This approach has been motivated by novel empirical evidence that contradicts two very influential

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previous generalizations: that ASNs cannot pluralize (Grimshaw 1990), and that NumP and AspP exclude each other (Rouveret 1994, Alexiadou 2001). We determined that ASNs can pluralize, as long as they contribute bounded events (Mourelatos 1978), and that boundedness characterizes both the nominal (Num, Class) and the verbal domain (Asp, VP). The picture that emerges is summarized in (65), where the parentheses indicate the projections that may be missing in some ASNs:

(65) DP > ((NumP) > ClassP > nP) > (AspP) > VP

The ASNs examined differ in terms of two parameters. The first parameter concerns the presence of a nominalizer. If a nominalizer is not available, ASNs lack nominal internal properties, and their external syntax is accounted for by the DP layer. If a nominalizer is included, a second parameter characterizes variation with respect to the height of attachment of the nominalizer. Specifically, a nominalizer can attach to (and thus nominalize) either the VP or the AspectP layer. This parameter offers us a way to integrate the verbal aspectual properties of Polish and Bulgarian ASNs in the picture that we have built on the basis of the ASNs in Romanian, English, German and Spanish.

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