Partial *pro*-drop as null NP-anaphora

Pilar P. Barbosa

University of Minho

0. Introduction

Even though it has become clear over the years that *pro*-drop is not a yes-no matter and that a variety of factors may condition it both within a language and cross-linguistically, it is possible to isolate at least three typological patterns of null-subject language (NSL) with referential null subjects:

1. Languages with rich subject agreement morphology (henceforth *consistent* NSLs), such as Italian, Spanish, Portuguese, Hungarian, Greek, among many others. In this type of language, subjects are freely dropped under the appropriate discourse conditions.
2. Languages that have agreement and referential null subjects whose distribution is restricted (henceforth *partial* NSLs) such as Hebrew, Finnish, Marathi, Russian, colloquial Brazilian Portuguese.
3. Languages that lack agreement, such as Chinese, Japanese and Korean. These have been described as topic-oriented languages and allow for any argument to be dropped not just subjects. These will be labeled *discourse pro*-drop languages.

In recent years, there has been a return to Perlmutter's (l971) insight that the implicit subject in NSLs is a fully specified pronoun that is deleted in PF (cf. Holmberg (2005) and Roberts (2010)). This view has been motivated in part by the observation that the classic Government and Binding theory of *pro,* according to which *pro* is a minimally specified nominal whose features are (or can be) supplied by Infl, is incompatible with the approach to feature theory developed in the Minimalist Program (MP) as outlined in Chomsky (l995: Ch. 4, 2001). In this framework, the φ-features in T/Infl are assumed to be uninterpretable and thus not specified for a particular value. This raises a problem for the idea that subject *pro* is inherently unspecified for *phi*-features.

Holmberg (2005) observes that there are two possible alternative hypotheses regarding a theory of *pro* within the MP.

(1) *Hypothesis A:* In null-subject languages, the φ-features of T are interpretable: Agr is a referential, definite pronoun phonologically expressed as an affix.

Hypothesis B: The null subject (henceforth NS) is specified for interpretable φ-features, values the uninterpretable features in Agr, and moves to Spec,TP, just like any other subject. That *pro* is silent is thus a PF matter.

Holmberg argues in favor of the latter hypothesis on the basis of Finnish, a partial *pro*-drop language. In previous work (Barbosa l995, 2009) I have argued that Hypothesis A is right for Type 1 languages. In this paper, I claim that the same general mechanism underlies *pro*-drop in languages of Type 2 and Type 3, namely null NP anaphora (also known as NP or N-bar ellipsis) as originally proposed by Tomioka (2003) for discourse *pro*-drop.

1. Key properties that distinguish the partial NSLs from the consistent NSL

Some languages, such as Finnish, BP, Marathi and Hebrew, have systematic NSs, but their pattern of distribution differs from that of the consistent NSLs in two ways: (i) the NS is optional in some contexts in which it is mandatory in a consistent NSL; (ii) the NS is excluded in many contexts in which it is possible in a consistent NSL. These two facts can be illustrated by comparing the European and Brazilian varieties of Portuguese. Consider the following examples:

(2) a. O João disse que ele comprou um computador.
the João said that he bought.3sg a computer
'John said that he bought a computer'
b. [O João] disse que [_] comprou um computador.
the João said that bought.3sg a computer

In the European variety of Portuguese (EP), the NS option (2b) must be used when the embedded subject takes the matrix subject as an antecedent. Unless it is emphatic, an embedded overt pronoun in examples such as (2a) in EP is preferably interpreted as non-coreferential with the matrix subject and signals topic switch. This phenomenon, which is a characteristic feature of the consistent NSLs, came to be known in the literature as the *Avoid Pronoun Principle* (Chomksy l981).

In BP, by contrast, the overt pronoun in (2a) may be co-referent with the matrix subject; in fact, both options (2a,b) are available in this language whenever the embedded subject is co-referent with the matrix subject. Thus, BP lacks the Avoid Pronoun Principle. The same observation holds for Finnish, Marathi (cf. Holmberg et al. 2009), Russian (cf. Lindseth (1998: 48)) and Hebrew (cf. Borer (l989)):

Now consider an example in which there is an intervening potential antecedent standing between the NS and its antecedent:

(3) [O João]$_i$ disse que os moleques acham [que [—]$_i$ é esperto]] *BP EP√
the João said that the children believe that is smart
'João says that the children believe that he is smart'

(3) is fine in EP. In BP, however, it is not and an overt pronoun must be used. Similar facts hold in Finnish, Marathi and Hebrew (Holmberg 2005). All of these languages show an asymmetry between the 3rd person and the other persons. Finnish,

Marathi and Hebrew (in the past and future tenses) do not allow a 3rd person NS in a matrix clause even though they allow 1st or 2nd person. Similar asymmetries have been reported to occur in BP (Rodrigues 2004) and Russian (cf. Müller 2005).

Ferreira (2000) and Rodrigues (2004) claim that the relation between the antecedent and the embedded NS in BP is one of obligatory control. Modesto (2008), however, argues against this view. Holmberg et al. (2009) show that there is variation among Finnish, Marathi and BP regarding the structural conditions governing the relation between the antecedent and the 3rd person NS, but conclude that in all three languages the relation is neither obligatory control nor non-obligatory control, 'but a third type of control relation, whose precise nature is not well understood'. In fact, Gutman (2004) examines a variety of evidence from Finnish and Hebrew that indicates that a purely syntactic analysis of the phenomenon cannot explain the whole range of data. He argues that only a theory of discourse anaphora can account for the distribution of NSs in these languages.

In all of the partial NSLs mentioned, 3rd person NSs can also be found in non-argumental subject constructions and when the subject is interpreted as a generic pronoun, corresponding to English 'one', as in (4) below:

(4) É assim que faz o doce *BP*
is-3sg so that make.3sg the cake
'This is how one makes the cake'

In (4) the generic 3sg NS in the embedded clause denotes people in general, including the speaker and the addressee. This reading of a 3rd person NS is unavailable in a consistent NSL. As already noted by Perlmutter l971, a consistent NSL cannot use a plain NS to convey the meaning of a generic (inclusive) subject and must resort to some overt strategy. This contrast can be seen clearly when we compare BP with EP. (4) is a well formed sentence in EP, but it has a different meaning, glossed as 'This is the way he/she makes the cake'. The generic subject reading requires the presence of the clitic *se*[1]:

(5) É assim que se faz o doce *EP*

2. Holmberg (2005)

In order to capture the differences between the consistent NSLs and the partial NSLs, Holmberg (2005) proposes that one of the parameters involved in regulating the

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[1] Finnish and Marathi pattern with BP (cf. Holmberg 2005). In Hebrew and Russian, the generic NS is marked as plural:

(i) Zdies´ rabotaiut mnogo. *Russian*
here work-3PL a lot
'Here one works a lot.'

(ii) Sotim hamon mic ba arec
drink.m.pl lots juice in-the country
'People drink lots of juice in Israel' *Hebrew* (Ritter l995)

In these examples, the NS may have an inclusive reading. The consistent NSLs also have an arbitrary 3pl NS (Jaeggli l986), but the range of interpretations available in this case crucially differs from that of the Hebrew and Russian 3pl NS given that they necessarily exclude the speaker and the addressee.

pronunciation of subject pronouns is whether finite T hosts a D-feature encoding definiteness. In the consistent NSLs T hosts a D-feature, in partial NSLs it does not. In addition, he proposes a typology of null pronouns: pronouns that are DPs and 'weak' or 'deficient' pronouns, labeled φPs after Déchaîne & Wiltschko (2002). These are specified for φ-features but lack D; therefore, they are incapable of co(referring) to an individual or a group. All NSs in the consistent NSLs are φPs and so are 3rd person NSLs in the partial NSLs. In a language with a D feature in I, a null φP that enters into an *Agree* relation with T is interpreted as definite. This is why the consistent NSLs must resort to overt strategies to express the meaning of a generic subject pronoun. Absence of D in I, on the other hand, means that a null φP subject is either bound by a QP or logophorically linked to a DP in a higher clause; as a last resort, it may be interpreted as generic.

Holmberg (2005) discusses data from Finnish and BP that indicate that the definite null 3rd person subject raises to a high position in the clause (Spec-TP, in his terms) whereas the generic NS must stay inside the *v*P, and concludes that the null φP in Finnish and BP is accessible for binding by a higher DP if and only if it moves out of *v*P. If it stays in spec-*v*P it is inaccessible and the generic reading is the only option.

Concerning 1st and 2nd person NSs, they are fully specified DP pronouns that are deleted in the phonology, by the same process that applies to other kinds of ellipsis. Thus, there are two kinds of NSs: one is an inherently deficient pronoun that needs to enter an *Agree* relation with T containing D to be interpreted as definite. In a language that lacks D in T, it can be interpreted as a bound or logophoric pronoun; in the absence of a binder it is interpreted as a generic pronoun. The other is a fully specified DP that is deleted in PF. Regarding the question why the non-NSLs do not allow almost any subjects to be null, Holmberg suggests that these languages have a stricter, "phonological" EPP-condition which not only requires a filled Spec-IP, but a pronounced Spec-IP.

In sum, Holmberg concludes that, as far as core syntax is concerned, NSs in languages with overt agreement are like regular pronouns; the fact that they are null is a PF matter: they are either deleted pronouns or feature matrices that fail to have a PF realization[2].

2.1 Discussion

Holmberg's work on the partial NSLs languages constitutes a major step in the understanding of the key properties of this type of language. Two strong empirical generalizations emerge: (i) there is a correlation between partial *pro*-drop and the existence of a plain 3rd person NS to convey the meaning of a generic (inclusive) subject; (ii) definite NSs in the partial NSLs raise to a high position whereas the generic NS occupies a low position.

In Holmberg's system, the core property that distinguishes the consistent NSLs from the partial NSLs is that T has a D-feature encoding definiteness in the former though not in the latter. Positing this feature has consequences for the licensing of pronouns that are deleted in PF, but has no further implications for the syntax of overt subjects: in both cases, they raise to Spec-TP in order to check the EPP as happens in a non-NSL. However, we have seen that one of the aspects that

[2] Holmberg et. al. (2009) offer a different account of the same facts, but the objections presented in section 2.2 apply to both analyses.

distinguish these two types of NSL is that there are environments in which an overt pronoun is not allowed in a consistent NSL unless it is emphatic; in a partial NSL, by contrast, its presence is optional. Under Holmberg's analysis it is not clear how these facts follow. Overt pronouns are assumed to be DPs in the consistent NSLs as well as in the partial NSLs, so they should behave similarly in both sets of languages, contrary to fact. Thus, the endeavor to reduce NSs in both languages to regular pronouns that delete in PF falls short of explaining the divergent behavior of overt pronouns in the two types of NSL.

For Holmberg, the D feature in T in the consistent NSLs is inherently definite. This assumption is designed to capture the observation that the consistent NSLs cannot assign a generic (inclusive) interpretation to the 3rd person singular pronoun. However, a persistent problem with this analysis is that it is not very clear what happens when the subject is indefinite. Moreover, in many consistent NSLs, the 3rd person plural NS can have an indefinite reading as shown below for EP.

(6) Estão a bater à porta.
are at to-knock at-the door
'They knocked at the door' / 'Someone knocked at the door'

(6) is ambiguous. It may mean that some contextually given set of people is knocking or it may mean that there is someone knocking. The latter is the non-anaphoric, arbitrary 3pl NS, which invariably has an interpretation that exludes the speaker and the addressee (cf. Cinque 1988 and Jaeggli l986, among others). In (6) the NS has an indefinite/existential interpretation, a fact that is problematic under the view that T has a D feature that is inherently definite[3]. In sum, Holmberg's (2005) deletion analysis has shortcomings: on the one hand, it lacks the predictive power required to account for the difference between the two types of NSL with respect to the properties of overt subject pronouns; on the other hand, it is too restrictive in that it invariably assigns a definite interpretation to a NS in a consistent NSL.

2.2 An alternative analysis

Now consider Hypothesis A sketched in the introduction. According to this hypothesis, the head bearing subject agreement has a nominal specification and interpretable *phi*-features in the consistent NSLs, thus behaving like a pronominal

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[3] Holmberg claims that the arbitrary 3pl NS of the consistent NSLs is equivalent to antecedentless 3pl pronouns in non-NSLs, as illustrated below for French (examples from Hofherr 2003).

(i) Ils ont trouvé une moto dans la cour.
'A motorbike has been found in the courtyard.'

Non-anaphoric 3pl pronouns have a variety of readings in common with 3pl NSs and all of them exclude the speaker and the addressee (cf. Hofherr 2003). These pronouns, however, are not entirely equivalent to 3rd plural NSs. In particular, they cannot be used in contexts such as (8), where the event described is anchored to a particular point in time (Hofherr 2003 labels this kind of reading *specific existential*):

(ii) Ils nous ataquent.
*Someone is attacking us.'
ok 'They are attacking us.' they=anaphoric

This contrast indicates that it is not possible to assimilate the indefinite/existential reading of the non-anaphoric 3pl NS in (8) to the available readings of the non-anaphoric 3pl overt pronoun.

affix. A corollary of this hypothesis is that pre-verbal (non-quantified/non-focalized) subjects are Clitic Left Dislocated topics. Barbosa (1995, 2009), Alexiadou and Anagnostopoulou (l998), Ordoñez and Treviño (l998), among others, discuss a number of differences between the consistent NSLs and the non-NSLs regarding pre-verbal subjects that follow under this hypothesis. These concern scope interactions between overt pre-verbal subjects and quantifiers elsewhere in the clause, asymmetries between referential and non-referential quantified subjects, and restrictions on the interpretation of pronouns.

In this context, Barbosa, Kato & Duarte (2005) argue that the differences between EP and BP regarding overt subject pronouns can be explained under the assumption that they are CLLD-ed topics in EP whereas in BP they raise (or may raise) to Spec-TP. Viewed in this light, the Avoid Pronoun Principle simply reduces to preference for not merging a pronoun as a left-dislocated topic unless it is required to signal topic switch or for emphasis/empathy. Barbosa, Kato & Duarte (2005) examine BP against the same set of phenomena where asymmetries in the behavior of overt subjects can be detected between the consistent NSLs and the non-NSLs and observe that BP patterns with the non-NSLs rather than with EP, thus concluding that subjects in BP raise to Spec-TP[4]. Consequently, we see no effect of topic switch.

One additional consequence of hypothesis A as applied to the consistent NSLs is that the occurrence of 3rd person subject agreement will always entail an interpretation that excludes the speaker and the addressee regardless of whether the empty subject is anaphoric or not. In Distributed Morphology, the person features 1., 2., 3. are to be decomposed into combinations of the more primitive features [±1], [±2], (see Noyer (1992), Müller (2005)) so that the feature composition of 3rd person is [-1, -2]. If this feature make up is what gets interpreted, then the prediction is that 3rd person agreement in a consistent NSL will always entail exclusion of the speaker and the addressee[5]. This consequence is automatic under hypothesis A. This kind of explanation has no bearing on the question whether the subject is interpreted as definite or not, which is a clear advantage over Holmberg's account.

In sum, we conclude that the interpretable Agr hypothesis is adequate for the consistent NSLs; partial *pro*-drop, on the other hand, is a different kind of phenomenon, not directly linked to the properties of agreement inflection. As a matter of fact, the languages that lack agreement morphology and yet license NSs, such as Chinese, Japanese and Korean, all have plain generic NSs (see Holmberg et. al. 2009).

(7) a. Ah John waa hai Jinggwok jiu gong Jingman Cantonese
Prt John say in England need speak English
'John says that one/he needs to speak English in England.'
b. John-wa kono beddo-de-wa yoku nemu-reru-to iu Japanese
John-TOP this bed-in-TOP well sleep-can-COMP say

[4] This doesn't mean that a pre-verbal subject cannot also be a Topic in BP (see Pires (2007) on the different structural positions occupied by pre-verbal subjects in BP).

[5] It is important to mention in this connection that the same reasoning leads to the conclusion that the feature [number] is not interpretable. This is so because of examples such as (i), where there is no commitment to semantic plurality:

(i) Bateram à porta. Era o Carlos.
knocked.3pl at-the door it-was the Carlos
'Someone knocked. It was Carlos.'

´John says that one/he can sleep well in his bed'

Yet another property that the partial and the discourse *pro*-drop languages share is the lack of Avoid Pronoun effects of the type discussed in section 2: an embedded non-emphatic overt pronoun in Chinese may take a matrix subject as an antecedent[6].

(8) Zhangsan$_i$ shuo (ta$_i$) meitian lai. *Chinese* (Huang l984)
Zhangsan say he every-day come

In the next section we will discuss the discourse *pro*-drop languages and show how they relate to the partial NSLs.

3 Type 3 languages (discourse *pro*-drop): properties in common with the partial NSLs

In Type 3 languages argument drop is even more widespread than in languages like Italian since any argument (not just subjects) can be dropped. Typologically, these languages exhibit the cluster of properties characteristic of discourse-orientation (cf. Huang l984). In particular, they are topic prominent in the sense of Li and Thompson (1976). Among the analyses that have been proposed in the literature on discourse pro-drop is the hypothesis that it reduces to null-NP anaphora (Tomioka 2003). In this section we briefly review this analysis.

Tomioka (2003) observes that all of the languages that allow discourse *pro*-drop allow (robust) bare NP arguments and proposes the following generalization:

(9) Discourse *pro*-drop Generalization
The languages that allow discourse *pro*-drop — Japanese, Chinese, Korean — allow (robust) bare NP arguments.

He notes that zero pronouns in Japanese receive a wide variety of semantic interpretations and argues that four out of the six interpretations of null pronouns in Japanese — E-type, (definite) pronoun of laziness, indefinite pronoun and property anaphora — are due to the inherent semantic flexibility of full-fledged bare NPs in Japanese. As the following examples show, a bare NP can have a wide range of interpretations in Japanese:

(10) Ken-wa ronbun-o yun-da
Ken-top paper-acc read-past
'Ken read a paper / papers / the paper / the papers
(11) Soto-in gakusei-ga imasu. Gakusei-wa totemo hutotteimasu
outside-in student-NOM exist student-TOP very fat-is
'There is a student outside. The student is very fat.'

Tomioka proposes that the different uses of full-fledged NPs are derived from one basic meaning, property anaphora (type <e,t>) and their differences are the result of two independently needed semantic operations, namely Existential Closure (cf. (12a)) and Type Shifting to an individual (cf. (12b)).

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[6] But note that an overt pronoun cannot be bound to a quantifier in Chinese (see Y. Huang 2000).

(12) a. Existential Closure (Heim l982): ∃ closure
For any P ∈ $D_{<e,t>}$
∃-closure (P) = ∃x.P(x)

b. Type-shifting of a predicate to an individual (Partee l987): Iota
For any x ∈ D, P ∈ $D_{<e,t>}$
Iota (P) = ix.P(x) (= the unique x such that P(x))

Then he goes on to propose that Japanese *pro* is a null NP whose descriptive content is pragmatically retrieved: the same semantic tools that are used to interpret full NPs are used to interpret *pro*. Tomioka suggests that what underlies discourse *pro*-drop is the fact that languages (almost) universally allow phonologically null NP anaphora (also known as N' or NP ellipsis). In a language that lacks determiners, this operation will give rise to phonologically unrealized arguments. In languages in which DPs are necessarily projected, a remnant D will always show up and so this process will never give rise to a silent argument.

Tomioka's proposal captures the fact that the discourse *pro*-drop languages allow virtually any argument to be dropped. Furthermore, it has the potential to relate discourse *pro*-drop and topic prominence. As mentioned by Tomioka, all discourse *pro*-drop languages seem to allow bare NP arguments, but not all bare NP argument languages allow *pro*-drop. This observation could be captured if topic prominence is somehow a condition for recoverability of reference of the null NP, particularly when it is interpreted as definite.

Independent evidence in support of Tomioka's hypothesis comes from Spanish, Greek and EP. Spanish and Greek have indefinite null objects only in the environments in which they allow bare plurals (on Spanish, see Campos (l986) and Raposo (l998); on Greek, see Giannakidou and Merchant (l997)). EP has definite null objects. Raposo (l998) argued that this option is connected with the unique distribution of bare plurals in this language as opposed to the other Romance languages. He claimed that EP has a null definite D and that the null object is a DP headed by a null D with a null NP complement. Thus, this is a case of null NP-anaphora that yields a silent argument.

4 Partial *pro*-drop revisited

As mentioned, the discourse *pro*-drop languages share two properties with the partial *pro*-drop languages that set them apart from the consistent NSLs: (i) lack of Avoid Pronoun effects of the type discussed in section 2 (cf. (8)); (ii) the availability of a generic (inclusive) plain NS (cf. (7)).

In section 2, it was observed that in Finnish as well as BP the generic 3rd person NS stays *in situ* whereas the definite interpretation is available just in case the NS raises to a high position[7]. The relevant data are the following (from Holmberg et al. 2009):

(13) a. Jari sanoo että tässä istuu mukavasti.
Jari says that here sits comfortably

[7] The original observation is due to Vainnika and Levy (l999).

‘Jari says that one can sit comfortably here.’
≠ ‘Jari says that he sits comfortably here’

b. Jari sanoo että [—] istuu mukavasti tässä
Jari says that he sits comfortably here
‘Jari says that he sits comfortably here.’
≠ ‘Jari says that one can sit comfortably here’

In Finnish, the EPP can be satisfied by other categories besides subjects. In (13a), the locative adverbial checks the EPP. In this case, the only reading available for the NS is the impersonal, generic interpretation. In (13b) the EPP is checked by the NS. Here, the generic reading is not a possibility and the subject must be interpreted as a definite pronoun controlled by the higher subject. Similar facts obtain in BP (Rodrigues 2004).

Holmberg (2005) assumes that the Finnish EPP position is Spec-TP. However, Holmberg and Nikanne (2002) show that this position is associated with topics and argue that Finnish is a topic prominent language. On the basis of these observations and on the fact that BP passes all of Li and Thompson’s (1976) diagnostics for being classified a topic prominent language, Modesto (2008), in a comparative study of BP and Finnish, argues that the definite/anaphoric NS in Finnish and BP is itself in topic position — i.e., is a null topic in the spirit of Huang (l984) — thus collapsing partial *pro*-drop with discourse *pro*-drop[8]. One strong argument in favor of this approach is that both languages have null objects interpreted with recourse to a discourse antecedent.

(14) O Pedro perdeu a carteira e não consegue achar [—]
the Pedro loose-pstt-3sg the wallet and not can-pres-3sg find.inf
em lugar nenhum.
in place none
‘Pedro lost his wallet and can’t find it anywhere.’ *BP* (Cyrino l997)

(15) Kalle väittää että Pekka uhkaili [—].
Kalle claim.3SG that Pekka threaten.pst
‘Kalle claims that Pekka threatened him.’ *Finnish* (Frascarelli 2007)

In this context, the null NP anaphora hypothesis would predict that both languages should allow bare NPs in argument positions, and this prediction is confirmed: Finnish doesn’t have determiners (cf. (16)); BP has determiners, but, unlike EP, it has bare singular and plural nouns in subject or object position (cf. Müller 2001, Schmidt & Munn l999).

(16) isä osta-a auto-n (V) *Finnish*
father-NOM buy-3sg car-ACC
‘the father buys a/the car’

(17) a. Eu ouvi cachorro. *BP*
I heard dog
‘I heard a dog/ dogs.’

b. Cachorros gostam de gente / Cachorro gosta de gente
Dogs like-3pl of people / Dog like-3sg of people

[8] For arguments that BP is topic prominent, cf. Pontes l987.

'Dogs like people'

Under the null NP anaphora hypothesis, the correlation between the two different positions (the Topic position or the VP internal position) and the available readings in (13a,b) would follow from the different configurations that serve as input to semantics: when the null NP stays inside the VP it is interpreted by Existential Closure under the scope of a generic operator; when it raises to a topic position, the individual (definite/anaphoric) reading becomes available (see Kuno (l973) for arguments that topichood signals definiteness in Japanese).

When we turn to the other partial *pro*-drop languages discussed above, we observe that all of them have null objects and bare nominals in argument position[9]. Marathi and Russian lack determiners, so they are robust bare NP argument languages, like Finnish:

(18) polis-An-nI cor pakaD-1-A
police-pl-erg thief.M catch-perf-m
'The police caught the thief.' *Marathi*

(19) Neskol'ko devochek i malchikov byli v komnate
Several girls and boys were in room
Mal'chiki igrali v karty. Devochki chitali knigi
Boys played in cards Girls read books
'Several boys and girls were in the room. The boys were playing cards. The girls were reading books.' *Russian* (Dayal 2004)

Hebrew has definite articles but lacks an indefinite article, and has singular as well as plural bare nouns with a range of interpretations that is similar to that of BP bare nouns (cf. Doron 2003).

(20) a. Noveax kelev
barks dog 'A dog is barking.'
b. Novxim klavim
bark dogs 'Dogs are barking.'

(21) Dinoza'ur /Ha-dinoza'ur hu min še kvar nik'xad
dinosaur / the-dinosaur he species that alreay extinct
'The dinosaur is a species which is already extinct.'

Thus, there is a correlation between partial *pro*-drop and the availability of bare NP arguments. Therefore, we suggest that the same mechanism underlies partial and discourse pro-drop, namely null NP anaphora.

Even though the correlation holds, the picture is more complex than this. In Hebrew, the availability of referential NSs is correlated with the presence of person agreement. Present tense verbs in Hebrew are participles bearing number and gender agreement only. In this tense, non-argumental and impersonal/generic (cf. (22a)) NSs are allowed; definite NSs are not (cf. (22b)):

9 On Russian null objects see Fehrmann & Junghanns 2008; on Hebrew, see Goldberg 2002.

(22) a. Sotim hamon mic ba arec
drink.m.pl lots juice in-the country
'People drink lots of juice in Israel' *Hebrew* (Ritter l995)
b. *(ani/ata) roce glida
I/you (m.sg.) want.M.SG ice cream
'I/you want ice-cream.'

In this respect, Hebrew differs from Russian. Past tense verbs in Russian are also participles that are only marked for number and gender. Yet, definite subject drop is possible in the past tense in Russian.

(23) Ona vybegala i ne lajala, poskol'ku [_] byla sderz(annoj sobakoj.
'She would run out but not bark since [she] was a well behaved dog.'

This fact indicates that more than one parameter of variation is involved. In Hebrew though not in Russian the definite (individual) interpretation of the NS appears to be contingent upon the presence of person features. The pattern of NSs found in Hebrew present tense is not unique. It is found in some creole languages, such as Cape Verdean Creole , as illustrated below:

(24) a. *(El) ta trabadja duro. *Baptista* (l995)
he asp works hard
b. Sta faze frio
is making cold
c. Na veron, ta korda sedu.
in-the summer Asp wake early
'In the Summer one wakes up early'

Cape Verdean Creole has non-argumental (cf. (24b)) and impersonal NSs (cf. (24c)), but no referential NSs (cf. (24a)). Similar facts hold in Papiamentu (Muysken and Law 2001). Interestingly, both creoles have bare nominals in argument position. Since they also lack agreement inflection, their behavior is parallel to that of Hebrew past tense.

The occurrence of impersonal NSs in correlation with the availability of bare nominals as arguments in these creoles as well as in Hebrew present tense indicates that Tomioka's hypothesis is on the right track even though it requires further elaboration. All of the non-consistent *pro*-drop languages discussed here allow impersonal NSs, but only a subset of them allows NSs with definite interpretation. Under the null NP anaphora approach, the definite/anaphoric interpretation of a bare NP requires the application of the operation of Type Shifting to an individual. Hence, the split among these languages can be viewed as depending on whether the language has the resources required for this semantic operation to apply to a bare NP subject. Above we have discussed evidence from Finnish that shows that the definite interpretation is available just in case the null NP raises to topic position and we suggested that topic prominence is a condition for Type Shifting to apply to the null NP subject. The Hebrew facts, however, suggest that person agreement also plays a role.

Ritter (l995) claims that verbal agreement in Past and Futures tenses in Hebrew has a D feature. Shlonsky (2009) argues that 1st and 2nd person agreement morphemes in Hebrew are incorporated subject clitics; 3rd person agreement has an unspecified person slot. Both authors converge on the idea that person agreement in Hebrew marks definiteness. Therefore, I suggest that, in Hebrew, Type Shifting of the null NP to an individual is achieved under Agree with T bearing a D feature[10]. Since Hebrew and the creole languages under discussion are not topic prominent and Hebrew present tense as well as the creoles lack person agreement features, a null NP subject can only be interpreted under Existential Closure and this is why the only fully argumental subject allowed in the creoles and in Hebrew present tense is the impersonal NS. In sum, we suggest that partial, discourse and residual *pro*-drop of the kind found in Cape Verdean Creole and Papiamentu are all manifestations of the same underlying process: null NP anaphora; the definite interpretation of the null NP is contingent upon the resources available in the language for the semantic operation of Type Shifting to an individual to apply: topichood or agreement with T containing D.

5. Summary and conclusions

In this paper, we have examined the properties of the partial NSLs when compared with the consistent and the discourse *pro*-drop languages and we have suggested that the same basic mechanism underlies *pro*-drop in partial as well as discourse *pro*-drop, namely null NP anaphora. This allows us to consider two basic processes yielding a silent argument[11]:

a) The functional head bearing agreement is pronominal in the sense that it has a nominal specification and interpretable phi-features: this is the case of consistent (Type 1) *pro*-drop.
b) In languages that have (robust) bare nominals in argument position, the silent argument is the result of null NP anaphora; this is the case of discourse (Type 3), partial (Type 2) and residual *pro*-drop of the kind observed in some creole languages. The differences in the interpretation of the NS depend on the resources available in the language for application of the semantic operation of Type Shifting to an individual.

[10] Note that it is crucial to assume that the 3rd person feature in Hebrew is not interpretable given that the non-anaphoric 3pl NS in the Past and Future tenses doesn't apparently exclude the speaker and the addressee (cf. Vainikka and Levy l999: 658).

[11] This hypothesis doesn't entail that if a language has (robust) bare NP arguments it will necessarily display the range of properties associated with discourse or partial *pro*-drop. Polish and Czech lack articles and, unlike Russian, they exhibit the properties associated with consistent *pro*-drop. In particular, an embedded subject pronoun signals switch reference (Lindseth l998:48; McShane 2009) and generic (inclusive) impersonal subjects must be overtly marked (Sigurdsson & Egerland 2009). These languages differ from Russian (cf. (35)) in that verbal inflection is marked for person agreement in all tenses. Thus, the behavior of Czech and Polish follows from the properties of Agr in these languages.

This proposal raises a number of questions. First, it is not clear why English (or Germanic, for that matter) doesn't have impersonal NSs given that it has bare plurals. Second, all of the languages discussed here have non-argumental NSs. As seems clear, the null NP anaphora analysis doesn't apply to non-arguments. For these reasons, we tentatively adopt Holmberg's suggestion that some languages, like English, have a phonological EPP; others do not. We leave a more careful investigation of these issues for future work.

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Departamento de Estudos Portugueses
Instituto de Letras e Ciências Humanas
Universidade do Minho
Campus de Gualtar
4710-057 Braga
Portugal
pbarbosa@ilch.uminho.pt