The category hybridization hypothesis and S-nominalization: a new approach to clausal gerunds

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Abstract Sentential nominalization has been taken to be a strategy employed by languages to avoid recursion, which, in this context, is understood as being synonymous with self-embedding. We analyze English gerunds, showing that they are not reduced structures. *Poss-ings* display a non-trivial noun/sentence cross pattern that does not support non-self-embedding analyses. Akin to sentences, *poss-ings* have accusative-marked objects, they license adverbial modifiers, and they permit sentential negation and aspect. However, their genitive-marked subjects, their behavior in clefts, and their compatibility with sub-aux inversion and extraposition resemble that of nominals. Like DPs, they disallow fronted wh-phrases, yet, similar to clauses, a copy of a wh-phrase in their outer specifier is available for interpretation at LF. We develop and explore a new mechanism - *category hybridization*- to explain this mixed pattern, suggesting that grammar can assemble new functional categories by selecting the intersection of sets of formal features from different categories previously stored in the lexicon. Application of this mechanism results in impoverished, defective categories, because just a subset of the features of each preexisting category is selected. We extend this proposal to *acc-ing* gerunds, arguing that *poss-ings* and *acc-ings* are both headed by a C∩D category, a hybrid formed by features in the intersection between complementizers and determiners. Our conclusion is, thus, that the existence of sentential nominalization does not argue against the claim that self-embedding is available as a universal property of human language; rather, sentence nominalization manifests a grammatical operation of category-formation.

Keywords: sentential nominalization, English gerunds, complementizers and determiners, functional category hybridization

1. Sentential subordination and nominalization

Languages differ with respect to sentential subordination (S-subordination). Certain languages display a single complementizer, usually preceding the embedded material, as attested in Romance and Germanic. Others may use doubled complementizers, as in Yaqui, where the embedded domain can be flanked on both sides by complementizers (Noonan 2007). Mohawk marks S-subordination prosodically, with both matrix and embedded clauses pronounced under a single intonational contour (Mithun 2010). Another pervasive type of S-subordination is nominalization (S-nominalization). In English, S-nominalizations are exemplified with gerunds (1). In Imbabura Quechua ((2) Cole 1982:20), a nominalizer morpheme is realized as a verbal suffix. A nominalized sentence can also display a definite determiner either preceding an infinitival TP, as in Spanish ((3) Alexiadou et al. 2011: 3), or realized as a verbal affix, as in Dakota ((4) Comrie and Thompson 2007: 337). Polish ((5) Kornfilt and Whitman 2011: 1299) exemplifies a further S-nominalization process, whereby a definite determiner combines with the complementizer.

(1) I appreciated [Johnny's singing Jackson]

(2) [Juan wagra-ta randi –shka] -ta ya -ni
Juan cow-Acc buy -NMLZ-Acc think -I
'I think Juan bought a cow.'

(3) [El cantar yo la Traviata]
the sing.Inf I the Traviata
'Me singing the Traviata.'

(4) [Unglapi kin] iyonicip‘ipi
1Pl.are.going.home the has.pleased.you
‘Our going home has pleased you.’

(5) Jan oznajmil [to ze Maria zmienia prace]
Jan announced that (DET) that (COMP) Maria is-changing job
‘Jan announced that Maria is changing her job.’

English gerunds illustrate intralanguage variation with repect to S-nominalization. There are several types of *-ing* constructions in English, *poss-ing* (1), *acc-ing* (6), *PRO-ing* (7) and *ing-of* (8), which differ from one another structurally (Chomsky 1970).

(6) I appreciated [Johnny/him singing Jackson]

(7) Johnny tried [PRO singing Jackson] at his concert in Memphis

(8) I appreciated [Johnny’s singing of Jackson]

Some researchers, understanding recursion as synonymous with self-embedding, have claimed that S-nominalization is a strategy employed by languages to avoid recursive structures – that is, as a strategy to reduce structural complexity. For example, Hixkaryána (Cariban) and Pirahã (Mura) are said to block S-subordination, forcing S-nominalization (Derbyshire 1979, Everett 2005). Pullum and Scholz (2010) take this as evidence against the idea that recursion is a universal of human language, thus contesting Hauser et al.’s (2002) claim that the combinatorial mechanism of grammar can recursively generate linguistic representations unbounded in length. Few studies, however, have focused on the internal structure of nominalized sentences, and obviously nothing should be concluded about the role played by S-nominalization without a detailed analysis of the internal structure of nominalized sentences. Data like (5), for example, indicate that the internal structure of nominalized sentences is not reduced, as a complementizer is realized, suggesting rather the presence of an underlying CP structure.

In the present paper, we analyze English gerunds, arguing that they have sentential structures (section 2). Our analysis will focus mainly on *poss-ings,* but a discussion of *acc-ings* will be included, as well. For space reasons, *Pro-ings* and *ing-of* gerunds will be set aside. The latter might be derived nouns in the sense of Chomsky (1970). To account for the cross-category pattern of *poss-ings and acc-ings*, we will explore an innovative analysis, claiming that they are not headed by a conventional complementizer or determiner. They are rather headed by a hybrid category C∩D, formed by an intersection set of features from both D and C (*Category Hybridization Hypothesis* - section 3). If this analysis is right, English gerunds, exemplars of S-nominalization, should not be seen as strategies used to avoid self-embedding, in particular, S-subordination. This conclusion is, in principle, generalizable crosslinguistically.

2. *Poss-ing* gerunds: sentences or nominals?

Nominalized sentences display mixed sentence-nominal pattern. Take English *poss-ing*s as an example. As shown in (1), repeated here as (9), the argument structure of the verb si*n*g is preserved, as the thematic relations between the verb and the event participants are identical in (9) and (10). Also, the verb's object is marked with accusative Case in (9), in harmony with (10).

(9) I appreciated [Johnny's/his bringing us to the concert]

(10) Johnny brought us to the concert

In addition, *poss-ings* license adverbial modifiers, but not adjectives, and they are compatible with aspect information and sentential negation:

(11) I appreciated [Johnny's/his intensely/*intense singing Jackson]

(12) a. I appreciated [Johnny's having been singing Jackson]
b. I appreciated [Johnny's not singing Jackson]

They do not, however, fully match regular sentences with respect to their subject Case and their external syntactic distribution. First, their subjects are marked with genitive rather than nominative Case. Second, as seen in (13), *poss-ings* are licensed in the focal position of cleft sentences similar to DPs, but differently from sentences:

(13) a. It was [Johnny's singing Jackson] that I appreciated the most
b. It was [his powerful voice] that I appreciated the most
c. *It was [that Johnny sang Jackson] that I appreciated the most

Third, *poss-ing* gerunds do not undergo extraposition (14), but they can participate in Sub-Aux inversion (15), behaving, thus, as DPs:

(14) a. * It pleased me [Johnny's singing Jackson]
b. * It pleased me [Johnny's powerful voice]
c. It pleased me [that Johnny sang Jackson]

(15) a. Did [Johnny's singing Jackson] please you?
b. Did [his powerful voice] please you?
c. *Did [that Johnny sang Jackson] please you?

Fourth, in contrast with affirmative sentences, both DPs and *poss-ing* gerunds occur as complements of true prepositions (16). And, fifth, on a par with DPs, *poss-ing* blocks fronted wh-phrases (17):

(16) a. June knew about [Johnny's singing Jackson]
b. June knew about [his powerful voice]
c. *June knew about [that Johnny sang Jackson]

(17) a. *June knew about [who$_1$ Johnny's loving t_1]
b. *June knew about [who$_1$ Johnny's love for t_1]
c. June knew about [who$_1$ Johnny had loved t_1]

This mixed pattern has motivated analyses of *poss-ings* as structures where a nominal category (either N or D) takes a non-nominal projection as its complement. Lees (1960) was the first to suggest an analysis along these lines, positing insertion of an N on top of S (18). Abney (1986) cashed in Lees' analytical insight into his DP hypothesis, analyzing *poss-ings* as DPs containing a NP, headed by the morpheme *ing,* which takes *a* VP as its complement (19). Alexiadou (2001) and Kornfilt and Whitman (2011), building on Borsley and Kornfilt (2000), also follow Lees' line of reasoning, while carrying out Abney's DP hypothesis. In Alexiadou's account, D is inserted above AspectP (20); in Kornfilt and Whitman's, D takes TP as its complement (21).

(18) $[_{NP}$ N $[_{S}$ Johnny sing Jackson]] (Lees 1960)

(19) $[_{DP}$ Johnny's $[_{D}$ $[_{NP}$ *ing* $[_{VP}$ sing $[_{DP}$ Jackson]]]]] (Abney 1986)

(20) $[_{DP}$ Johnny's $[_{AspectP}$ -ing $[_{vP}$ v $[_{LP}$ √sing Jackson]]]] (Alexiadou 2001)

(21) $[_{DP}$ Johnny's $[_{TP}$ $[_{vP}$ singing Jackson]]] (Kornfilt and Whitman 2011)

These analyses face a c-selection problem, as canonical Ns and Ds do not directly select S, TP or AspectP. A way out is Panagiotidis and Grohmann's (2009) switch category, capable of mediating between categories with a mismatch in feature composition. Switch, represented as *Ger* by the authors in gerund structures, glues together nominal and verbal/sentential domains. In *poss-ings, Ger* has both an interpretable [N] feature and an uninterpretable [V] feature, and [*u*V] forces merge with a VP, being checked and eliminated by the verb's V feature. [N] makes *Ger* selectable by D (22). Also, in *poss-ings, Ger* is inserted above VP, but it is assumed that *switch* is flexible, being able to take any prolific domain – and only prolific domains (VP, TP or CP - Grohmann 2003) - as complements. This proposal, thus, has the potential of explaining the typology of S-nominalization, assuming that languages vary with respect to the size of the constituent (prolific-domain) that is nominalized.

(22) $[_{DP}$ Albert $[_{D'}$ ['s$_{\text{[}\sout{\text{uN}}\text{]}}$ $[_{GerP}$ Ger$_{\text{[}\sout{\text{uV}}\text{][N]}}$ $[_{VP\ [V]}$ eating herring]]]]]

This ingenious hypothesis, however, faces some difficulties of its own. First, it posits the existence of a functional category that is not otherwise justifiable. Second, although the prolific-domain restriction placed on the complement of *Ger* aims at explaining the fact that there is no N-sententialization (i.e., a process transforming nominals into sentences), it seems artificial as it does not stem from any general property of grammar. DPs are mapped into discourse domains and define phases just as CPs do. Hence, the reason for *switch/Ger* not taking DPs as complements remains unexplained. Third, the categorical status of *switch/Ger* is not well defined. Since its [*u*V] feature is eliminated right after merge, *switch/Ger* is just an [N] throughout the derivation and at the interfaces, although, as observed by Panagiotidis and Grohmann, it does not really behave like a noun. In the end, thus, this analysis does not really solve the aforementioned selection problem because representationally *poss-ing* gerunds are still taken to be DP structures with a VP in the complement position of an N head.

All the above analyses try to capture an established consensus that *poss-ings* behave inwardly as sentences, but outwardly as nominals, as presented above. This consensus is not well grounded, however. Frank and Kroch (1994) present fine evidence that *poss-ings* and DPs interact differently with the structural environment surrounding them. First, the interpretation of amount questions with the format *how many N* depends on whether the wh-phrase is extracted from a CP embedded under a bridge verb or from an indirect question (Cinque 1990). (23a), for instance, is ambiguous: either only a number of books is at issue (Quantificational reading - *they decided to publish n books. What is n?*), or a pre-existing set of books is presupposed (Referential reading - *there are n books that they decided to publish. What is n*?)). In (23b), in contrast, only the referential reading is available.

(23) a. How many books$_1$ did they decide [to publish $_{t1}$] (✓Ref ✓Quant)
b. How many books$_1$ did they decide [whether to publish *t*1] (✓Ref *Quant)

The disambiguation effect seen in (23b) is also observed in extractions from DPs. In (24), only the referential reading is available.

(24) a. How many cities$_1$ did they make [a plan to attack t_1] (✓Ref *Quant
b. How many cities$_1$ did Hitler insist on [the destruction of t_1] (✓Ref *Quant)

Contrastingly, extraction from *poss-ings* preserves ambiguity, patterning, thus, as extraction from sentences. *How many cities* in (25) can be interpreted either as referential (*There are n number of cities that Hitler insisted on our destroying. What is n?*) or quantificational (*Hitler insisted on our destroying n number of cities. What is n?*).

(25) How many cities$_1$ did Hitler insist on [our destroying t_1] (✓Ref ✓Quant)

Frank and Kroch interpret this as resulting from an island effect. The quantificational reading is possible only when *how many N* is interpreted in an intermediate position, in which it has scope over the embedded domain only. DPs do not contain such a position, but *poss-ings,* similar to sentences, do, allowing an intermediate copy of the wh-phrase to be accessed and interpreted at LF.
The interaction between a PRO-subject and a parasitic-gap object within an adjunct clause is another piece of evidence offered by Frank and Kroch. Sentences with an embedded finite clause (26a) and sentences with an embedded *poss-ings* (26b) are both acceptable with PRO being controlled either by the matrix subject (*the mayor*) or by the embedded subject (*Trump*). Given that obligatory controlled PRO takes the closest DP as its controller, (26a, b) is structurally ambiguous: the adjunct clause is either within the matrix sentence or within the embedded clause, with the parasitic gap being licensed either way.

(26) a. Which building$_1$ did the mayor$_2$ report [that Trump$_3$ renovated t_1 [after PRO$_{2/3}$ previously abandoning e$_1$]]?
b. Which building$_1$ did the mayor$_2$ report on [Trump$_3$'s renovating t_1 [after PRO$_{2/3}$ previously abandoning e$_1$]]?

In contrast, when the embedded domain is a possessive DP, either PRO takes only the matrix subject as its controller (27a) or the parasitic gap is removed (27b). In other words, in (27a) the parasitic gap is licensed only if the adjunct is modifying the matrix predicate, not the possessive DP. Hence, DPs, differently from finite sentences and *poss-ings*, prevent a parasitic gap from being bound.

(27) a. Which building$_1$ did the mayor$_2$ report on [Trump$_3$'s renovation t_1 [after PRO$_{2/*3}$ previously abandoning e$_1$]]?
b. Which building$_1$ did the mayor$_2$ report on [Trump$_3$'s renovation t_1 [after PRO$_{2/3}$ previously abandoning it]]?

Licensing of negative polarity items is additional evidence that *poss-ings* are not nominals. Inherently negative verbs can license an NPI within a S-complement (28a), but not within its own clausal domain (28b).

(28) a. Jones denied [that a single allegation of the prosecution had merit]
b. *Jones denied a single allegation of the prosecution

Frank and Kroch point out that while NPIs within a nominal complement are not licensed, NPIs within a *poss-ing* or a *PRO-ing* complement are:[1]

(29) a. * The owner denied [the proposal of a single improvement]
b. I denied [(his?) eating of a single cookie]

Following Progovac (1988) and Laka's (1990) analyses of NPIs, Frank and Kroch interpret these contrasts as showing that inherently negative verbs select for CPs with a negative operator in its specifier. This operator is the licenser of the embedded NPI in (28a). DPs do not license a negative operator in their outer specifier and consequently NPIs embedded under DPs are not licensed (29a). Thus, the gerunds in (29b) are not DPs, but CPs with a negative operator sitting in their outer specifier. Note that, independently of the correctness of the negative operator analysis endorsed by Frank and Kroch, what is relevant here is the observation that *poss-ings* are not like DPs with respect to NPI licensing.

In conclusion, the syntactic distribution *of poss-ings* is a category puzzle: sometimes it mimics that of nominal projections; other times it mimics that of sentences.[2]

Using a TAG-based formalism, Frank and Kroch (1994) try to solve this puzzle by analyzing *poss-ing* gerunds as bare IPs, observing that bare IPs, similarly to *poss-ings*, cannot be extraposed, can participate in Subject-Aux inversion and do not license-fronted wh-phrases (30). In addition, gerunds, similar to bare IPs, seem to allow subject raising (31). [Notice, however, that (31) is not a clear case of *poss-ing*, since it could be an *acc-ing*. (See our discussion about Case valuation on section 3.)]

[1] We were informed by a reviewer that not all native speakers of English get the NPI reading assigned (29b).

[2] See Kornfilt and Whitman (2011) for a similar conclusion about Turkish nominalized clauses, which do not fully match the external distribution of nominals. In complement position, they are porous for movement (post-verbal scrambling), while DPs are not; under psychological predicates, they can receive realis and irrealis readings, while DPs allow only realis readings; in subject position, they can display a subjunctive morphology with an indicative reading, DPs allow only indicative morphology.

(30) a. *Leonore couldn't believe [which pasta to have finished cooking first]
b. *Ted knows about [who her kissing]

(31) a. The alarm prevented [the burglar]$_1$ from [-$_1$ taking the jewelry]

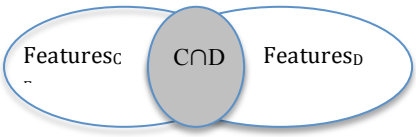
Despite these similarities, Frank and Kroch's solution does not cover some important characteristic of *poss-ing* gerunds. Bare IPs do not have genitive-marked subjects and the contextual distribution of gerunds in general (*PRO-ing*, *poss-ing, acc-ing*) does not entirely match that of bare IPs. Bare IPs can occur as complements of raising verbs; gerunds cannot. Also, bare IPs can occur as complements of ECM predicates, while gerunds cannot.

(32) a. Johnny seems [to be singing Jackson]
b. *Johnny seems [singing Jackson]
c. *It seems [his/Johnny's singing Jackson]
d. *It seems [him/Johnny singing Jackson]

(33) a. June believed [him/Johnny to be the singer of Jackson]]
b. *June believed [PRO singing Jackson]
c. *June believed [his/Johnny's singing Jackson]
d. *June believed him/Johnny [singing Jackson]

Furthermore, explaining Frank and Kroch's empirical observations under their bare-IP analysis is not trivial. Bare IPs do not have a left preiphery, hence in principle they are not endowed with an outer A-bar specifier able to licence copies of quantified-wh-phrases, parasitic gaps and NPI operators.
One way to solve the category puzzle presented by English gerunds is by positing a category that is both D and C. However, such a category does not exist and, in a theoretical framework that imposes endocentricity and takes categories to be discrete sets of features (See Baker 2003 for a discussion on this.), this category cannot be built by the grammar. However, while acknowledging this, it is reasonable to question the rigidity of functional heads. We will start from the understanding that functional heads are formed by a flexible set of formal features, allowing hybrid categories to be formed by intersecting sets of features from more than one category. Henceforth, we will assume that features shared by D and C can be intersected, forming a hybrid category C∩D:

(34)



We will call this the *category hybridization hypothesis*, and in what follows, we will explore this hypothesis as a way of accounting for *poss-ing* and *acc-ing* gerunds.

3. English gerunds and the category hybridization hypothesis

Ever since Standard Theory (Chomsky 1965), categories have been understood as discrete clusters of distinctive features stored in the lexicon and manipulated by the computational system as discrete, well-defined heads. Within the Government and Binding theory, the functional elements D and C were introduced as categories that

determine the grammatical status of the nominal and clausal domains (Szabolsci 1983, 1994; Chomsky 1986, Fukui and Speas 1986, Abney 1987). Nevertheless, these two categories do not seem to be synchronically and diachronically independent from each other. Based on agreement and Case in Hungarian, Szabolsci (1983) analyzed the structural articulation of nominal phrases as parallel to that of sentences, suggesting that nominals are also headed by a complementizer phrase (ComP). Although Abney (1987), in his formalization of the DP-hypothesis, traced a parallel between DP and IP, cross-language evidence involving N movement (Longobardi 1994, Koopman 2005), focus and topicalization (Aboh 2004), agreement and Case (Lefebvre and Muysken 1988, Danon 2011), tense, modality and aspect (Lecarme 2007, Tonhauser 2008) and the definition of phase domains (Gutiérrez-Bravo 2001, Matushansky 2005, Citko 2014, Abels 2012)) have pointed towards a Szabolscian parallelism, equating D with C. In addition, it has been suggested that in some languages, including Romance and Germanic, complementizers have developed out of pronouns, being, thus, exponents of the D category (Kayne 1982, Robert and Roussou 2003, Roussou 2010, 2020, among others). Therefore, although we do not have a robust theory for the notion of feature yet, we already know that D and C share formal features. That is to say that there is an intersection between the set of formal features that compose C and D, as depicted in (34). For example, C and D are both endowed with φ-features and possibly δ(discourse)-features. On that account, our category hybridization hypothesis states that grammar manipulates and makes use of intersection sets of features, forming new hybrid categories, such as C∩D. Notice that C∩D is neither C nor D, but a subset of C and D.

Let us emphasize that the category hybridization hypothesis under discussion assumes that feature sets are not rigid, fixed-for-good properties of individuated categories stored in lexicon. Rather, they are flexible sets that can be manipulated by the computational system, in accordance with the structural context in which categories are inserted. Thus, grammar can assemble new hybrid functional categories by selecting an intersection set of features from distinct categories already listed in the lexicon. Importantly, application of this operation does not result in enriched, complete functional categories, but in impoverished, defective hybrids. This possibility opens an interesting line of research, which is applicable to S-nominalization.

As shown in the introduction, languages like Greek and Polish do S-nominalization by overtly stitching together a determiner and a complementizer. Hence, either the determiner takes a CP as its complement, as proposed in Roussou (1991) for Greek, or category hybridization takes place. The first possibility does not seem to be the right one to explain English gerunds. As discussed in section 2, *poss-ings* do not exhaustively behave as structures headed by a nominal category (N or D) with a non-nominal complement. Hence, category hybridization presents itself as a hypothesis to be explored. It should be acknowledged, however, that a full implementation of this idea depends on the development of a fine-grained theory of features that would give us a complete architecture of the features that compose C and D. As we do not have this theory yet, implementation of our hypothesis is naturally limited at the moment.

C∩D is a hybrid category, not containing all of the features of C and D, but only those compatible with C and D (thence, the idea that these features are an intersection set). This provides an explanation for the fact that C∩D does not exhibit the same contextual distribution as C or D, presenting rather an unstable structural distribution. In addition, in our analysis, the defective nature of C∩D is responsible for the lack φ-

feature agreement observed in *poss-ings (*and in *acc-ings),* which do not inflect for number and person.

(35) a. *Johnny's/his singings Jackson
b. *Johnny/him singings Jackson

If C and D define phase domains and if φ-features and Case are features of phase heads inherited by the next head down (Chomsky 2005, 2007, 2008), a T dominated by a C∩D does not carry all the φ-features commonly associated with C. The φ-incompleteness of C∩D results from the fact D carries a person feature, but not number and gender (Adger and Harbour 2008). Thus, only the Person feature is in the intersection set between D and C; number and gender are not. Consequently, the subject of *poss-ings* has its Case valued as genitive, because, from C∩D, T inherits only the person feature associated with D. We will return to this shortly, in our discussion of *acc-ings*.
As an illustration of a derivation under this analysis, consider (37), the syntax of (36). Features in the intersection between D and C are copied from the lexicon and put together in the bundle forming C∩D, which is, thus, placed into the numeration (37a). A TP is built via external merge of items from the numeration, plus internal merge of *Johnny* to [spec, TP] to satisfy the EPP (37b). The case feature of the internal argument is valued as accusative by *v*. When C∩D is merged with TP, the person feature from D is inherited by T, and under agree the subject *Johnny* has its Case feature valued as genitive (37c).

(36) [Johnny's singing Jackson]

(37) a. N = {C∩D_1, T_1, {v_1, $sing_1$, $Johnny_1$, Jackson1}}
b. [$_{TP}$ Johnny [$_{T'}$ T [$_{vP}$ Johnny [$_{v'}$ *v* [$_{VP}$ sing [Jackson]]]]]]
Agree/EPP Agree/ACC
c. [$_{C\cap DP}$ C∩D [$_{TP}$ Johnny [$_{T'}$ T [$_{vP}$ Johnny [$_{v'}$ *v* [$_{VP}$ sing [Jackson]]]]]]
Person/Genitive Case

There is evidence that *poss-ings,* as well as *acc-ings,* are structures that carry their own unvalued Case feature (Pires, 2006). That means C∩D is restricted to syntactic Case positions. We will return to this point, but let us first introduce *acc-ings* gerunds, which differ from *poss-ings* in relevant ways.
To start, consider (38). A*cc-ing* subjects are not only marked with accusative Case, they can also, in contrast with *poss-ing* subjects*,* be expletives. In addition, Ross (1972) observed that *acc-ings* tolerate non-referential subjects more readily than *poss-ings* do (39).

(38) a. There being no more beer is a nightmare
b. *There's being no more beer is a nightmare

(39) a. ?? Few children/No children preparing dinner is good for her health
b. * Few children's/No children's preparing dinner is good for her health

The semantics of *acc*-ings is also different from that of *poss-ings.* Portner (1989) claims that (40a), as opposed to (40b), is presuppositional: Bill must have left, and Jill

visualized it.

(40) a. Jill imagined [Bill's leaving]
b. Jill imagined [Bill leaving]

This contrast is also observed in definite versus indefinite DPs:

(41) a. John imagined/predicted [the earthquake]
b. John imagined/predicted [an earthquake]

Portner, thus, interprets (40) as a difference in definiteness: *poss-ings* are definite structures, while *acc-ings* are indefinites. This is in line with Horn's (1975) observation that *poss-ings* are more acceptable as sentential topics than *acc-ings* (42).[3]

(42) a. John's/his kissing Mary, we remember
b. * John/him kissing Mary, we remember

Portner's observation has important consequences for our characterization and analysis of gerunds. First, the postulated C∩D category must be specified as [+definite] in *poss-ings*. Also, given that, in prenominal possessive DPs, D matches the possessor in definiteness specification (see Barker 2000, 2011), it follows that only referential, specific DPs are fully acceptable in the subject position of *poss-ings*, as (39) indicates.

Moving on to *acc-ings,* they were previously analyzed as clausal structures (Abney 1987, Johnson 1988, Pires 2006, among others). Pires (2006), analyzing *acc-ings* as nominalized TPs, argues that structures like (43) are TPs headed by a nominalized T furnished with a Case feature, which is valued derivationally by the matrix *v*. The internal subject, *John/him*, gets accusative Case via Case transmission, with the nominalized T transfering its valued Case to the DP in its specifier.

(43) I prefer John/him swimming

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[3] Another piece of evidence, first pointed out by Horn and then by Portner, suggests that the definite/indefinite difference at issue is wh-extraction. While *acc-ings* are porous to wh-movement, *poss-ings* are not (i). This pattern is similar to wh-extraction out definite/indefinite DPs (ii).

(i) a. Which city do you remember him describing?
b. Which city do you remember his describing?
(ii) a. Which man did you see a picture of?
b. ?? Which man did see a picture of?

Related to this, a reviewer inquired about the predictions of our hypothesis for the acquisition of gerunds. Around the age of three, children seem to have already mastered the syntax of gerunds, including the constraints on wh-extraction shown in (i) (de Villiers and Roeper 1995). This discussion is out of the scope of this paper, but assuming *category hybridization* to be a universal operation of grammar, we understand that it should be present at the first stages of acquisition, with hybridization of D & C occurring once the features of these categories are acquired and properly stored and in the lexicon.

Two points of Pires' proposal deserve our attention. First, *acc-ings*, as well as *poss-ings*, occur either in Case positions or in positions derivationally related to a Case position, confirming Pires conclusion that they themselves are endowed with Case. Also, in languages where Case is morphologically realized, nominalized sentences are visibly marked with Case. For example, in (2) - from Imbabura Quechua, repeated here as (44) - the accusative morpheme *-ta* is suffixed to the nominalized sentence.

(44) [Juan wagra-ta randi –shka] -ta ya -ni
Juan cow-Acc buy -NMLZ-Acc think -I
'I think Juan bought a cow.'

This empirical fact is compatible with our proposal. The category hybridization hypothesis states that both *poss-ings* and *acc-ings* are headed by a C∩DP projection whose head includes D-features. Hence, the syntactic distribution of these gerunds, as well as their syntactic requirements and constraints, are partially similar to that of DPs. The Case requirement is one of the properties shared by C∩DPs and DPs.
As for the Case transmission mechanism proposed by Pires, we disagree with it. Pires presents data like (45) and (46) in support to his claim that *acc-ings* are different from canonical ECM configurations. (45) shows that canonical ECM verbs, such as *believe*, do not select for *acc-ings*, and (46) is supposed to demonstrate that subject-to-subject raising is possible in passivized ECM predicates (46a), but not in passives with *acc-ing* complements (46b). We will return to this shortly.

(45) a. Johnny believed Peter and Paul/them to be the interpreters of Jackson
b. *Johnny believed Peter/him signing Jackson

(46) a. Peter and Paul are believed to be the interpreters of Jackson
b. *Peter and Paul are preferred singing Jackson

Importantly, however, the acceptability of (47) below indicates that, in structure with *acc-ing* complements, the embedded subject can bind an anaphor inside a matrix-VP adjunct, suggesting similarities between *acc-ings* and ECM configurations. By dissociating *acc-ings* from ECMs, Pires leaves us without an answer to the availability of binding in (47). Under his analysis, the gerund subject should not c-command the anaphor in (47). The gerund subject is not in a direct Agree relation with matrix *v*, hence the subject's features responsible for binding the anaphor should not be moved to the matrix *v*P.

(47) Johnny imagined Peter and Paul/them singing Jackson during each other's concert

Holding onto the category hybridization hypothesis and onto Portner's observations, we suggest that *acc-ings* are C∩D projections formed by features from C and indefinite D.
It has been suggested that the LF counterpart of a grammatical person feature is a semantic or referential index (Longobardi 2008, Kučerová 2019). Thus, if only definite determiners carry a referential index, only definite Ds are endowed with a person feature; indefinites are not. Therefore, C∩D is endowed with a person feature in *poss-ings*, but not in *acc-ings*, which means the subject of an *acc-ing* is unable to

value its Case feature within the gerund domain itself. This conclusion is confirmed by (47), where the internal *acc-ing* subject has its Case valued by an outside functional head (matrix *v*). Thus, in structures like (43), a double agree operation takes place. The matrix *v* agrees with C∩D valuing its Case feature, but since C∩D is φ-defective, *v* agrees with the internal subject as well, valuing its Case, too:

(48) [I [$_{vP}$ [$_{v}$ [$_{V}$ prefer [$_{C\cap DP}$ [$_{TP}$ John swimming]]]]]

It seems to us that the data in (45)) only indicate that canonical ECM predicates select for TPs, but not for C∩DPs. Also, the unacceptability of (46b) does not show that passive *acc-ings* block subject-to-subject raising. Since the gerund clause surfaces in a non-Case position, (46b) is independently ungrammatical. Note that (49) is equally unacceptable.

(49) *It was preferred John swimming

A potential problem for our analysis, as well as for Pires' analysis, is the availability of *acc-ings* in subject position, as in (50):

(50) [Them singing Jackson] would surprise Johnny

Under our analysis, the gerund subject in (50), *them*, should have nominative Case, with the matrix T double agreeing with C∩DP and the subject at issue. This very same problem is observed in Pires (2006) analysis, which assumes, as discussed above, that the subject of *acc-ings* has its Case value under Case transmission by the local T. In fact, *acc-ings* in subject position is not easy accounted for; it's a real mystery, as there is no non-ad-hoc source for the accusative Case of their internal subject. We suspect this is not abstract, structural Case, but rather default, morphological case.

An important difference between the derivation in (48) and the derivation of (50) is that the matrix T in (50), differently from the matrix *v* in (48), has an EPP feature to be checked and the only grammatical way of checking it is via movement the entire C∩DP to spec,TP. If this movement occurs right after matrix T agrees with C∩DP, it makes it impossible for the matrix T to hold an agree relation with the gerunds subject. If so, either the gerund subject in (50) does not have structural Case or the derivation crashes, given that the gerund subject cannot value its Case locally, within the C∩DP domain.

Schütze's (2002) remarks on assignment of default case (homophonous to accusative structural Case in English), arguing that it is a morphological process that takes place in structural environments that block abstract Case. An example given by Schütze is the nominal phrase in (51), where the 1st Person pronoun surfaces in its accusative form. In Schütze's analysis, the pronoun, being in a Caseless position inside the subject DP, cannot be furnished with an abstract Case, receiving, thus, a default Case at morphology.

(51) The me nobody knows (has a complex personality)

If the analysis we sketched above is correct, (50) is similar to (51), in that both contain a DP in a Caseless position, forcing assignment of default case at PF.
In summary of our discussion, it seems that *acc-ings* are more impoverished domains than *poss-ings*. The subject of *poss-ings* has its Case feature valued derivationally, within the C∩DP-T domain, whereas in *acc-ings* the internal subject gets Case either via agree with a functional head outside the C∩D domain (when C∩D is in complement position), or post-syntactically, via assignment of default case (when C∩D is in subject position).

4. Conclusion

The intricate mixed pattern of gerunds, particularly *poss-ing and acc-ings*, has led researchers to investigate different syntactic possibilities, most of them betting on syntactic analyses where a nominal category is placed on the top of a non-nominal/clausal projection. These analyses face some difficulties, as shown above. S-nominalization is not really a process of transforming a non-nominal into a nominal. Thus, taking it to be a strategy to block sentential embedding is not right. In fact, S-nominalization might be a complex derivational mechanism of intersecting features from different functional categories, forming new hybrid syntactic heads, as posited by our *category hybridization hypothesis.*
Needless to say, this hypothesis is new and largely speculative, and the approach presented above should be seen as a first approximation. Nevertheless, we believe it provides us with a rationale for the mixed properties of S-nominalization in a more principled and unified way. Also, it may foster a better understanding of features and functional categories.
We focused on *poss-ing* and *acc-ing* gerunds, but the hypothesis at issue should be systematically extendable to other S-nominalizations in a cross-linguistic fashion, considering possible parametric differences, as individual grammars may differ with respect to the categories (set of features) they choose to intersect.[4,5]

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[4] Feature work should investigate other syntactic phenomena that might fall under the scope of the category hybridization hypothesis. As a reviewer pointed out, factive clauses are the most obvious candidate. These clauses share some of the internal and external properties of gerunds, and previous proposals have claimed that they are also headed by a nominal projection (see Kiparsky and Kiparsky 1970, Varlakosta 1994, Kastner, 2015, among others).

[5] Another issue awaiting further investigation is the acquisition of the proposed hybrid category (C∩D), see fn. 3.

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