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Phase theory, linearization and antisymmetry in morphology

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Abstract

This paper argues for the implementation of phase theory in morphology. On the basis of evidence from two types of structure, i.e. nominal root compounds and incorporated nominal gerunds (INGs), it is shown that phase theory interacts with linearization and antisymmetry in a principled way; thus allowing for a uniform account of syntactic word-formation processes below the word-level and well-known and thoroughly discussed syntactic operations in phrasal syntax. Hence, the position taken in this paper follows the trend set in the pioneering work of Hale & Keyser (1993), and more recently developed in Marantz (2001, 2007), Harley (2004, 2009) and the insightful first Phase syntax account in Ramchand (2008).

1 Introduction

According to Kayne (1994) all syntactic structures must correspond to the Linear Correspondence Axiom (LCA) which maps asymmetric c-command relations onto linear precedence. Nunes (2004) shows that this requirement follows naturally from minimalist assumptions and is completely in line with the strong minimalist thesis when certain independently motivated assumptions on Merge and PF-realizations of copies are adhered to.[1] While Chomsky (1995) and di Sciullo (2005) consider the LCA to be relevant in phrasal syntax only, Kayne (1994) and Moro (2000) argue that the LCA is also relevant for syntactic structures below the word-level. Grohmann (2003) and Kayne (2005) show that in a bare syntax account LCA compliance is not guaranteed under standard assumptions on antisymmetry and linearization. In phrasal syntax phase theory offers a potential solution to linearization problems (cf. e.g. Fox & Pesetsky 2005), although what counts as a phase is still a matter of much and fervent debate (cf. among many others e.g. Chomsky 2001, 2004, 2005; Fox & Pesetsky 2005, Matushansky 2005, Sabbagh 2007).[2] This paper argues that implementing phase theory in (non-phrasal) syntax below the word level solves linearization problems in a uniform way and offers a

[1] It is beyond the scope of this paper to go into the detailed analysis of Nunes (2004) who explicitly argues *pace* Chomsky (1995, 2004) that the LCA is vital for the realization and linearization of copies. In short, Nunes develops an account of the copy theory of movement that makes use of the independently motivated operations of Copy, Merge, Chain Formation and Chain Reduction. Accounts that follow Nunes in arguning against Chomsky's rejection of head-movement in narrow syntax (which was Chomsky's principal reason for criticizing Kayne (1994)) are readily available (cf e.g. Matushansky 2006 for an overview as well as Roberts 2010; Boeckx *to appear*, Bauke in preparation etc).

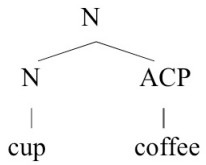
[2] Thus, it is generally acknowledged as a fact that syntactic computation proceeds cyclically by building chunks of structure and then transferring some of the structure to syntax-external computational systems. When transferred, structure previously built is inaccessible to further syntactic operations. However, it is far from clear at which point in the derivation Transfer applies. Quite generally, *v* and C are taken as Phase-heads. Whether Phases also exist in the nominal domain is not so clear, however.

principled answer to what counts as a phase in syntactic computation below and potentially also above the word-level. For that purpose two types of structures that show clear evidence for phase properties are taken into account: nominal root compounds and incorporated nominal gerunds (INGs).

2.1 Nominal Root Compounding

In nominal root compounding a distinction is commonly made between the Romance pattern and the Germanic pattern (cf. among others Roeper & Snyder 2005; Roeper et al. 2002; and Delfitto, et al. in press). The most significant differences between the two patterns are that in Germanic languages nominal root compounding is productive, recursive and compositional and thus a syntactic process while in Romance languages root compounds have a fixed interpretation and are neither productive nor recursive, which strongly suggests that they are the product of a lexical process of word formation. Roeper & Snyder (2005) and Roeper et al. (2002) account for these differences in terms of a root compounding parameter, which is characterized as a morphological parameter that allows Merge to create syntactic objects with the status of complex words. These complex words are created by merging two non-maximal projections, i.e. heads. Following the line of reasoning in Keyser & Roeper (1992), Roeper & Snyder (2005) argue that Set-Merger of the two compound heads proceeds via an Abstract Clitic Position (ACP):[3]

(1)

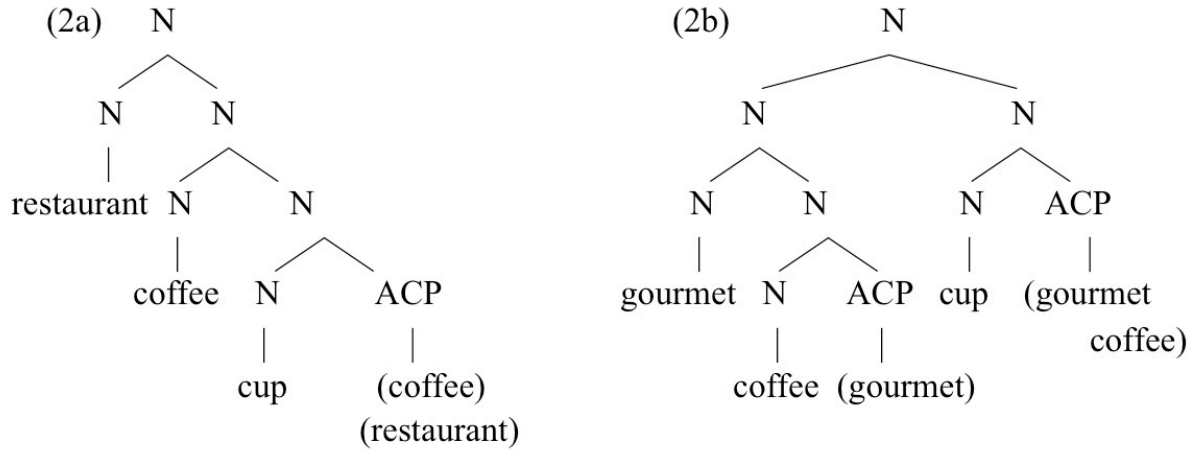


The element merged in the ACP is then moved to the left in line with standard assumptions on movement (cf. e.g. Kayne 1994, Chomsky 1995, Roeper 1999). Crucially, the moved element is not an argument of the N it is merged with and thus does not leave behind a trace (or copy in

[3] One reviewer remarks that making use of Roeper's (et al.) account on the ACP constitutes an unnecessary complication of the facts and brings in a number of additional problems. I agree that the ACP analysis of Roeper (et al.) is not without flaws (cf. Bauke in preparation for detailed criticism). However, I do not subscribe to the specific assumptions of the ACP here, I only take it as a means to model syntactic merger of two nominal heads. While most accounts on compounding would not deny that compounding is the result of Merging two heads - and indeed a vast body of literature that describes compounding in exactly these terms exists - it is often ignored that this assumption poses a PoS problem for Merge. Most recently what is described in terms of the ACP here could also be expressed in standard minimalist terms by saying that it is the Edge Feature (cf. Chomsky 2008) on the nominal heads that creates these structures (also cf. Narita 2009, *forthcoming* for detailed exposition).

The same reviewer asks how NN compounds with intervening adjectives (like *London financial markets)* can be derived under the ACP and suggests capturing the distinction between modified nouns, (which can also be coordinated (*London and Cambridge colleges*)), and true compounds in terms of a distinction between 'composite nominals' and compounds (cf. CGEL 2002). This amounts to casting the distinction between compounds and composite nominals along the lines of lexical vs. syntactic word-formation and is thus another instance of an approach that disregards the option - endorsed here - of syntactically deriving nominal root compounds. Under an ACP analysis a modified noun like *financial markets* is absolutely unproblematic simply because a noun so modified is not a head and thus never a candidate for ACP insertion. Additionally, a point of symmetry (cf. below) does not arise here either, because this is not an instance of the Merger of two heads, but of a head and a larger structure, arguably an NP instead.

more modern parlance)[4]. This is what makes these structures recursive (cf. Roeper & Snyder 2005 and Roeper et al. 2002), quite simply because under these assumptions multiple insertion into the ACP is possible:



As the structures in (2a) and (2b) show, the ACP can host either simple nouns or complex nouns already merged via the ACP, as long as these do not have the status of arguments and thus will not leave behind an unpronounced copy either.
Bauke (2009) shows that this analysis can be extended analogously to nominal root compounds in German, but argues for a distinction between those compounds that show inflectional marking on the stem merged in the ACP and stem-stem compounds that do not show any inflectional marking inside the compound:

(3a) Landkarte
country + map
'map'

(3b) Landsmann
country+GEN+man
'compatriot' or 'man who loves the countryside' or 'man who advocates for the conservation of the countryside' etc.

(3c) Landeskirche
country+GEN+church
'national church' or 'church that is associated with the country' or 'church that shows the country's typical architecture' etc.

(3d) Länderspiel
country+PL+match
'match between two national teams' or 'game that involves knowledge about certain countries' or 'game that is typically played in certain countries' etc.

[4] When translating Roeper & Snyder's and Roeper et al's account into a bare phrase structure framework, this comes close to saying that copies in the ACP are deleted completely.

While the form in (3a) is non-compositional, the forms in (3b) - (3d) — other than the lexicalized and possibly preferred interpretation — all allow for a compositional interpretation in (3b) -- (3d). In other words, the forms in (3b) - (3d) show the properties of their English counterparts and the form in (3a) is most likely the result of a lexical process of word formation.[5] Additionally, Keyser & Roeper (1992) argue that the ACP can be filled with more than one element of the same category type, as has been illustrated above for the nominal root compounds already, but it is not possible to insert several elements of different category types into that position:

(4a) rereread (4b) *rewrite up[6]

Thus, it is possible to insert multiple instances of *re-* in (4a), just as much as it is possible to insert more than one N in (2) and (3b) - (3d). What is not possible, as (4b) shows, is that a verbal prefix like *re-* and a particle like *up* can both be inserted into the ACP even though the copy of *re-* is deleted when the prefix is moved out of the ACP.

This further supports the assumption that the ACP can only be filled with elements that are categorially specified. In other words, the elements inserted in (3b) - (3d) are stems that have previously been merged with a category defining little n-head (cf. Marantz 2007) and not bare stems unlike the form in (3a).

The accounts in Roeper et al. (2002), Roeper & Snyder (2005) and Bauke (2009) can thus all account for productive, recursive and compositional compounding in German and English via the ACP. What these accounts lack though, is a motivation for movement out of the ACP. Delfitto et al. (in press) argue that merging two nouns in a nominal root compound creates a point of symmetry (PoS). This PoS needs to be dissolved by moving one of the members of the Merge-set to a higher specifier position of a functional projection, because otherwise the structure would violate the LCA and could not be linearized. This movement is induced by a probing head that attracts a gender feature on one of the members of the symmetric Merge-set:

[5] Although this is far from a safe bet. Cf. e.g. Bauke (in preparation) for a syntactic analysis also of this type of compound and Boeckx (to appear) for an analysis that goes into the same direction.

[6] One reviewer remarks that counter-examples exist when sufficient context is provided, as e.g. in

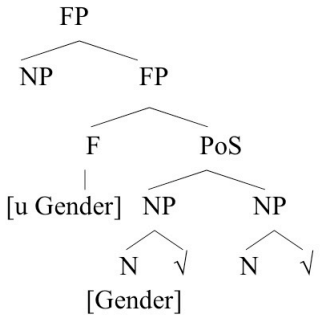
(i) The archeologists had to re-cover up the mosaics before the construction firm began building the new car park

However, this seems to be a different case here. Notice that past tense morphology cannot attach to the verb, nor does the form exhibit the free-variation between particle + object and object + particle orders:

(ii) *They re-covered up the mosaics
(iii) *They re-covered the mosaics up

So a lot more seems to be at issue here than the apparent counter-example suggests and it does not provide any evidence against the assumption that it is categorized heads which are merged via the ACP.

(5)



Delfitto et al. (in press) further argue that movement for symmetry resolution creates a compound phase, which is subject to an earliness principle. This earliness principle ensures that this type of movement precedes all other syntactic operations.[7] Thus, Delfitto et al. (in press) in contrast to Roeper et al. (2002), Roeper & Snyder (2005) and Bauke (2009) provide a motivation for movement in terms of the PoS argument and argue for a phase in syntactic processes of word formation.

However, what remains unclear in Delfitto et al.'s (in press) account is the status of the gender feature that induces the movement. In fact, gender is an uninterpretable feature (cf. Chomsky 1995) that needs to be checked before the phase-boundary. On the other hand the features of the elements inserted in the ACP in German nominal root compounds suggested in Bauke (2009), i.e. plural and genitive case, are interpretable and thus would not lead to any problems upon Spell-out. The absence of these features in stem-stem compounds of the type in (3a), in turn, is completely in line with this analysis, quite simply because here the meaning of the two stems merged is not realized independently. And this is what leads to the non-compositional interpretation described above.

Additionally, it is to be noted that the correlation between gender features and declension class that Delfitto et al. (in press) postulate does not hold in English and is unstable in German.[8] In Delfitto et al.'s account the movement-triggering gender feature is derived from the declension class the noun belongs to and the realization of the gender feature is then reflected in the linking element on the moved stem in the compound. This relation between gender and declension class is biunique in their account. However, the examples in (3) illustrate that the realization of what is identified as a morphological realization of the gender feature in terms of a linking element in Delfitto et al's analysis can actually be realized in a number of ways in

[7] Unfortunately, Delfitto et al. (in press) do not formalize this interesting idea, thus leaving open the question how exactly the derivation proceeds (cf. also comments below).

[8] Although some forms even in English show inflectional marking inside the compound:

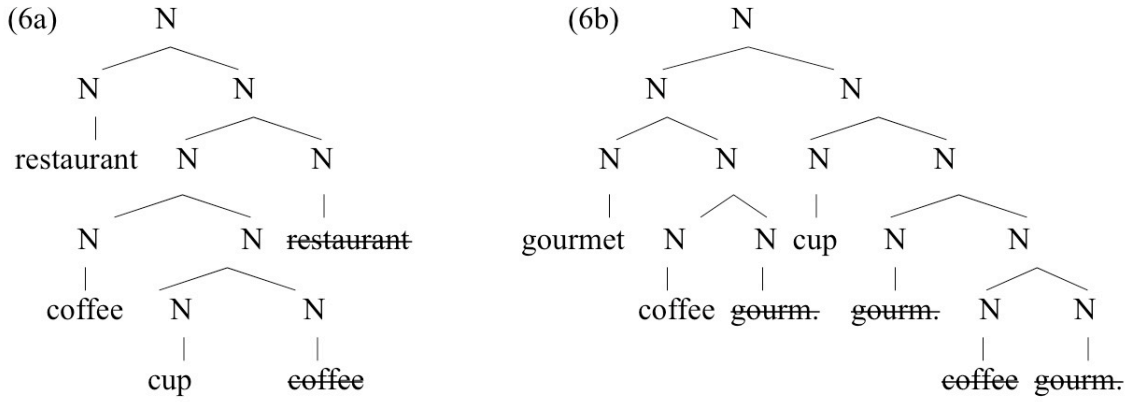
(i) reservations desk
(ii) shoes sale

this is certainly not the norm and the marker is always a plural marker that does not depend in any way on the gender of the stem. Still these forms are interesting in their own right. In (i) the plural marker on *reservations* seems to be lexicalized in the same way as it is on *arms* and *news* in *arms race* and *news stand* respectively. Hence, in these cases an already lexicalized form is inserted in the ACP and, while the compound is still interpreted compositionally, this lexicalized form is not decomposed further. In (ii), on the other hand, the difference between *shoe sale* and *shoes sale* reveals that here the plural marker on *shoes* leads to a variety interpretation and thus contributes to the compositional interpretation of the complex form (although judgements here vary among native speakers).

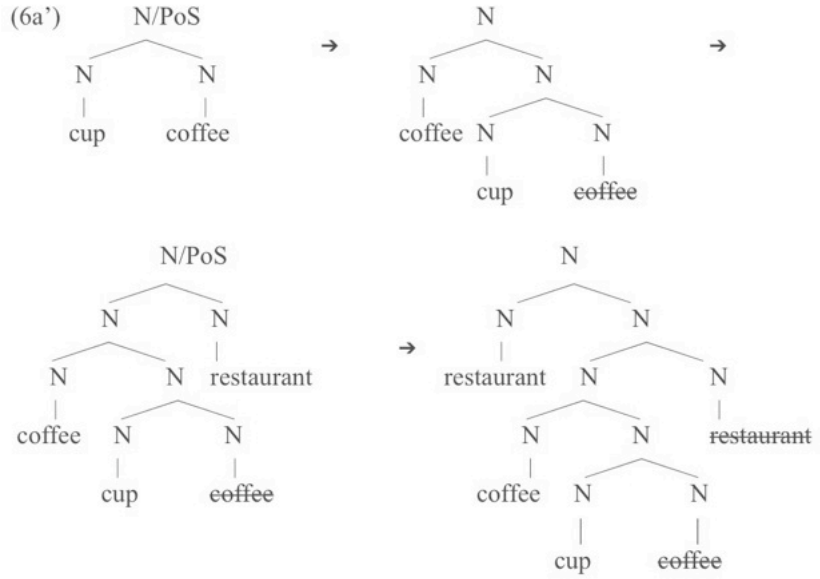
compounds in German. Another aspect is that the property of recursivity that Roeper et al. (2002) capture via multiple insertion into the ACP is not accounted for in Delfitto et al. (in press). On the contrary, the structure created by moving one of the members of the Merge-set to Spec, FP in (5) should be sufficiently asymmetric to avoid further PoS.

Finally, root compounds in Delfitto et al.'s (in press) analysis are phrasal units. While this excludes head movement, which is hard to accommodate under a bare syntax account (cf. e.g. Chomsky 2000, Harley 2004 and Fanselow 2003), at the same time it suggests that compound constituents behave like phrasal constituents in other contexts, which is not the case (cf. Roeper et al. 2002, Harley 2008).

Alternatively when applying the motivation for the movement operation provided by Delfitto et al. (in press) to the analyses in Roeper et al. (2002), Roeper & Snyder (2005) and Bauke (2009), the following structure emerges:



The individual steps are shown in (6a') for the recursive compound *restaurant coffee cup* for expository purposes:



In (6a) and (6b) Set-Merge of two heads creates a PoS that is dissolved by moving one of the members of the Merge-set to a higher position. This PoS dissolving movement operation is non-feature-driven (cf. Moro 2000) and after this movement operation, which coincides with a phase, the label (and along with this the head) of the no longer symmetric Merge-set can be determined.[9] When this head is merged with another head a new PoS arises that is once again dissolved by movement coinciding with a phase. As before, the head is determined here only after movement and after the phase.[10]

Two things follow from this quite naturally. First, due to the Spell-Out inducing phase the meanings of the members of the Merge-set are realized independently, hence generating a compositional interpretation for the compound. In fact, just moving one of the constituents from the Merge-set to a higher position on the left alone does not dissolve the PoS and still leads to linearization problems, as this movement is too local (cf. Kayne 2005, Grohmann 2003). Second, the structures are recursive and the freely left- and rightward branching structures in (6a) and (6b) are completely in line with what is expected under the assumption that Set-Merge is order-independent and source-independent (cf. Boeckx 2008).[11]

2.2 Incorporated Nominal Gerunds (INGs)

The second type of structure that shows evidence for phase properties at a sub-phrasal level are INGs. They also exhibit a a PoS and here the Merger of the verb and its nominal complement again leads to a symmetric structure that cannot be linearized. Van Hout & Roeper (1998)

[9] This is a somewhat unusual assumption, because it begs the question (one reviewer rightfully asks) what properties lexical phases and their phase heads actually have. The answer is that Phase heads here have the same properties they are ascribed in phrasal syntax in so far as they are they are the triggers for Spell-Out and of the movement operation. However, as pointed out above, the movement operation here is not triggered by features, but rather by the symmetric configuration that is the result of Merge. This allows for maintaining the independent meaning realization of the two N heads in the nominal root compounds discussed here, while at the same time it allows for circumventing the fact that Spelled-out material is rendered inactive for the remainder of the derivation.

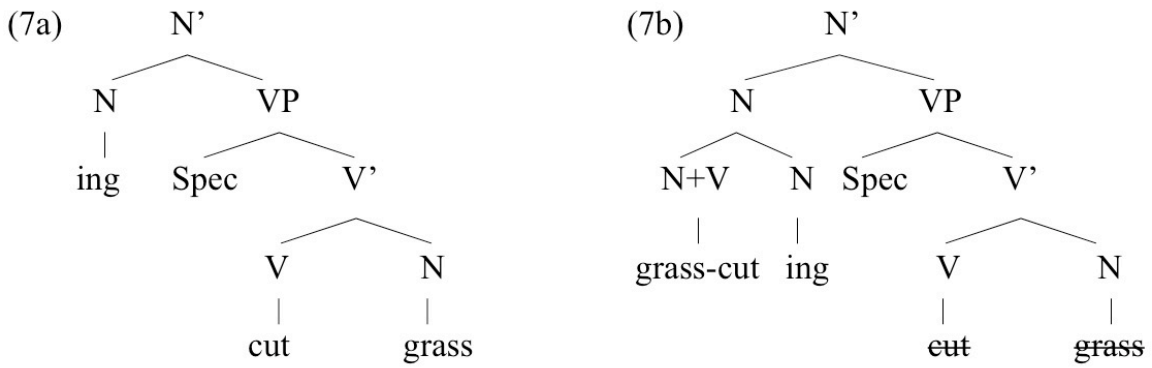
This comports well with the standard assumption in DM that a categorizing (i.e. labeling) *n*-head is a Phase-head (cf. e.g. Marantz 2007; Harley 2008).

[10] One reviewer asks in how far the movement operation really dissolves the PoS, since the copy left behind by movement violates the LCA just as much as the initial structure. So (i) is just as bad as (ii) for the LCA:

Several solutions come to mind here. Either the LCA only applies after movement and deleted copies are invisible to the LCA, as argued in Chomsky (1995) (but cf. Nunes 2004 for an elaborate argument against this). This amounts to making the LCA a PF (or at least post Spell-Out) constraint - a stand also taken in Chomsky (2004). A similar argument can be derived from a Phase theoretic account, where the two instances of Y are in separate cycles. An alternative comes from the ACP where copies are fully deleted and where the movement operation then amounts to an incorporation-like structure in the spirit of Matushansky's (2006) m-merger or the updated version of it in Roberts' (2010) (cf. also Bauke in preparation for an analysis along these lines).

[11] In fact, when taking the order-independent character of Set-Merge seriously, the question whether compounds are left- or right-headed (cf. e.g. Williams 1981 and subsequent literature) does not emerge, simply because any member of the symmetric Merge-set can be moved for PoS dissolution as this movement is not feature-driven and the member of the Merge-set that is not moved is labeled as the head only after the movement operation.

distinguish incorporation structures of this type which they identify as synthetic compounds, from their non-incorporated counterparts, which are analyzed as event nominals, and argue that the incorporated structure is derived by inserting the bare noun complement into the ACP of the verb. In a next step the noun moves to the specifier position of VP, from where it cliticizes onto the verb and this complex VP, in turn, cliticizes onto the nominalizing *-ing* head. So here the following structure emerges (cf. ibid):



In van Hout & Roeper's (1998) analysis the incorporation of the nominal complement from Spec VP into V is forced by the bare noun status of the N. Bare nouns are never licensed in specifier positions, since these host maximal projections only (cf. also Keyser & Roeper 1997). Along the same lines van Hout & Roper (1998) explain the lack of an agent-reading in synthetic compounds, since in the absence of a specifier position an agent interpretation cannot arise unless the bare noun is interpreted as a mass term, which - as a maximal projection - can be moved to Spec, VP.

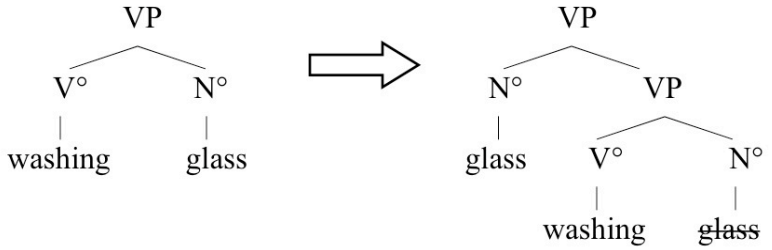
Roeper & Snyder (2005) argue for a similar analysis. However, they make a distinction between synthetic and root compounding on the basis of the availability of the ACP and argue that only the structure of the latter types of compounds comprises this position. In synthetic compounds, on the other hand, the ACP is not licensed, because here the relation between the verb and its nominal complement is an argument relation, which means that the nominal element leaves behind a copy after movement. The ACP, however, can host adjuncts only, which do not leave behind a copy after movement.[12] One other major contrast, between Roeper & Snyder's (2005) analysis and van Hout & Roeper's (1998) analysis is that the complement of the nominalizing *-ing* head is a V in Roeper & Snyder's account, while it is a VP in van Hout & Roeper's (1998) analysis, as shown above. So in Roeper & Snyder (2005) the nominal complement, which is an argument of the verbal head it is merged with, incorporates into the V-head, and this complex V-head then further incorporates into the nominal *-ing*-head. Under the analysis discussed above for nominal root compounds, this would mean that the two incorporation operations constitute two phases, which immediately follow one another. This

[12] Actually, the status of the ACP is far from clear. Keyser & Roeper (1997) argue for an ACP in complement structures and they even go so far as to relate the ACP to the specifier position of the verb, while Roeper & Snyder (2005) argue strictly against this. For some more comments on the internally and externally problematic status of the ACP cf. also Bauke (2010).

would be an extremely undesirable result as is discussed in Boeckx (2009). Additionally, regardless of whether INGs are base-generated via an ACP or not, neither of these approaches provides an answer to the question why the nominal element is incorporated into the verbal head.

Barrie (2006) argues that it is the PoS arising from the Merger of the verb with its complement that forces the incorporation operation, in order to make the structure LCA compliant (cf. ibid:155 & cf. also Bauke & Roeper 2009: 5 for a similar analysis based on Barrie):

(8)



Barrie analyzes the movement operation in terms of phrasal movement and thus avoids the problematic cases of head movement, just as Delfitto et al. (in press) did in their analysis for nominal root compounds. However, movement from complement to specifier position within the same phrase and without the instantiation of a phase does not dissolve the PoS under a bare syntax account, and it is precisely here, where problems with head-movement are expected to arise.

Alternatively, under a PoS analysis as introduced above for nominal root compounds, in which the movement operation suggested by Barrie (2006) coincides with a phase, the problem of anti-locality does not occur. However, the structure resulting from the movement operation that strives for PoS dissolution under Barrie's analysis is a verbal structure. While this is not an altogether unwelcome result, it begs the question how the *-ing* affix (that is analyzed as a nominalizing affix in Roeper & Snyder (2005) and van Hout & Roeper (1998)) is analyzed here. In fact, the examples in (9) strongly suggest that verbal functional structure is involved in INGs (cf. Fu, Roeper & Borer 2001):

(9a) Ted's grass-cutting for hours
(9b) *Ted's grass-cutting in an hour
(9c) Ted's grass-cutting immediately/with a scythe
(9d) *Ted's grass-cutting unfortunately
(9e) Ted's grass-cutting and Bobby's doing so too
(9f) Ted_i enjoys PRO_i grass-cutting

The examples in (9a) and (9b) illustrate that atelic aspectual modifiers are licensed in INGs, while modification by a telic aspectual modifier is illicit. Along the same lines (9c) shows that non-sentential adverbial and prepositional modifiers are licit while sentential modifiers are ungrammatical. Additionally, the anaphor *do-so* is licensed (9e) and control into the nominal gerund is possible (9f). So, all in all the data in (9) suggests that INGs contain verbal functional structure on top of the incorporation and here in particular an aspectual projection in which the atelic modifier is licensed. The ungrammaticality of the telic modifier is what is expected given that the incorporated complement of the verb is just a bare noun and thus not quantized. If the

complement were a full DP that is quantized, a PoS that forces the incorporation should not even arise and the non-incorporated variant in (10), which licenses a telic modifier, is as is expected:

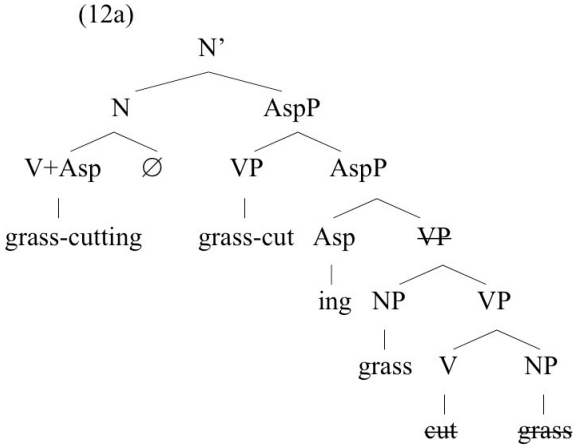
(10) Ted's mowing of the lawn in an hour

Tentatively, the aspectual projection then is the place where the *-ing* affix is generated (cf. e.g. van Hout & Roeper 1998; Fu, Roeper & Borer 2001 and Bauke & Roeper 2009). The difference between the grammaticality of (9c) and the ungrammaticality of (9d) shows that TP is not licensed, because sentential modifiers are out while non-sentential ones are fine. (9e) and (9f) are yet another indication that verbal functional projections on top of VP are licensed, because otherwise neither a control reading should arise nor would the anaphor be licensed (cf. Fu, Roeper & Borer 2001, van Hout & Roeper 1998). However, the forms in (11) cast some doubt on the validity of this analysis:

(11a) *Ted's grass-cuttings for hours
(11b) *Ted's grass-cuttings in an hour
(11c) *Ted's grass-cuttings immediately/with a scythe
(11d) *Ted's grass-cuttings unfortunately
(11e) *Ted's grass-cuttings and Bobby's doing so too
(11f) *Ted$_i$ enjoys PRO$_i$ grass-cuttings
(11g) Ted's/The grass-cuttings

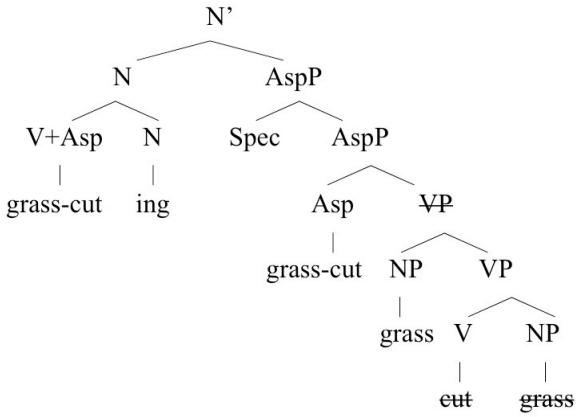
The form in (11g) shows that INGs can be pluralized, which is unexpected given their verbal character illustrated in (9) (cf. also Grimshaw 1990). However, this pluralization comes at the cost of the licensing of the modifiers that are licit in (9) and that were taken as an indication for the presence of verbal functional structure. On the basis of these observations Bauke & Roeper (2009) argue that the *-ing* affix on the forms in (9) is an aspectual affix, while in (11) the *-ing* affix is a true nominalizer leading to the structures in (12a) and (12b) respectively[13]:

(12a)



[13] A comparable analysis can be found in Alexiadou et al. (2009), where a distinction between the two types of *-ing* affixes is made in terms of boundedness.

(12b)



As is illustrated in Bauke & Roeper (2009), further support for a distinction between two types of *-ing* affix comes from German, where the difference between the aspectual affix and the nominalizing affix is encoded in the morphology (cf. also Motsch 2004, Alexiadou et al. 2009):

(13a) das Straßekreuzen
the street-cross-en(inf)
'the streetcrossing'

(13b) die Straßenkreuzung
the street-pl-cross-ung
'the streetcrossing, i.e. intersection'

The form in (13a), which is a nominalized infinitive, corresponds to the English INGs in which *-ing* is analyzed as an aspectual marker, while the form in (13b), which is an *-ung* nominalization, corresponds to the English INGs in which the affix is a nominalizer. As expected, only the *-ung* form in (13b) can be pluralized as can be seen in (14):

(14) die Straßenkreuzungen
the street-pl-cross-ung-pl
'the street-crossings, i.e. intersections'

On the other hand, nominalized infinitives, which cannot be pluralized, license all the modifiers that can be found with their English aspectual *-ing* ING-counterparts as well (cf. Bauke & Roeper 2009):

(15a) das Rasenmähen für zwei Stunden
the lawn-mow-en(inf) for two hours
'the lawn-mowing for two hours'

(15b) *?das Rasenmähen in zwei Stunden
the lawn-mow-en(inf) in two hours
'the lawn-mowing in two hours'

(15c) das Rasenmähen heute abend/gestern
the lawn-mow-en(inf) this evening/yesterday
'the lawn-mowing this evening/yesterday'

(15d) das Rasenmähen mit einer Sense

the lawn-mow-en(inf) with a scythe
'the lawnmowing with a scythe'

Bauke & Roeper (2009) argue furthermore that the incorporation into the *-ung/-ings* nominal head constitutes a second phase that blocks access to the lower functional structure, which in turn explains why the lower functional structure that is not located on the phase-edge is not accessible for modification. In line with these assumptions the pattern in (16) is completely expected:

(16a) das Straßenkreuzen
the street-pl-cross-en(inf)
'the crossing of (several) streets'

(16b) *die Straßekreuzung
the street-cross-ung

In German nominalized infinitives corresponding to English aspectual *-ing* INGs, both singular and plural marked constituents can be incorporated and interpretational differences follow. Hence, the form in (16a) differs from the form in (13a) in so far as the former denotes a crossing of either multiple streets or several crossings of the same street, while the latter denotes the crossing of just one street. This shows that, just as in the nominal root compound cases discussed above, a first phase — corresponding to what Marantz (2007) identifies as inner morphology — is involved in INGs as well. The incorporated element thus is interpreted independently and compositionally, and the verbal functional structure projected on top of the incorporation remains accessible throughout the derivation. In the *-ung/-ings* nominals instead, in which the nominalizing affix is generated in a higher structural position, the second phase — corresponding to Marantz' (2007) outer morphology — blocks access to those lower functional projections that are accessible in the other type of ING, where the aspectual affix is generated in a lower structural position.

3 Conclusion

In this paper two structures in which a PoS arises from the Merger of two heads have been investigated, i.e. nominal root compounds and INGs. Despite the fact that one of these structures is an adjunction structure, while the other is a complement structure, in both of these structures the PoS can be dissolved uniformly by moving one of the elements from the Merge-set to a higher position. This non-feature-driven movement is motivated by the need to introduce asymmetry into the structure, thus making it LCA compliant and therefore linearizable at PF. In order to avoid anti-locality effects the movement operation coincides with a phase, as is suggested implicitly in Marantz (2007) and in Delfitto et al. (in press) for nominal root compounds. All these observations point into the direction that the LCA and along with that considerations on antisymmetry and linearization apply also below the word level, which is in line with the stronger claim already discussed in Kayne (1994). Additionally, independently motivated considerations on anti-locality show that phase theory applies to structures below the word level and interacts with linearization and antisymmetry in a principled way. Finally, under the assumption that the Merge-operation that creates the PoS is symmetric, and source- and order-independent (cf. Boeckx 2008, Bauke 2010) in this analysis the strictly right-branching character of INGs and the optionally left- or right-branching structures of nominal root compounds receive a natural explanation. In the incorporation structures the selectional restrictions of higher functional projections play an important role. These projections select for a

verbal head, hence, only an incorporation structure in which the noun incorporates into the V will be selected. In the NN structures of nominal root compounds this does not play a role. Any of the two Ns can incorporate into the N-head; the only difference between the two incorporation alternatives that is expected to arise here is one in interpretation, as the discussion in 2.1 has shown.

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Frication and affrication of /t/ in RP English

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Abstract

Processes of plosive lenition are known to occur in several varieties of English and have been observed in Received Pronunciation (RP) too. This paper presents the results of a detailed phonetic investigation of frication and affrication of voiceless alveolar plosive in RP English spontaneous speech. The auditory analysis highlights the presence of a significant number of fricated /t/s as well as affricated /t/s. These two categories are analysed acoustically and compared to the canonical aspirated realisation. The fricated variants are also compared to the voiceless alveolar and post-alveolar fricatives, in order to establish whether the two types of obstruents maintain their contrast. Results indicate that fricated plosives and phonological fricatives maintain their distinction. Moreover, the issue of whether affrication should be considered lenition is addressed. Findings suggest than affrication is more accurately described as fortition rather than lenition.

1 Introduction

Frication and affrication are commonly considered processes of lenition – a term used to refer to phenomena of weakening in which a sound undergoes "some *reduction in constriction degree or duration*" (Kirchner, 2004: 313). Defining what can be considered as a 'weakening' and which processes can be included under the cover-term 'lenition' is a problematic task. In the literature, several conflicting definitions of lenition can be found (see Lavoie, 2001 and Bauer, 2008 for an overview). While there is general agreement on the status of frication as a lenition process, the case of affrication is "ambiguous" (Lavoie, 2001: 45). Considering that processes of sound variation can be investigated by looking at the process affecting a given phoneme or by looking at the output of the process (Bauer, 2008), this paper analyses the 'canonical' aspirated realisation of /t/ and the outcomes of frication and affrication – the fricated and affricated realisations of /t/ – in order to investigate the nature of the two processes.

Plosive frication is a process whereby an oral stop is realised without a complete closure in the vocal tract, but with a narrow constriction which produces frication noise at the place of articulation (Jones and Llamas, 2008). Frication of /t/ has been noticed and studied in various accents of English, such as the varieties spoken in Liverpool (Watson, 1997, 2006; Honeybone, 2001; Sangster, 2001), London (Wells, 1982; Tollfree, 1999), Newcastle (Foulkes and Docherty, 2006), Middlesbrough and Dublin (Jones and Llamas, 2008), Australia (Jones and McDougall, 2006, 2009) and in American English (Lavoie, 2002). A few of these studies (e.g. Jones and MacDougall, 2006, 2009; Jones and Llamas 2008) focus on fricated /t/ attempting to assess whether the fricated variant is a low-level phonetic effect or the result of a phonological process. Moreover, they compare the fricated realisation of the voiceless alveolar plosive to the voiceless alveolar and post-alveolar fricatives in order to determine whether there are acoustic differences between the fricative realisation of /t/ and the phonological fricatives /s/ and /ʃ/. Their findings indicate that, although fricated /t/s present acoustic features similar to those of /ʃ/, the two categories of obstruents maintain their distinction.

Plosive affrication is a process whereby a plosive is realised with a slow and fricated release. As Cruttenden claims (2008: 168), "common realizations of the English plosives /p,b,t,d,k,g/ might […] be followed by brief fricatives of the types [ɸ,β,s,z,x,ɣ]." Although affrication of /t/ is a frequent and well attested phenomenon in English (see e.g. Lavoie, 2001; Sangster, 2001; Watson, 2006), so far it has received little attention. Rather than on its phonetic analysis, research has focused on its status as a process of either lenition or fortition. As already mentioned, this issue is much debated. For example, Watson's description (2006: 3) of lenition as "a series of phonological processes which turn phonological stops into affricates and fricatives" leaves no room for doubt about the nature of affrication. On the other hand, most of the definitions that attempt to define the common ground of all lenition processes seem to automatically exclude affrication. Bauer (2008: 611), for example, defines lenition "as the failure to reach a phonetically specified target: articulatory undershoot or underachievement". This is not the case of affrication. Even though the issue is too complex to be addressed in this paper, an attempt is made to establish whether, on the basis of the data analysed, affrication is better described as lenition or fortition, bearing in mind Harris' discouraging statement: "one researcher's lenition frequently turns out to be another's fortition" (1990: 257).

The aim of this paper is to investigate affrication and frication of voiceless alveolar plosives in RP English spontaneous speech, in order to establish whether /t/ is systematically lenited and to provide a detailed phonetic analysis of lenited tokens. Moreover, the contrast between fricated plosives and phonological fricatives is analysed in order to determine whether the two types of obstruents maintain their distinction. Section 2 describes the collection of data and the type of speech analysed. Section 3 reports the auditory analysis and gives a description of the three main categories of /t/ investigated: aspirated, affricated and fricated. Section 4 describes methods and results of the acoustic analysis of these three categories. Section 5 reports the results of the comparison between fricated plosives and phonological fricatives /s/ and /ʃ/. Section 6 discusses the findings and section 7 draws the conclusions.

2 Data

The data analysed were downloaded from the BBC radio website at the page http://www.bbc.co.uk/podcasts/. In order to collect unscripted speech, programmes with guests that talk freely about topics they are experts of, were selected (e.g. In Our Time, Front Row, Politics UK, Law in Action, Midweek). Twenty speakers of 'Modern' RP (Trudgill, 2001) were selected. Sample files of the length between 40 and 60 seconds for each speaker were sent to two native speakers of English academics, experts of English accents, in order to have a second, experienced opinion on the suitability of the speech collected. The two experts listened to the files and made their judgments independently. The accents of the twenty speakers were said to range between traditional-RP and Modern-RP by both experts. The accent taken into account is the broad variety of RP which includes recent innovations that are nowadays accepted in Modern-RP too; that is, those changes that do not alter RP's most important feature: the absence of a regional connotation (Trudgill, 2001). These changes include: l-vocalisation, t-glottaling, intrusive-r, just to name a few (Fabricius, 2009).

The audio files were converted from mp3 to wav format – more suitable for acoustic analysis – using the sound editor Goldwave. The first minute of speech of each speaker was sampled using the digital audio editor Audacity 1.2.6. A first phonemic transcription of the passages was carried out in order to count the instances of voiceless alveolar plosives. For this

transcription the citation form of words was considered[1]. The average number of instances of /t/ in one minute of speech varied between 40 and 60; the total number of voiceless alveolar plosives collected from 20 minutes of speech was 992.

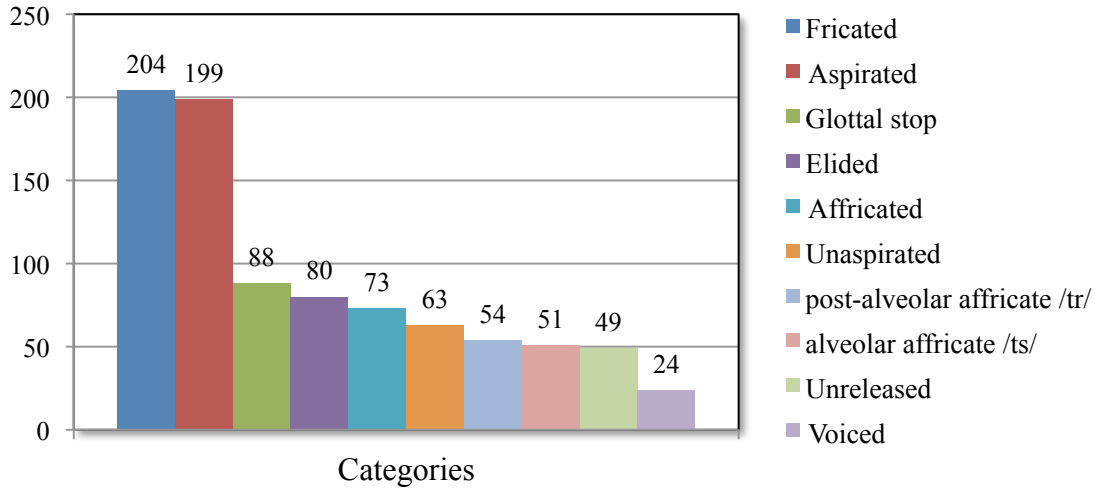
3 Auditory analysis

3.1 Methods

Auditory analysis of the entire data set of voiceless alveolar plosives was first carried out through an impressionistic phonetic transcription (Kelly and Local, 1989) using the set of symbols of the International Phonetic Association (IPA, 1999). Along with the auditory analysis, spectral observation using the speech analysis software Praat (Boersma, 2009) was employed. The transcription and the observation led to the classification of the plosives in several categories according to their phonetic realisation. Table 1 shows the main categories that were identified and the number of tokens that belong to each class[2].

After classifying the voiceless alveolar plosives, three main categories of /t/ were analysed and compared: aspirated, affricated and fricated /t/. Aspirated plosives have been used as yardstick against which to compare the two other categories, in order to establish what the phonetic differences between the 'canonical' realisation and the lenited realisations of /t/ are.

Table 1 : Phonetic realisations of /t/



3.2 Results

The most striking result is the high number of fricated plosives, which exceeds that of aspirated plosives, being the most frequent realisation (20.6% of all tokens). Instances of aspirated alveolar plosives are almost equal (20.1% of the total set), while affricated plosives are 7.4% of the data set. The clusters /tr/ and /ts/ were kept separated from the category of affricated plosives because, although they maintain their status of clusters of phonemes, they are post-alveolar affricates in their canonical realisation (Wells, 1982) and not as a consequence of lenition.

[1]For this purpose the Cambridge English Pronouncing Dictionary 17th edition (CEPD), edited by Roach *et al* (2006) was used.

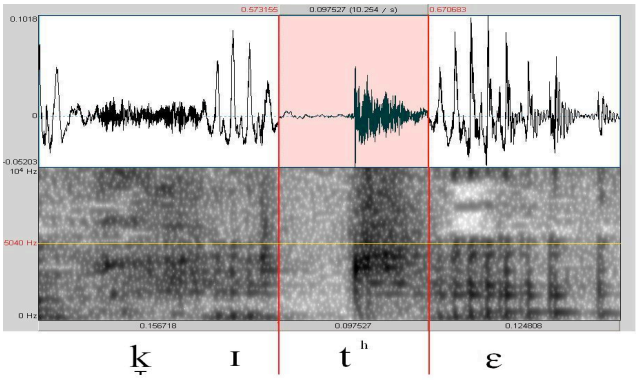
[2] A few minor categories such as assimilated plosives, ejectives and taps have been left out from Table 1.

3.3 Variants description

3.3.1 Aspirated plosives

Aspirated plosives, as in their traditional description (see e.g. Laver, 1994), have a period of silence – the hold phase – in which a complete closure in the vocal tract is created, which prevents air from flowing out. The hold phase can be identified in the spectrogram and waveform as the absence of energy at any frequency. This silent period is followed by the sudden release of air pressure in the form of a transient wave – the burst – as the active articulator moves away from the passive articulator. The burst is identifiable as a spike of high amplitude followed by a brief period of friction produced at the place of articulation. Between the release and the beginning of the vocal fold vibration, frication noise is produced at the glottis – aspiration – recognisable in the spectrogram as a relatively weak aperiodic energy at mid frequencies and dark bands in anticipation of F2, F3 and F4 of the following vowel (Klatt, 1975; Stevens, 1998).

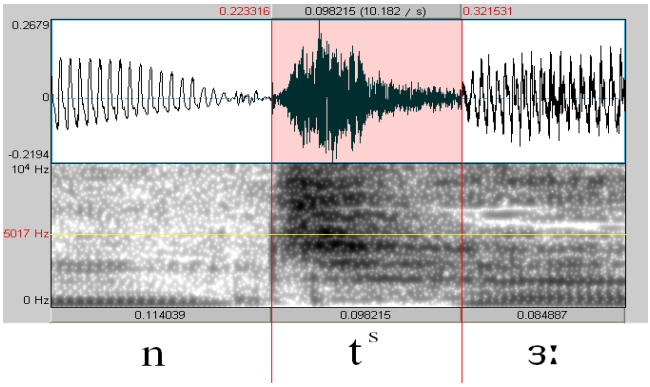
Figure 1 : Waveform and spectrogram of an aspirated plosive in <architecture>



3.3.2 Affricated plosives

Affricated /t/s have the same hold phase as aspirated /t/s, but they differ in the release phase. As mentioned in the introduction, affricated plosives have a slower and fricated release (Cruttenden, 2008). Therefore, the movement of the active articulator away from the passive articulator takes a longer time to be completed and more turbulence is created by the constriction at the place of articulation, identifiable as high aperiodic energy at high frequencies. Moreover, the presence of a portion of aspiration after the frication makes the duration of affricated /t/s even longer.

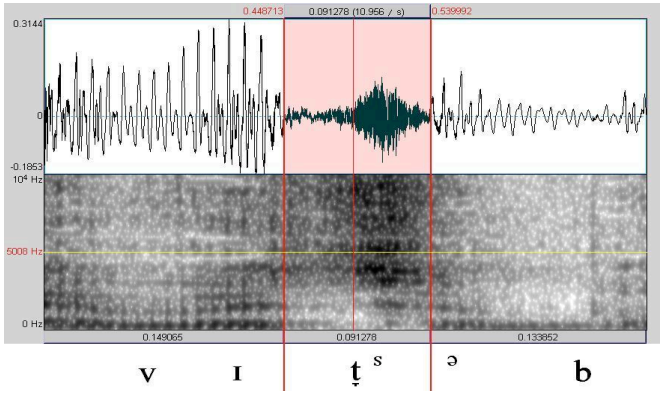
Figure 2 : Waveform and spectrogram of the release phase of an affricated /t/ in <in terms>



3.3.3 Fricated plosives

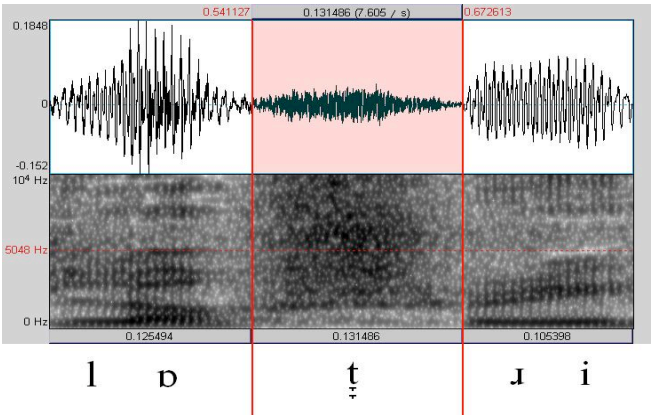
Fricated plosives do not present a complete closure in the vocal tract, but a stricture of close approximation at the place of articulation which produces frication noise throughout their duration (Jones and Llamas, 2008).

Figure 3 : Waveform and spectrogram of a partially fricated plosive in <inevitable>



Two main types of fricated /t/s were identified: *partially fricated* and *fully fricated*. Partially fricated plosives are characterised by a spectral discontinuity between a first phase – corresponding to the hold phase of a stop consonant – and a second phase – corresponding to the release phase (Figure 3[3]). Fully fricated plosives differ from partially fricated in that they have constant amplitude without abrupt variations (Figure 4). It was also noticed that between these two fricated realisations there are many variants which show slightly different degrees of frication, as in a continuum between partially and fully fricated /t/.

Figure 4 : Waveform and spectrogram of a fully fricated /t/ in <lottery>



4 Acoustic analysis

Following the auditory analysis, acoustic and statistical analyses were carried out, in order to acoustically compare the three categories of plosives and to establish the significance of their differences.

[3] In the figures 3 and 4 the symbols [t̪ˢ] and [t̪] have been used to represent, respectively, a partially fricated plosive and a fully fricated plosive.

4.1 Methods

The **segmentation** was carried out following Olive *et al* (1993) and Ladefoged (2003). The segmentation of some sequences of sounds was problematic, as in the case of a fricated plosive preceded by a voiceless alveolar fricative /s/. In order to identify a discontinuity between the two segments either as a change of amplitude or distribution of energy along the frequency scale, the spectrogram settings were set to display frequencies up to 12000 Hz. In instances of /t/ preceded by a nasal consonant, a pause or an unreleased plosive, the hold phase could not be accurately identified, therefore only the release phase was segmented. When /t/ was followed by a voiceless fricative /f, θ, s/ or the approximant /ɹ/, it was not segmented. In partially fricated plosives the two phases described in section 3.3.3 were segmented.

The **measurements** carried out were: mean duration of hold and release phase (based on the manual segmentation); mean amplitude and mean centre of gravity of the release phase. In fully fricated tokens amplitude and centre of gravity were measured on the entire duration. The centre of gravity (hereafter cog), which is a statistical analysis of the distribution of energy along the frequency scale that gives an amplitude-weighted mean frequency (Jones and McDougall, 2009), was automatically calculated in Praat (power = 2). Both mean amplitude and mean cog were measured in a temporal window of half the release phase centred at mid-point. Frequencies below 2000 Hz were filtered out with a pass Hann band to avoid including formant transitions of adjacent sounds into the measurements of /t/.

Although in the classification of lenited plosives, a distinction was made between partially and fully fricated /t/, in this section the two categories have been grouped together under the label *fricated*. Thus, the comparisons that follow are between three categories: *aspirated* (176 tokens), *affricated* (73 tokens) and *fricated* (203 tokens) plosives.

In order to compare the fricated plosive to its homorganic fricative, instances of voiceless alveolar fricatives were segmented and measured. Moreover, it was noticed that some fricated /t/s sounded retracted, therefore, also the voiceless post-alveolar fricatives were analysed. The fricatives were sampled from the same audio files and measured using the same methods. The number of tokens collected is: 15 /ʃ/s and 82 /s/s.

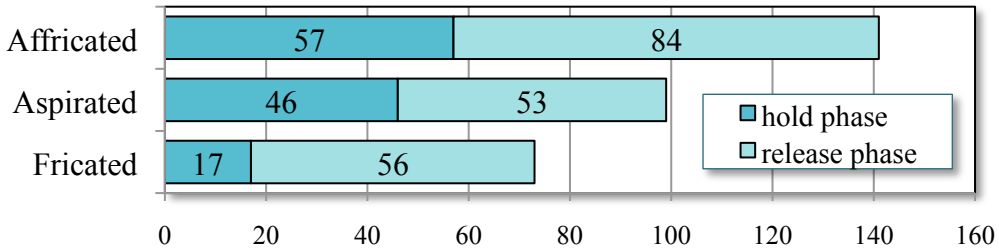
4.2 Results

4.2.1 Duration

Figure 5 shows the mean duration of hold and release phase[4]. The release phase of affricated /t/ is 37% longer than the release phase of aspirated /t/, while the duration of the hold phase is only 20% longer. The total duration of affricated plosives is approximately 30% longer than aspirated plosives, while the duration of fricated plosives is approximately 27% shorter than that of aspirated ones. The average total duration of the three categories is: fricated 73.3 ms, aspirated 98.8 ms, affricated 141.2 ms.

[4] In this case, the two phases of partially fricated plosives were segmented and measured separately.

Figure 5 : Mean duration (in ms)

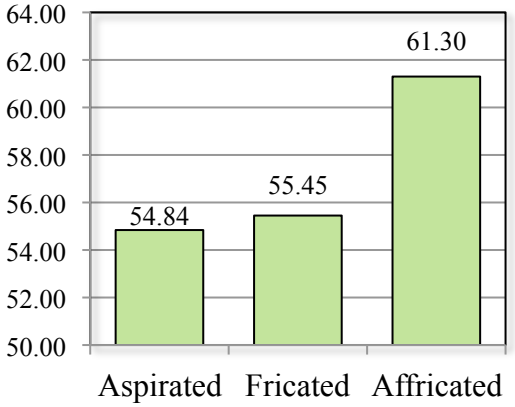


A factorial analysis of variance (ANOVA) with Bonferroni adjustment was carried out in SPSS with *Category* (aspirated, affricated, fricated /t/) as fixed factor and *Speaker* as random factor. The results show that the effect of *Category* is significant ($F=42.210$, $p<0.001$) and that also the interaction between *Category* and *Speaker* is significant ($F=2.092$, $p<0.001$). *Speaker* is not significant ($F=1.094$, $p=0.391$). A t-test for the comparison between categories gives all highly significant results: aspirated and fricated ($t=8.474$, $p<0.001$) aspirated and affricated ($t=15.016$, $p<0.001$) affricated and fricated ($t=16.576$, $p<0.001$).

4.2.2 Amplitude

Figure 6 presents the mean amplitude of aspirated, fricated and affricated /t/s. Affricated plosives have the highest mean amplitude, while aspirated and fricated plosives have lower and similar amplitude.

Figure 6 : Mean amplitude (in dB) of the release phase

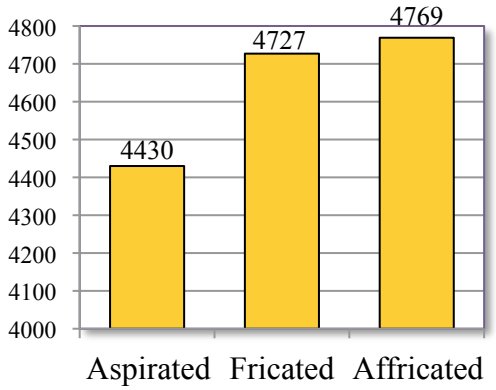


An ANOVA shows that the effect of *Category* is significant ($F=30.376$, $p<0.001$), and also the effect of *Speaker* is significant ($F=4.524$, $p<0.001$). Pairwise comparison with Bonferroni adjustment shows that the mean amplitude is significantly different between affricated and aspirated plosives ($p<0.001$) and between affricated and fricated plosives ($p<0.001$), but not between aspirated and fricated plosives.

4.2.3 Centre of gravity

Figure 7 shows the mean centre of gravity of the three categories. Affricated and fricated /t/s have higher mean cog compared to aspirated /t/s but the difference is not significant. The main difference between the three groups is that fricated /t/s have a wider range (4948 Hz) than the other categories.

Figure 7 : Mean centre of gravity (in Hz) of the release phase



Results of an ANOVA show that the effect of *Category* is significant ($F=4.176$, $p=0.021$) and that also *Speaker* has a significant effect ($F=7.540$, $p<0.001$). However, pairwise comparisons (t-test and Games-Howell Post Hoc) do not give any significant result between any of the three categories.

4.3 Summary of results

Affricated plosives are significantly longer and have higher amplitude than aspirated plosives. In particular, the release phase presents differences in the duration and in the distribution of energy: in affricated /t/s, the portion of frication is longer and followed by a portion of aspiration. Fricated /t/s are realised without a complete closure – no silence and no burst – but frication throughout. Compared to aspirated plosives, they are significantly shorter, but have approximately the same amplitude. Moreover, in the fricated category several variants that differ in the degree of frication were observed.

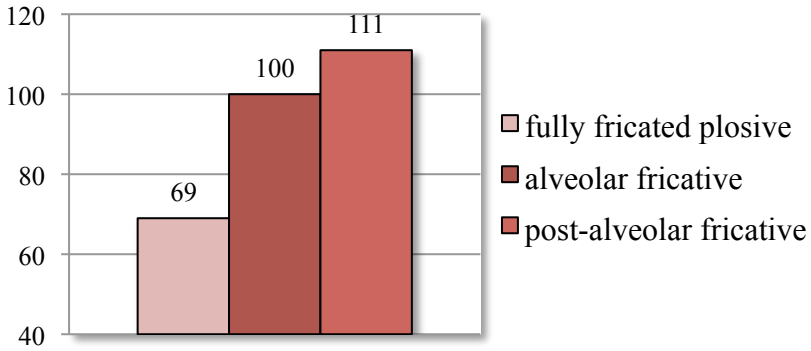
5 Fricated plosives vs. Fricatives

The voiceless alveolar plosive realised as fully fricated was compared to its fricative counterpart at the same place of articulation /s/ and to the voiceless post-alveolar fricative /ʃ/, in order to establish if the two classes of obstruents maintain their contrast.

5.1 Duration

The mean duration of fully fricated alveolar plosives is 30% shorter than the mean duration of the two fricatives, which are very similar.

Figure 8 : Mean duration (in ms)

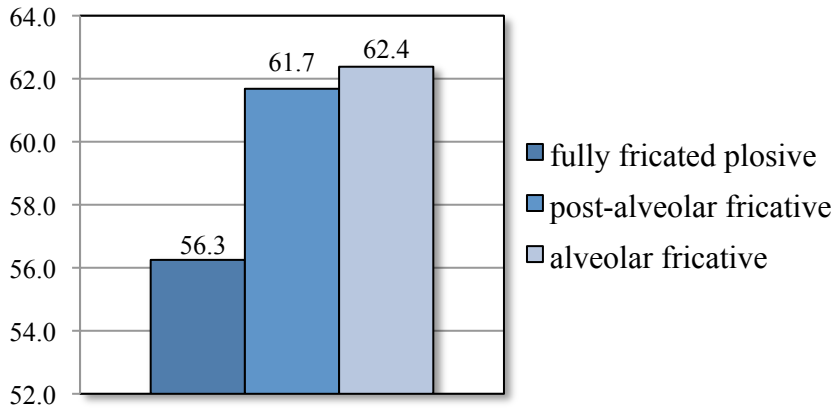


An ANOVA with *Category* as fixed factor and *Speaker* as random factor gives significant results for *Category* ($F=12.492$, $p<0.001$). Pairwise comparison with Bonferroni adjustment shows that the fricated plosive is significantly different from the alveolar fricative /s/ ($p<0.001$) as well as the post-alveolar fricative /ʃ/ ($p<0.001$).

5.2 Amplitude

The mean amplitude of fully fricated alveolar plosives is much lower than the amplitude of the two fricatives which are close to each other.

Figure 9 : Mean amplitude (in dB)

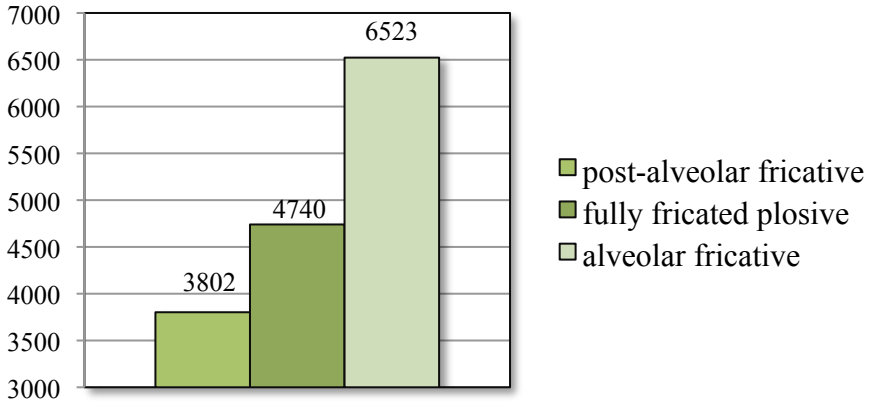


ANOVA results indicate that both *Category* ($F=22.705$, $p<0.001$) and *Speaker* ($F=2.446$, $p=0.018$) have a significant effect on amplitude. Pairwise comparison with Bonferroni adjustment shows that fricated /t/s are significantly different from both fricatives ($p<0.001$).

5.3 Centre of gravity

The cog of the three categories differs greatly. Post-alveolar fricatives have the lowest mean cog, while alveolar fricatives have the highest cog. The cog of fully fricated /t/s is between the two, but closer to that of post-alveolar fricatives, being approximately 1000 Hz higher than the cog of /ʃ/ and 2000 Hz lower than the cog of /s/.

Figure 10 : Mean centre of gravity (in Hz)



ANOVA results indicate that *Category* has a significant effect on cog ($F=38.617$, $p<0.001$) and also the interaction of *Category* and *Speaker* is significant ($F=3.110$, $p<0.001$). Moreover, pairwise comparison with Bonferroni adjustment shows that all three categories are significantly different ($p<0.001$).

5.4 Summary of results

Despite being realised as fricatives, fully fricated /t/s maintain their distinction with the phonological fricatives, both alveolar and post-alveolar. The measurements of duration and amplitude clearly indicate that the difference is between the manners of articulation of the sounds compared. The two fricatives have similar mean duration and mean amplitude, while the fricated /t/ differs greatly from the two fricatives in both parameters. The cog, being affected by the place of articulation, is the only parameter that is significantly different in all three sounds. The cog of fricated /t/s is closer to the cog of the post-alveolar rather than the alveolar fricative.

6 Discussion

This paper reports the results of a phonetic analysis of the realisations of the voiceless alveolar plosive in RP English connected speech. Firstly, the auditory analysis showed that 20.6% of voiceless alveolar plosives is realised without a complete closure (Table 1) and this fricated realisation of /t/ has the highest number of tokens, more than the 'canonical' aspirated realisation. Within the group of fricated /t/ at least two types of fricated realisations were identified – partially fricated and fully fricated – between which several variants of fricated /t/ with different degrees of frication were observed. In addition to fricated plosives, 7.4% of /t/ is affricated – realised with a slow, fricative release. These tokens are characterised by a longer portion of frication in the release phase compared to aspirated /t/s and several tokens show also a period of aspiration after the frication noise.

The measurements of the three categories of plosives show that: firstly, their mean duration is significantly different, with affricated plosives being the longest ones. Fricated /t/s are the shortest ones, 27% less than aspirated /t/s and approximately half of affricated /t/s. The mean amplitude of the release phase of affricated /t/s is significantly higher than that of fricated and aspirated /t/s, which have similar amplitude. The mean cog did not present significant results, although aspirated plosives show a lower cog than the other two groups.

Regarding the issue of whether affrication should be considered as a process of lenition or fortition, the present results suggest that we are looking at a strengthening rather than a weakening process. According to Kirchner's definition quoted at the beginning of this paper,

lenited segments should be shorter and with a reduction in the degree of stricture (Kirchner, 2004). Affricated plosives, on the contrary, are longer and present a narrower constriction at the place of articulation. If we consider only the release phase of affricated and aspirated /t/s (excluding the hold phase), the higher energy of affricated /t/s gives evidence that the stricture at the alveolar ridge is narrower compared to the constriction of aspirated plosives, otherwise no frication noise would be produced at the place of articulation and the release phase would be characterised by aspiration. However, the issue is far from being solved and will be analysed deeper in future research.

The same measurements were carried out for voiceless alveolar and post-alveolar fricatives, in order to establish whether the fricated /t/s maintain their distinction from fricatives. The mean duration of the plosive is significantly shorter than the duration of the two fricatives (which are similar). The mean amplitude is also significantly different: fricated /t/s have a much lower amplitude compared to the two fricatives (which again are similar). From these results it can be said that the contrast is between the two manners of articulation, since within the fricatives there is little variation (except for cog), indicating that the fricated realisation of the voiceless alveolar plosive maintains its contrast with the fricatives /s/ and /ʃ/.

7 Conclusion

The findings presented in this paper show that in RP English spontaneous speech, common realisations of the voiceless alveolar plosive include a significant number of fricated and affricated /t/s. While fricated /t/s are a clear instance of lenition, affricated /t/s seem more likely to represent a process of fortition. Moreover, despite their fricative realisation, fully fricated plosives maintain their distinction with the homorganic fricative.

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The status of the unaccusative / unergative split in Greek-English interlanguage

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Abstract

This paper explores SV and VS order in L1 Greek/L2 English unaccusative and unergative predicates at the syntax/lexicon and the syntax/phonology interfaces. Both unaccusatives (e.g. arrive) and unergatives (e.g. walk) are intransitives with one argument but in the former this argument originates in a VP-internal position and has a Theme/Patient role, while in the latter the argument originates in a VP-external position and has an Agent role (Perlmutter, 1978; Levin & Rappaport-Hovav, 1995). In non-null subject languages like English, the canonical SV order in both types of predicates derives from movement of the subject (S) to the TP specifier to get (nominative) case. In null subject languages like Greek, S is canonically postverbal both in unaccusatives and unergatives, with a pro at the TP specifier. The unaccusative/unergative difference is rarely manifested in the English input, given that only some unaccusative verbs may take an expletive there subject (e.g. There arrived two women). Yet, learners of English produce VS order mostly in unaccusatives (Zobl, 1989; Oshita, 2000) and more so when S is focused and phonologically heavy (Lozano & Mendikoetxea, 2008; 2009). An online acceptability judgement task was administered to 15 intermediate and 15 advanced proficiency adult speakers of English with L1 Greek, as well as to 15 English natives. The results showed that the learners preferred VS to SV order mainly with unaccusatives with phonologically long subjects. This indicates sensitivity to both the syntax-lexicon and the syntax-phonology interfaces in L2. Developmental effect was attested only regarding the syntax-phonology interface in that the advanced but not the intermediate learners performed like the native speakers.

1. Introduction

The part which Universal Grammar (UG) plays in the process of acquiring a second language (L2) has been one of the major issues in L2 acquisition research within the generative framework. To prove that UG is indeed involved in L2A as it is in L1A, it needs to be demonstrated that certain interlanguage phenomena are UG-compatible and, that the relevant UG principles operate in the L2 learners' interlanguage despite the impoverished data to which learners are exposed. In other words, it has to be shown that the phenomena in question are both determined by UG and underdetermined by the input, and that learners have received no explicit instruction about the phenomena. Thus, if L2 learners are found to possess knowledge of (un)grammaticality based on positive evidence alone, then like in the case of L1, this poses a poverty-of-the-stimulus problem and the specific knowledge may be claimed to be UG based (Schwartz & Sprouse, 1998).[1]

[1] This means that there should be no negative evidence available whatsoever, either directly, pragmatically (when learners produce a non-target form and their utterance becomes unintelligible), or

One such area posing a poverty-of-the-stimulus problem for L2 learners is the acquisition of the unaccusative / unergative distinction. The latter is a phenomenon crosslinguistically attested, yet languages differ in the syntactic encoding of the distinction. Additionally, English input renders the phenomenon invisible since verbs from both subclasses of the class of intransitives -unaccusatives and unergatives- are largely similar in the way they surface in the English language. Explicit instruction does not address the matter either.[2] Besides, EFL teachers would need to acquire a theoretical linguistic background in order to possess such complex syntactic knowledge, which is scarcely ever the case. Thus, if Greek learners of L2 English use English in such a way that suggests they are aware of the unaccusative / unergative distinction, they must have access to UG.

2. The unaccusative/unergative split

The examination of the relationship between lexical semantics and syntax has led to a very important observation regarding intransitive verbs. It has been found that not all intransitive verbs behave syntactically alike. Rather, the class of intransitives consists of two subclasses, each, according to certain aspects of their meaning, involving a distinct syntactic pattern. What is more interesting, this relationship between lexical properties and syntactic configuration of intransitive verbs has been attested cross-linguistically. The Unaccusative Hypothesis, as first formulated by Perlmutter (1978), claims that there are two classes of intransitive verbs, unaccusative and unergative, distinguished from each other in D-structure. This state of affairs is also described by the term split intransitivity. In terms of Government and Binding Theory (Chomsky, 1981), in D-structure an unergative verb has a subject and no object, while an unaccusative verb has only an object, as described in (1):

(1)

a. Unergative verb: $[_{NP}\ [_{VP}\ V]]$

b. Unaccusative verb: $[_{VP}\ V\ NP/CP]$

In general, intransitive verbs cannot assign Accusative Case (ACC) (Burzio, 1986). Consequently, to satisfy Case requirements, the sole argument NP (DP) of an intransitive verb moves to the only position where it can receive Case. This is the specifier of I where it is assigned Nominative Case (NOM) by the [+finite] feature of I, via a specifier-head relation. Thus, the difference between the D- structure and S-structure of a sentence like *three men survived* is as demonstrated below[3]:

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indirectly (i.e. learners never observe a particular type of structure in the input). To exclude the last case of indirect input as a source of knowledge, the structure in question must be particularly covert, as it happens with unaccusative and unergative verbs.

[2] Being an EFL teacher myself, I am familiar with the contents of the syllabus. Also, I have discussed with other EFL teachers the possibility that they include such explicit information in their instruction and they have unanimously given me a negative answer.

[3] For the purposes of this study, the distinction between D-structure and S-structure is assumed, and external arguments are assumed to be generated in the specifier of an Infl category, and therefore do not need to move to get Case.

(2)

a. $_{[IP\ e\ past}$ [$_{VP}$ survive three men]] D-structure

b. [$_{IP}$ Three men$_{i\ past}$ [$_{VP}$ survive $_{t\ i}$]] S-structure

On the other hand, the only argument of an unergative verb does not have to move to receive Case, since it generates in subject position. So, both in D- structure and S-structure the sentence *Three men cried* is represented as follows:

(3)

a. [$_{IP}$ Three men $_{past}$ [$_{VP}$ cry]]

In terms of argument structure, the unergative verb has an external argument, bearing the theta-role of AGENT, but no internal argument, whereas the unaccusative verb has an internal argument with a THEME or PATIENT theta -role but no external argument. In this respect, an unaccusative verb resembles a passive verb in that the latter also has an internal argument but no external argument. Semantically, the participant in an activity denoted by an unaccusative verb has no volitional control over the activity, whereas the participant of the event described by an unergative verb does have volitional control over the activity. Some examples of unaccusative verbs bearing all the above syntactic characteristics are the verbs *exist, flow, grow, hide, live, appear, die, return, fall* and *occur*. The unergative class of verbs includes among others *cry, shout, sing, speak, walk, laugh, smile, jump, run* and *fly*.

3. English and Greek postverbal subjects at the lexicon / syntax interface

Although the unaccusative/unergative distinction is a universal phenomenon, languages vary according to the way they mark this distinction syntactically. Two ways languages can do this are via auxiliary selection (Montrul, 2005) and / or word order (Lozano, 2006; Lozano & Mendikoetxea, 2007; 2008; 2009).

In English a particular class of unaccusative verbs (verbs of *appearance*, *existence* and *inherently directed motion*) may appear in VS order if certain conditions are met (Levin & Rappaport-Hovav, 1995). Those conditions are summarised in the examples below.

(4)

a.<u>There</u> arrived three girls (in *there*-constructions)

b. <u>On one long wall</u> hung a row of Van Goghs. (with a locative element clause initially)

c. <u>Then</u> came the turning point of the match. (with a time adverbial clause initially)

d. <u>With incorporation, and the increased size of the normal establishment</u> came changes which revolutionised office administration. (with a *with*-PP)

Biber et al. (1999: 912-3)

Unlike English which is almost exclusively an SVO language, Greek favours VSO as the predominant word order, regardless of verb type. Some linguists claim that there is a pragmatic preference for VS with unaccusative verbs and SV with unergatives

(Georgiafentis, 2004; Lozano, 2006). The examples below are taken from Lozano (2006: 373-4):

(5)

a. Irthe ena pedhi	# Ena pedhi irthe[4]
Arrived a boy	A boy arrived
b. Ena pedhi fonakse	# Fonakse ena pedhi
A boy shouted	Shouted a boy

Still others suggest that the picture is a little more complex for Greek since it is also possible to have postverbal subjects with unergative verbs provided that there is a locative element occupying the specifier of IP (Alexiadou et al., 2004: 10):

(6)

Edo pezun pedja

Here play children

4. English and Greek postverbal subjects at the syntax / phonology interface

The principle requiring long and heavy clause elements to be placed at the end of a clause has been termed by Quirk et al (1985) the 'End-Weight Principle'. The tendency for heavy (i.e. phonologically long) material to be placed clause-finally has been stressed in previous research (Levin & Rappaport-Hovav, 1995; Arnold, 2000; Culicover & Levine, 2001; Lahousse, 2006; Lozano & Mendikoetxea, 2007; 2008) and it has been claimed to be among the conditions under which VS word order is licensed. An analysis made by Lozano and Mendikoetxea (2007) of L&RH's (1995) corpus-based examples of inverted subjects verifies that the postverbal subject is significantly heavy. They found that light postverbal subjects were always followed by material in apposition. Here are some examples from their analysis:

(7)

a. And when it is over, off will go Clay, smugly smirking all the way to the box office, the only person better off for all the fuss.
(R. Kogan *Andrew Dice Clay Isn't Worth 'SNL' Flap*, 4 , cited in L&RH: 221)

b. Above it flew a flock of butterflies, the soft blues and spring azures complemented by the gold and black of the tiger swallowtails.
(M. L' Engle *A Swiftly Tilting Planet*, 197, cited in L&RH: 257)

(all cited in Lozano & Mendikoetxea, 2007: 6)

The End-Weight Principle also operates in Greek with a preference for longer constituents to be placed last (Laskaratou, 1998). Yet, given that Greek generally favours the VS order, subjects do not need to be phonologically long, heavy, in order to be placed after the verb. VS in Greek is perfectly grammatical and pragmatically felicitous even if the subject is light.

[4] # denotes pragmatically infelicitous sentences

5. Previous L2 acquisition studies

Research on the errors made by learners from diverse L1 backgrounds has revealed that the unaccusative/ unergative distinction is part of their interlanguage grammars. The most prominent types of errors that point towards this conclusion include inappropriate passive morphology and postverbal subjects. Passive morphology refers to the application of the rule be + past participle schematised by Zobl (1989) as 'be' V –ed. Interestingly, a large body of research on the subject suggests that these types of errors tend to occur with unaccusatives but not with unergatives (Zobl, 1989; Balcom, 1997; Oshita, 2000; 2001; 2004; Hertel, 2003; Lozano & Mendikoetxea, 2007; 2008; Kras, 2007). Here are some examples from Zobl's study (1989: 204):

(8)

a. The most memorable experience of my life was happened 15 years ago.

b. My mother was died when I was just a baby.

c. I was just patient until dried my clothes.

d. Sometimes comes a good regular wave.

Also, more examples from Oshita (2004: 119):

(9)

a. ....it *existed* a lot of restrictions....

b. ....it *happened* a tragic event.....

c. .....it *arrived* the day of his departure.....

And some evidence from Lozano and Mendikoetxea (2008: 107):

(10)

a. I do believe that *it* will not exist a machine or something able to imitate the human imagination.

b. Nevertheless exist other means of obtaining it [i.e., money] which are not so honourable, but quicker.

c. *In the main plot* appear the main characters: Volpone and Mosca...

d. *Later* came a world of disorder, during and after the First World War....

e. ...and *from this moment* begins the avarice.

The fact that learners either produced passive unaccusatives and postverbal subjects with unaccusative verbs, or judged as correct sentences containing such errors suggests that L2 learners of English are aware of the object like properties of the sole argument of unaccusatives. Hence, their interlanguage grammars must be shaped by UG.

With regard to the syntax-phonology interface, the extent to which L2 learners can accomplish native-like representations is an area less documented in the existing literature on L2 acquisition. From the available research though, it can be drawn that L2 learners prefer to place phonologically long, heavy, constituents postverbally. Lozano and Mendikoetxea (2007; 2008) examined the extent to which the distribution of postverbal and preverbal subjects in the interlanguage of advanced Spanish and Italian learners of L2 English is constrained by the phonological weight of these subjects. They concluded that postverbal subjects in L2 English are not only unaccusative and focus, but also heavy (phonologically long). On the other hand, light (phonologically short) subjects are preferably placed preverbally by L2 learners. See the L2 data below and compare preverbal to postverbal subjects with respect to phonological weight.

(11)

a. ...for the first time, **beggars** appeared.

b. **Violence** does exist.....

c. We could call it the body language and through it, emerges **the protagonists' personality**.

d. This is conveyed in line 25 where by the expression, emerges **the people's ignorance in having prejudices.**

(Lozano & Mendikoetxea, 2008: 108)

Thus, what can be claimed to hold with respect to existing research is that constraints operating at the syntax-phonology interface are psychologically real for advanced learners of English L2.

6. Aims, assumptions and research questions

The aim of the present study is to investigate the status of the unaccusative/ unergative distinction in the interlanguage of Greek learners of English. Specifically, my primary goal is to determine whether these learners' mental grammars reflect the difference in argument structure between these two categories of intransitives. This concerns the acquisition of the syntax-lexicon interface. A second aim of the study is to test the acquisition of the syntax-phonology interface by checking the extent to which heavy subjects of unaccusative verbs are placed postverbally. I regard the distribution of word order – SV or VS depending on verb type (unaccusative or unergative) - as indicative of both the acquisition of the unaccusative / unergative split and of the syntactic encoding of the End-Weight Principle in relation to verb type. Thus, in a nutshell, this study seeks to identify the syntactic, semantic and phonological conditions under which Greek learners of English produce postverbal subjects, and whether those conditions licensing postverbal subjects in the Greek-English interlanguage are the same ones that license postverbal subjects in native English.

I assume that acquisition of the unaccusative/ unergative split poses a poverty-of-the-stimulus problem for L2 learners for two reasons. First, because the surface properties of English input give no information pointing to different syntactic representations of unaccusative and unergative verbs in D-structure; since English is an SVO language, sentences containing either type of verb generally appear with their single argument in subject position. Thus, the unaccusative/ unergative distinction is largely covert and cannot have been learned from the input. Second, because explicit classroom instruction addressing the difference in argument structure between unaccusatives and unergatives, and how this difference is encoded in syntax, does not take place. EFL teachers in Greece insist on the

SVO status of English, and do not refer to a special category of intransitives (unaccusatives) which can be attested in VS structures under certain conditions. Besides, it is doubtful whether the majority of EFL teachers possess such complex linguistic knowledge on syntactic structures. Likewise, EFL teachers exhibit little, if any at all, tolerance on learners' errors which have to do with English SVO word order. Thus, learners from an early age are strongly advised not to violate the prevalent English SVO order. In addition, most teachers are unaware of such grammatical subtleties and cannot provide sophisticated linguistic explanations for their learners.

As shown in section 3 of this paper, the conditions under which postverbal subjects are licensed in English and Greek are far from identical. We shall bear in mind that Greek and English are predominantly VSO and SVO languages respectively. Hence, in English, but not in Greek, postverbal subjects are licensed under very specific conditions. Consequently, if Greek learners of English transfer VS order from their native tongue, they should apply VS no more to unaccusatives than to unergatives and regardless of the conditions under which VS is allowed by the English grammar. If, on the contrary, Greek learners of English prove to adhere to the English licensing contexts and only to those, then this must constitute evidence for access to UG.

Also, as previously mentioned in the paper (section 4), the phonological conditions licensing a postverbal subject in Greek are not strictly the same as those in English.

Given the situation described above, the tools available to the Greek learners of English L2 can be claimed to involve, at least for the most part, knowledge of UG and exposure to input. L1 transfer can also be a source of information but this would rather mislead than help, since the contexts of VS distribution in Greek are many more than those in English.

In view of the above, my research questions can be stated as follows:

- Do learners show a preference for word order according to verb type- unaccusative or unergative? (the syntax-lexicon interface)
- Are learners sensitive to the syntactic encoding of phonological weight via word order? In other words, do they prefer to place heavy subjects of unaccusative verbs postverbally and light ones preverbally? (the syntax-phonology interface)
- Is there a developmental pattern to both the acquisition of the syntax-lexicon and the syntax-phonology interfaces? At what stage do learners become sensitive to how lexical semantics and phonology each interacts with word order in English?

7. Hypotheses

Taking into consideration findings in previous studies, I formed the following hypotheses.

H_1: Lexicon-Syntax interface: If learners are sensitive to the distinction between unaccusatives and unergatives at the Lexicon-Syntax Interface, they will accept VS order more with unaccusative than with unergative verbs, like the native speakers. Additionally, a developmental pattern in the acquisition of the unaccusative/unergative distinction is expected, with advanced learners behaving more like the native speakers in differentiating between the two verb types in terms of word order and intermediate learners making random selections, which will manifest their non acquisition of the distinction.

H_2: Syntax-Phonology interface: If learners are sensitive to the syntax-phonology interface, they will exhibit a stronger acceptance of VS order when the subject is heavy than when the subject is light, as native speakers will do. Again, a pattern of developmental effect is expected to emerge, in that the advanced learners will resemble the native speakers in acceptance rates, while the intermediate learners will equally accept either heavy or light subjects with VS.

8. Method

8.1 Participants

The learners who participated in this study were adult Greek native speakers who had learnt English as a foreign language in private language schools. Their age ranged from 24 to 40 years and their educational level varied from High School graduates to MA/Msc holders. They were placed in two basic proficiency groups according to results from the Oxford Quick Placement Test (UCLES 2001, paper and pen pack). This test consists of two parts with a total of 60 items. Part 1 involves 40 items and Part 2 20 items. The participants who scored under 36/40 in Part 1 did not take Part 2, so their score was counted out of 40 items overall. The rest proceeded to Part 2 and their performance was judged out of 60 items overall. Results showed that participants fell within 4 proficiency levels: lower intermediate (scored either 24-30/40 in Part 1 or 30-39/60 in both Part 1 and 2), upper intermediate (scored either 31-40/40 in Part 1 or 40-47/60 in both Part 1 and 2), advanced (scored 48-54/60), and very advanced (scored 55-60/60). Those proficiency levels were later merged accordingly in order to form two learner groups, one intermediate and one advanced. There was also a control group consisting of 10 native speakers (NS) of English, all British, with their educational level varying from High School graduates to MA/Msc holders. Their age ranged from 24-38. Information about the participants is summarized in Table 1.

Table 1: *Participants' profiles*

Group	Number	Age range	Range in placement test score
NS	10	24-38	-
Adv.	15	24-40	48-55/60
Int.	15	24-40	30-47/60

8.2 Experimental material

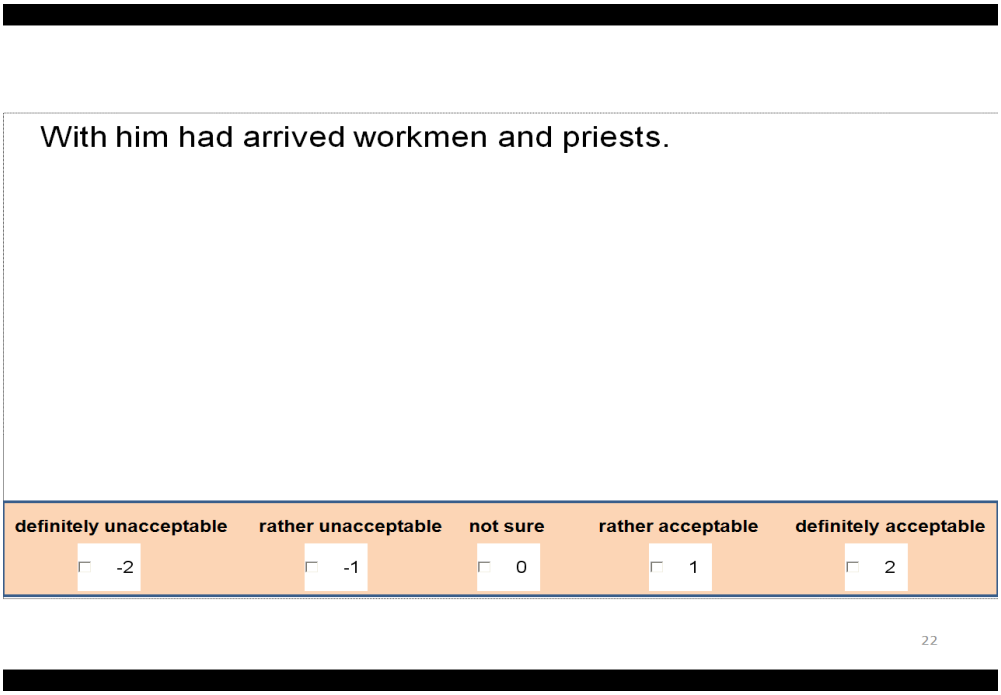
The experimental material used was an Acceptability Judgement Test (AJT) consisting of 50 sentences, 20 with unaccusative and 20 with unergative verbs. In the sentences with unaccusative verbs, there were 10 with SV order and 10 with VS order and the latter comprised 5 sentences with heavy subjects and 5 with light subjects. In the sentences with unergative verbs, there were 10 with SV order and 10 with VS order (ungrammatical), the latter sentences containing some locative element or time adverbial preceding the verb. Finally, there were 10 sentences used as distractors, 5 of which were grammatical and 5 ungrammatical. The target verbs in the AJT are presented in Table 2, further subcategorised into 'core' and 'peripheral' unaccusatives and unergatives, according to Sorace's (2000) Unaccusative Hierarchy.

Table 2: *Verbs in the Acceptability Judgement Task*

Unaccusative verbs		Unergative verbs	
Core	Peripheral	Core	Peripheral
arrive, come, become, emerge, appear	*remain, survive, hung, exist*	*work, walk, run, laugh, speak, smile, dance, shout*	*sleep, cry*

The test was presented electronically, in a power point form. At the beginning of the test, the participants received detailed instructions as well as examples serving as training sentences for participants to understand how they were expected to respond. Instructions to both learner groups were given in their mother tongue to ensure full comprehension of the task procedures. Each of the test sentences was presented in a separate slide, and slides automatically succeeded one another after 13 seconds for the two learner groups, and after 10 seconds for the control group. During their allocated test time participants had to read the sentences and decide on their acceptability by left-clicking the appropriate box, using their mouse. Replies were given on a 5-point Likert scale, ranging from -2 (definitely unacceptable) to 2 (definitely acceptable). The version administered to Greek speakers had the 5-point scale translated in Greek. A typical example sentence follows as it was presented to the control group:

(12)



As it is evident, the sentence was presented at the top of each slide and the five point scale was furnished right below, at the bottom of the page. Two versions of the test, each with a different order of items, were prepared and offered in order to control for order-of-presentation effects. Half of the subjects in each group were administered version A, and the rest were administered version B of the test.

Prior to the main experiment, a pilot version of the test was given to 10 native speakers of English and 5 speakers of Greek. Since the AJT was intended as an online task, the purpose of the pilot test was to ensure that the participants were allocated sufficient time for task completion but not enough time to employ any metalinguistic knowledge in the task. Furthermore, it was needed to check whether participants were familiar with the vocabulary items used in the test. Last, the native speakers' judgements were essential to decide on the validity of the test items. For example, it was found that not all of the sentences with VS order in unaccusatives were equally acceptable by native speakers.

Subsequently, quite a few alterations were made to the initial form of the test. Moreover, it was decided that allocated time should be kept as little as possible for the control NS group, so that their answers were based on their intuitions. As regards the two learner groups, the main consideration was to allocate them time enough to read, decide on acceptability rate and also click the appropriate box on their screen. At the same time, the possibility of applying metalinguistic knowledge to the task had to be limited to the extent that was possible. Last, since the test was administered electronically, participants' familiarity with the relevant technology was also a very important consideration to bear in mind. Therefore, only participants who had relevant skills were chosen for the experiment.

9. Results

9.1 Results for the syntax-lexicon interface

We analysed word order with respect to verb type (unaccusative or unergative). Four analyses were carried out, one for each context. [5]

SV order with unaccusative verbs

Table 3 displays the frequency of responses of acceptance, 'not sure' and rejection to the experimental items involving unaccusative verbs in SV order.

Table 3: *Acceptance of SV order with unaccusative verbs*

	Groups			
	native	**advanced**	**intermediate**	Total
Rejected	27	37	41	105
Not sure	3	6	10	19
Accepted	70	107	99	276
Total	100	150	150	400

[5] While the test instrument required participants to rate items on a Likert scale from -2 to +2, before running the analyses we recoded scores of both -2 and -1 as 'rejected' and, likewise, both +1 and +2 as 'accepted', and then calculated these as percentages.

Initially it appears that all three groups of participants largely accept sentences containing unaccusative verbs in SV order. Pearson Chi- Square tests were performed and the results showed that the interaction between groups and word order was not significant [x^2 (4, N=400) = 2,543, p= 0, 637]. This result was verified by results from a Fisher's Exact test, which yielded similar findings [x^2 (2, N= 381)= 0,464, p=0,793). Thus, all groups behaved similarly, largely accepting SV order with unaccusative verbs. More specifically, native speakers accepted such sentences at 70%, the advanced group at 71,3% and the intermediate group at 66%. These results are summarised in Table 4.

Table 4: *Acceptance of SV order with unaccusative verbs (in percentages)*

	Groups			P (Chi- Square Test)
	native	advanced	intermediate	
Rejected	27,0%	24,7%	27,3%	
Not sure	3,0%	4,0%	6,7%	**0,637**
Accepted	70,0%	71,3%	66,0%	

SV order with unergative verbs

Table 5 demonstrates the frequency of responses of acceptance, 'not sure' and rejection to the experimental items involving unergative verbs in SV order.

Table 5: *Acceptance of SV order with unergative verbs*

	Groups			Total
	native	advanced	Intermediate	
Rejected	40	29	51	120
Not sure	1	6	6	13
Accepted	59	115	93	267
Total	100	150	150	400

Native speakers appear more reluctant to accept items with unergative verbs in SV order than the advanced and intermediate groups. According to Pearson Chi- Square tests, the interaction between groups and word order was significant [x^2 (4, N= 400) = 15,516,

p=0,004]. A Fisher's Exact test confirmed the results [x^2 (2, N= 387) = 13,346, p=0,001]. While all groups, accepted rather than rejected SV order with unergative verbs, this was more so in the advanced group (76, 7%), followed by the intermediates (62%), while the native speakers accepted these sentences even less (59%). Table 6 presents these results.

Table 6: *Acceptance of SV order with unergative verbs (in percentages)*

	Groups			P (Chi- Square Test)
	native	advanced	Intermediate	
Rejected	40,0%	19,3%	34,0%	**0,004**
Not sure	1,0%	4,0%	4,0%	
Accepted	59,0%	76,7%	62,0%	

If we compare these results with the ones regarding SV unaccusatives (Table 4), we see no great difference with respect to verb type, unaccusative or unergative. Overall, both proficiency groups seem to have set SV as the default word order in English, just like the native speakers.

Contexts with VS order and unaccusative verbs

Table 7 displays the acceptance of items containing unaccusative verbs in VS order.

Table 7: *Acceptance of VS order with unaccusative verbs*

	Groups			Total
	native	advanced	Intermediate	
Rejected	53	76	69	198
Not sure	1	12	13	26
Accepted	46	62	68	176
Total	100	150	150	400

Both learner groups appear to moderately accept sentences with unaccusative verbs in VS order without a great difference in their rate of acceptance. Also, both learner groups exhibit a slightly smaller rate of acceptance than the control group. Indeed, the interaction between groups and word order was not proven to be significant. This was again shown by both Pearson Chi-Square tests [x^2 (4, N= 400) = 7,310, p=0,120] and Fisher's Exact tests [x^2 (2, N= 374)= 0,631, p= 0,730]. All groups performed alike with regard to these contexts. They

rejected VS order with unaccusative verbs but not categorically. Particularly, the native speakers accepted 46% of the unaccusative VS contexts, the advanced group did so at a 41,3% percentage and the intermediate group performed similarly in terms of acceptance (45,3%). See Table 8.

Table 8: *Acceptance of VS order with unaccusative verbs (in percentages)*

	Groups			P (Chi- Square Test)
	native	advanced	Intermediate	
Rejected	53,0%	50,7%	46,0%	
Not sure	1,0%	8,0%	8,7%	**0,120**
Accepted	46,0%	41,3%	45,3%	

VS order with unergative verbs

Table 9 shows the frequency of acceptance to experimental items which involved unergative verbs in VS order.

Table 9: *Acceptance of VS order with unergative verbs*

	Groups			Total
	native	advanced	intermediate	
Rejected	79	94	96	269
Not sure	2	10	10	22
Accepted	19	46	44	109
Total	100	150	150	400

Primarily it appears that no group seems to accept VS order with unergative verbs. This is true for both learner groups and the native group is even more disinclined to accept VS order with unergatives.

These contexts showed a marginal significance of word order according to group, as revealed by both a Chi- Square test [x^2 (4, N= 400) = 9, 106, p=0,059] and a Fisher's Exact test [x^2 (2, N=378)= 5,825, p=0,054]. VS with unergative verbs was accepted more by learners of the advanced group (30,7%) which was quite unexpected. Next in acceptance of the same structure stands the intermediate group (29,3%) and last came the native speakers (19%), who rejected VS order with unergative verbs most readily of all, as it was initially expected. See Table 10.

Table 10: *Acceptance of VS order with unergative verbs (in percentages)*

	Groups			p (Chi- Square Test)
	native	advanced	intermediate	
Rejected	79,0%	62,7%	64,0%	
Not sure	2,0%	6,7%	6,7%	**0,059**
Accepted	19,0%	30,7%	29,3%	

A statistical test of differences for 2-sample proportions was performed in order to investigate the degree of significance of acceptance of VS order according to verb type: unaccusative or unergative, for each group. This was proven significant for the native speakers (p=0,041) and the intermediate learners (p=0,045), yet, non-significant for the advanced proficiency group (0,045). Details are shown in the Table 11, where N refers to the number of sentences.

Table 11: *Acceptance of VS order in unaccusatives and unergatives*

Groups	Unaccusatives	unergatives	p
native	N= 40 46%	N=19 19%	0,041
Advanced	N= 62 41,3%	N=46 30,7%	0,129
intermediate	N=68 45,3%	N=44 29,3%	0,045

All groups seem to prefer VS order with unaccusative verbs to VS order with unergatives. However, this differentiation in preference according to verb type is not equally significant for all groups (within-group difference). The native speaker group is the one most willing to accept VS order with unaccusatives and the one most reluctant to accept VS with unergatives. Second comes the intermediate group which significantly accepted VS order with unaccusatives more than VS order with unergatives. The advanced group is the least enthusiastic about VS with unaccusative verbs compared to the other two groups. Equally unexpectedly, advanced learners have the highest rate of acceptance of VS order with unergative verbs compared to the other two groups (30.7% acceptance).

9.2 Results for the syntax-phonology interface

Table 12 displays the frequency of acceptance of VS order with respect to the phonological weight of the subjects of unaccusative verbs.

Table 12: *Acceptance of VS in unaccusatives with light and heavy subject*

	PHONOLOGICAL WEIGHT		**Total**
	Light	Heavy	
Rejected	121	77	198
Accepted	70	106	176
Total	191	183	374

As it is evident from Table 12 above, heavy subjects of unaccusative verbs are generally accepted more in VS order than light subjects of the same intransitive verb type. The statistical analysis revealed an interaction between phonological weight and word order. According to Fisher's Exact Test (computed only for a 2x2 table) all groups preferred heavy subjects of unaccusative verbs in postverbal position and light ones in preverbal position [x^2 (1) = 16,978, p=0,000]. These results were confirmed by Pearson Chi-Square tests [x^2 (2) = 19, 603, p=0,000]. See Table 13.

Table 13: *Acceptance of VS in unaccusatives with light and heavy subject (in percentages)*

	PHONOLOGICAL WEIGHT		**p**
	Light	Heavy	
Rejected	63,4%	42,1%	**0,000**
Accepted	36,6%	57,9%	

Table 14 demonstrates the frequency of acceptance of experimental items with VS order in relation to phonological weight of subjects of unaccusative verbs according to group of participants.

Table 14: *Acceptance of VS in unaccusatives with light and heavy subject according to group (between-group difference)*

PHONOLOGICAL WEIGHT	GROUPS	UNACC- VS			Total
		REJECTED	NOT SURE	ACCEPTED	
LIGHT	**native**	34	1	15	**50**
	advanced	46	4	25	**75**
	intermediate	41	4	30	**75**
Total		121	9	70	**200**
HEAVY	**native**	19	0	31	**50**
	advanced	30	8	37	**75**
	intermediate	28	9	38	**75**
Total		77	17	106	**200**

Figures show a tendency for all groups to accept VS order with heavy subjects of unaccusative verbs rather than with light ones. In fact, all groups performed similarly with respect to the syntax-phonology interface. There was no group effect either for heavy subjects [$x^2(4, N= 200) = 6,850$, $p=0,144$] or for light ones [$x^2(4, N= 200) = 2,774$, $p=0,596$], according to Chi-Square Tests (see Table 15).

Table 15: *Acceptance of VS in unaccusatives with light and heavy subject according to group (between-group difference in percentages)*

PHONOLOGICAL WEIGHT	GROUPS	UNACC- VS			p
		REJECTED	NOT SURE	ACCEPTED	
LIGHT	**native**	28,1%	11,1 %	21,4%	
	advanced	38,0%	44,4%	35,7%	
	intermediate	33,9%	44,4%	42,9%	**0,596**
HEAVY	**native**	24,7%	0,0%	29,2%	
	advanced	39,0%	47,1%	34,9%	
	intermediate	36,4%	52,9%	35,8%	**0,144**

Table 16 presents within-group difference in relation to the frequency of acceptance of VS with unaccusatives according to phonological weight of subjects.

Table 16: *Acceptance of VS in unaccusatives according to phonological weight (within-group difference)*

GROUPS	UNACC- VS	PHONOLOGICAL WEIGHT		**Total**
		Light	**Heavy**	
Native	REJECTED	34	19	**53**
	NOT SURE	1	0	**1**
	ACCEPTED	15	31	**46**
Total		50	50	**100**
Advanced	REJECTED	46	30	**76**
	NOT SURE	4	8	**12**
	ACCEPTED	25	37	**62**
Total		75	75	**150**
intermediate	REJECTED	41	28	**69**
	NOT SURE	4	9	**13**
	ACCEPTED	30	38	**68**
Total		75	75	**150**

The advanced group appear to perform like the native speaker group in discriminating between heavy and light subjects of unaccusative verbs and preferring the former in VS order. The intermediate group also prefer heavy as opposed to light subjects in VS, yet they seem to exhibit a less consistent behaviour than the two other groups. As Table 17 demonstrates, native speakers preferred VS with heavy subjects of unaccusative verbs more than with light subjects (62 % vs. 30.0%). This difference was significant [x^2 (2, N=100) = 10,811, p=0,004]. The advanced group demonstrated a similar performance (49.3% vs. 33.3 %), which was also significant [x^2 (2, N=150) = 7,024, p=0,030]. Last, the intermediate group too preferred VS order with heavy subjects of unaccusative verbs and SV order with light subjects (50.7% vs. 40.0%). However, this within-group difference was only near- significant [x^2 (2, N=150) = 5,314, p=0,070]. Exact Fisher's Tests were also performed and results were shown to be similar.

Table 17: *Acceptance of VS in unaccusatives according to phonological weight (within-group difference in percentages)*

GROUPS	UNACC- VS	PHONOLOGICAL WEIGHT		**P**
		Light	**Heavy**	
Native	REJECTED	68%	38%	
	NOT SURE	2,0%	0,0%	
	ACCEPTED	30%	62%	**0,004**
Advanced	REJECTED	61,3%	40,0%	
	NOT SURE	5,3%	10,7%	
	ACCEPTED	33,3%	49,3%	**0, 030**
intermediate	REJECTED	54,7%	37,3%	
	NOT SURE	5,3%	12,0%	
	ACCEPTED	40,0%	50,7%	**0, 070**

Thus, with unaccusative verbs, although all groups preferred heavy subjects in postverbal position and light subjects in preverbal position, this preference was less categorical for the intermediate learners, who seem to be less sensitive to phonological principles at this stage. Presumably, they need more exposure to input and sufficient time to acquire these principles operating in the L2.

10. Discussion

As demonstrated in the previous section, first, all groups preferred SV order to VS order with both unaccusative and unergative verbs. While in SV unaccusatives there was no between-group difference in acceptance rates, SV unergatives were accepted significantly more by the advanced learners than by the other two groups. Also, it is notable that of all groups, the native speakers were the least eager to accept SV unergatives. This is potentially attributable to considerations other than the SV word order. Given the high level of acceptance of SV order overall, regardless of verb type, maybe the native speakers judged some of our SV unergative sentences unacceptable due to stylistic considerations or because certain vocabulary items were not thought to appropriately collocated with others. Similarly, intermediate learners' less categorical views about SV unergative contexts may be due to a number of reasons irrelevant to word order.

More importantly, moving to VS contexts, all groups were proved to prefer this word order with unaccusative rather than with unergative verbs yet, this preference was not statistically significant for the advanced group. On the other hand, there were no between-group differences in accepting VS with unaccusative verbs and sentences were largely regarded as being acceptable by all groups, without having differences according to group.

On the contrary, VS unergative sentences were largely rejected by all groups, yet our two learner groups were not as determinate in their rejection of those contexts as the native speakers were; with a marginal significance, both the advanced and the intermediate learner groups allowed for more VS with unergative verbs than the native speakers did. Possibly, this is a case of transfer from the learners' L1 which favours VS as the unmarked option.

Overall, both advanced and intermediate learners show a preference for VS order with unaccusative verbs rather than with unergatives, in spite of the advanced learners being less categorical in their selection. On the contrary, when it comes to unergative verbs, both learner groups seem to prefer subjects to occupy preverbal places. These findings are consistent with previous research (Zobl, 1989; Oshita, 2000; 2001; 2004; Hertel, 2003; Lozano & Mendikoetxea, 2007; 2008; Kras, 2007). This, in my opinion, constitutes proof that even at intermediate stages of L2 development, Greek learners of English maintain distinct syntactic representations for unaccusative and unergative verbs. Their mental grammars seem to include such sophisticated syntactic information as the fact that unaccusative verbs have a VP-internal argument while unergative verbs' sole argument originates VP-externally. This cannot be attributed to L1 transfer; despite the fact that VS is the dominant word order in their mother tongue, it is not sure whether Greek does readily discriminate between word order with unaccusative and unergative verbs (although Lozano, 2006 and Georgiafentis, 2004 claim the opposite). In order to be more certain as to whether Greek indeed dictates word order with respect to intransitive verb type (unaccusative or unergative), material testing this parameter should have been assigned to our participants. Unfortunately, the present study did not cover this area.

Thus, our H_1 was partly confirmed as, on the one hand, the learners seem sensitive to the syntax-lexicon interface but, on the other hand, the developmental pattern that emerged was not as hypothesised. The fact that advanced learners proved to be the least categorical of all groups in their selection of VS with unaccusatives rather than with unergatives, should be considered in relation to Sorace's (2000) Unaccusative Hierarchy. Specifically, while the vast majority of unergative verbs in this study were core unergatives according to the Unaccusative Hierarchy, the unaccusatives that were used split between core and peripheral ones. In this respect, it is not impossible that advanced learners, assumingly the most sophisticated developmentally in order to distinguish between so fine syntactic matters, have treated the most peripheral unaccusative verbs as being less unaccusative and more unergative. Similarly, the two unergative verbs used in our study which were peripheral in terms of their place in the Hierarchy, may have well been treated more as unaccusatives.

With regard to the syntax-phonology interface, all groups proved to be sensitive to the interaction between syntax and the End-Weight phonological principle, as with unaccusatives they preferred phonologically long, heavy subjects in postverbal position, while phonologically shorter, light subjects in preverbal position. The results of the present study agree with earlier research on L2 acquisition of phonological weight (Lozano & Mendikoetxea, 2007; 2008). This preference for word order according to phonological weight of the subject was categorical for native speakers and advanced learners, yet less so for the intermediate ones. While the intermediate group also preferred VS order with heavy subjects of unaccusative verbs and SV order with light subjects, this differentiation in preference was proven only marginally significant. Perhaps, the intermediate group requires more exposure to L2 input to acquire this distinction. Hence, my H_2 was fully confirmed, further supporting that interfaces are inherently more difficult domains in the L2, as found in previous studies (Sorace, 2004; Lozano, 2006). Intermediate learners are not yet ready developmentally to acquire such an area. Presumably, what they need is more time and contact with the L2.

Last, although the materials used in the present study were not designed to explore passivisation errors, a personal examination of 72 essays of both intermediate and advanced learners of L2 English showed that erroneous passivisation occurred only with unaccusative verbs, never with unergatives. This finding lends further support to the idea that L2 learners hold distinct mental representations according to intransitive verb type.

(13)

1. There wasn't any park there, but suddenly, it was appeared.

2. All the things were disappeared.

3. ....what I did when I was left from centre of the town.

4. Suddenly one clown was fallen off the horse.

11. Conclusion

Before I conclude, I will refer to the limitations of the present study**.** First, the AJT should have been preceded by the administration of a separate cloze test to Greek learners in order to ensure that they were familiar with all of the vocabulary items in the AJT. Although I tried to keep the vocabulary in the test as simple as possible, a pre-administered cloze test checking for word comprehension would have eliminated the possibility of such a bias on the learners' performance. Second, my selection of unaccusative and unergative for the AJT should have taken Sorace's (2000) Unaccusative Hierarchy into more serious consideration. While most of the unergative verbs were of the hierarchically core unergative category, this was not so with the unaccusatives. If my AJT had included more unaccusatives of the core category, some results might have turned out more categorical. Third and last, pre-testing material should have been designed to accompany the study, whose main purpose should have been to deduce the status of the unaccusative/unergative split in native Greek, as well as whether there is actually a shift in word order according to intransitive verb type.

I hope that this study has contributed to the current debate of whether L2 learners of English are sensitive to the syntax-lexicon and the syntax-phonology interfaces, and whether there is a developmental pattern in the acquisition of the two interfaces. It has been shown that Greek learners of English are indeed sensitive to the interfaces, with split intransitivity represented in their interlanguage grammars both with respect to phonological and to syntactic principles. A developmental pattern has emerged concerning the syntax-phonology interface, in which intermediate learners proved less categorical in their judgements than the advanced learners who exhibited a clearer native-likeness. The most possible source of such a difference has been attributed to intermediate learners' more limited exposure to input. Concerning the weird developmental effect which was shown to emerge at the syntax-lexicon interface, i.e. the fact that our advanced learners were the least categorical of all groups in their preference for VS with unaccusatives rather than with unergatives, it could be assumed that the latter was due to the more peripheral status of some of the unaccusative verbs used in the study. As previously discussed, this factor might have led more sophisticated advanced L2 grammars to treat those verbs as less unaccusatives and more unergatives, and thus, VS structure was rejected as it would have been normally the case with unergatives in native grammars. These parameters need to be taken into consideration by future research. What is more, further L2 evidence is needed to confirm or disconfirm the present findings.

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Animacy and Agreement with Conjoined Nouns in Bulgarian

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Abstract

The controversy surrounding the autonomy of syntax, and more specifically the claim that syntax is blind to non-grammaticalised semantics (cf. Keller (1990: 119), Falk (2001: 1)), will be revisited in the light of Bulgarian data. We examine agreement patterns with two conjoined singular nouns. Attributive targets, such as determiners or adjectives, can either agree with the resolved plural features of the whole coordinate phrase or with the number and gender of the first conjunct.

The variation between these patterns is not random. It is constrained by a number of factors, the most important of them being animacy – animate conjuncts prefer plural attributive elements, whereas inanimates have a preference for singular attributive elements which agree with the closest conjunct. This is confirmed by Internet searches and fieldwork with native informants.

Like other Slavic languages, Bulgarian can be argued to have animacy as part of its grammar, as it has relative pronouns and numerals used only with masculine nouns which refer to humans. However, the animacy that influences agreement with conjoined nouns is not the same as this grammaticalised animacy, because the former includes non-masculine humans and animals, as opposed to just masculine humans, and also because there is no morphological marking for it. It is therefore argued that semantic animacy is relevant to Bulgarian syntax and this is yet another piece of evidence against an autonomous syntax.

1. Introduction[1]

Grammatical agreement is not influenced by grammar alone. Non-grammatical (e.g. semantic) factors often have an effect on the grammar of a language, and a model of agreement must have a way of dealing with such effects[2]. In this paper, we make a case for this by using data from Bulgarian (South Slavic). After briefly outlining some relevant characteristics of Bulgarian NPs in relation to coordination and agreement, we present naturally occurring Bulgarian data from a corpus study, as well as data obtained by using a questionnaire. Despite some differences, both datasets suggest that there is interesting variation in agreement patterns with conjoined nouns, which seems to correlate with the animacy of the conjuncts, among other possible factors. The paper ends with a discussion of animacy as a semantic factor influencing grammatical agreement with conjoined nouns.

2. Agreement Patterns with Conjoined Nouns in Bulgarian

The Bulgarian noun phrase is similar to the English NP in that it has pre-modifying determiners (except some possessive pronouns and the definite article, which is a suffix/enclitic), followed by optional pre-modifying adjectives and the head noun[3]. In Bulgarian, pre-modifying elements such as determiners and adjectives agree with the head noun in number and gender. In the singular,

1 Special thanks go to Mary Dalrymple, Andrey Stoevsky and Mary MacRobert, who have devoted a lot of time to reading drafts of this paper and have given many helpful comments and suggestions. Thanks are also due to G. Corbett for helping me come to a better understanding of some of the points. Finally, I would like to thank the audience at the LangUE 2010 conference at the University of Essex for the stimulating discussion.

2 The view presented here differs from that of Chomsky and others who claim that syntax is completely autonomous and independent of semantic or pragmatic factors (cf. Keller (1990: 119)). We do not agree with statements to the effect that 'syntax is a system purely internal to language, [which] does not interface with nonlinguistic cognitive or motor systems' (Falk (2001: 1)). The present author tends to agree with Dik's (1968: 292-4) opinion that grammar, in the sense of inflectional morphology and syntax, incorporates semantic notions. As Dik (1968: 294) puts it, 'it seems impossible to explain all restrictions on the well-formedness of coordinative constructions in purely grammatical terms, since part of these restrictions turn on […] semantic values and semantic relations', as will also be demonstrated below.

3 For more information on the Bulgarian NP, see Brezinski (1988), Brezinski (1995: 180-92) and Osenova (2008).

agreement targets distinguish between the masculine, feminine and neuter genders (cf. (16) below). However, the gender distinction collapses in the plural. Plural determiners and modifiers are marked in the same way, irrespective of the gender of the head noun.

Agreement with conjoined nouns seems to be more complicated. In this paper, we focus on conjoined singular nouns, to the exclusion of conjoined plural nouns, which are more straight-forward due to the lack of gender distinctions in the plural. A possible agreement strategy with conjoined singular nouns in Bulgarian is using a plural determiner which has scope over both conjoined singular nouns, as in (1):

(1) tezi momche i momiche
this.PL boy(NT)[SG] and girl(NT)[SG][4]
literally: 'these boy and girl' (meaning: 'this boy and girl') [attested on the web]

Example (1) is an illustration of resolved agreement, where two conjoined singular nouns are used with a plural determiner. Although neither of the nouns is plural, two singulars resolve to plural (i.e. there is more than one member in total), which justifies the use of the plural determiner[5]. A singular determiner is also possible in this case, without any change in meaning, as can be seen from example (2):

(2) tova momche i momiche
this.NT.SG boy(NT)[SG] and girl(NT)[SG]
'this boy and girl' [attested on the web]

As both conjuncts in (2) happen to be neuter singular, we cannot tell if the neuter singular demonstrative pronoun agrees only with the conjunct closest to it or with both conjuncts. If the two nouns differ in their number and/or gender, and if a singular determiner is used, the determiner formally agrees only with the conjunct closest to it. In (3) we find a masculine and a feminine noun, and a masculine determiner, while (4) shows what happens if the order is reversed:

(3) tozi glants i belot-a
this.M.SG sheen(M)[SG] and whiteness(F)-SG
'this sheen and whiteness' [web]
(4) tazi knig-a i kompaktdisk sa…
this.F.SG book(F)-SG and CD(M)[SG] are
'This book and CD are...' [web]

An important thing to note about examples (3) and (4) is that while the determiner formally agrees with its closest conjunct, at the same time it has scope over both conjuncts, i.e. it applies to both of them. This is proved by the fact that the second conjunct has no other determiner – i.e. *this* is the only determiner in the noun phrase and therefore it must have scope over both conjuncts (although it formally agrees only with the closest one).

This can be contrasted with a case of coordinating two full noun phrases, each of which has its own determiner agreeing with it in number and gender, as demonstrated in (5):

(5) tozi byuletin i podpisk-a-ta
this.M.SG ballot.paper(M)[SG] and petition(F)-SG-DEF.F.SG
'this ballot paper and the petition' [web]

[4] Abbreviations: M – masculine; F – feminine; NT – neuter; DEF – definite (article); ACC – accusative; SG – singular; PL – plural; COUNT – count (plural form of nouns); PERSON – personal (form of nouns agreeing for animacy); PST – past (tense); ADJ – adjective; NP – noun phrase; DIM – diminutive

[5] There are examples suggesting that a conjunction of masculine and feminine resolves to masculine: *John i Mary i dvamata/*dvete* 'John and Mary both.M/*both.F/NT' (Many thanks to A. Stoevsky for pointing this out to me; also cf. Stoevsky (2001) for a more detailed discussion of anthropocentrism and androcentrism).

It should be pointed out that, unlike (3) and (4), *this* in (5) only agrees with the first noun, and also has scope only over it, without having scope over the second noun. The second noun *podpiska* 'petition' has its own determiner – the definite article *-ta* 'the' suffixed to it – podpisk-a-***ta***. We cannot say **tazi podpiskata* 'this the.petition'. We will only be interested in cases like (3) and (4), where the conjoined elements are N's which share a determiner or a pre-modifying adjective; we will be ignoring conjoined full NPs each of which has its own determiner like (5).

What we have established so far is that a Bulgarian attributive determiner or pre-modifier either agrees with the resolved plural features of the coordinate phrase as a whole or with the features of the closest conjunct[6]. Having listed these possible agreement patterns, one might wonder what are the conditions governing the choice of one pattern or the other. In the next section we present corpus data suggesting that the choice is influenced by semantic factors like animacy.

3. Presentation of Corpus Data

The corpus data for the present study were collected by conducting Internet searches for specific phrases; a search was launched for the same phrase, first with a singular and then with a plural determiner or pre-modifier (e.g. first 'this boy and girl' and then 'these boy and girl'). The examples were then recorded and a comparison was made between the frequencies of the different determiners/pre-modifiers (singular or plural) used with any given phrase. The Internet was trusted as a database, because unlike English, which has many non-native speakers, Bulgarian has a negligible number of non-native speakers and the examples were almost certainly produced by speakers with native competence, as judged by the author – also a native speaker of the language.

What follows is a summary of the data. Searching for conjoined phrases referring to humans tended to produce more plural than singular targets. For instance, the phrase in (6) (with a plural determiner) appears five times, and there are no occurrences of (7) (the same phrase but with a singular determiner):

(6) tezi brat i sestr-a
this.PL brother(M)[SG] and sister(F)-SG
'this brother and sister' [5 instances on the web]

(7) tozi brat i sestr-a
this.M.SG brother(M)[SG] and sister(F)-SG
'this brother and sister' [0 instances on the web]

However, a search for 'my grandfather and grandmother' produces twenty-three results with a plural 'my' and three with a singular 'my', which means that using a plural determiner with such conjuncts is at best a tendency.

(8) mo-yat/mo-ite dyado[7] i bab-a
my-M.SG/my-PL grandfather(M)[SG] and grandmother(F)-SG
'my grandfather and grandmother' [attested on the web]

The situation gets even more complicated if one looks for occurrences of the Bulgarian equivalent of 'this/these boy and girl' – there are three instances with a singular determiner, as in (9), and only one with a plural determiner, as in (10):

(9) tova momche i momiche
this.NT.SG boy(NT)[SG] and girl(NT)[SG] [3 instances on the web]

[6] This is contrary to what we read in prescriptive texts suggesting that the only acceptable strategy should be closest-conjunct agreement (cf. Popov (1988)).

[7] In terms of declension, and more specifically in terms of the plural suffixes and/or the definite articles that they take, the nouns *dyado* 'grandfather' and *bashta* 'father' behave like a neuter and a feminine noun, respectively. However, both of them take masculine attributive targets, which makes them grammatically masculine nouns.

(10) tezi momche i momiche
this.PL boy(NT)[SG] and girl(NT)[SG] [1 instance on the web]

This is contrary to what would be expected if there were a tendency for conjoined singular animates to take a plural determiner. In the present author's opinion, the fact that both conjuncts in (9) and (10) are neuter singular makes a resolved plural target less likely and at the same time favours the use of a neuter singular determiner which agrees with both conjuncts. Note that the only conjoined nouns from *Table 1* below which have a relatively high percentage of singular determiners are conjoined same-gender nouns: *momche i momiche* 'boy and girl' (both neuter), and *bashta i sin* 'father and son' (both masculine); nevertheless, the sameness of gender of *mayka i dushterya* 'mother and daughter' (both feminine) has not resulted in a high number of feminine singular targets. In general, it can be concluded that singular animate nouns *tend* to go with a resolved plural determiner, as demonstrated in *Table 1*.

Table 1: Conjoined nouns with human referents attested on the web:

	SG	**PL**		**SG**	**PL**
This$_{SG}$/these$_{PL}$ man$_{M}$ and woman$_{F}$	0	7	This$_{SG}$/these$_{PL}$ father$_{M}$ and son$_{M}$[8]	2	3
This$_{SG}$/these$_{PL}$ man$_{M}$ and woman$_{F}$[9] [10]	3	17	This$_{SG}$/these$_{PL}$ mother$_{F}$ and daughter$_{F}$ (follow-up search)	1	4
This$_{SG}$/these$_{PL}$ brother$_{M}$ and sister$_{F}$	0	5	My$_{SG}$/my$_{PL}$ grandfather$_{M}$ and grandmother$_{F}$	3	23
This$_{SG}$/these$_{PL}$ son$_{M}$ and daughter$_{F}$	0	1	This$_{SG}$/these$_{PL}$ boy$_{NT}$ and girl$_{NT}$	3	1
This$_{SG}$/these$_{PL}$ mother$_{F}$ and daughter$_{F}$	0	2			

By contrast, conjoined singular nouns with inanimate referents tend to go with a singular determiner or pre-modifier which only agrees with the conjunct closest to it, as in (11):

(11) kantselarsk-o byur-o i stol
office-NT.SG desk(NT)-SG and chair(M)[SG]
'an office desk and [office] chair' [web]

Looking for other coordinate NPs shows that this is only a tendency too. A search for the phrase in (12), a coordination of two inanimates with a plural determiner, yields sixty results. However, despite the sixty results for the phrase with a plural determiner, a search for the same phrase with a singular determiner, as in (13), produces ten times more results – 603. So, inanimates tend to be used with a singular determiner or pre-modifier (see *Table 2*).

8 It is worth mentioning that one of the two occurrences of a singular determiner with "Father and Son" is in a religious context and is an obvious reference to the Holy Trinity; therefore, the singular determiner may be a result of the singular reference of the coordinate phrase.

9 A follow-up search with the same parameters was conducted for 'this/these man and woman' about a year after the initial one. This time the Internet yielded more examples: we found some singular determiners but the overall tendency to use a plural determiner was confirmed.

10 The opposition between personal and non-personal is important on the animacy scale. If, instead of man and woman, we have proper names like John and Mary, the only option will be a resolved plural target: *tezi/*tozi John i Mary* 'these/*this John and Mary' (A. Stoevsky, p.c.). So, there is a cut-off point above which single-conjunct agreement becomes ungrammatical. It seems that the more individuated two nouns are, the more likely they are to get resolved agreement, with proper nouns being more individuated than common nouns and always getting resolved agreement (see Yamamoto (1999) for more on animacy and individuation).

(12) vash-i-te ime i famili-ya
your-PL-DEF.PL name(NT)[SG] and surname(F)-SG [60 instances on the web]

(13) vash-e-to ime i famili-ya
your-NT.SG-DEF.NT.SG name(NT)[SG] and surname(F)-SG [603 instances on the web]

Table 2: Conjoined inanimate nouns in Bulgarian attested on the web

	SG	**PL**		**SG**	**PL**
$This_{SG}/these_{PL}$ $fork_F$ and $spoon_F$[11]	1	0	Sg/Pl target + $love_F$ and $marriage_M$	10	0
Sg/Pl adj + $desk_{NT}$ and $chair_M$	1	0	Sg/Pl target + $rain_M$ and $wind_M$	19	1
Sg/Pl adj + $rifle_F$ and $pistol_M$	9	0	$Heavy_{SG}/heavy_{PL}$ $rain_M$ and $wind_M$[12]	11,200	0
Sg/Pl adj + $blouse_F$ and $skirt_F$	7	0	Sg/Pl target + $soul_F$ and $body_{NT}$	14	4
New_{SG}/new_{PL} $house_F$ and car_F	5	0	Sg/Pl target + […], $soul_F$ and $body_{NT}$	4	1
$This_{SG}/these_{PL}$ box_F and [-animate]	2	0	Sg/Pl target + $heart_{NT}$ and $soul_F$	40	0
Sg/Pl adj + $notebook_F$ and pen_F	6	1	Sg/Pl adj. + $appearance_M$ and $condition_{NT}$	16	3
Sg/Pl adj + $church_F$ and $school_{NT}$	1	0	Sg/Pl target + sun_{NT} and $moon_F$[13]	6	9
$Nice_{SG}/nice_{PL}$ bag_F and $coat_{NT}$	1	0	$Friday_{SG}/Friday_{PL}$ day_M and $night_F$	1	0
$Your_{SG}/your_{PL}$ $name_{NT}$ and $surname_F$	603	60	$That_{SG}/those_{PL}$ day_M and $night_F$[14]	1	0
$This_{SG}/these_{PL}$ day_M and $night_F$	4	1			

So far, we have established that conjoined humans tend to take plural targets and conjoined inanimates tend to take singular targets agreeing with the conjunct closest to them. From the relatively scanty corpus data that we have for animals, it seems that they pattern with humans and not with inanimates (cf. *Table 3*). In other words, non-human animates also tend to take plural attributive targets, as in (14):

[11] There are at least two factors favouring closest-conjunct agreement here – the inanimate conjuncts as well as the fact that the conjuncts are the same gender. The same applies to all same-gender conjuncts in *Table 2*.

[12] In Bulgarian, the adjective *silen* (translated as 'heavy') has scope over both nouns. A more idiomatic English translation of *silen duzhd i vyatur* 'heavy[M.SG] rain(M)[SG] and wind(M)[SG]' would be 'strong wind and heavy rain'.

[13] At present I have no explanation why "sun and moon" does not follow the general trend.

14 If the determiner is *edin* 'one/a certain', which is inflected for number and gender like an adjective, we find six examples of 'one.SG day and night', and no examples of '?one.PL day and night'. It is believed that this preponderance of the singular is due not only to the inanimate nature of the conjuncts, but also to the semantic nature of the determiner. This becomes evident if one compares the situation with 'one.SG/one.PL man and woman', where searches also produce more singular than plural examples. However, there are some instances of the plural with 'one man and woman' as well. We believe that in the case of 'one day and night' the inanimate nature of the conjuncts and the semantic nature of the determiner 'conspire' in favour of the singular, whereas with 'one man and woman' the animate nature of the conjuncts works against the semantics of the determiner.

(14) i pribere v doma si svo-i-te krav-a i tele
and to.take in home own own-PL-DEF.PL cow(F)-SG and calf(N)[SG]
'and to drive back home his cow and calf' [web]

Table 3: Conjoined nouns with animal referents attested on the web[15]

	SG	**PL**		**SG**	**PL**
Sg/Pl target + cow_F and $calf_{NT}$	0	2	Sg/Pl adj. + $wolf_M$ and fox_F[16]	1	1
Sg/Pl target + cow_F and $bull_M$	0	1	Sg/Pl adj. + $wolf_M$ and $bear_F$	1	1
$This_{SG}$/$these_{PL}$ dog_{NT} and cat_F	0	1	S./Pl adj. + $stag_M$ and doe_F[17]	3	0
My_{SG}/my_{PL} dog_{NT} and cat_F	0	4	Sg/Pl target + he-$wolf_M$ and she-$wolf_F$	0	4

This is an indication that the category of animate nouns comprises both humans and animals, at least as far as agreement patterns with conjoined nouns are concerned; arguably, the results for animals are not as unequivocal as those for humans, which might be due to some prototype effects – humans might be treated as "more animate" than animals.

The observed variation in agreement with conjoined singular nouns seems to be constrained by the factors listed below (as was confirmed in subsequent work with informants, parts of which are presented in Section 4 below):

- the animacy of the conjuncts (animates tend to get resolved plural agreement and inanimates tend to get closest-conjunct singular agreement)
- the gender of the conjuncts (same-gender conjuncts tend to get a singular target of the same gender)
- the type and semantics of the target (determiner, adjectival modifier, etc.)

4. Presentation of Questionnaire Data[18]

The aim of the fieldwork was to confirm or refute the observations on the role played by animacy and other factors in determining the choice of agreement patterns in Bulgarian. The null hypothesis was that the variables identified (animacy, sameness of gender, grammatical role, etc.) have no effect on agreement patterns in Bulgarian.

Questionnaires with 33 or 34 Bulgarian sentences in which a word is missing were distributed to over 100 informants (all of them students between 17 and 18 years old). The informants had to fill in the missing word, which had to begin with the letter(s) given. The test sentences contained two conjoined singular nouns and the word that had to be provided was either a determiner or an attributive adjectival modifier. The idea was to see what agreement choices the informants would make.

The test sentences were generated according to the grammatical role of the NP (subject, subject of an embedded clause, direct object, prepositional complement) and according to the type of determiner/pre-modifier. For each combination of grammatical role and type of target (except for

15 A search for *ovts-a i agn*e 'ewe(F)-SG and lamb(NT)[SG]' produced only the phrase *vsyak-a ovts-a i agne* 'each-F.SG ewe(F)-SG and lamb(NT)[SG]'. This is not included in the table because we believe that the single-conjunct agreement here is not a result of the animacy of the controllers (which would have favoured resolved agreement) but of the semantics of the target; as pointed out above, words like 'one' and 'each' seem to behave differently from other determiners/adjectives in that they favour single-conjunct agreement, possibly because of their singular meaning (similar effects are observed with the conjunction 'or' as opposed to 'and').

16 The occurrence of the plural adjective may be due to the fact that the wolf and the fox from this example are personified (the example comes from a fairy tale).

17 This reversal of the trend with 'stag and doe' may be due to a repetition of the same phrase – *sveshten elen i koshout-a* 'sacred[M.SG] stag(M)[SG] and doe(F)-SG' is repeated in all three websites with results, so this may be a consequence of copying and pasting.

18 I would like to thank all my informants and the people who made the fieldwork possible, especially S. Tosheva, G. Dimitrov, A. Hristova, D. Hristova and D. Todorova.

two), there were three sentence templates: one with conjoined human nouns, one with animals and one with inanimates[19].

Within each sentence template (cf. (15)), the conjoined NPs were transformed to give three sentence tokens: the first one was with naturally conjoined[20] nouns of the same gender (with two or three exceptions, in which the same-gender nouns were accidental coordinations), the second with naturally conjoined nouns of different genders, and the third with accidentally conjoined nouns of different genders. In addition, the sentences were constructed so that they would be maximally similar to each other in length and in the type of verb used (including person and number features) etc.

Below we give a sample of a conjoined sentence template, in which the conjoined NPs are subjects and the target is a possessive pronoun functioning as determiner (expected *my*). It tests agreement with humans. Similar templates were created to test animals and inanimates in the same grammatical role and with the same determiner, but they are not given here.

(15) *Mo*_____ **bratche i sestriche/brat i sestra/bratovched i sestra** sa po-golemi ot men – i dvamata veche sa stoudenti.
*M*____ **brother.DIM and sister.DIM (NT+NT)/brother and sister (M+F; natural coord.)/cousin and sister (M+F; accidental coord.)** are older than me – they are both students.

We hoped that restricting the conditions in this way would ensure that any possible variation would be due to the variables isolated, and not to some other variable which had gone undetected. Thirty filler sentences were generated. The test sentences were divided into twenty blocks of randomly distributed three to four test sentences, where every block included at least one coordination of humans, animals and inanimates, usually with different determiners/pre-modifiers and with different grammatical roles. The test sentences were inserted among the fillers at numbers 6, 14 and 29 (in cases with three test sentences) or at numbers 6, 14, 24 and 30 (in cases of four test sentences).

Because of space considerations, we will only be presenting the results concerning animacy, which is the main focus of this paper, although grammatical role, sameness of gender and other factors were shown to be significant too. If the results are divided into three groups of nouns: humans, animals and inanimates, and then the scores for each group are totalled up, we end up with interesting observations correlating with the generalisations made in the previous section.

Table 4	SG (N)	SG (%)	PL (N)	PL (%)
Humans	57	42.20%	78	57.80%
Animals	37	37.00%	63	63.00%
Inanimates	74	53.60%	64	46.40%

As shown in *Table 4*, nouns with animate reference (humans and animals) have a significantly higher total number of plural targets and they pattern together. Inanimate nouns stand out in that the singular targets are more than the plural targets. Over half of the attributive elements agreeing with animates are plural, whereas over half of those agreeing with inanimates are singular. This seems to be solid evidence that the observations concerning the importance of animacy for agreement with conjoined nouns are borne out by this experiment. If we collapse the nouns referring to humans and animals into one common animate category, we get the total numbers presented in *Table 5*.

Performing a chi-square test (Dunbar (1998, ch. 10)), gives us $\chi^2 = 6.69$. According to the table from the following URL (http://faculty.southwest.tn.edu/jiwilliams/probability.htm (accessed on 30 August 2010)), at $p = 0.01$, and with degrees of freedom at 1, the critical value is 6.64. Our result 6.69 is greater than 6.64. Therefore, the null hypothesis is discarded and the results are statistically significant. In other words, the above variation is unlikely to have arisen by chance (the probability being less than 1%).

[19] We included only inanimates with concrete denotation, as opposed to abstract ones, in order to avoid further complications and multiplication of the test sentences.

[20] Natural coordination is coordination of nouns which often go together (e.g. *bread and butter*), whereas accidental coordination is coordination of nouns which are not typical collocates (e.g. *bread and carrots*) (see Dalrymple and Nikolaeva (2006) for more on natural and accidental coordination and agreement with conjoined nouns).

Table 5	SG (N)	PL (N)
Animate	94	141
Inanimate	74	64

One thing to note when comparing the results from the Internet corpus study and the results obtained by means of the questionnaires is that the animacy effects are much more pronounced in the corpus study. Other factors, such as the grammatical role of the NP, would have been almost imperceptible had it not been for the work with informants. The much more ambiguous results from the questionnaire might to a considerable extent be due to the very nature of the task, in which the informants were faced with a more or less conscious decision.

We found that most of the factors identified did have some impact on agreement patterns with conjoined nouns. Natural and accidental coordination did not exhibit such effects, but sameness of gender and grammatical function proved to be significant in determining the choice of agreement pattern. Such signs were also shown by the type of agreement target, but maybe to a lesser extent. Most importantly, the significance of animacy in influencing the choice of agreement pattern was confirmed. Taken on its own, animacy did prove to be an important and statistically significant factor in determining agreement with conjoined nouns, with animacy favouring resolved plural agreement and inanimacy favouring closest-conjunct agreement. What is more, animacy was found to cross-cut the effects of all the other factors in very interesting ways. Animacy was demonstrated to play a part at the level of the individual informant too, in that the overall statistics were often reflected in the individual answer sheets.

The interactions of all those factors seem to be very complicated. Excluding sameness of gender, all the other factors (definiteness, subjecthood and animacy) can be grouped under the heading of topic-worthiness (cf. Comrie (2003: 328ff) and Dalrymple and Nikolaeva (2006)). It seems that the more topic-worthy two conjoined nouns are, the more likely they are to get resolved plural agreement (cf. Footnote 10). In turn, animacy is one of the most important factors contributing to topic-worthiness, and hence to resolved plural agreement. In the final section we zoom in on the place of animacy in Bulgarian grammar.

5. Animacy and Grammar

Such deeply rooted cognitive distinctions as that between animate and inanimate are often reflected in human language (cf. Dahl (2008: 148-9) and Yamamoto (1999, ch. 2)). Linguistic typology shows that animacy is an important factor influencing agreement patterns in various unrelated languages (cf. Corbett (1991: 265), Comrie (1992: 190), Aoun, Benmamoun and Sportiche (1994: 197), Haspelmath (2004b: 12), Bril (2004: 499-500), Matasović (2004: 47)).

Animacy also enjoys a salient status in the grammar of Slavic languages, where it often has an effect on case syncretism (see Matasović (2004: 66) for Old Church Slavonic and a comparative historical overview, Wechsler and Zlatić (2000: 799) for Serbian/Croatian, Corbett (1991: 267) and Corbett (2006: 179) for Russian and a wide range of typological data and generalisations). By contrast, animacy has not been discussed in such detail with regard to their South Slavic relative Bulgarian, which has lost its case declensions. What is more, some 20th century Bulgarian linguists explicitly note the diminished morphological importance of animacy in Bulgarian in comparison to other modern Slavic languages or to earlier stages of Bulgarian itself (cf. Andreychin (1942: 88) and Andreychin, Kostov, Nikolov (1972: 169), quoted in Kostadinova (1995: 54)). However, such statements are not accurate.

If we define grammatical gender as a set of syntactic subclasses of nouns primarily controlling agreement (Gleason (1961: 227), quoted in Aronson (1964: 87)), it becomes evident that agreement is crucial in distinguishing the inventory of grammatical gender classes in a language. If gender is to be distinguished on the basis of adjectival agreement (in the singular), then Bulgarian undoubtedly has three genders: masculine, feminine and neuter, as illustrated in (16) (cf. Aronson (1964: 87-8)):

(16) *Grammatical gender in Bulgarian on the basis of agreement with attributive adjectives*

durven stol	durven-a mas-a	durven-o legl-o
wooden[M.SG] chair(M)[SG]	wooden-F.SG table(F)-SG	wooden-NT.SG bed(NT)-SG
'a wooden chair'	'a wooden table'	'a wooden bed'

Russian, on the other hand, will distinguish between the following genders if we compare noun phrases in the accusative singular: 1. An animate gender: *bol'šógo čeloveka* 'large man'; 2. Masculine: *bol'šój dóm* 'large house'; 3. Feminine: *bol'šúju zadáču* 'large task'; 4. Neuter: *bol'šóe oknó* 'large window'[21] (Aronson (1964: 88)). From this, we can see that animacy has a grammatical status in Russian. It was mentioned at the beginning of this section that, unlike other Slavic languages, in which animacy is clearly reflected in the grammar, the role of animacy in Bulgarian grammar is not so obvious. In what follows, an answer will be sought to the question if animacy in Bulgarian is a morphosyntactic or a purely semantic feature.

Arguments can be advanced in favour of analysing Bulgarian animacy as a morphosyntactic feature. It seems morphosyntactic due to the existence of a special 'count' plural form of nouns which is morphologically distinct and in the standard language is only used with masculine inanimate nouns when they follow a numeral (e.g. 'two courses'); the count plural form (17a.) can be contrasted to the regular plural form (17b.). On the other hand, (17c.) shows that the count plural form is (prescriptively) disallowed if the noun has human reference.

(17) a. *Count PL form*	(17) b. *Regular PL form*	(17) c. *Count PL form*
dv-a kours-a	mnogo kours-ove	?dv-a stoudent-a[22]
two-M course(M)-COUNT	many course(M)-PL	two-M student(M)-COUNT
'two courses'	'many courses'	'two students'

And yet, the evidence from the count plural forms of nouns is problematic. Stankiewicz's (1968: 38) position is that this distinction between the behaviour of animates and inanimates is better interpreted as a distinction subordinate to the opposition of quantification, and not as an independent grammatical category of animacy. On this view, there is a category of quantification, which is marked in the special count forms of nouns (i.e. the categories of quantification/number involve the values of singular, count and plural). It should be pointed out that even nouns referring to male persons can, and often do, have a count form, although this is proscribed in the standard language (cf. 17c.). Then animacy is not an independent grammatical category, but just a semantic condition on the choices made within the category of quantification – i.e. inanimacy favours the choice of the special count form.

Less controversial evidence in favour of treating animacy as a morphosyntactic feature in Bulgarian comes from the special masculine personal forms of some numerals like *dv-a-ma* 'two-M-PERSON' or relative pronouns like *kogoto* 'whom'. Those show morphological marking for animacy and also syntactically agree for animacy. This is conclusive proof of animacy's status as a morphosyntactic feature in Bulgarian. For instance, the phrase 'two students' in (18a.) below has the special form of the numeral 'two' used only with masculine nouns referring to male humans (or groups with at least one male member). The form of the numeral marked as masculine personal is unacceptable with inanimates (18b.) – the simple form of the numeral has to be used with inanimates (see (17a.) above).

[21] While animacy in Russian is a sub-gender of the masculine in the singular, in the plural it supersedes the threefold gender division into masculine, feminine and neuter (M. MacRobert, p. c.).

[22] This is proscribed in the written standard but it is often encountered in the speech/writing of native speakers.

(18) a. *Personal numeral with humans*		(18) b. *Personal numeral with non-humans*	
dv-a-ma	stoudent-i	*dv-a-ma	kours-a
two-M-PERSON	student(M)-PL	two-M-PERSON	course(M)-COUNT
'two students'		'two courses'	

An example involving the relative pronoun *когото/kogoto* 'whom', which also agrees for animacy, is given in (19):

(19) muzh-a /*duzhd-a, kogoto vid-yah
man(M)-DEF /*rain(M)-DEF, whom.ACC.M.PERSON see-PST.1SG
'the man/*rain whom I saw'

On the basis of these facts, it could be argued that Bulgarian animacy is a morphosyntactic feature indeed. The analysis of the grammatical importance of animacy suggests that as far as Bulgarian grammar is concerned, morphosyntactic animacy means "male person" (cf. Kostadinova (1995: 82)).

As pointed out above, agreement is important for establishing the number of grammatical gender classes in a language (cf. Aronson (1964: 87), Corbett (1991)). According to adjectival agreement (in the singular), Bulgarian has three gender classes – masculine, feminine and neuter. There are also other agreement targets, such as the relative pronouns and numerals discussed above, which have a special form used only for male persons. Thus, we arrive at the following inventory of genders in Bulgarian: masculine personal, masculine non-personal, feminine, neuter (cf. Aronson (1964: 89) and Kostadinova (1995)). So, animacy, or more accurately 'male humanness', can be labelled a morphosyntactic feature of Bulgarian, and can be treated as a masculine personal sub-gender[23]. The fact that grammatical animacy (which only includes male humans) does not overlap with semantic animacy, clinches the point that it is a morphosyntactic category (cf. Stankiewicz 1968: 30).

In addition, animacy in Bulgarian influences agreement patterns with conjoined singular nouns. Examining our data presented in Sections 3 and 4 above, we established that if the nouns denoted animates, the shared determiner/pre-modifier was more likely to be plural, whereas if the nouns denoted inanimates, the determiner/pre-modifier was more likely to be singular and to agree with its closest conjunct.

But the animacy which influences agreement with conjoined nouns does not seem to be a grammatical (in the sense of morphosyntactic) feature; rather, it is a semantic one. Unlike the grammatical feature of animacy, which in Bulgarian only includes male humans, the animacy that influences the said agreement patterns includes not just males but also females and (higher) animals[24] (it should be conceded that it may not include "lower" animals like bees, so in that respect it does not overlap with purely semantic animacy 100%).

Secondly, the animacy influencing agreement with coordinate NPs is not marked morphologically in any way, so it cannot be morphological. Beard (1995: 59) altogether dismisses the claim that animacy is a grammatical category in any Slavic language, instead claiming that it is a semantic category because no Slavic language, including the ones for which animacy seems very central, 'exhibits any special marker (affix, etc.) for animacy, despite the plethora of Gender, Number and Declension Class markers'. Although it is marked on the Bulgarian relative pronoun and numerals discussed above, animacy is not marked morphologically in coordinate NPs. Some might argue that, since animate and inanimate conjoined nouns appear in different agreement patterns, they will form two separate gender classes, but this is not a tenable argument because the preferences for one agreement pattern over the other are just tendencies. Therefore, the animacy affecting agreement with conjoined nouns is not a morphosyntactic feature, but a semantic category

[23] In sum, while most Slavonic languages have a morphosyntactic distinction between animate and inanimate nouns which is realised by accusative-genitive syncretisms (cf. the Russian example above), Bulgarian, which lacks nominal case declension, does not exhibit this distinction but does operate with a possibly older morphosyntactic category of male human/person which was present in Old Church Slavonic and the early Slavonic languages. I would like to thank Mary MacRobert for this comment and for her help with the comparative and historical aspect.

[24] In fact, the preference for resolved agreement is even clearer for animals than it is for humans in *Table 4* above.

which acts as a condition on number/gender agreement[25].

6. Conclusion

To sum up, a feature such as animacy cannot be unambiguously labelled as purely grammatical or semantic. Animacy in Bulgarian appears to be:

1. a morphosyntactic feature (on the grounds of special "masculine personal" forms of numerals and relative pronouns);
2. a semantic feature relevant to syntax (a semantic condition affecting grammatical choices, such as the choice of count plural forms, as well as the agreement choices with coordinate NPs);
3. a purely semantic feature[26].

What distinguishes 2. from 3. is that the former excludes, for example, lower animals. Those instantiations of animacy in Bulgarian seem to be more akin to points on a continuum than clear-cut categories. On the basis of this argumentation, it can be safely concluded that the animacy which acts as a condition on agreement patterns with conjoined nouns in Bulgarian is a semantic feature indeed. Therefore, the claim made at the beginning of this paper, namely that syntax needs to have recourse to semantics, remains valid. While it would be bizarre if targets in a language only agreed with things which referred to red objects, our case study has demonstrated that Bulgarian is more likely to have resolved agreement with things which refer to animate beings. This is yet another argument in favour of models of grammar in which syntax has a way of accessing semantic information.

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[25] This is similar to the effect animacy has on the use of the count plural form of nouns in the prescriptively standard language. Unlike the use of the count form, however, the effect of animacy on agreement with conjoined nouns is not a result of prescriptive pressures.

[26] Corbett (1981: 75) also argues that the semantic feature of animacy should be distinguished from the syntactic feature of animacy if there are discrepancies between them.

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Prenominal infinitives in English: semantic and syntactic constraints

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Abstract

Prenominal modifying infinitives in English have received hardly any attention due to their very low frequency. Based on around 750 attested examples, this paper investigates the relation between prenominal infinitives and the other non-finite pre-modifiers. The goal of the paper is to bring out the major properties of the construction and identify the constraints that account for its form and interpretation. It is shown that prenominal infinitives do not form a homogeneous class and can be divided into two groups corresponding to the distinction between direct and indirect modifiers. The discussion then focuses on four major constraints: subject interpretation, informativeness, the Head Final Filter and unaccusativity. Finally, it is argued that prenominal infinitives pattern with pre-modifying past participles.

1. Introduction

English non-finite verbal modifiers inside the noun phrase have received varying degrees of attention in the literature. While present participles, past participles and *to*-infinitives used as **post-modifiers** (i.e. modifiers following the head noun) have been studied extensively, descriptions of their **detached** or appositive variants (i.e. modifiers set off from the host clause by comma intonation and receiving a non-restrictive reading) are scarce. Nonetheless, it is generally admitted that all three non-finite verbal forms can occur postnominally, either attached (1) or detached (2).

(1) a. The dog *barking next door* sounded like a terrier. (Quirk *et al* 1985: 1263)
b. The train *recently arrived at platform 1* is from New York. (ibid. p1265 [4b])
c. The case *to be investigated tomorrow* ... (ibid. p1267 [2])

(2) a. The apple tree, *swaying gently in the breeze*, ... (ibid. p1270 [1])
b. The substance, *discovered almost by accident*, ... (ibid. p1270 [2])
c. This scholar, *to be found daily in the British Museum*, ... (ibid. p1270 [3])

Conversely, non-finite **pre-modifiers** (i.e. modifiers occurring between determiners and the head noun) are often assumed to be restricted to participial forms (3), therefore excluding infinitival forms in the prenominal domain.[1]

(3) a. I was wakened by a *barking* dog (Quirk *et al* 1985: 1326 [4])
b. the *newly-arrived* immigrant (ibid. p1327)

Yet the literature contains rare examples of prenominal infinitives.

1 The reader is referred to Quirk *et al* (1985: 1336), Huddleston & Pullum (2002: 444) and the references cited in Simonin (2007: section 1.4.5).

(4) a. unavoidable or *not to be avoided* current expenses (Jespersen 1914: 340)
b. a satisfaction that will abide underneath the *never to cease* dissatisfaction which belongs to life (Jespersen 1940:221)
c. I do not think I have ever read a more decided specimen of the *to-be-damned* doggrel, than was then exhibited by Lord Byron himself. (Poutsma 1923: 80)
d. the *to-be-dreaded* legacies of smallpox (Oxford English Dictionary 1989: entry for "to")

The aim of this paper is to present and describe the prenominal infinitives illustrated in (4). Section 2 is a presentation of the construction, in which I propose a general classification of the corpus data based on formal properties. In section 3, I show that prenominal infinitives do not form a homogeneous class and I distinguish direct infinitival pre-modifiers from indirect infinitival pre-modifiers. In section 4, I discuss the various constraints that account for the form and interpretation of the construction.

2. General presentation of the construction

2.1 Frequency and productivity

The Corpus of Contemporary American (400 million words, 1990-2009, abbr. COCA) contains 670 occurrences of the construction while the British National Corpus (100 million words, 1982-1993, abbr. BNC) contains only 79 occurrences[2,3]. The results from COCA indicate that prenominal infinitives are essentially limited to written English. Most of the occurrences are found in newspapers (34%) and magazines (26%), less frequently in fiction (15%), academic texts (15%) and the spoken section of the corpus (10%).

The very low frequency of prenominal infinitives may explain why the construction is almost never mentioned in reference grammars of the English language, as it is probably seen as a minor, even negligible linguistic phenomenon. Nonetheless, 749 occurrences are significant enough not to be treated as mere performance errors.

Despite their low frequency, prenominal infinitives tend to be very flexible and allow for great lexical variation. The list in (5) contains the 168 lexical verbs that appear in the 573 sequences either of the form (ADVERB) TO V (e.g. "the soon-to-open symphony hall") or of the form (ADVERB) TO BE V-EN (e.g "a to-be-named research associate"). Most of these verbs occur only once, which is a sign of syntactic productivity.

(5) abandon, achieve, acquire, adopt, alter, analyse, announce, anoint, anticipate, appear, appoint, approve, arrive, assign, baptise, believe, break (up), (re)build, certify, change, christen, claim, close, collide, come, complete, conceive, (re)construct, convert, cook, cool, create, cross, debut, decide, declare, define, deliver, depart, describe, design, destroy, determine, develop, die, disappear, discard, discover, displace, do, document, duplicate, emerge, emulate, enact, escape, establish, evict, expand, expect, experience, expire, explain, explore, extinguish, fade, fill, finish, fire, fit, flood, flop, follow, foreclose, forget, form, found, fulfil, fund, graduate, grow, hatch, hear, identify, ignore, imagine, imitate, immortalise, implement, impose, imprison, install, incarcerate,

2 The following search strings were used:
(i) COCA: to-*, *-to-*, [D*] [TO], [D*] [R*] [TO], [J*] [TO] and [J*] [R*] [TO]; [D*] = determiner, [J*] = adjective, [R*] = adverb, [TO] = infinitival to.
(ii) BNC: to-*, *-to-*, [D*] [TO0], [D*] [AV*] [TO0], [AJ*] [TO0] and [AJ*] [AV*] [TO0] ; [AJ*] = adjective, [AV*] = adverb, [D*] = determiner, [TO0] = infinitival to.

3 Proportionally, prenominal infinitives are more frequent in the American corpus than in the British corpus, though the significance of the difference is not clear to me.

introduce, invent, know, launch, learn, locate, lose, martyr, materialise, mature, merge, miss, murder, (re)name, occult, offer, (re)open, overlook, pass by, phase out, plant, (re)possess, privatise, produce, publish, reach, realise, recall, recondition, record, recycle, redesign, release, relinquish, rely upon, renew, repaint, repeat, resolve, restore, resume, retire, return, revamp, rise, roll, scar, schedule, see, sell, send, sequence, settle, severe, shed, ship, shoot, speak, sponsor, strike, submerge, subordinate, sunder, suppress, surpass, terminate, test, title, transfer, trifle with, trust, unveil, undertake, use, wear, write

2.2 Formal properties

To a first approximation, the occurrences of prenominal infinitives in COCA and BNC can be divided into three groups[4]. The first group comprises infinitival constructions with a lexical verb, which is either a transitive verb in the passive form (i.e. auxiliary BE followed by a past participle) (6a) or an intransitive verb (6b). Transitive verbs in the active form are not attested in the corpora (see section 4.3).

(6) **Lexical infinitives**
(ADVERB) TO BE V-EN (passive infinitives)

a. What to do? Abandon or modify Newton's laws [...] ? Or postulate a *yet-to-be-discovered* planet in the outer solar system, whose gravity was absent from the calculations for Uranus's orbit? (*Natural History*, April 2008)
(ADVERB) TO VINTRANSITIVE

b. For example, the highly anticipated, *soon-to-arrive* reader from Plastic Logic is expected to be flexible. (*Christian Science Monitor*, May 6, 2009)

The second group, to be refined in section 3, includes infinitival constructions with copular BE followed by an adjectival phrase (7). The omission of the adverb is not attested.

(7) **Copular infinitives** ADVERB TO BE ADJP
[...] the company settled on Tab, and chose the *soon-to-be-famous* slogan, "How can just one calorie taste so good?" (American Heritage, July 2006)

The last group of prenominal infinitives stands out because the constructions are reduced to the sequence ADVERB TO BE directly followed by the head noun (8). As with copular infinitives, the omission of the adverb is not attested.

(8) ADVERB TO BE
Kyle Sheppard will be there, along with Jeff's fiancee, Stacey Reed, who has something else in common with her *soon-to-be* husband (Atlanta Journal Constitution, March 13, 1998)

The presence of a short adverb is a key property of prenominal infinitives. Indeed, 94% of the occurrences found in the corpora contain a short initial adverb, including the negative particle "not". Table 1 shows the distribution of the initial adverbs.

4 Note that the discussion in this paper is limited to the combined results from COCA and BNC. Other rare sequences might be acceptable. For instance, see (37b).

Table 1 *Distribution of the short initial adverbs in prenominal infinitives*

soon	yet	never	not	still	Ø
61%	21%	6%	4%	2%	6%

2.3 Pre-modifying units: the coordination test

Prenominal infinitives and adjectival phrases, like "modern" in (9a) and "plentiful" in (9b), can be coordinated to create sequences of pre-modifiers.

(9) a. As she showed me through the modern, and *soon-to-be-expanded*, plant, Joan Maxwell explained that the company [...] (*Motor Boating*, October 1998)
b. [...] spend one weekend on its plentiful and *yet-to-be-crowded* singletrack and you'll think it should be Mountain Bike Town USA. (*Bicycling*, May 2006)

Coordination phenomena confirm what has been taken for granted in the previous sections of this paper. Given the balance of unity and function required between conjoined elements (Schachter 1977)[5], the examples in (9) clearly indicate that prenominal infinitives are syntactic units[6] in the prenominal domain, and that they have essentially the same modifying function as adjectival phrases.

However, sequences of the form ADVERB TO BE as in (8) above differ from lexical and copular prenominal infinitives in that they are not independently identifiable units of the language. The following section is a discussion of the nature of those seemingly truncated sequences.

3. Two types of prenominal infinitives

In his seminal paper on adjectives in English, Bolinger (1967) discusses, among other things, two classes of attributive (i.e. prenominal) adjectives, based on the ability or inability to use them predicatively. I will represent this property as a binary feature noted [±BE]. The feature will be positive for those attributive adjectives that can also be used predicatively, and negative for those that cannot. The following examples illustrate the difference. The attributive adjectives "red", "tall" and "interesting" in (10) can be used after copular BE whereas "main", "former" and "future" in (11) cannot.

(10) a. a red [+BE] box ; the box is red
b. a tall [+BE] man ; the man is tall
c. an interesting [+BE] book ; the book is interesting

(11) a. the main [-BE] reason ; *the reason is main
b. my former [-BE] friend ; *my friend is former

5 It should be noted that Schachter (1977:87) also postulates that conjoined constituents "must belong to the same syntactic category". The following examples from Sag & Gazdar (1985:117) show that there is no such constraint.
(i)a. Pat is a Republican and proud of it. [NP and AP] (=their 2b)
b. Pat is healthy and of sound mind. [AP and PP] (=their 2c)
The examples in (9) illustrate the same phenomenon known as "coordination of unlike categories".

6 This is also suggested by the hyphens, though their use is not systematic and often incoherent.

c. the future [-BE] king ; *the king is future

A similar contrast can be observed with prenominal infinitives. All lexical infinitives like those in (6) can be analysed as [+BE] modifiers.

(12) a. a yet-to-be-discovered planet (=6a) ; the planet is yet to be discovered
b. the soon-to-arrive reader from Plastic Logic (=6b) ; the reader from PL is soon to arrive

Indeed, the interpretation of lexical prenominal infinitives is derived from the modal / futurate expression BE TO. The choice between a futurate reading (e.g. "There's to be one more meeting.") and a deontic reading (e.g. "You are to come in at once.") is generally dictated by the short initial adverb. The proximative time adverb "soon" favours futurate interpretations as in (13a) while the negative particle "not" tends to give the infinitival construction a strong deontic flavour as in (13b).

(13) a. Trinidad-Reid will be staged in a *soon-to-be-constructed* 10,000-seat outdoor arena at Caesars Palace-Las Vegas. (*Houston Chronicle*, January 1, 2000)
a'. the 10,000-seat outdoor arena is soon to be constructed [future situation / arrangement]
b. Baked in a pieplate, this *not-to-be-missed* dessert boasts a super-rich and moist texture. (*Southern Living*, April 2008)
b'. this dessert is not to be missed [deontic necessity]

Sequences of the form ADVERB TO BE, on the other hand, cannot be analysed as [+BE] modifiers because their insertion after BE yields ungrammatical sentences.

(14) a. her soon-to-be husband (=8) ; *her husband is soon to be
b. And joining me with more on the *soon-to-be-governor*, Frank Buckley, who has been covering him for several days. (CNN Live, October 10, 2003) ; *the governor is soon to be
c. [...] the phrase you would most often hear issuing from the *yet-to-be* father was, "Yes, of course we'll have children. But when the time's right." (*She*, 1989) ; *the father was yet to be

As already mentioned in section 2.3, "soon-to-be" and "yet-to-be" are not independently identifiable units of the language. They receive a global idiomatic interpretation comparable to the [-BE] adjective "future". Therefore, they should also be analysed as instances of [-BE] modification[7].

The distinction between [+BE] and [-BE] modification proves especially helpful to describe sequences of the form ADVERB TO BE ADJP. The prenominal infinitives in (15) can be

7 Interestingly, similar short infinitival sequences can be found appended to nouns.
(i) a. Her husband-*to-be* worked in a chemistry lab. (*Antioch Review*, Fall 2007)
b. Nothing is known of Brule's existence prior to the day in April 1608 when he set sail for the New World with Champlain, King Henry IV's royal geographer and the governor-*to-be* of New France. (*American Heritage*, September 2001)
c. Warren recently mentored a 19-year-old father-*to-be* who is facing his girlfriend's pregnancy. (*Ebony*, June 2006)
The position of "to-be" with relation to the head noun is determined by the presence of the initial short adverb (prenominal position as in (14)) or its absence (postnominal position as in (i)).

easily identified as [+BE] modifiers.

(15) a. the soon-to-be-famous slogan (=7) ; the slogan is (soon to be) famous
b. In Owen's ironically titled " The Dead-Beat, " for example, the unwounded yet *soon-to-be-dead* lad " lay stupid like a cod, heavy like meat " (*Style*, Summer 1996); the lad is (soon to be) dead

Not only can the infinitival sequences "soon-to-be-famous" and "soon-to-be-dead" in (15) appear after BE (thus retrieving the modal / futurate expression BE TO), but so can the adjectives "famous" and "dead" directly following infinitival BE. Interpretatively, "famous" in (15a) and "dead" in (15b) are part of the infinitival modifiers:

(16)	a.	the [soon-to-be-famous] slogan (=15a)
	b.	the [soon-to-be-dead] lad (=15b)

The sequences ADVERB TO BE ADJP in (17) have a very different behaviour. As the ungrammaticality of the transformations indicates, they cannot be used after BE.

(17) a. Playing with a doll next to the TV screen is four-year-old Abigail, Anna's *soon-to-be-adoptive* sister. (*Christian Science Monitor*, September 15, 1999) ; *Anna's sister is (soon to be) adoptive
b. [...] everything will look fine to my *soon-to-be former* co-workers. (J. Hemry, *Generation Gap*, 2002) ; *my co-workers are (soon to be) former
c. [...] yet the fullness of her *soon-to-be-maternal* breasts excited him and made her shy. (B.M. Campbell, *Singing in the comeback choir,* 1998) ; *her breasts were (soon to be) maternal

Despite what the hyphenation of "soon-to-be-adoptive" and "soon-to-be-maternal" suggests, the italicised sequences in (17) do not form units. More precisely, the adjectives "adoptive", "former" and "maternal" cannot be used predicatively after infinitival "be". They are instances of [-BE] modification. Unlike "famous" and "dead" in (15), "adoptive", "former" and "maternal" in (17) do not belong to the infinitival modifiers, which are reduced to the sequence "soon-to-be" also found in (14):

(18)	a.	Anna's [soon-to-be] adoptive sister (=17a)
	b.	my [soon-to-be] former co-workers (=17b)
	c.	her [soon-to-be] maternal breasts (=17c)

Table 2 summarises this section.

Table 2 *Two types of infinitival modifiers in the prenominal domain*[8]

[+BE] modification	**[-BE] modification**
(ADVERB) TO BE V-EN (12a) (ADVERB) TO VINTRANSITIVE (12b) ADVERB TO BE ADJP [+BE] (15)	ADVERB TO BE (14) ADVERB TO BE (ADJP [-BE]) (17)

8 See Cinque (2010) for a detailed discussion of the distinction between indirect modification (reduced relatives) and direct (adverbial) modification.

The following section will focus on lexical [+BE] pre-modifiers in the infinitive.

4. Constraints: a comparison with past participles

To my knowledge, the only negative/ungrammatical example of a prenominal infinitive comes from Williams (1982: 160). It is given in (19).

(19) *the to cry man (Williams 1982, 160, his (1e))

In this section, I will use Williams' example to detect and identify the major constraints that account for the form of prenominal lexical infinitives.

4.1 Subject interpretation

The head noun can only be interpreted as the implicit (syntactic) subject of prenominal infinitives.

(20) a. He is the best man [_ to be chosen].
b. That plan, they hope, will chart the course for a [_ soon-to-be-chosen] Department of Energy blue ribbon panel to follow as it sets out to develop a new national nuclear waste strategy. (*Las Vegas Review-Journal*, August 17, 2009)

In sharp contrast to the post-modifying infinitives in the (a) examples below, the head noun cannot be the implicit direct (21) or indirect (22) object of a prenominal infinitive.

(21) a. The man [to see _] is Mr Johnson.
b. *the [still-to-see _] man

(22) a. She is not a person [to rely on _].
b. *a [never-to-rely-on _] person

Clearly, that constraint does not account for the ungrammaticality of (19). Given the intransitive status of the verb "cry" (with the intended reading "to produce tears from your eyes"), the only possible interpretation would be "the man is to / will cry". In other words, the head of the nominal construction "man" would be the implicit subject of the verb "cry" and the constraint I have just presented would not be violated.

In fact, that constraint is shared by all non-finite pre-modifiers, as it is observed with participial forms as well.

(23) a. his [_ recently published] book
a'. *the [substance discovered by _] scientist
b. a [_ barking] dog
b'. *the [man carrying _] large umbrella

4.2 Adverbs and informativeness

As already mentioned in section 2.1, a large majority (94%) of prenominal infinitives are introduced by a short adverb. Jespersen (1914: 340) observes that "infinitive pre-adjuncts are frequent in the whole of the Modern English period, but generally on condition of being

preceded by an adjunct, such not or never, more rarely another adverb." However, Simonin (2007: section 1.4.5) notes that the presence of the adverb can only be seen as a strong tendency rather than a condition, at least in contemporary English. As indicated in Table 2, 6% of the occurrences found in the corpora are not preceded by an adverb.

(24) a. Psychiatric inpatients are often overly medicated for the convenience of staff, who do not always treat the *to-be-expected* side effects with compassion or expertise. (P. Chesler , *Women and madness: A feminist diagnosis*, 1997)
b. Pitching for the Suns will be a *to-be-named* member of the all-female Colorado Silver Bullets. (*USA Today*, March 9, 1996)

Crucially, the insertion of a short adverb in (19) does not seem to improve the acceptability of the sequence.

(25) *the {soon; yet; still; not; never} to cry man

Interestingly, the strong tendency to insert a short adverb in prenominal infinitives is also at work in prenominal participles.

(26) a. ?a born baby
b. ?an occurring phenomenon
c. ?a to-be-born baby
a'. a recently born baby
b'. a naturally occurring phenomenon
c'. a soon-to-be-born baby

Ackerman & Goldberg (1996, 28) suggest that "attributive adjectival past participles can only occur if they are construable as predicating an informative state of the head noun referent." Accordingly, the acceptability of (26a) is degraded because "born" does not predicate a state of the referent of "baby" which is considered informative enough. Being born is indeed a necessary condition for the existence of the head noun referent. However, the insertion of the adverb "recently" in (26a') provides a source of information that guarantees the informativeness of the pre-modifier. Similarly in (26b), the present participle "occurring" predicates a state of the noun "phenomenon" that is not informative enough to justify its insertion in the noun phrase. The phrase "an occurring phenomenon" sounds redundant because the idea of occurrence cannot be dissociated from the denotation of the noun "phenomenon". The adverb "naturally" in (26b') warrants the use of the pre-modifier by providing informative content. Note that a similar constraint is operative in prenominal infinitives. The infinitival sequence "to-be-born" in (26c) is not attested in the corpora while the sequence "soon/yet/still/never-to-be-born" illustrated in (26c') occurs 10 times.

Again, the informativeness constraint cannot account for the ungrammaticality of (19). As shown in (25), the insertion of a short adverb does not save the construction. Moreover, the type of degradation caused by the violation of the informativeness constraint (26a,b,c) is milder and therefore distinct from the sharp ungrammaticality of (19). Finally, the present participle "crying" can pre-modify the head noun "man" without the presence of a short adverb.

(27) the crying man (Williams 1982: 160, his (1d))

The acceptability of (27) indicates that the state predicated by "crying" is sufficiently informative to justify the insertion of the present participle in the prenominal domain of the head noun "man". Indeed, crying is not a necessary condition for the existence of a man, nor does "crying man" sound redundant. Thus it would be difficult to explain why the infinitival

form "to cry" is considerably less informative than the participial form "crying".

4.3 The Head Final Filter

To account for the ungrammaticality of his own example, Williams (1982) resorts to a well-known surface filter which he defines as follows.

(28) **Head Final Filter** Williams (1982, 160)
Post-head material is barred in prenominal modifiers.

Typical examples illustrating the effect of the HFF are given in (30).

(29) a. a [$_{AP}$ proud] mother
b. a [$_{AP}$ very proud] mother
c. *a [$_{AP}$ proud [$_{PP}$ of her children]] mother
d. a mother proud of her children
e. *a [$_{PP}$ to [$_{NP}$ Bill]] letter
f. a letter to Bill

In (29a) and (29b), the last element in the adjectival phrase is the head, the adjective "proud". The presence of the adverb "very" in front of the head in (29b) does not affect the grammaticality of the sequence. However, in (29c) the presence of the prepositional complement "of his children" to the right of the adjectival head violates the HFF and renders the whole sequence ungrammatical. In order to escape the HFF, the adjectival phrase must move to the right of the head noun (29c'). Similarly in (29d), the presence of the NP complement "Bill" after the head of the prepositional phrase results in the ungrammaticality of the example. Williams claims that a violation of the same filter accounts for the ungrammaticality of (19). In his analysis, "to cry" is an infinitival / inflectional phrase whose head, the infinitive particle TO, is followed by its complement, the verb phrase "cry".

(30) *the [$_{IP}$ to [$_{VP}$ cry]] man

Thus, Williams concludes, (30) violates the HFF. Crucially though, Williams' analysis wrongly predicts that <u>all</u> prenominal infinitives will be barred, including the 749 attested occurrences found in the corpora.

In fact, effects similar to those illustrated in (29) <u>can</u> be observed with prenominal infinitives when the lexical verb (or the adjective) is followed by a *by*-phrase (31a), a complement (31b) or an adjunct (31c).

(31)	a.	According to a survey *soon to be released by the D.C. Commission on Public Health*, the number of women […] (*Washington Post*, December 11, 1990)
	a'.	*According to a *soon to be released by the D.C. Commission on Public Health* survey, the number of women […]
	b.	[...] given the collateral damage *soon to be inflicted on the civilian population of Iraq* [...] (*Harpers Magazine*, October 2002)
	b'.	*the *soon to be inflicted on the civilian population of Iraq* collateral damage
	c.	There was a shift around the 1930s, according to Dennis Carey of SpencerStuart, [...] , in an article *soon to be published in Directors & Boards*. (*Forbes*, December 4, 1995)
	c'.	*a *soon to be published in Directors & Boards* article

As was already observed in (29c,d) and (29e,f) with adjectival and prepositional phrases, the infinitival sequences in (31) cannot be inserted in the prenominal domain and are forced to appear after the head of the nominal construction. If the HFF is correct, then we are forced to conclude that the head of a prenominal infinitive is the lexical verb (or the adjective), and that both the infinitive particle TO and passive BE in (32b) are non-heads[9].

(32) a. a [very proud (*of her children)] mother (=29c)
b. a [soon to be published (*in Directors & Boards)] article (=31c')

Following the same reasoning, the head of "to cry" in (19) is the lexical verb "cry", which is the last element of the premodifier. Consequently, the ungrammaticality of (19) cannot be ascribed to HFF effects.[10]

4.4 Unaccusativity

Active transitive verb forms cannot be used in prenominal infinitives. Indeed, the presence of a direct object after the verb would violate the HFF. Conversely, all intransitive verb forms, including the verb "cry", are now predicted to be allowed, providing they are not followed by adjuncts. So why is Williams' example in (19) ungrammatical?

A closer look at the types of one-argument verbs that can be used in prenominal infinitives reveals that some of them are closely related to passive forms.

(33) a. They are certainly museum-worthy, as evidenced by a *soon-to-open* permanent exhibition at the New Mexico Museum of Natural History & Science in Albuquerque. (*Country Living*, October 2006)
b. Pruett has already formed a shuttle bus service that will run between the *soon-to-be-opened* Riverstone Plaza shopping mall and the city's downtown district. (*Atlanta Journal Constitution*, October 23, 1997)

(33a) illustrates the anticausative alternation. The transitive verb "open" is turned into an **unaccusative** (intransitive) verb and the theme argument "a permanent exhibition at the NM Museum of NH&S in Albuquerque" is now interpreted as the (implicit) syntactic subject. A similar promotion is observed in the alternative passive form in (33b). Other transitive verbs used as unaccusatives in the corpora include *cease, close, cool, grow, launch, ship* and

9 An anonymous reviewer notes that neither conclusion is very plausible and that strong arguments that infinitival TO is a head can be found in Pullum (1982) and Levine (2010).

10 It should be noted that certain phrasal premodifiers like the those in (i) escape the HFF.

(i) a. a higher-than-average salary (Escribado 2004: 5, his 28a)
b. a hard-to-pronounce name (Escribado 2004: 5, his 28b)
c. a difficult-to-please child (Sadler & Arnold 1994: 190, their 8a)

Escribado (2004:5) proposes that the hyphenated sequences in (i) are formed in the lexicon, where the HFF is assumed to be inactive, and are later merged as modifiers of NPs. This approach seems particularly appealing to account for the highly lexicalised sequence "soon-to-be" mentioned in section 3 and illustrated in (ii).

(ii) her soon-to-be husband (=8)

If we extend the analysis to the [+BE] prenominal modifiers discussed in this section, we no longer need to assume that infinitival TO and passive BE are non-heads because their status is no longer an issue when the infinitival sequences are merged as premodifiers. It is not entirely clear though whether prenominal infinitives should be treated as lexical units. The lexical variation and syntactic productivity noted in section 2.1 seem to argue against it and lexicalisation still fails to explain why prenominal infinitives with a *by*-phrase (31a), a complement (31b) or an adjunct (31c) cannot be formed in the lexicon and then merged as premodifiers. For lack of space, I cannot explore this alternative and its consequences any further.

transfer.

However, such an alternation is not a requirement. Some intransitive verbs used in prenominal infinitives have no transitive counterpart.

(34) a. the highly anticipated, *soon-to-arrive* reader from Plastic Logic (=6b)
b. the happy Bob, the sad Bob, the triumphant Bob, the brimstone Bob, the sensitive Bob, and the sick, *soon-to-die* Bob. (Natural History, November 1995)
c. But the government staffers picked up their lances and charged off, tilting not at windmills but at possible windmills, *yet-to-appear* problems in a market that itself was drifting into the still waters of the Bay of Irrelevance. (*U.S. News & World Report,* November 25, 1996)

But again, note that the verbs *arrive, die* and *appear* are typically analysed as unaccusative predicates. Similar verbs in the corpora include *become, emerge, fade* and *mature*.

On the other hand, **unergative** verbs, i.e. intransitive verbs whose subject has an agentive role, are not attested in prenominal infinitives (but see 37a) and indeed, the following examples are ungrammatical.

(35) a. *the *soon-to-talk* man
b. *his *soon-to-run* child
c. *the *yet-to-dance* ballerina

Table 3 summarises the constraint on the types and forms of the verbs allowed in prenominal infinitives.

Table 3 *Types and forms of verbs allowed in pre-modifying lexical infinitives*

transitive		intransitive	
active	passive	unaccusative	unergative
NO	✓	✓	NO

It is now possible to account for the ungrammaticality of (19). The infinitival phrase "(soon-)to-cry" cannot be used as a pre-modifier because the verb "cry" - like "talk", "run" and "dance" in (35) - is an unergative predicate.

As I already mentioned in sections 4.1 and 4.2, prenominal infinitives and prenominal past participles share a number of properties. Unaccusativity is another one. Levin & Rappaport (1986: 654) observe that past participles derived from unaccusative verbs can occur prenominally, like past participles derived from passive transitive verbs but unlike past participles derived from unergative verbs. The contrast in (36) parallels that in Table 3.

(36) a. UNACCUSATIVES a fallen leaf, an escaped convict, a collapsed tent, burst pipes, rotted railings, swollen feet, vanished civilisations, a recently expired passport
b. UNERGATIVES *cried child, *run man, *coughed patient, *swum contestant, *flown pilot, *exercised athlete, *sung artist, *yawned student, *laughed clown

Finally, consider the examples below.

(37) a. Wearily, the *soon-to-resign* Mr. Altman replied: 'One could argue that there is a difference between implied and inferred. I don't know.' (*The New York Times*, August 28, 1994)
b. ??the soon to be crying child

The acceptability of (37a) is unexpected because the verb "resign" is generally analysed as an unergative verb (i.e. the person who resigns decides to do so). Yet, resigning also implies that the subject will be affected by their own decision since their resignation will be the turning point between the state of being employed in a company or institution and the resultant state of not being an employee of that company or institution any longer. The notion of "change of state" is closely related to unaccusativity (Bresnan 1995) and it might be the case that under certain conditions, it becomes the determining factor. As for the relative improvement in acceptability in (37b), one could suppose that the use of the aspectual marker BE V-ING gives the activity verb "cry" state-like properties necessary for the identification of a future change of state. I plan to address these issues in future research.

5. Conclusion

Despite what reference grammars of the English language suggest, all three non-finite verb forms, i.e. past participles, present participles and *to*-infinitives can be used as pre-modifiers. Though the very low frequency of prenominal infinitives makes them almost unnoticeable, a detailed analysis of the construction reveals rules and constraints very similar to those observed for pre-modifying past participles. In a sense, one could say that prenominal infinitives have no properties of their own except for their infinitival form. Interestingly, this is not an idiosyncrasy of English. In his comparative study of adjectival participles, Haspelmath (1994) notes that cross-linguistically, "modal/future participles" (like prenominal infinitives in English) always pattern with past participles and differ from present participles. English is therefore no exception. A closer look at postnominal infinitives may also reveal that so-called infinitival relative clauses do not form a homogeneous class: it may be possible to distinguish participial infinitives from genuine relative constructions, as suggested by Bhatt (1999). These questions will be the focus of my future research.

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On dative case assignment by *spray/load* verbs in Japanese*

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Abstract

It is well known that spray/load *verbs in Japanese can participate in an argument alternation (i.e., a verb is associated with two sentence patterns)*, *while* give *verbs cannot (Fukui, Miyagawa & Tenny 1985). The contrast between these two types of ditransitive verbs has attracted much attention in the lexical semantics literature (Kishimoto 2001c, among others). In this paper, in contrast, I will present a syntactic analysis of* spray/load *verbs. I will make two main points: firstly, I argue that dative case assignment by* spray/load *verbs involves remerge, while dative case assignment by* give *verbs involves pure merge; secondly, the difference between these two types of dative case marking predicts whether or not a verb can take part in argument alternation.*

1 Introduction

Spray/load verbs in Japanese (e.g., *nuru* 'paint', *tsumeru* 'pack', etc.,) can be associated with two different sentence patterns as in (1), constituting the so-called argument alternation paradigm.

(1) a. Taro-wa kabe-ni penki-o nut-ta
Taro-TOP wall-DAT paint-ACC paint-PAST
'Taro painted paint onto the wall'

b. Taro-wa kabe-o penki-de nut-ta
Taro-TOP wall-ACC paint-with paint-PAST
'Taro painted the wall with paint'

On the other hand, *give* verbs in Japanese (e.g., *ageru* 'give,' *okuru* 'send,' etc.,) cannot constitute the same paradigm, failing to form the pattern in (1b), as (2b) shows.

(2) a. Taro-wa Hanako-ni ringo-o age-ta
Taro-TOP Hanako-DAT apple-ACC give-PAST
'Taro gave apples to Hanako'

b. *Taro-wa Hanako-o ringo-de age-ta
Taro-TOP Hanako-ACC apple-with give-PAST
'Taro gave Hanako with apples'

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In the lexical semantics literature, it is often discussed that the sentence in (1a) and the one in (2a) are based on the same event schema. According to Kishimoto (2001b), *ni* on the GOAL of *give* verbs (e.g., *Hanako* in (2a)) cannot be replaced with a directional marker *e/made* 'toward' as in (3).

(3) John-wa Mary-{??e/*made} jyouhou-o atae-ta[1]
John-TOP Mary-toward information-ACC give-PAST
'Literally: John gave the information toward Mary'

Based on this, he claims that *ni* in (2a) is not a goal marker but a possessor marker. Given these assumptions, we expect that the GOAL of *spray/load* verbs in (1a) pattern with that of *give* verbs in the same test, if they are supposed to share the same event schema. (4) shows that this is borne out and the assumptions are correct.

(4) Taro-wa kabe-{*e/*made} penki-o nut-ta
Taro-TOP wall-toward paint-ACC paint-PAST
'Literally: Taro painted paint toward the wall'

From (3) and (4), we may suppose that the GOAL of these two types of verbs is inherently the same. This may lead us to expect further similarities in other syntactic contexts. A closer inspection, however, reveals that this expectation is not borne out. For example, in (5), the GOAL of *give* verbs cannot be marked with *o* in a cleft sentence, whereas that of *spray/load* verbs can.

(5) a. *[Taro-ga t_i ringo-o age-ta no]-wa gakusei-o_i fu-tari da
Taro-NOM apple-ACC give-PAST C-TOP student-ACC two-CL COP
'Literally: It is two students that Taro gave apples to'

b. [Taro-ga t_i enogu-o nut-ta no]-wa osara-o_i ni-mai da
Taro-NOM paint-ACC paint-PAST C-TOP plate-ACC two-CL COP
'Literally: It is two plates that Taro painted paint onto'

This fact indicates that it is quite hard for the lexical-semantic approach of verbs to exhaustively analyze the nature of these verbs.

I propose a syntactic account for these verbs in this paper, showing that they have a different dative case assignment. *Spray/load* verbs involve case assignment after movement, while *give* verbs involve in-situ assignment. Furthermore, I claim that these two types of assignment predict whether or not a verb can participate in argument alternation. Hence, argument alternation falls under my analysis along with other syntactic properties of these verbs with no further stipulation. The organization of the paper is as follows: in section 2, I will document certain empirical problems with the analysis of *spray/load* verbs proposed in Fukui, Miyagawa and Tenny (1985) (henceforth, FMT). In section 3, based on the proposal in section 2, I further argue that dative case assignment by *spray/load* verbs involves movement, adopting Hiraiwa's (2001) Multiple Agree. Section 4 presents a condition on argument alternation under the given analysis. Section 5 concludes the discussion.

[1] A replacement of *made* 'toward' with *ni* 'to' is severely deviant to me. For this reason, I mark it as ungrammatical, although in Kishimoto (2001b) it is double-question marked.

2 Argument structure of *spray*/*load* verbs and *give* verbs in Japanese

FMT argue that an infinitival verb and its sister can form an N-V compound. In (6), the accusative phrase *kitte* 'stamp' can form such a compound with the verb infinitive *atsume* 'collect,' while the nominative phrase *Taro* cannot.[2]

(6) a. Taro-ga kitte-o atsume-ru
Taro-NOM stamp-ACC collect-PRES
'Taro collects stamps'

b. *kitte-atsume* 'stamp-collection,' **Taro-atsume* 'Taro-collection'

As shown in (7), both the *ni*-phrase and the *o*-phrase of *spray/load* verbs in (1a) can form an N-V compound.

(7) *penki-nuri* 'paint-painting,' *kabe-nuri* 'wall-painting'

Based on this, extending the First Sister Principle (Roeper & Siegel 1978) that an N-V compound is formed from the complement and the verb, FMT claim that both phrases of *spray/load* verbs are sister to the verb, as in (8).

(8) [$_{VP}$ GOAL-*ni* THEME-*o* V]

I will show that the structure (8) has an empirical problem. According to Hoji (2003), a demonstrative pronoun *so-ko* 'that-place' can be a variable iff it is included within the c-command domain of the phrasal binder. For instance, in a transitive sentence like (9a), *so-ko-no kantoku* 'its manager' in the *o*-phrase refers to the manager of *Mettu* 'the Mets' in the *ga*-phrase. On the other hand, in (9b), when *so-ko-no kantoku* is included in the *ga*-phrase and *Mettu* is in the *o*-phrase, the pronoun does not have a bound variable reading.

(9) a. BVR (Bound Variable Reading) (*Mettu*, *so-ko*)
Mettu-sae-ga [so-ko-no kantoku]-o uttaeta (koto)
Mets-even-NOM that-place-GEN manager-ACC sued (fact)
'Literally: Even the Mets sued its manager'

b. *BVR (*Mettu*, *so-ko*)
[So-ko-no kantoku]-ga Mettu-sae-o uttaeta (koto)
that-place-GEN manager-NOM Mets-even-ACC sued (fact)
'Literally: Its manager sued even the Mets'

(Hoji 2003: 393-394 (33a), (33b))

This contrast is predicted under the c-command condition of the bound variable reading of *so-ko*: when *so-ko* is included in the c-command domain of binder *Mettu*, as in (9a), it has a bound variable reading, while when it is outside of that c-command domain as in (9b), it cannot obtain the variable reading.

[2] As FMT admit, compound formation in Japanese is rather complex; not every case follows the First Sister Principle. I confine myself to introducing FMT's argument here.

A similar fact holds between the *ni*- and *o*-phrase of *spray/load* verbs. When included in dative phrase in (10a), *so-ko* is interpreted as bound by *subete-no penkigaisya* 'every paint manufacturer'. In addition to a discourse-bound reading of the pronoun (i.e., there is a specific company that *so-ko* refers to in the discourse), the sentence obtains another reading that *so-ko* refers to an individual company (e.g., company A, B, C, etc.,) in a set. On the other hand, when it is included in the dative phrase and the binder is in the accusative phrase as in (10b), it does not have the variable interpretation.

(10) a. BVR (*subete-no penkigaisya*, *so-ko*)
Sono daiku-ga [subete-no penkigaisya$_i$-no kabe]-ni
the decorator-NOM every-GEN paint.manufacturer-GEN wall-DAT
[so-ko$_i$-no penki]-o nut-ta
that-place-GEN paint-ACC paint-PAST
'The decorator painted every paint manufacturer's new product (paint) onto its wall'

b. *BVR (*subete-no penkigaisya, so-ko*)
Sono daiku-ga [so-ko$_i$-no kabe]-ni
the decorator-NOM that-place-GEN wall-DAT
[subete-no penkigaisya$_i$-no penki]-o nut-ta
every-GEN paint.manufacturer-GEN paint-ACC paint-PAST
'The decorator painted paint produced by every paint manufacturer onto the wall'

The same fact holds for *give* verbs (Hoji 1985, among others). As in (11a) and (11b), *so-itsu* 'that-person' is interpreted as a variable bound by the binder *subete-no gakusei* 'every student' only when the pronoun is included within the c-command domain of the binder.

(11) a. BVR (*subte-no gakusei*, *so-itsu)*
Mary-ga [subete-no gakusei$_i$]-ni [soitsu$_i$-no sensei]-o syookaisi-ta
Mary-NOM all-GEN student-DAT he-GEN teacher-ACC introduce-PAST
'Mary introduced every student's teacher to that student'

b. *BVR (*subte-no gakusei*, *so-itsu)*
Mary-ga [soitsu$_i$-no sensei]-ni [subete-no gakusei$_i$]-o syookaisi-ta
Mary-NOM he-GEN teacher-DAT all-GEN student-ACC introduce-PAST
'Mary introduced all the students to that person's teacher'

These facts show that the *ni*-phrase c-commands the *o*-phrase in both sentences of *spray/load* verbs and that of *give* verbs. Hence, I hypothesize (12).

(12) The GOAL of *spray/load* verbs and *give* verbs asymmetrically c-commands the THEME.

A Secondary Depictive (SD) describes a state of an argument of a verb during the action of the main verb (Koizumi 1994). As in (13), an SD *nama-de* 'raw' is a predicate of the accusative phrase *katsuo* 'bonito' during the action of eating. Boldface represents SDs.

(13) Taroo-ga katuo-o$_i$ **nama-de**$_i$ tabeta
Taro-NOM bonito-ACC raw ate
'Taro ate the bonito$_i$ **raw**$_i$' (Koizumi 1994: 27, (4a))

Under the ternary branching hypothesis, Koizumi (1994) claims that a verbal argument must be the sister of the verb in order to be a subject of an SD. Under this condition, consider the distribution of SDs in *spray/load* and *give* sentences. (14a) shows that the GOAL of *give* verbs *Hanako* cannot be the subject of an SD *hadaka-de* 'naked', while (14b) shows that the GOAL of *spray/load* verbs *sono osara* 'that plate' can be a subject of an SD *kitanaimama-de* 'filthy'.

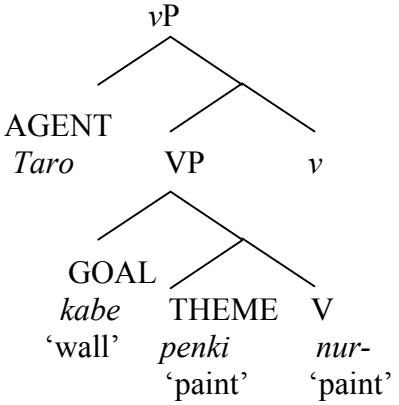
(14) a. *Taroo-ga Hanako-ni$_i$ **hadaka-de$_i$** hon-o yon-da
Taro-NOM Hanako-DAT naked book-ACC read-PAST
'Taro read Hanako$_i$ a book **naked$_i$**'

b. Taro-ga sono osara-ni$_i$ **kitanaimama-de$_i$** enogu-o nut-ta
Taro-NOM that plate-DAT filthy paint-ACC paint-PAST
'Literally: Taro painted paint on that plate$_i$ when it was **filthy$_i$**'

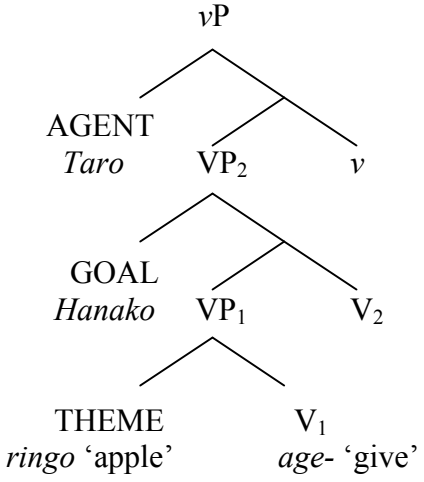
On the assumption that an argument can be a subject of an SD only when it is a sister of the verb, we say that the GOAL of *spray/load* verbs can be a sister of the verb, while the GOAL of *give* verbs cannot. However, this conflicts with the position of the GOAL of *spray/load* verbs under the binary branching hypothesis (Kayne 1984). As (10) and (11) show, the binding facts concerning *spray/load* verbs suggest that the GOAL is higher than the THEME, namely, the THEME is the single sister of the verb, while the GOAL is not. On the other hand, the distribution of SDs requires that the GOAL must be a sister of the verb. Neither fact can be predicted by FMT's structure in (8).

I propose the structure in (15a) for *spray/load* sentences like (1a). The VP shows a double object structure; the GOAL is its specifier and the THEME is its complement. Following the neo-Larsonian shell structure (Chomsky 1995), which claims that the subject of a transitive sentence is an argument of the light verb *v* rather than the lexical verb, I locate the AGENT in [Spec, *v*P]. I borrow the phrase structure from Ura (2000: 262) for *give* sentences like (2a), which is shown in (15b). In (15b), only the THEME is merged to VP but the GOAL is merged outside of that VP. I also modify Koizumi's condition on SDs and argue that an argument can be a subject of SDs if it is included within the smallest VP. The smallest VP is VP in (15a), while it is VP_1 in (15b).

(15) a.



b.



3 Dative case assignment after movement

Miyagawa (1989) claims that the direct passive in Japanese can be formed when a passive morpheme *rare* absorbs the structural Case and suppresses the external argument.[3] As in (16), the GOAL of *give* verbs (e.g., *Hanako*) and that of *spray/load* verb (e.g., *sono tsubo* 'the pot') can be a subject of passivized forms of *give* and *spray/load* verbs, respectively. This in return means that both GOAL of *spray/load* and *give* verbs is assigned the structural Case.

(16) a. Hanako-ga Taro-niyotte ringo-o oku-rare-ta
Hanako-NOM Taro-BY apple-ACC send-PASS-PAST
'Hanako was sent apples by Taro'

b. Sono tsubo-ga Jiro-niyotte enogu-o nur-are-ta
that pot-NOM Jiro-BY paint-ACC paint-PASS-PAST
'The pot was painted paint by Jiro'

As mentioned earlier, the GOAL of *give* verbs cannot be accusative-marked when it is clefted (e.g., (5a)), while the GOAL of *spray*/*load* verbs can (e.g., (5b)). As observed in (16), both GOALs are structural Cases. These facts show that the GOAL of *spray/load* verbs can be associated with accusative Case at some point of the derivation, while it can also be associated with dative Case at some other point of the derivation. In contrast, the GOAL of *give* verbs is always associated with dative Case at any point of the derivation. Assuming that accusative Case assignment in Japanese takes place within the c-command domain of *v* (Hiraiwa 2010), which will be introduced immediately, I argue that the GOAL of *spray*/*load* verbs is assigned accusative Case in its base position, whereas the GOAL of *give* verbs is assigned dative Case in its base position.

(17) The GOAL of *give* verbs is assigned dative Case in its base position, while the GOAL of *spray*/*load* verbs is assigned accusative Case.

Under (17), we may ask how dative Case is assigned to the GOAL of *spray/load* verbs, if it has been assigned accusative Case in its base position. As in (1a), the GOAL can be marked with dative case *ni*. With the distribution of the manner adverb and the licensing of the Negative Polarity Items (henceforth, NPIs) of the indeterminate words, I will show that the GOAL argument of *spray/load* verbs is assigned dative Case after movement.

3.1 Manner adverb distribution

First, compare the pair of sentences in (18). As we see (18a) where the GOAL of *spray/load* verbs is marked with *o* and appears lower than the manner adverb *fude-de* 'by brush' is more acceptable than (18b) where the GOAL is marked with *ni* at the same position.[4;5]

[3] Japanese has two types of passives: the direct passive and the indirect passive (Shibatani 1990, among others). I focus on the former type of passive here.

[4] The same pattern holds for *tsumeru* 'pack' and *umeru* 'fill.in', which belong to the same class.

[5] I dropped accusative markers on the THEME *enogu* 'paint' in these sentences, because the original sentences involve an effect of the Double-*o* Constraint (henceforth, D*o*C) violation, and cannot be tested. The D*o*C bans two adjacent realizations of the structural accusative Case (Hiraiwa 2010). Dropping one of

(18) a. ?Sono toogeisakka-wa fude-de osara-o enogu-ø nut-ta
that potter-TOP brush-with plate-ACC paint-ø paint-PAST
'The potter painted paint onto the plate with a brush'

b. ??Sono toogeisakka-wa fude-de osara-ni enogu-ø nut-ta
that potter-TOP brush-with plate-DAT paint-ø paint-PAST
'The potter painted paint onto the plate with a brush'

Next compare the grammaticality in (19). A sentence in which the dative-marked GOAL appears lower than the manner adverb is less grammatical than a sentence where the same GOAL appears higher than the manner adverb.

(19) a. ??Sono toogeisakka-wa fude-de osara-ni enogu-o nut-ta
that potter-TOP brush-with plate-DAT paint-ACC paint-PAST
'The potter painted paint onto the plate(DAT) with a brush'

b. Sono toogeisakka-wa osara-ni fude-de enogu-o nut-ta
that potter-TOP plate-DAT brush-with paint-ACC paint-PAST
'The potter painted paint onto the plate(DAT) with a brush'

From the facts in (18) and (19), we can say that the GOAL of *spray/load* verbs is assigned dative Case at a position higher than the manner adverb. In contrast, in (20), since the GOAL of *give* verbs can occur in a position lower than the manner adverb, we must say that the GOAL is assigned dative Case at the lower position of the manner adverb.[6]

(20) a. Sono sakka-wa sokutatsu-de syuppansya-ni genkou-o okut-ta
that writer-TOP special.delivery-BY publisher-DAT draft-ACC send-PAST
'The writer sent a draft to the publisher(DAT) by special delivery'
b. Sono sakka-wa syuppansya-ni sokutatsu-de genkou-o okut-ta
that writer-TOP publisher-DAT special.delivery-BY draft-ACC send-PAST
'The writer sent a draft to the publisher(DAT) by special delivery'

Based on these facts, I argue that the GOAL of *spray/load* verbs is assigned accusative Case at a position lower than the manner adverb, while it is assigned dative Case at a position higher than the manner adverb. The GOAL of *give* verbs is assigned dative Case lower than the manner adverb. I assume that the manner adverb in Japanese attaches to the left edge of VP (Ura 2000). Under this assumption, I hypothesize (21).

(21) The GOAL of *spray/load* verbs is assigned accusative Case inside of VP and assigned dative Case outside of VP and the GOAL of *give* verbs is assigned dative Case inside of VP_2.

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accusative markers is called the PF D*o*C salvation strategy, which alleviates the effect of D*o*C violation (see Hiraiwa 2010 for details about the given salvation strategy).

[6] The same pattern holds for *ageru* 'give' and *osieru* 'teach' that belong to the same class.

3.2 Indeterminate pronoun binding

It has been proposed that indeterminate NPs in Japanese (e.g., *dare* 'who', *nani* 'what', etc.,) can form NPI when it is combined with a quantificational particle *mo* 'also' (Kishimoto 2001a, Hiraiwa 2005). In (22), the indeterminate object NP *nani* 'what' plus the particle *mo* can be interpreted as an NPI.

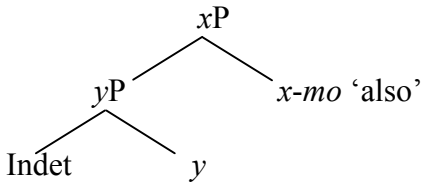
(22) Taro-wa nani-mo kawa-nakat-ta
Taro-TOP what-also buy-NEG-PAST
'Taro didn't buy anything' (Kishimoto 2001a: 598, (1), modified)

The same NPI is licensed even when the indeterminate NP is separated from the particle. As shown in (23), the indeterminate object NP *nani-o* can form an NPI with *mo* attached to the verb infinitive *kai* 'buy'.[7]

(23) Taro-wa nani-o kai-mo-si-nakat-ta
Taro-TOP what-ACC buy-also-do-NEG-PAST
'Taro didn't buy anything'

Hiraiwa (2005) claims that the indeterminate NP is interpreted as an NPI iff it is within the c-command domain of *mo* as in (24). 'Indet' in (24) represents the indeterminate NP.

(24)



(Hiraiwa 2005: 97, (8))

Under this assumption, an NPI interpretation of the indeterminate NP and *mo* in (23) is expected, because the indeterminate NP is within the c-command domain of *mo*.

I will show that an indeterminate GOAL of *spray/load* verbs is more readily interpretable as an NPI when it is accusative-marked, as in (25a), compared to when it is dative-marked as in (25b).

(25) a. Sono daiku-wa doko-o penki-ø nuri-mo-si-nakat-ta
that decorator-TOP where-ACC paint-ø paint-also-do-NEG-PAST
'The decorator didn't paint paint anywhere(ACC)'
b. ??/*Sono daiku-wa doko-ni penki-ø nuri-mo-si-nakat-ta
that decorator-TOP where-DAT paint-ø paint-also-do-NEG-PAST
'The painter didn't paint paint anywhere(DAT)'

Furthermore, the dative-marked indeterminate NP of *give* verbs can be interpreted as an NPI in (26a), whereas an indeterminate NP of *spray/load* verbs cannot, as in (26b).

[7] In both cases, the light verb *sur* 'do' is inserted to carry the tense (i.e., this process is parallel to *do*-support in English).

(26) a. Sono sensei-wa dare-ni hon-o okuri-mo-si-nakat-ta
that teacher-NOM who-DAT book-ACC send-also-do-NEG-PAST
'The teacher didn't send the book to anyone(DAT)'

b. ??/*Sono daiku-wa doko-ni penki-o nuri-mo-si-nakat-ta
that decorator-TOP where-DAT paint-ACC paint-also-do-NEG-PAST
'The decorator didn't paint paint anywhere(DAT)'

Given the c-command condition on NPI-licensing, we conclude from the facts in (25) and (26) that the indeterminate dative GOAL of *give* verbs is within the c-command domain of *mo*. The same holds for the indeterminate accusative GOAL of *spray/load* verbs. Contrary to this, the indeterminate dative GOAL of *spray/load* verbs must not be within the c-command domain of *mo*. I assume that *mo* attaches to *v* (Kishimoto 2001a). We therefore arrive at generalization (27).

(27) a. The GOAL of *spray/load* verbs is within the c-command domain of *v*, when it is marked with *o*, while it is not when it is marked with *ni*.

b. The GOAL of *give* verbs is within the c-command domain of *v* when it is marked with *ni*.

Assuming that the manner adverb marks the left edge of VP, I propose (28).

(28) The GOAL of *spray/load* verbs is assigned accusative Case inside of VP, while it is assigned dative Case outside of VP, while the GOAL of *give* verbs is assigned dative Case within VP_2.

If morphological dative Case alternates with accusative Case on the GOAL of *spray/load* verbs in the base position (i.e., the specifier of VP), we would not expect the grammaticality difference in (18) and (19), and (25) and (26).

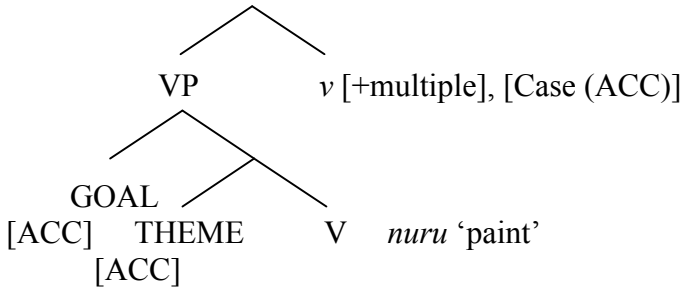
3.3 Multiple Agree

I formalize (28) adopting Hiraiwa's (2001) operation of Multiple Agree. Multiple Agree is a type of Agree, the Case-licensing operation in Phase theory (Chomsky 2000). In this model, the Case-feature is defined as a set of ϕ-features that needs to be licensed before the spell-out.

(29) Multiple Agree as a single simultaneous operation (Hiraiwa 2001: 4 (8))
AGREE (α, β, γ) where α is a probe and both β and γ are matching goals for α

In (29), α is a head, and β and γ are DPs that are included within the c-command domain of the head α. These DPs are unvalued in Case-feature when they are initially merged. Case-licensing occurs when a Case-feature on a probe (i.e., head) enters into an Agree with unvalued matching goals (i.e., DPs) within the c-command domain of the probe. The matched goals are Case-valued in return. In Chomsky (2000), Agree is defined as taking place between a probe and a single goal. As I have shown, both GOAL and THEME of *spray/load* verbs must be accusative-valued in situ. Under the single Agree, when Agree (*v*, GOAL) takes place, *v* no longer enters into an Agree relation with the THEME. For this reason, I adopt Multiple Agree, which can value accusative Case on both arguments of *spray/load* verbs simultaneously, as (30) shows.

(30)



In line with (29), I suggest that the GOAL and the THEME of *spray/load* VPs are valued as accusative in situ within the c-command domain of *v*, thereby checking [-interpretable] Case feature on *v*.[8] When the GOAL moves to the specifier of *v*P, as in (30), I claim that the given GOAL is assigned dative Case.

(31) Dative Case assignment under Agree

a. The DP_{GOAL} of *spray/load* verbs is assigned dative Case in [Spec, *v*P].

b. The DP_{GOAL} of *give* verbs is assigned dative Case within VP_2.

4 Condition on argument alternation

I have proposed that a *give* sentence like (2a) involves in-situ dative case assignment, while a *spray/load* sentence like (1a) involves dative case assignment after movement. I will show that the type of dative case assignment that a verb participates predicts whether or not a verb can participate in argument alternation in Japanese. In order to show this, let me clarify the structure of *spray/load* verbs in a sentence pattern like (1b).

The *o*-phrase of this sentence is an argument of the verb, since it cannot be freely omitted as (32a) shows, while the *de*-phrase of this sentence is an adjunct, because it can be freely omitted from the sentence as in (32b). Strikethroughs represent that given phrases are omitted.

(32) a. *Taro-wa ~~kabe-o~~ penki-de nut-ta
Taro-TOP ~~wall-ACC~~ paint-with paint-PAST
'Taro painted ~~the wall~~ with paint'

b. Taro-wa kabe-o ~~penki-de~~ nut-ta
Taro-TOP wall-ACC ~~paint-with~~ paint-PAST
'Taro painted the wall ~~with paint~~'

The *o*-phrase has structural accusative Case, while the *de*-phrase does not. This is because the former can be passivized, while the latter phrase cannot.

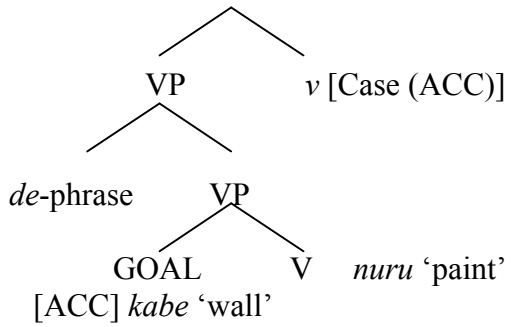
[8] An anonymous reviewer suggests a comparison between *spray/load* verbs and the possessor raising constructions in relation to the multiple accusative cleft. Although I share the point, I focus on the analysis of *spray/load* verbs in this paper. See Hiraiwa (2010) for a possessor raising analysis of the inalienable possession construction in Japanese under Multiple Agree.

(33) a. Sono osara-ga Taro-niyotte enogu-de nur-are-ta
that plate-NOM Taro-BY paint-with paint-PASS-PAST
'Literally: The plate was painted with paint by Taro'

b. *Sono enogu-ga Taro-niyotte kabe-o nur-are-ta
that paint-NOM Taro-BY wall-ACC paint-PASS-PAST
'Literally: That paint was painted onto the plate by Taro'

From (32) and (33), I propose that sentences like (1b) have a structure like (34), where the GOAL is the complement of the verb and is accusative-valued by *v*, assuming that the *de*-phrase attaches to the left edge of VP (because it is an adjunct), following Ura (2000).

(34)



I propose a condition on argument alternation in Japanese as in (35).

(35) Verbs that participate in argument alternation must meet the following syntactic conditions: (i) the GOAL must be merged within the smallest VP; (ii) the GOAL must be accusative-valued.

Spray/load verbs participate in argument alternation, since they satisfy this condition; their GOAL appears within VP and is accusative-valued. On the other hand, *give* verbs can never take part in argument alternation, since they fail to satisfy the condition: their GOAL is merged outside of VP_1 (i.e., the smallest VP) and it is not accusative-valued.

5 Conclusion

This study has attempted to show that dative case marking of *spray*/*load* constructions in Japanese involves movement (remerge), and is different from case marking in *give* constructions. Whether or not a verb participates in argument alternation is related to these two types of dative case assignment. If a verb involves in-situ dative case assignment (i.e., *give* verbs), it will not participate in argument alternation, since the GOAL is never accusative-valued, while if a verb involves dative case assignment after movement (i.e., *spray/load* verbs), it will enter into alternation, since the GOAL is accusative-valued.

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Generative and Usage-based Approaches to L1 Acquisition: Evidence from Cypriot-Greek

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Abstract

The most influential approaches to first language acquisition include generative approaches and usage-based accounts. Generative approaches encompass the idea that child's grammar is UG-constrained, while usage-based accounts assume that children's early syntactic development does not involve abstract constructional schemas. In this paper, we investigate the L1 acquisition of clitic positioning in Cypriot Greek based on samples of spontaneous speech and the implementation of two semi-structured elicitation techniques. Data analysis reveals an asymmetry regarding clitic placement in proclisis and enclisis contexts. Enclisis environments are adult-like from the onset of L1 acquisition, while proclisis environments remain problematic for some children until the age of 3;2 years, with high proportions of misplaced clitics. The phenomenon observed, the overgeneralization of enclisis, is in line with Petinou and Terzi's (2002) outcome for the acquisition of Cypriot Greek and Duarte and Matos' (2000) claim for the acquisition of European Portuguese. The main finding of this study is that the pattern of clitic placement in early Cypriot Greek is not characterised by un-constrained optionality, but it is constrained by a systematic grammar that goes in either adult-like or non-adult-like directions. On the grounds of this finding, we discuss to what extent each of these two approaches to L1 acquisition can explain our results.

1. Introduction

The current debate in the literature for first language acquisition (henceforth L1A) involves on the one hand functional, usage-based approaches and, on the other, generative accounts emerging from Chomsky's theory for formal syntax. The basic assumption behind usage-based accounts is that children learn the language item-by-item from the language they are exposed to, while generative accounts assume that children's grammar is constrained by an innate system, the Universal Grammar (henceforth UG). Adult input has an important role to play in both accounts, but there is a substantial difference between generative and usage-based approaches. Within the generative framework, adult input is necessary for language development, but not sufficient, while for usage-based accounts adult input is argued to be both necessary and sufficient.

This paper investigates the acquisition of clitic positioning in Cypriot Greek (henceforth CG) and discusses to what extent each of these accounts can explain the phenomenon observed, namely the over-generalization errors in clitic placement. Sections 2 and 3 offer some background information for generative and usage-based approaches. Section 4 presents the rationale behind this study and section 5 gives an outline of the two studies carried out. Section 6 discusses which of the two accounts better accommodates the findings of our study.

2. Generative Approaches to L1A

Generative approaches to L1A encompass the idea that children have an innate mechanism, the so-called Universal Grammar, with certain aspects of their linguistic knowledge being genetically determined. In Radford's wording, UG provides children with 'a 'template' which specifies the (universal) structure of phrases and clauses' (1996:43). Yet, there are obvious discrepancies between child and adult language. A number of accounts were put forward in the late 90s aiming to capture the mechanism that boosts the development of the deficient child system into the advanced

adult system. The most influential proposals for the development of the clausal structure within the generative framework include Radford's (1996) *Structure Building Hypothesis*, Clahsen et al.'s (1996) *Lexical Learning Hypothesis*, Hyams' (1996) *Underspecification Hypothesis*, Wexler's (1994) *Tense Omission Model* and Rizzi's (1994) *Truncation Hypothesis*.

The basic assumption behind all the aforementioned accounts is that UG constraints the search space for available alternatives at the initial stages of L1 acquisition. A number of choices are available to children by UG, not all of which are licit in adult language. Taking for example the acquisition of pronoun case marking, the well-known Agreement/Tense Omission Model (Schütze & Wexler 1996) predicts the use of nominative subjects with both inflected and uninflected verb forms, even though the latter is illicit in adult language. However, it does not predict the use of non-nominative subjects with inflected verbs, which is completely ruled out by UG. In the generative framework, children learn on the basis of their innate endowment. Yet, the innate mechanisms are obligatorily supplemented by positive evidence in adult input.

The generativists have used the so-called overgeneralization errors as evidence for the existence of abstract syntactic representations in child language, since children use forms or structures absent from the adult input. An error of this type is the over-regularization of the past tense of irregular verbs, with children producing forms that adults don't, i.e. *goed* instead of *went* and *singed* instead of *sang* (Tsakali 2006:118-119). The argumentation of generativists is based on the hypothesis that if children do not learn these patterns from the language they are exposed to, they must have constructed them based on some abstract representation.

3. Usage-based Approaches to L1A

The central idea behind usage-based accounts is that children's language development is item-based. Within this approach, the adult input constitutes the only source of linguistic information for children and plays a major role in the course of L1A. There is no innate grammar to restrict children's choices, with their grammar being derivative (Tomasello 2006:7). This section presents one of the most influential usage-based accounts for L1A put forward by Michael Tomasello in a number of papers published over the last decade (2000a, 2000b, 2006).

Tomassello's account is under the umbrella of Cognitive-Functional linguistics and is part of a growing literature opposing generative theories. For Tomasello, there is continuity of process in language learning: children learn the syntactic structures in the same way adults learn different kinds of idiomatic structures, typically located by generativists in the linguistic periphery. Within this account, children's early syntactic development is driven by the implementation of their cognitive skills, some of which are grouped together under the heading Intention-Reading and others fall in with Pattern-Finding.

Skills related to intention-reading are involved in cognitive processes aiming to capture the symbolic dimension of language, while skills related to the process of pattern-finding are employed in the construction of abstract representations. A number of skills, including cultural learning, joint attention and the understanding of communicative intentions constitute the so-called intention-reading, while processes such as categorization, schema formation, statistical learning and analogy are part of the pattern-finding mechanisms (Tomasello 2006:8). Entrenchment and competition / pre-emption play an important role in L1A, with the former term denoting the process by which the way of doing something becomes habitual, and the latter denoting humans' ability to discover the communicative reason why someone uses X instead of Y. Thus, entrenchment and competition constrain children's abstractions, while distribution analysis helps them construct paradigmatic categories, such as 'nouns' and 'verbs' (Tomasello 2006:72).

Based on data from longitudinal studies (see Tomasello 2000a for references), Tomasello suggests that children's early clauses are organised around individual verbs and other predicative terms, an idea expressed in his so-called Verb Island Hypothesis (1992). For example, in a clause like 'John hits the ball', two entities are involved, the 'hitter' and the 'hittee' (Tomasello 2000a:213-4). Tomasello offers evidence that linguistic items and structures, such as determiners in

English and verbs in Italian, Brazilian Portuguese and Hebrew are not used productively at the initial stages of L1A. What follows is that child language is constructed around concrete and not abstract entities.

The bulk of the experimental studies reported by Tomasello in all his recent papers (see Tomasello 2000a; 2000b; 2006 for detailed descriptions of the experiments and the relevant references) involve the use of novel verbs for the investigation of argument structure. The non-existence of these verbs in the natural language children are acquiring is claimed to ensure that children's performance cannot be affected by the input they receive. The basic assumption being that if children have created the abstract category of 'verb', they will be able to use novel verbs in a simple transitive construction when prompted.

In a number of production experiments, Tomasello and his colleagues have shown that young children fail to use novel verbs in transitive constructions, if these verbs are introduced in different constructions (in passive, intransitive or imperative constructions). Furthermore, he reports that experimental work carried out has shown that young children fail to assign correct agent-patient roles to the arguments of the clause and they are also unable to produce canonical SVO structures, when novel verbs are introduced in non-canonical SOV or VSO forms. Based on the findings of the aforementioned studies, Tomasello rejects the existence of abstract syntactic representations in child language and suggests that the constructions found in child speech derive solely from the adult input. It should be mentioned that the application of this methodology, that involves the elicitation of transitive constructions with novel verbs for testing the existence of the abstract category 'verb', has received some criticism (Fisher 2002).

As for the overgeneralization errors, Tomasello insists that they can be explained on the basis of adult input alone. To illustrate, it's worth mentioning the explanation he gave for a well-known error in early English: the use of accusative instead of nominative subjects, in structures like 'Me eat', 'Her go' etc. Tomasello argues that children simply tear apart structures that exist in adult input, i.e. 'Let me eat', or 'Make her go', and use the first part of the clause alone (2000a:240). He also denies the existence of early abstractions that go in non-adult-like directions (Tomasello 2000a:243). In the following section, we present a phenomenon that offers evidence for the existence of such an abstraction in early child language.

4. L1 Acquisition of CG Clitics

4.1. The Syntactic Construction

The L1 acquisition of clitic constructions has been widely studied cross-linguistically (such as Hamann et al. 1996 for French, Schaeffer 1997 for Dutch, Costa at al. 2007 *et seq.* for European Portuguese, Marinis 2000 and Stephany 1997 for Greek, Guasti 1993/94 for Italian, Babyonyshev & Marin 2005 for Romanian, Ilic & Ud Deen 2003 for Serbo-Croatian, Wexler et al. 2004 for Spanish). The reason why clitics are such interesting elements for acquisition studies is that they have, according to Joao Costa (2008), a number of properties that make them a good tool for assessing language development. First, they have controversial status (X°/XPs): some formal approaches for cliticization treat them as markers of object agreement (Sportiche 1996), while others suggest that clitics head their own projections (Uriagereka 1995). Second, they are lexical materials, which are highly dependent on the functional domain, thus they constitute a good testing tool for the acquisition of this domain. Third, in the Romance languages (Roberts 2010), CG (Agouraki 2001, Terzi 1999a, 1999b) and Standard Modern Greek (Mavrogiorgos 2009), object clitics have variable placement depending on the syntactic environment.

Languages like CG, European Portuguese (henceforth EP) and Galician exhibit the enclisis pattern; in finite clauses clitics appear post-verbally (example 1), but if the clause is headed by a proclisis-triggering element, for example a negation marker (example 2), they appear pre-verbally.

1. Efera to
   Brought CL
   '(I) brought it'
2. O João não o comprou.
   Joao not CL bought
   'Joao didn't buy it'

Based on work done by Terzi (1999a; 1999b) and Agouraki (2001) for CG, Duarte and Matos (2000) for EP, and Uriagereka (1995) for Galician, proclisis-triggering environments for these languages are summarized in Table 1.

Table 1: The Proclisis-Triggering Environments for CG, EP and Galician

Syntactic Environments	CG	EP	Galician
Subjunctive Clauses	*YES*	*NO*	*YES*
Negatives	*YES*		
Contrastive Focalised XPs	*YES*		
Wh-operators	*YES*	*YES*	*NO*
(some) Pre-verbal Adverbs	*NO*	*YES*	*NO*

Constructions involving object clitics represent a challenge for children acquiring languages that exhibit the enclisis pattern. In early EP high rates of clitic omission are reported (Costa and Lobo 2007; 2009; Costa et al. 2008) and clitic misplacement is also observed (Duarte and Matos 2000). Greek-Cypriot children misplace clitics at the onset of L1A (Petinou and Terzi 2002). To the best of our knowledge, there are no existing studies for the L1A of clitics in Galician.

4.2. Research Hypothesis

This study aims to find out whether young children acquiring CG exhibit overgeneralization errors that go in non-adult-like directions. Based on the results of a previous study on the L1A of CG clitics (Petinou & Terzi 2002), Greek-Cypriot children are expected to pass through some developmental stages until they reach the adult-like clitic positioning. Taking into account that CG is a language exhibiting the enclisis-pattern, where clitics usually follow the finite verb, unless the clause is headed by a proclisis-trigger, children may erroneously manifest enclisis in proclisis environments and / or vice-versa. Yet, what is important to find out is whether they randomly use pre- and post-verbal clitics regardless of the syntactic context, or if their clitic placement is systematic. The former case represents true optionality that can be easily accommodated in a usage-based account, while the latter is an indication for a step beyond adult input. The overgeneralization of either proclisis or enclisis across syntactic contexts would offer evidence for the existence of a systematic grammar in child language based on criteria that differ from those valid in adult grammar. Thus, the experimental investigation conducted to study the initial stages of L1A of CG clitics is driven by the following research question: Is clitic positioning characterized by un-constrained optionality or is it constrained by a systematic grammar?

5. Methodology

Two studies were conducted to investigate the developmental stages in the course of L1A of CG pronominal clitics. The first study is a preliminary investigation of the spontaneous speech of nine typically-developing children, aiming to reveal the general pattern for clitic positioning in early CG.

The second study is an experimental investigation in a more structured setting and involves the implementation of two semi-structured elicitation techniques.

5.1. Spontaneous Speech Recordings

The aim of this study is to lay the foundations for the creation of a solid knowledge base for clitic placement by young Greek-Cypriot children acquiring their mother tongue. The results obtained from this study, offered useful insights that were taken into consideration for the implementation of the experimental investigation.

Samples of spontaneous speech were collected from nine monolingual Greek-Cypriot children, aged 2;3-3;4 years, with a monolingual CG-speaking background and no history of cognitive deficits or language impairments. Each child was audio-recorded at his / her home for an hour. In each recording session, the experimenter was interacting with the children using stickers, picture books and wooden puzzles. The toys were used as prompts for the elicitation of constructions involving clitics. In order to reduce the artificiality of the situation, other members of the family were occasionally present but silent.

5.2. Experimental Investigation

Nineteen Greek-Cypriot children participated in this study, their age range was 2;7-3;9 years and they were randomly recruited from two Greek-speaking nurseries in Limassol, after approval from the directors and upon written parental consent. Only monolingual children, with a monolingual CG-speaking background and no history of cognitive deficits or language impairments participated in this study.

Two semi-structured elicitation techniques were implemented:

a. the puzzle task, introduced by Sonja Eisenbeiss in her recent paper (2009) discussing elicitation techniques for studies on child language acquisition, and,

b. a picture-based task (the pictures appear in the book 'First Hundred Words in English' by Amery & Cartwright (2009)).

Two factors were taken into consideration for the choice of the aforementioned semi-structured elicitation techniques. First, the age range of the participants and, second, the effectiveness of the task for the elicitation of constructions involving pre- and post-verbal clitics. Given that in the literature for methodological issues in acquisitional studies it's widely accepted that experiments are suitable for participants older than three years of age (Crain & Thornton 1998, Eisenbeiss 2009), and since children aged 2 to 4 were recruited for this study, semi-structured elicitation techniques were considered as the most appropriate experimental design. Moreover, semi-structured elicitation provides a non-strictly constrained experimental set-up with many prompts for the elicitation of the relevant structures. The testing for both the puzzle task and the picture-based task was carried out in a single session that lasted no longer than 25 minutes. Participants were tested once, the sessions were audio recorded and the data were then transcribed by the experimenter.

a. The puzzle-task

The purpose for the implementation of the puzzle task was twofold, on the one hand it served as a warm-up session and on the other it was used to elicit pre- and post-verbal clitics. Two puzzles were used, each consisting of a wooden puzzle board with pictures in cut-outs and puzzle pieces with pictures. Some jungle animals were depicted on the pieces of the first puzzle, and the characters of the well-known cartoon 'Dora the Explorer' were depicted on the pieces of the second. The children were initially encouraged to put the puzzle pieces in the corresponding cut-outs and then they were asked to guide the naïve experimenter to correctly place the puzzle pieces herself. In this way, children were prompted to use several clitic constructions, including matrix clauses ('Put it over there'), negatives ('It doesn't fit'), subjunctives ('You have to place it here') etc.

b. The picture-based task

The picture-based task constitutes an elicitation-production task for 3rd person singular object clitics. The material included 12 pictures selected from the book 'First Hundred Words in English' (Amery & Cartwright 2009) matched with 12 questions. The children were shown the pictures one at a time and the experimenter would point at a picture and would then address a question related to the situation depicted on this picture (example 3) in order to elicit a clitic construction (example 4).

3. Ti θeli na kami to koritsaki to kaδro?
   What wants Subj do the-nom girl-nom-diminutive the-acc frame-acc
   'What does the girl want to do the frame'
4. Na to kremasi.
   Subj it-CL hang up
   '(She wants) to hang it up'

The experimental questions were designed to elicit clitic constructions in three different conditions, two proclisis-triggering environments (negatives and subjunctives / future clauses) and one enclisis-triggering environment (bare finite clauses). Only singular forms were elicited and we controlled for genitive and accusative case and all the three genders to be equally represented in the task (table 2).

Table 2: The morphological paradigm of Cypriot Greek clitics

	1st person	2nd person	3rd person		
			Masculine	Feminine	Neuter
Singular					
Genitive	mu	su	tu	tis	tu
Accusative	me	se	to(n)	ti(n)	to
Plural					
Genitive	mas	sas	tus	tus	tus
Accusative	mas	sas	tus	tes	ta

5.3. Data Analysis

The samples of the spontaneous speech and the recordings of the experimental investigation, were orthographically transcribed following the conventions of CHAT format, used by the largest database of chid language, CHILDES (MacWhinney 2010 (electronic edition); 2000 (last printed edition)). These transcripts were used to build up a corpus of utterances for each child. Only (a) fully intelligible, (b) multi-word, and (c) spontaneously used (imitations and immediate self-repetitions were discarded) utterances were included in data analysis.

The first stage of data analysis was to pin-point the syntactic environments involving clitics and classify them as proclisis- or enclisis-triggering contexts. Table 3 shows the number of clitics produced in each condition in the two studies. In the spontaneous speech recordings, children's overall production includes 1025 clitic constructions, and it is estimated that each child produced on average 114 clitics. Out of the 1025 clitics, 518 were produced in enclisis environments and 507 in proclisis environments. In the experimental study, children's overall production includes 1018 clitics, and 54 clitics were produced on average in each experimental session. The overall clitic production of the participants of the experimental study is remarkably lower than the clitic production of the participants of the first study. This is due to the duration of the recordings in each

study; recall that the first study involves one-hour recordings of spontaneous speech, while each experimental session lasted approximately 25 minutes. Overall, 654 proclisis contexts were produced in the experimental investigation, but only 364 enclisis contexts. The mean number of enclisis environments in each experimental session was 19 and the mean number of proclisis environments was 34. The obvious discrepancy in the numbers of clitics produced in each condition is due to high production of subjunctive clauses during the implementation of the puzzle task.

Table 3: Clitic Production in Enclisis and Proclisis Contexts

Spontaneous Speech Recordings		Experimental Tasks	
Enclisis Contexts	*Proclisis Contexts*	*Enclisis Contexts*	*Proclisis Contexts*
1025		1018	
518	*507*	*364*	*654*
100%		100%	
50.5%	*49.5%*	*35.8%*	*64.2%*

Clitic constructions were then coded as correct or incorrect: a clitic construction was coded as correct if the clitic was placed pre-verbally in a proclisis environment or post-verbally in an enclisis environment, and reversely, a clitic construction was coded as incorrect, if the clitic was placed post-verbally in a proclisis environment or pre-verbally in an enclisis environment. Finally, the proportion of correctly placed and misplaced clitics in each condition was calculated.

5.4. Results

Data analysis revealed that clitic placement in enclisis environments is target-like from the onset of L1A, whereas proclisis-triggering environments are problematic for young Greek-Cypriot children. In the spontaneous speech samples, children use exclusively post-verbal (100%) clitics in enclisis environments, in accordance with adult-language, but proclisis environments are characterized by clitic misplacement. The percentage of incorrect clitic placement in proclisis environments varies across individuals, ranging from 2% to 98%. Similarly, in the experimental investigation, children's clitic positioning in enclisis contexts is almost adult-like; only three children exhibit incorrect clitic placement, but with remarkably low error rates (4%-7%). Yet, high proportions of misplaced clitics are found in proclisis environments, with percentages of incorrect clitic misplacement ranging from 0% to 100%.

Enclisis environments are adult-like from the onset, while proclisis environments are problematic for some children under three years of age. A number of young children use exclusively post-verbal clitics across environments. In other words they over-generalise enclisis over proclisis environments as well, regardless of the presence of proclisis-triggering elements. This outcome is in line with Petinou and Terzi's (2002) finding for L1A of CG and Duarte and Matos' claim (2000) for L1A of EP.

Leaving aside the enclisis environments, we turn to proclisis environments. Figures 2 and 3 show the proportions of correct and incorrect clitic placement in proclisis environments from spontaneous speech data and experimental data correspondingly. Children's clitic positioning in proclisis contexts reveals a bimodal distribution: some children are always correct and some others are always incorrect. Their choice for clitic placement is consistent across conditions: they either use pre-verbal or post-verbal clitics. For this reason the proportions of correct and incorrect clitic placement reach ceiling levels.

Figure 1: Clitic Placement in Proclisis Environments (Spontaneous Speech Recordings)

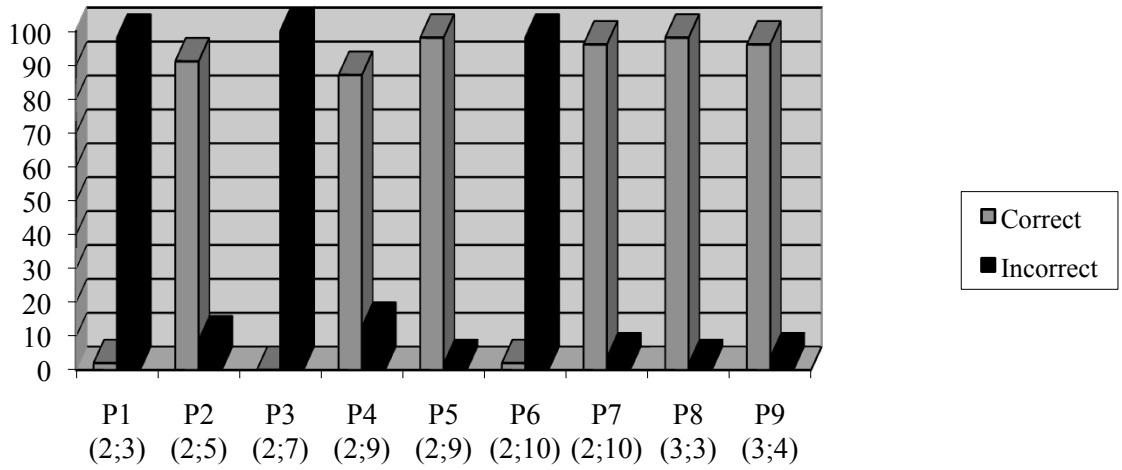
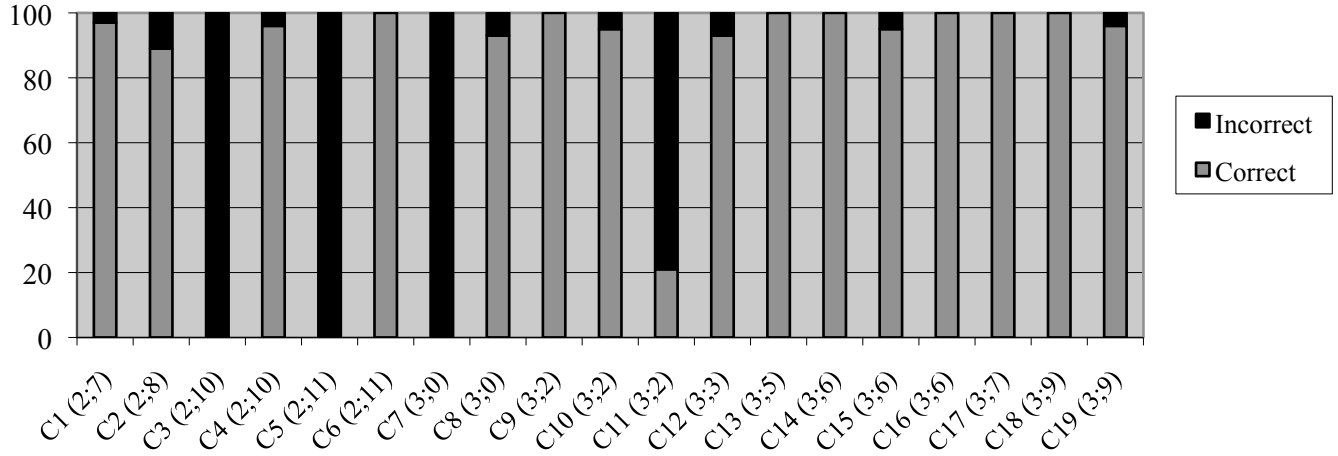


Figure 2: Clitic Placement in Proclisis Environments (Experimental Tasks)



The obtained results partly confirm the outcome of a previous study on L1A of Cypriot-Greek clitics carried out by Petinou and Terzi's in 2002 with a small number of participants (five typically developing children). Petinou and Terzi put forward that the initial stages of L1 acquisition of CG are characterized by the overgeneralization of enclisis pattern. The existence of this phenomenon is confirmed on the basis of the results presented above, but it is not generalised across participants.

This study has shown that a number of Greek-Cypriot children initially generalize enclisis across syntactic contexts, irrespectively of the presence of proclisis-triggering elements. The observed bimodal distribution reveals that there is no true optionality for clitic positioning in early CG, but children's choices are individually consistent. Some children have acquired the adult rule for clitic positioning, i.e. post-verbal clitics in enclisis contexts and pre-verbal clitics in proclisis contexts, whereas others use exclusively post-verbal clitics across conditions. In both cases, though, their choices are constrained by a grammatical system: in the former case, this is in accordance with the adult system, but in the latter case it is not. The latter case has some very interesting implications regarding the existence of early syntactic abstractions in child language and accordingly for the current debate in the literature for L1A.

6. Summary and Discussion

The main finding of this study is the existence of overgeneralization errors in early CG, namely the enclisis pattern is overgeneralized across conditions at the initial stages of L1A. Interestingly, only enclisis pro proclisis was found but not the reverse. This indicates that children's positioning of pronominal clitics is not characterized by true optionality, but it is constrained by a systematic grammar, which may differ from adult grammar.

Over-generalization errors are predicted from generative accounts on the basis of non-adult-like abstract representations that are available by UG. For usage-based accounts, however, they present a challenge, as they constitute constructions that do not occur in adult language. As previously discussed, from a functionalist perspective, children learn the language from the adult input alone and they construct their clauses based on the language they are exposed to. Tomasello argues in favour of an 'extended period of child conservativeness, denying the existence of early abstractions that go in non-adult-like directions' (Tomasello 2000a:243). This argument would be rejected on the basis of the evidence presented above.

The proponents of usage-based approaches can put forward a counter-argument based on the morphology of CG. Singular definite articles and 3rd person clitics share the same morphological paradigm in CG (Table 4), thus Greek-Cypriot children are exposed to functional elements that have the same phonological realization.

Table 4: The Morphological Paradigm of 3rd person Clitics and Definite Articles in CG

	Clitic			Definite Article		
	Masculine	Feminine	Neuter	Masculine	Feminine	Neuter
Singular						
Nominative	-	-	-	o	i	to
Genitive	tu	tis	tu	tu	tis	tu
Accusative	to(n)	ti(n)	to	ton	tin	to
Plural						
Nominative	-	-	-	i	i	ta
Genitive	tus	tus	tus	ton	ton	ton
Accusative	tus	tes	ta	tus	tes	ta

In (5), *to* is the definite article of the NP 'book', while *to* in (6) is a 3rd person masculine clitic - with the NP 'book' as antecedent. The article and the clitic have the same phonological realization in both structures, so children may be unable to assign the correct function to each form. This would lead to an incorrect statistical analysis of the adult input, as they would sum up all the instances of the same phonological realization, irrespectively of its function in each construction. The instances of post-verbal clitics and determiners may out-number preverbal clitics and as a result, children may construct some syntactic pattern / cue of the kind VP-X-(…), where X stands for the phonological realization of clitics and determiners, according to which X must appear post-verbally.

5. Efera *to* vivlio .
   brought-1sg the book
   'I brought the book'
6. Efera *to* .
   brought-1s CL
   'I brought it'

Although this line of argumentation seems reasonable, acquisition data from Standard Modern Greek challenge it's validity. In Marinis (2000), although the production of pre-verbal clitics in

child speech out-numbers the production of post-verbal clitics, which only appear in imperatives and constructions involving gerunds, clitic placement is target-like from the onset of L1A.

Turning to the generative tradition, there are two possible lines of reasoning to accommodate the over-generalization of enclisis in early CG. Generative analyses for cliticization in the Romance languages traditionally involve movement of some element (Roberts 2010; Uriagereka 1995 for Romance languages; Belletti 1999 for Italian; Duarte & Matos 2000 for EP). Similarly, in the analyses so far proposed for clitic constructions in CG, verb movement is manifested as either V-to-M (Terzi 1999a; 1999b) or V-to-C (Agouraki 2001). The over-generalization of enclisis can be either attributed to the overgeneralization of verb movement across syntactic contexts or to the absence of clitic movement. Petinou and Terzi's (2002) argumentation is in lines with the former account suggesting that verb movement is over-generalised in early CG, whereas Duarte and Matos (2000) claim that clitic movement is not manifested in early EP. A fine-grained account for the structure and derivation of pronominal clitics in CG goes beyond the scope of this paper and remains an open question for future research.

The research question was whether clitic placement in early Cypriot Greek reveals true optionality or not. On the basis of the results obtained, we can argue that child language is constrained by a systematic grammar. This presupposes the existence of early syntactic abstractions and provides corroborative evidence for UG-constrained grammar. Initially, a child's grammar may go in either adult-like or non-adult-like directions. In subsequent stages and on the basis of sufficient input, it conforms with the conventions of adult grammar.

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Instrumental agreement in Bohra Wagdi

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Abstract

Indo-Aryan languages show a wide range of variation with regard to verb-NP agreement and its interaction with case marking. Most of these languages exhibit some type of split-ergative subject marking based on aspect, which, together with differential marking on the direct object, may result in a variety of possible verb-NP agreement patterns. While the possibility of verb agreement with overtly marked or unmarked core arguments is uncontroversial, verb agreement with an oblique instrumental-NP is an extremely rare phenomenon. Such agreement patterns do occur in certain sub dialects of Wagdi, spoken in southern Rajasthan, India, as in (1-4):

1. *mein telwa:r:-thi e-nu mathu ka:pi didh-u*
   I.ERG sword.F-INSTR 3rdPRO-GEN head.N cut give-N
   'I cut off his head with a sword.'

2. *mein talwa:r-thi e-ne ma:r-i*
   I.ERG sword.F-INSTR 3rdPRO.M-ACC kill-F
   'I killed him using a sword.'

3. *la:kDi-thi ha:np-ne ma:r-i*
   stick.F-INSTR snake.M-ACC kill-F
   '(Someone) killed the snake with the stick.'

4. *patthar-thi ha:np-ne ma:ri-y-o*
   stone.M-INSTR snake.M-ACC kill-PF-M
   '(Someone) killed the snake with a stone.'

In (1) the subject is ergative and the verb agrees with the unmarked direct object. In (2) the verb cannot agree with the subject or the accusative marked object, and in this case I have found that it agrees in gender with the instrumental. In (3) and (4) the verb agrees again with the feminine and masculine instrumental respectively. Such agreement patterns are only found with verbs that denote a type of action requiring an instrument e.g. 'hitting', 'killing', 'burning', and even then instrumental agreement is optional. Following Koenig and Davis (2006), I hypothesise that the instrumental agreement focuses on the manner of the activity denoted by the verb ('stick-killing' or 'stone-killing', as opposed to 'killing', etc.). This accords with native speaker judgements that the agreeing instrumental is brought to the fore in the description of the action. Koenig and Davis discuss alternations in event profiling such as poke X with a stick and use a stick to poke X, with the instrument made prominent in the latter. As instrumental agreement in Wagdi only appears when other controllers of agreement are unavailable, I assume that the instrument-prominent semantic form is generally available, but can only be marked as such in certain circumstances.

1. Introduction

New Indo-Aryan (NIA) languages in general exhibit a rich typology of verb agreement and case marking of core-arguments. With numerous language-specific idiosyncrasies, this language family has provided extensive data for testing notions of the linking of argument structure to grammatical functions, and its surface manifestation in the form of verb-NP agreement and case marking. While the majority of NIA languages follow a split-ergative system based on aspect, many of them deviate in some way from this pattern. Even major regional languages vary in this respect in their local varieties. For example Marathi displays as much variation in agreement and marking patterns in its local dialects as is found within the scope of the major NIA languages (see Deo and Sharma; 2006). Agreement and marking characteristics have been shown to be quite fluid and vary significantly within a small geographic area and local speech varieties of major regional languages may exhibit grammatical structures which extend beyond the parameters of what was previously considered possible in the typology of NIA.

In this paper I will present examples from Wagdi, a Central NIA language spoken in the districts of Dungarpur and Banswada in the Indian state of Rajasthan (Masica; 1991:12). The subdialect of Wagdi examined here is that spoken within the Bohra community in city of Dungarpur. Bohra Wagdi, as I will call it, in many ways parallels its NIA neighbours in terms of split-ergative marking and the corresponding verb-NP agreement pattern. It is, however, unique in that the verb of a perfective transitive construction may optionally agree with an instrumental oblique adjunct.

In Section 2, I summarise the different agreement possibilities in Bohra Wagdi with particular focus on instrumental agreement, and compare it to a similar construction in Nepali. In Section 3, I discuss possible theories that may explain the factors motivating this agreement pattern. These include the grammatical status of the NPs in 3.1. where I look at Smith-Stark's (1994) analysis of Pocomam where cross-referencing with an instrumental-NP may correspond to grammatical realignment of the NPs. In 3.2. I consider cases of agreement alternation based on factors of information structure and the notion of secondary topic, as discussed in Nikolaeva's (2001) analysis of North Ostyak. In 3.3. I hypothesise that agreement alternation in Bohra Wagdi is primarily due to lexical entailment, and present Koenig and Davis's (2006) analysis as a possible explanation.

2. Split-ergativity in Bohra Wagdi

Similar to its NIA neighbours, Bohra Wagdi exhibits morphologically ergative alignment in perfective transitive constructions and accusative alignment in all other aspects. This is demonstrated in the difference between examples (1) and (2-3) below:

1. *sora keri ka:pi-ry-o hai*
   boy.NOM mango.F cut-CONT-MS AUX.PRS.3rd
   'The boy is cutting the mango.'

Bohra Wagdi

2. *sora-e keri ka:p-i*
boy-ERG mango.F cut-PF.F
'The boy cut the mango.'

Bohra Wagdi

3. *sori-e e-nu kha:va:nu kha:d-u*
girl-ERG 3rdPRO-GEN.N meal.N eat-PF.N
'The girl had taken her meal.'

Bohra Wagdi

In (1) the transitive verb is in the present continuous and agrees with the nominative subject. In the perfective constructions of (2) and (3), the subject is marked ergative and the verb agrees with the unmarked object.

When the direct object is marked accusative, agreement is sometimes blocked, in which case the verb defaults to neuter, in this case neutral agreement, as in (4-6):

4. *mein bairi:-ne dekh-y-u hai*
I.ERG woman-ACC see-PF-N AUX.PRS.3rd
'I have seen the woman.'

Bohra Wagdi

5. *ame ana-ne dekh-y-u hai*
we 3rdPRO-ACC see-PF-N AUX.PRS.3rd
'We have seen him.'

Bohra Wagdi

6. *mein su:ri-ne uTha:v-y-u*
I.ERG girl-ACC lift-PF-N
'I lifted the girl.'

Bohra Wagdi

Agreement with the accusative marked object, however, seems to be optional with some verbs as in (7)[1]:

7. *sora-e bhega thai-ne su:ra-ne dhamor-y-o / dhamor-y-u*
children-ERG together become-PTCP boy-ACC beat-PF-MS / beat-PF-N
'The children got together and beat the boy.'

Bohra Wagdi

While agreement/marking patterns in (1-7) all fall within the accepted typological parameters of Indo-Aryan, far more unusual are instances where – provided the direct object is marked accusative – the verb may optionally agree with an instrumental oblique as demonstrated in (8-12):

[1] The reason for this inconsistency in the agreement-marking pattern is as of yet unclear and testing the conditions for its alternation will require more extensive data. I suspect that it is related to the semantics of the predicate as 'beat' implies a greater amount of volition on the part of the agent, and affectedness on the part of the patient than do verbs like 'lift' or 'see' which cannot agree with an accusative object.

8. *mein telwa:r-thi e-nu mathu ka:pi didh-u*
I.ERG sword.F-INSTR 3rdPRO-GEN head. **N**.NOM cut give-**N**
'I cut off his head with a sword.'
Bohra Wagdi

9. *mein talwa:r-thi e-ne ma:r-i*
I.ERG sword.**F**-INSTR 3rdPRO.M-ACC kill-**F**
'I killed him using a sword.'
Bohra Wagdi

10. *pela-e bandu:q-thi kutara-ne ma:ri di:dh-i*
someone-ERG gun.**F**-INSTR dog.M-ACC kill give-**F**
'Someone killed the dog with a gun.'
Bohra Wagdi

11. *pela-e kutara-ne ma:ri di:dh-u*
someone-ERG dog.M-ACC kill give-PF.**N**
'Someone killed the dog.'
Bohra Wagdi

12. *haruman-e e-ni pu:siri-thi lanka-ne ba:ri: didh-i*
Hanunman.M-ERG 3rdPRO-GEN.F tail.**F**-INSTR Lank.F-ACC burn give-**F**
'Hanuman burned Lanka with his tail.'
Bohra Wagdi

Sentence (8) has an ergative subject, a nominative object, and an oblique instrumental. The verb, as expected, agrees with the direct object. The construction in (9) is structurally parallel to (8) with the exception that the animate/human direct object is obligatorily marked accusative. This results in the verb taking agreement with the oblique instrumental. The two core-arguments are again overtly marked in (10), and the verb appears to agree with the instrumental oblique 'sword'. In (11) the instrumental is omitted and the verb defaults to neuter agreement. In (12), the verb 'burn' agrees with the feminine instrumental 'tail'.[2]

This agreement pattern, however, appears to be optional as the verb alternates between agreeing with the marked direct object and the instrumental. It also seems that the verb takes the *-i* suffix - commonly associated with feminine gender - to agree with any non-masculine i.e. feminine or neuter instrumental-NP as in (13-15):[3]

13. *la:kDi-thi kutra-ne ma:r-y-o / ma:r-i*
stick.F-INSTR dog.M-ACC kill-PF-MS / kill-PF.F
'(Someone) killed the dog with a stick.'
Bohra Wagdi

[2] This sentence refers to the Hindu epic myth the *Ramayana*, in which Hamuman, the monkey god, burned the Island of Sri Lanka with using his tail.

[3] It is possible that the *-i* suffix on the verb is a kind of default for agreeing with both feminine and neuter instrumental-NPs. This example of partial mismatch in agreement, where two values are cross-referenced by one feature, has several cross-linguistic parallels outside of NIA (see Corbett; 2006:151-154). One is Jingulu, a non-Pama-Nyungan language, spoken in the Northern Territory of Australia (Pensalfini; 2003, c.f. Corbett; 2006:151). The *-i* suffix may as well be a synchronised form of the two non-masculine suffixes, but based on available data nothing can be ascertained.

14. *patthar-thi kutra-ne ma:r-y-o / ma:r-i*
stone.N-INSTR dog.M-ACC kill-PF-MS / kill-PF.F
'(Someone) killed the dog with a stone.'
Bohra Wagdi

15. *bom-thi kutra-ne ma:r-y-o / *ma:r-i*
bomb.M-INSTR dog.M-INSTR kill-PF-MS / kill-PF.F
'(Someone) killed the dog with a bomb.'
Bohra Wagdi

While the respondent had initially given the apparently feminine option for the construction in (13) in which the verb appears to agree in gender with the instrumental 'stick', on inquiry she admitted that both masculine and feminine suffixes on the verb were acceptable. Example (14), however, shows that the verb may use a feminine suffix to agree with a neuter instrumental-NP. Presumably, in (13) and (14) the verb is alternating between agreeing with the direct object and the non-masculine instrumental respectively. In (15) the two possible controllers of agreement are masculine, and the verb can only take a masculine suffix.

This agreement pattern seems only to be possible with a small subset of verbs - in the available data only 'kill' and 'burn'. The constructions in (16-19) have verbs that denote the use of an instrumental, yet the instrumental-NP is not available as an agreement controller:

16. *ma:lik i: sari-thi a:dmi-ne ka:T-y-o / * ka:T-i*
Malik.M.(ERG) DEM knife.F-INSTR man-ACC cut-PF-MS / cut-F
'Malik cut the man with this knife.'
Bohra Wagdi

17. *ta:her-ye ca:bi-thi a darva:za-ne khol-y-o / *khol-i*
Ta:her.M-ERG key.F-INSTR DEM door.M-ACC open-PF-M / open-PF.F
'Taher opened the door with a key.'
Bohra Wagdi

18. *i: sari-thi di:va:r-par lakh-y-u/ *lakh-i*
3RDPRO.(ERG) knife.F-INSTR wall.M-LOC write-PF-N / write-PF.F
'He wrote on the wall with a knife.'
Bohra Wagdi

19. pe*la-e cashma-thaki manakha-ne dekh-y-u*
DEM.M-ERG spectacles.MP-INSTR man-ACC see-PF-N
'Someone saw the man through glasses.'
Bohra Wagdi

In (16) and (17) the verb can only agree with the object. In (18) there is an instrumental and no object, and the verb defaults to neuter i.e. non-agreement. In (19) the verb 'see' cannot agree with either the object or the instrumental.

Examples (1-19) demonstrate the three possible patterns of agreement in Bohra Wagdi perfective transitive constructions in the presence of an instrumental-NP:

- Agreement with the object
- Agreement with the instrumental
- Default neuter non-agreement

To the best of my knowledge, such an agreement pattern that includes verb agreement with an instrumental-NP is unattested in NIA, or in any other language family. The only other comparable examples of constructions in other languages about which it has been claimed that the verb is agreeing with an instrumental are found in Nepali (Poudel; p.c.) and Pocaman (Smith-Stark; 1994) - an indigenous language of Guatemala. In the case of Nepali, however, this agreement may only occur when the agent has been dropped (Poudel; p.c.):

20. *sita-le yo laura-le sa:t-waTaa sarpa ma:r-i*
sita.F-ERG DEM stick-INST 7-CLASS snakes kill.TR-PF.3SG.F
'Sita killed seven snakes with this stick.'

Nepali

21. *yo laura-le sa:t-waTa: sarpa ma:r-yo*
DEM stick.M-INST 7-CLASS snakes kill.TR-PF.3SG.MASC
'This stick killed seven snakes.'

Nepali

22. *yo laura-le sa:t-waTa: sarpa mar-e*
DEM stick.M-INST 7-CLASS snakes die.INTR-PF.3PL
'Seven snakes died by this stick.'

Nepali

(ibid)

In Nepali, perfective agents take ergative marking yet continue to control verb agreement. In (20) the verb agrees with the feminine agent '*Sita*'. In (21) the A (transitive subject) argument from (20) is missing and the verb agrees with the 'stick'. In (22), the verb takes an intransitive morphology and agreement shifts to the 'snakes', which is now the S (intransitive subject) argument. In (22) the 'stick' becomes truly optional as an adjunct rather than a kind of agentive instrumental argument as it could be analysed in (21). It must be noted, however, that unlike in Wagdi, ergative and instrumental NPs are both marked by the same form (*-le*). It is not uncommon in NIA for ERG/INSTR markers to have homophonous forms (see Butt; 2007) and therefore the possibility must be considered that the A in (21) has not simply been omitted phonologically, but has had its function taken over by the instrumental-NP. It is possible for 'stick' in (21) to be analysed as an ergative subject rather than an instrumental oblique as in (20).[4] Furthermore, unlike in the Nepali examples where a shift in verb agreement from the instrument to the direct object corresponds to a loss of transitivity, in Bohra Wagdi, as shown in examples (13-15), agreement alternation does not correspond to any change in the valence of the predicate. I will therefore assume that agreement with the 'stick' in (21) is due to it becoming an argument linked to the grammatical function (GF) of subject. In Bohra Wagdi there is no evidence of such a promotion.

[4] Ahmed also notes a general tendency towards syncretism of instrumental/sociative/ablative, as well as ergative case markers (see Masica; 1991:246, and Ahmed; 2007).

3. Governing factors of instrumental agreement

3.1 *Grammatical function alternation*

Smith-Stark (1994) describes what he refers to as "instrumental voice" in Pocomam, in which a morphological change on the verb stem appears to signal the promotion of instrumental-NPs to direct object status:

23. *hin ?ih-Ø-nu-sir ma? xu:t pech r-i:j ?ak'ach*
I COM-B3-A1-paint the water.jug with A3-feather chicken
'I painted the water jug with a chicken feather.'
Pocomam

24. *?-ih-Ø-nu-k'ol-?-ie-h pach ma? chie? ma q'ehis*
COM-B3-A1-gather-INS-V-THEM with the wood the rubbish
'I gathered the rubbish into a pile with the stick.'
Pocomam

(ibid: 241)

In example (24) but not (23) the instrumental-NP is cross-referenced on the verb by the instrumental voice suffix *-?-*. Smith-Stark also points out that in (23) the instrument follows the direct object while in (24) it precedes it, indicating that the grammatical status of the NPs is different between the two (ibid: 241).

He speculates that the function of such a promotion is to focus on the instrumental-NP as being a more prominent participant in the event similar to the promotion of objects in passive constructions and agents in anti-passives (ibid: 251). Smith-Stark explains this as being due to a rather mobile "cline" of grammatical relations where an instrumental and a direct object may compete to be encoded on the verb. The instrumental, he argues, becomes more object-like when it loses its case marking and controls verb agreement, while the direct object, no longer controlling verb agreement, resembles more an oblique NP (ibid: 250). He concedes however that evidence such as verb agreement and case marking can be "ambiguous and conflicting" (ibid: 257).

Based on Smith-Stark's (1994) argument that a feature continuum exists in which NPs may be more or less subject-like or object-like based on their inherent semantics and relationship to the predicate, it is possible that agreement choice in Bohra Wagdi between the direct object and the instrumental could be governed by competing levels of grammatical prominence. Following the assumption that a prototypical patient argument is low in the relational hierarchy of animacy and definiteness shown below in (25), and is therefore less likely to take accusative case, it follows that accusative marking on a direct object is an indicator of grammatical demotion (see Silverstein 1976, Hopper and Thompson 1980, DeLancey 1981, Comrie 1989, Aissen 2003):

25.

- Animacy scale: Human > Animate > Inanimate
- Definiteness scale: Personal pronoun > Proper name > Definite NP > Indefinite specific NP > Non-specific NP

(Aissen; 2003:437)

In the Bohra Wagdi examples (8) and (9) we saw that the verb in an ergative construction must agree with an unmarked direct object regardless of the presence of an instrumental-NP. Instrumental agreement is only an option when the animacy/definiteness criterion requires the object to be marked with *-ne*. Drawing a parallel between Pocomam and Bohra Wagdi, we might assume that the accusative marked direct object is demoted and therefore loses verbal concord, resulting in the possibility of verb agreement with the now promoted instrumental-NP. While this explanation is not entirely implausible, in the absence of other major changes to the clause e.g. word order or loss of case marking on the instrumental, such a realignment of GFs seems unlikely. The argument is further weakened by the fact that the pattern is optional, as it was shown in (13-15) that either the accusative marked direct object or the instrumental are acceptable as controller of agreement.

3.2. *Information Structure*

Verb-NP agreement alternation, similar as that found in Bohra Wagdi, has been known to occur in languages determined primarily on the basis of information structure, and not grammatical function structure. I assume here the basic concepts of Lexical-Functional Grammar (LFG) that lexical information connects to the surface syntax through multiple levels of structure (see Bresnan; 2001). The arguments of a predicate – agent, patient etc. – are represented in argument structure (ARG STR) which are mapped to grammatical functions – SUBJ, OBJ etc. – f-structure, or GF STR, which may have various kinds of realisations in the morphosyntax of the particular language (see Mohanan; 1994:15-52). Information structure, though it is used to refer to a wide range of properties related to discourse, here refers only to topic and focus. Generally, an NP with topic properties is more likely to control verb agreement than the focused element, which may correlate to the fact that subjects make natural topics and objects tend to be the focused information. As a result, NPs that become focused tend to lose verb agreement (see Corbett; 2006:197-204). There are instances, as in the Northern Ostyak language of Western Siberia, when NPs with the same grammatical properties may or may not control verb agreement depending on their discourse function. In (26) to (29), verb agreement with the object in a transitive clause appears to be optional (Nikolaeva; 2001):

26. *ma tam kala:ng we:l-s-am*
I this reindeer kill-PST-1SG
'I killed this reindeer.'

Northern Ostyak

27. *ma tam kala:ng we:l-s-Ø-e:m*
I this reindeer kill-PST-SG.OBJ-1SG
'I killed this reindeer.'
Northern Ostyak

28. *ma tam kala:ng we:l-s-l-a:m*
I this reindeer kill-PST-PL.OBJ-1SG
'I killed these reindeer.'
Northern Ostyak

29. *ma tam kala:ng we:l-s-ngil-am*
I this reindeer kill-PST-DU.OBJ-1SG
'I killed these (two) reindeer.'
Northern Ostyak

(Nikolaeva; 2001)

In (26) the verb agrees only with the subject, while (27-29) display dual agreement of subject and object. Object agreement, however, is not entirely optional. Nikolaeva (2001) establishes that the un-agreeing object is the focused element in the sentence, while the agreeing object has topic properties and functions as a kind of secondary topic to the subject. A focused object cannot take verb agreement, and one that can requires a degree of topicalisation (ibid).

3.3. *Lexical entailment*

While it is not implausible that agreement alternation in Bohra Wagdi corresponds to a change in grammatical or information based status of the NPs, evidence based on data is, as of yet, insufficient to support such a claim. A third possible explanation, and one that may apply regardless of realignments of grammatical function or information structure, is that the instrumental agreement option reflects a shift in prominence, and occurs when the emphasis of the clause, as intended by the speaker, is primarily on the means by which the event occurs and less on the participant core-arguments. I emphasise, however, that such a pattern would only 'reflect' this shift in prominence, as agreement is dependent on focus and not vice-versa. Recall in example (8) that when an ergative construction has an unmarked direct object, the verb will agree with the object whether or not an instrumental-NP is present. I assume that the underlying semantic form is available to native speaker intuition, whether or not agreement is an option in the surface syntax.

Koenig and Davis (2006) analyse instances where the same semantic event may be realised differently in the surface syntax using the following pairs of sentences:

30.
a) They poked the body with a stick.
b) They eat ice-cream with a knife.

31.
a) They used a stick to poke the body.

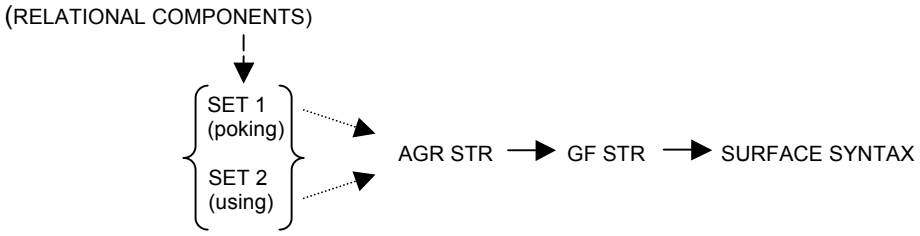
b) They use a knife to eat ice-cream.

(ibid:78)

The sentences in (30) and (31) describe the same event with the syntactic difference that in (30) the instrument is the object of the preposition 'with', while in (31) it is the direct object of the verb. In (30), prominence is given to the action i.e. 'poking' and 'eating', while in (31) it is the means by which the event is carried out i.e. "the stick" and "a knife" in (a) and (b) respectively. These instruments function as adjuncts in (30) but become arguments of the verb 'use' in (31). As the ARG STR of a single semantic predicate describing a particular event links to a different GF STR between (30) and (31), it would follow that the realisation of the surface syntax is determined by factors others than just lexical stipulation.

Koenig and Davis (2006) acknowledge the difficulty of formulating a common lexical semantic representation for both 'poke' and 'eat', as the former "entails the presence of an instrument participant" while the later does not (ibid: 79). They question the assumption that lexical entries are made up of a "single semantic unit" as this would not allow for the variation in the linking of the arguments of a semantic predicate to GFs. It would, therefore, fail to account for the difference between constructions of (30) and (31) where the descriptions of events are synonymous, while at the same time "respecting the differences in entailment between *poke* and *eat*" (ibid: 79). They offer, as an alternative, the *semantic set hypothesis,* which suggests that a single lexical entry may consist of a "set of semantic units", among which they make a distinction between the set of relational components that relate the different participants to one another, and the modal component, which "evaluate[s] those relations at different worlds" (ibid: 73). They conclude that only *one* of the set relational components would be relevant in linking ARG STR to GF STR. As a result, the surface structure of the clause may alternate, as in (30) and (31), depending on which relational component is selected by the constraints that in turn link it to GF STR (ibid: 73). This linking selection is illustrated in the diagram in (32).

(32)



Assuming that Koenig and Davis's (2006) hypothesis accurately describes a universal feature of lexical composition, one would expect different possibilities for syntactic manifestation of this phenomenon. The same underlying factors, i.e. the constraints that select one semantic unit over another, might govern what in English surfaces as a reordering of constituents and addition or subtraction of a finite verb as in (30) and (31), and in Bohra Wagdi as an alternation in verb-NP agreement patterning. In the sentences in (30) the event described is exactly that of (31). However, in (30) the speaker's intent is to specify the action, while in (31) the important information is the means by which that action was carried out. In Bohra Wagdi, which has a more

elaborate inflectional system than English, agreement alternation may be a surface manifestation of a similar shift of focus. If this assumption is true, then the difference in semantic distinction might be captured by the two translations of (33), which differ depending on which NP controls verb agreement:

32. *la:kDi-thi kutra-ne ma:r-y-o / ma:r-i*
stick.F-INSTR dog.M-ACC kill-PF-MS / kill-PF.F
'Someone killed the dog with the stick.' / 'Someone stick-killed the dog.'
Bohra Wagdi

Although the explanation for this alternation may be due to the factors specified in Koenig and Davis (2006) and summarised above, I do not claim that the shift in focus is parallel to the English examples of (30) and (31), where the different syntactic surface forms cause the focal point of the sentence to shift between the predicate and the instrument. Rather, the instrument becomes prominent by specifying the nature of the action along with the verb. Instrumental agreement is one possible outcome of the speaker's intention to put emphasis on the type of action, in (33) 'stick-killing' rather than 'killing'. I see this as the syntactic reflection of a shift to an instrumentally prominent construction, and perhaps one method at the disposal of the speaker to help convey this sense. Recall that this pattern is only possible given very specific conditions, such as the blocking of other controllers of agreement i.e. the subject must be ergative and object accusative, an instrumental the gender of which is in contrast to other possible agreement controllers, and a verb of a particular lexical stipulation. Agreement would be highly unreliable as the sole means to convey the instrument-prominent sense. I hypothesise, therefore, that the underlying semantic form is always available and capable of being expressed by different means, regardless of whether it is syntactically visible via agreement.

Recall that most verbs in Bohra Wagdi do not allow this agreement pattern, including those that denote the use of an instrument, as was seen in (16-18) repeated below in (34-36):

33. *ma:lik i: sari-thi a:dmi-ne ka:T-y-o / * ka:T-i*
Malik.M.(ERG) DEM knife.F-INSTR man-ACC cut-PF-MS cut-PF.F
'Malik cut the man with this knife.'
Bohra Wagdi

34. *ta:her-ye ca:bi-thi a darva:za-ne khol-y-o / *khol-i*
Ta:her.M-ERG key.F-INSTR DEM door.M-ACC open-PF-MS open-PF.F
'Taher opened the door with a key.'
Bohra Wagdi

35. *i: sari-thi di:va:r-par lakh-y-u/ *lakh-i*
3RD PRO.(ERG) knife.F-INSTR wall.M-LOC write-PF-N write-PF.F
'He wrote on the wall with a knife.'
Bohra Wagdi

Based on available examples, Bohra Wagdi verbs that take instrumental agreement entail some kind of violent action, and tend to agree with an instrument which functions as some kind of weapon. Hence, the semantic similarity of the events *kill X*

with a stick, sword, gun etc., *plunder X with a stick, shove X with a chair,* and *burn X with a tail*. Whether these semantic properties of the predicate underlying (non)-agreement is a subject for further research.

4. Conclusion

Bohra Wagdi exhibits a pattern of verb agreement with instrumental-NPs that is unique within the Indo-Aryan family and has few parallels in any language. Having presented examples of its occurrence, I compared these constructions with examples from other languages such as Nepali, Pocomam and North Ostyak that show a similar type of agreement alternation. In Section 3 I examined several theoretical analyses of grammatical function hierarchy (Smith-Stark; 1994), information structure (Nikolaeva; 2001), and lexical semantic composition (Koenig and Davis; 2006), and discussed their potential relevance to instrumental agreement in Bohra Wagdi.

While factors related to GF STR, and information structure cannot be entirely excluded without further elicitation, I hypothesise that the most probable explanation for this verb agreement alternation between the instrumental-NP and the direct object in Bohra Wagdi is that it follows a general shift in emphasis in which a particular NP is brought to the forefront of prominence in the sentence. The work of Koenig and Davis (2006) on the semantic representation of lexical entries provides a framework that is potentially useful in understanding its occurrence.

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Information structure markers as prosodic affixes

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Abstract

Most literature on focus and topic marking assumes that they are privative features (F, T) on syntactic nodes. Büring (2007) for English and Yamato (2007) for Japanese introduce a third category of Contrastive Topic (CT). Apart from syntactic movement and morpheme markers, F, T and CT are marked by prosodic phrasing (Truckenbrodt 1999 for Chichewa) and pitch accent and intonational contour (Ladd 1996 and Büring 2007 for English). In OT Prosodic Phonology, constraints see these syntactic features (Truckenbrodt's (1999) Align-F in Chichewa, Samek-Lodovici's (2005) Stress-Focus). These constraints are undesirable if modularity is to be maintained, and they fail to connect specific tones or contours to different information structure being marked. This paper reanalyzes this data utilizing the recent view in syntax (Starke 2009 inter alia) by which all features are merged into the syntactic tree as individual terminals. Lexical entries consist of phonological information paired with a syntactic structure they can spell out, this being either terminal or phrasal nodes. A suprasegmental affix pairing a H tone with F feature is parallel to segmental affixes marking focus and topic e.g. in Japanese (Yamato 2007) or Kîîtharaka (Abels and Muriungi 2006). Lexical entries for F and CT features in English would be </H*/, F >, < /L+H*L-H%/, CT >, just as the past suffix is < /id/, Past >. The lexical entry for focus in Chichewa spells out the F feature as a Prosodic Phrase. This allows us to capture the syntax-phonology interface without sacrificing the idea of modularity.*

1. Introduction

In recent years syntactic theory has been experiencing a proliferation of functional elements in the syntactic structure. A number of 'syntax-all-the-way-down' approaches have appeared (e.g. Distributed Morphology, Nanosyntax), erasing the traditional distinction between morphology and syntax. This paper explores the effects of this change on the syntax-phonology interface, addressing a problem for language modularity and offering the Lexicon as the locus of communication between the two modules. The term 'modularity' refers to the notion that language consists of three independent modules, (morpho)syntax, phonology and semantics. This model originated in Chomsky (1965) and has been the basis for generative theories of grammar ever since. These modules are considered to be independent of one another, operating on domain-specific primitives and not understanding the 'vocabulary' of the other modules. We cannot 'see sounds', and in the same way phonology cannot understand or operate on syntactic primitives. Furthermore, the view here is derivational, in the sense that phonology follows syntax, and output of the syntactic computation serves as input to the phonological computation. The term 'interface' refers to the translation of information from one module to another. In the case of the syntax-phonology interface, 'spell-out' is used to refer to the process of linearising the syntactic tree structure and performing lexical insertion, which provides phonology with a linear input consisting of underlying forms of lexical items.

However, certain interactions between the modules do seem to exist, as we will see in section 2, and this has been a problem for current theories of the syntax-phonology mapping. As a result, they have been unable to maintain full modularity. The goal of the work

presented here is to account for the interaction of syntax and phonology in a modular view of language. The questions I will be answering are: How can we derive the effects of information structure on prosody without referring to that structure in the phonological computation? What is the nature of input to phonology? Where and how is the connection between intonational contours and their meaning encoded?

Section 2 presents an overview of current theories of prosodic marking of information structure and shows how they violate modularity. Section 3 gives a brief introduction to Nanosyntax, the model of syntax assumed by this paper, focusing on aspects relevant to phonology. Section 4 addresses the issues arising from combining our views on phonology and its interface with syntax with the current advancements in syntactic research, whereas section 5 offers a way of formally capturing the proposed solution in Optimality Theory. Section 6 gives some concluding remarks and offers directions for future research.

2. Prosodic marking of Information Structure

Prosodic Phonology is the part of phonological theory dedicated to modelling the mapping from syntax to phonology (e.g. Selkirk 1981, 1986, 1995; Nespor and Vogel 1986; Hayes 1989; Truckenbrodt 1995 *et seq*). Since, in the modular view of grammar, syntactic representations are not phonological objects and phonology cannot access syntax directly, it does so indirectly via prosodic structure. Prosodic constituents mediate between syntactic structure and phonological rules/constraints. In Prosodic Phonology this is known as The Indirect Reference Hypothesis. Suprasegmental representations are organized into a Prosodic Hierarchy of domains (PH), consisting of Syllable, Foot, Prosodic Word, Prosodic Phrase, Intonation Phrase and Utterance levels[1]. The original motivation for proposing it and evidence for the various prosodic domains comes from a number of segmental processes that seem to be sensitive to them. Since then, the PH has assumed an increasingly important role in the syntax-phonology interface. Computationally, when accounting for the mapping from the output of the syntactic component to a phonological representation, current work in Prosodic Phonology uses constraints and constraint interaction as defined within Optimality Theory (Prince and Smolensky 1993; McCarthy and Prince 1993, 1995).

Despite modular underpinnings of the Indirect Reference Hypothesis, even without referring to specific syntactic categories, labels, syntactic relations or the rest of the syntactic information present in the tree, current theory assumes that prosody still sees certain syntactic information, such as edges of syntactic constituents, the distinction between lexical words, i.e. nouns, verbs, adjectives, and function words, i.e. determiners, prepositions, auxiliaries, complementizers etc. (cf. Selkirk 1995, Truckenbrodt 1999 *inter alia*) and information structure (IS) features, such as Focus and Topic. This paper will be focusing on the modularity violations as a result of prosodic marking of IS features. Accepting that information structure receives interpretation both at PF and LF (Chomsky 1995), and that in the model of language assumed here (the inverted Y model of Chomsky & Lasnik 1977) the only way for phonology and semantics (i.e language realization and interpretation) to communicate is through syntax, it is necessary to postulate elements of information structure such as Topic and Focus to be part of syntax in some way, present at spell-out and visible to both post-syntactic modules. Following Jackendoff (1972) most literature on focus and topic marking assumes that they are represented as privative features (F, T) on syntactic nodes. Since Rizzi (1997) both are considered to project their own phrases, FocP and TopP, in the left periphery of a clause. A third category of Contrastive Topic (CT) has been argued for by Büring (2007) for English and Yamato (2007) for Japanese. In addition to syntactic

[1] More detailed versions of PH exist in various work, I list here the most general view, as it will suffice for the discussion at hand.

movement in e.g. Polish (Szczegielniak 2005), Hungarian (Kiss 1998), Serbian (Migdalski 2006) and morpheme markers in e.g. Japanese (Yamato 2007), Kîîtharaka (Abels and Muriungi 2006), F, T and CT are marked in phonology by prosodic phrasing (Chichewa: Kanerva 1990, Truckenbrodt 1999) and pitch accent and intonational contour (English: Ladd 1996 and Büring 2007 in (1) below).

(1) a) A: Well, what about FRED? What did HE eat?

L+H* L- H% **H*** L- L%

B: $\text{FRED}_{\mathbf{CT}}$ ate the $\text{BEANS}_{\mathbf{F}}$.

b) A: Well, what about the BEANS? Who ate THEM?

H* **L+H* L- H%**

B: $\text{FRED}_{\mathbf{F}}$ ate the $\text{BEANS}_{\mathbf{CT}}$.

In literature on Focus there is often a distinction made between broad, novelty or information focus on the one hand and narrow, contrastive or identificational focus on the other (Ladd 1996, Kiss 1998, Fery and Samek-Lodovici 2006, to name but a few). An important distinction between the two types is presented in Kiss (1998), in that only the second type is associated with focus movement to Spec,FocP, and thus with the F-feature, whereas the neutral 'information' focus shows no F-marking properties. Also, FocP of Rizzi (1997) is associated with contrastive focus. Thus, in this paper the term 'Focus' will refer to narrow/contrastive focus.

The other category, Topic, is often defined as that which is already present in the discourse. It has been argued (Lee 2003, Büring 2007 and references cited therein) that instead of the focus/background and topic/comment distinction, there is a tripartition, which allows, apart from focused and non-focused, optionally, for a non-focused part to be specially marked as link, or Contrastive Topic (CT). In English, for example, Topic is marked by topicalisation movement whereas CT is marked by a specific intonational contour, which would suggest that there are two features present, both T and CT (existence of separate categories of topic and contrast, in addition to focus, has also been argued for e.g. Japanese, cf. Yamato 2007).

The example in (1) above illustrates the difference in meaning between (contrastive) Focus and CT. In (1b) Focus introduces a set of alternatives ("people at the dinner") and provides an exhaustive answer ("Fred and nobody else ate the beans"). In (1a) CT creates the set of alternatives by expanding on the given topic ("Fred" becomes associated with the superset "people at the dinner") and provides a non-exhaustive answer ("As for the people at the dinner, Fred ate the beans, and I don't know/care what other people ate").

In OT work within Prosodic Phonology it is assumed that phonology sees these syntactic features. Truckenbrodt (1999) introduces the constraint Align-F, aligning the right edge of a focused constituent with a prosodic phrase to capture the effects of focus in Chichewa, Samek-Lodovici (2005) and Fery & Samek-Lodovici (2006) use Stress-Focus and Stress-Topic to assign highest prominence to the focused/topicalised constituent:

(2)

AlignF

align the right edge of an F constituent with a prosodic phrase

StressFocus

focused phrase has the highest prosodic prominence in its focus domain.

StressTopic

topic phrase has the highest prosodic prominence in its domain.

However, these constraints are undesirable in a fully modular system. Since prosody is not a separate module, but is for all intents and purposes part of the phonological computation, these constraints are part of phonology and they contain reference to both phonological and syntactic primitives. Thus, the separation of the syntactic and phonological module is not achieved. For full modularity to exist we would need a 'No Reference Hypothesis'[2] (cf. also Scheer 2010), which is what this paper is arguing for. Crucially, the Prosodic Hierarchy itself, being a model of phonological representation of suprasegmental structure, is not a violator of modularity. It is the mapping constraints used to compute prosodic phrasing for individual utterances that are non-modular. This paper maintains reference to the PH, but attempts to derive the particular phrasings modularly. The mapping algorithm used in section 5 is based on the relevant (morpho)syntactic information being encoded in the Lexicon, via subset indices, which are then referred to by indexed constraints (e.g.Pater 2009). The approach will, for lack of space, be briefly outlined in section 5, and the reader is kindly referred to Šurkalović (to appear) for details.

Furthermore, none of these constraints make the connection between specific tones or tone contours and different information structure being marked, i.e. the fact that e.g. in English H* Pitch Accent, and not L*, marks Focus whereas L+H*L-H% tonal contour, and not some other, marks Contrastive Topic. Section 3 below gives an overview of one of the current syntactic theories, and shows how it offers a solution to the issue of modular mapping.

3. Nanosyntax

Nanosyntax is an approach to (morpho)syntax currently being developed at the Centre for Advanced Studies in Theoretical Linguistics in Tromso (Starke 2009, Caha 2009, Lundquist 2008, Ramchand 2008 *inter alia*). It is most akin to Distributed Morphology (e.g. Harley and Noyer 1999), in that it subscribes to the idea that what is traditionally considered two modules, morphology (word-syntax) and (phrasal) syntax, is actually one computational module governed by syntactic rules and operations, as well as to the idea of post-syntactic lexical insertion. The crucial difference between Nanosyntax and Distributed Morphology is in that the latter allows spell-out of only terminal nodes, whereas in Nanosyntax lexical insertion can target any node in the tree, including phrasal nodes. The building blocks of syntax are features, not lexical items or feature bundles. Each terminal is a single feature. Thus, for example, the 3rd person singular present tense '*-s*' in English lexicalizes the stretch of three terminal nodes, [3rd [Sing [Pres]]]. In some cases a single lexical item can spell-out a stretch of functional hierarchy for which two items are required in other cases, as in English '*went*' vs '*walk-ed*'. As far as spell-out is concerned, all nodes are equal, be they terminals or phrasal nodes.

Lexical items, schematized in (3), consist of three pieces of information: phonological gesture (the underlying form, input into the phonological module), syntactic configuration (the piece of syntactic tree that a particular item can spell out) and conceptual information (encyclopedic knowledge). The conceptual information is limited to the kind that distinguishes '*cat'* from '*dog'*, whereas the formal semantic interpretation is computed from the syntactic features being lexicalized. As such, the Lexicon only stores those structures that syntax has built, and there is no syntactic computation done in the Lexicon.

[2] I use the term Direct Reference to signal phonology having direct access to syntax, and term No Reference to refer to phonology only processing phonological information and not referring to syntactic notions. Scheer (2010) uses the term Direct Reference in the opposite sense than it is used here.

(3) </gesture/,  ,concept >

Once two features are chosen, they Merge, within the module in charge of syntactic computation, following the strict order in a functional hierarchy (f-seq). After each merge the created tree is sent to spell-out where it is matched against the trees stored in the lexicon, to check if there is a lexical item corresponding to the tree created at this point (for purposes of lexical insertion, not for checking whether the created syntactic structure is licit). If one is not found, the computation continues and lexical matching is attempted at the next merge. If one is found, it is inserted, and the computation cycles back to do the merging of the next feature in the f-seq. At the next merge, the whole tree is sent to spell-out again, and either the new feature is spelled out by a second lexical entry and the lexical entry from the previous cycle is kept (e.g. creating a regular plural form of a noun, e.g. 'book-s') or a lexical entry is found that spells out the whole tree in one lexical item, in which case it overrides the previous spell-out (e.g. creating an irregular plural form of a noun, in which case e.g. 'mice' overrides the 'mouse' spell-out of the previous cycle). For a more detailed account of lexical insertion in Nanosyntax the reader is referred to Starke (2009) and Caha (2009). For the purpose of this paper the relevant aspect is that each feature in a syntactic tree is an individual terminal and can correspond to a lexical item spelling out that particular feature.

Section 4 will show how this view of syntactic features and lexical items solves the modularity problem of prosodically marking information structure by allowing us to formalize prosodic markers of Focus and Topic as lexical items (morphemes; affixes) that spell out syntactic features and have no segmental but only suprasegmental phonological content.

4. Lexicon as the interface: suprasegmental affixes

If we are to argue for the idea of modularity, the only place in the system where syntactic and phonological information are in contact is the Lexicon. It translates syntactic information to phonological information that serves as input to phonological computation. A natural avenue to pursue is to attempt to use the lexical entries as translators of IS features in (morpho)syntax into phonological information (see also Scheer 2010, and Bye and Svenonius *to appear*). As we have seen in section 3, in Nanosyntax all features are merged into the syntactic tree as individual terminals. By default, then, information structure features are also individual terminals in a syntactic tree. In some languages those features drive movement while in others they correspond to lexical items. These lexical items pair a feature with its phonological realization, which is in some languages a segmental morpheme (e.g. Japanese Topic marker '*-wa*') and in some a prosodic morpheme. Thus, prosodic markers of Focus and Contrastive Topic in English are lexical items (morphemes) with no segmental but only suprasegmental phonological content that spells out certain syntactic material, much as e.g. the English '*-ed'* suffix spells out Tense/Past. The idea that the Pitch Accent marking Focus is assigned to a focused element in the (morpho)syntactic structure and is thus already present in the input to phonology is mentioned in Selkirk (2005:448) when discussing the AssocPA constraint given in (6) below. However, the source of the PA and the nature of its encoding in (morpho)syntax is not made explicit, and the idea is lost in subsequent work.

The view of prosodic markers of information structure as suprasegmental affixes, although absent in the literature on Prosodic Phonology, fits well with what we currently know about the system. Lexical entries consisting of only *segmental* phonological information as well as those consisting of *segmental and suprasegmental* information (in

lexical tone languages) exist, so the existence of lexical entries consisting of solely *suprasegmental* information naturally follows. Furthermore, lexical entries consisting of suprasegmental information that spell out *morpho-syntactic* categories such as number or gender are already attested in many African languages[3], so it is possible for suprasegmental affixes to spell out *IS-related* parts of the functional sequence. Finally, if discourse-related parts of the f-seq can be marked by *segmental affixes*, why could those features not be marked by *suprasegmental affixes* as well.

Lexical entries for F and CT features in English in (4) would be as in (5), just as the lexical entry for the past suffix would be < /id/, Past >.

(4) a) A: Well, what about FRED? What did HE eat?
L+H* L- H% **H*** L- L%
B: $\text{FRED}_{\mathbf{CT}}$ ate the $\text{BEANS}_{\mathbf{F}}$.

b) A: Well, what about the BEANS? Who ate THEM?
H* **L+H* L- H%**
B: $\text{FRED}_{\mathbf{F}}$ ate the $\text{BEANS}_{\mathbf{CT}}$.

(5) < /H*/, F >,
< /L+H*L-H%/, CT >

Encoding tones and tunes in the Lexicon and not in the phonology also allows for capturing the arbitrariness and cross-linguistic variation in their association to different meanings. As a reviewer points out, not all languages have a one-to-one relation between focus and tones (e.g. Cressels 1996 on Tswana). There are two possibilities, either it is a case of allophonic variation at a suprasegmental level, or we have not fully understood the pattern in question. In any case, as long as there is some sound (segmental or suprasegmental alike) connected to a meaning, even if we do not yet fully understand the specific meaning or the connection between the two, the only way to encode the connection is in the Lexicon. Furthermore, this approach is also applicable to cases of purely intonational marking of questions (e.g. English Y/N Questions), assuming that the intonational contour is a spell-out of a Q/Interrog feature in syntax, and tonal marking of various grammatical features such as is found in Bantu languages.

The merit of this approach in view of modularity is that, after lexical insertion is done, what reaches phonology is pure phonological information, and the same type of constraints that place segmental affixes in their rightful place are used to place suprasegmental affixes in theirs. The segmental and prosodic affixes are treated equally by phonology. The Lexicon provides the tonal contour, the spell-out (linearization) provides the domain of realization, and phonology places the tones within that domain with Prosodic Well-formedness Constraints, which make sure that the suprasegmental affix is properly placed on an appropriate Tone Bearing Unit (TBU) within its domain, e.g. that the H* tone marking Focus in English is realized on the main stress unit of the focused constituent. A Focus feature in syntax triggers the insertion of a H* morpheme, whose presence in the phonological input triggers the adjustment of stress, i.e. because something is focused in syntax it receives the H* which in turn causes it being 'focused' in phonology by being stressed.

[3] As an anonymous reviewer points out, although it is not a widespread approach in generative literature, treating tones as lexical entries spelling out (morpho)syntactic features is standard in literature on Bantu (e.g. Kula 2007)

5. OT computation

Constraints currently used in OT Prosodic Phonology are given below:

(6)

AlignF
align the right edge of an F constituent with a prosodic phrase
(Truckenbrodt 1999)
StressFocus
focused phrase has the highest prosodic prominence in its focus domain.
StressTopic
topic phrase has the highest prosodic prominence in its domain.
(Fery and Samek-Lodovici 2006:9)
AssocPA
a Pitch Accent associates to (aligns with) a stressed syllable (head of a Ft)
(Selkirk 1995)

The StressFocus constraint suggests that Focus requires highest stress prominence, which attracts the H* tone. The focus marker, i.e. the pitch accent, is assigned to the most prominent segment. Taking it one step further, Fery and Samek-Lodovici (2006) argue against the relation between pitch accents and F-marking, and that instead their distribution follows from the interaction between the constraints governing the prosodic organization of the clause, like AssocPA, on the one hand and the constraints like Stress-Focus and StressTopic governing the prosodic expression of discourse status on the other. In her recent work, Selkirk (Kratzer and Selkirk 2007) also adopts this view and uses these constraints.

An example tableau of the current approach is given in (7) below, using function words as an example of a clear distinction in prosodification dependent on IS status, and the constraint ranking from Selkirk (1995).

(7)

Throw it [to]$_F$ the dog (not at it)	Stress Focus	AlignR (LexP; PPh)	AlignR PPh; PWd)	AlignL/R (Lex; PWd)	AlignL/R (PWd; Lex)	HP
a. ☞((**tʊ**)$_\omega$ (ðə (dɔg)$_\omega$)$_\varphi$)$_\varphi$					**	*
b. (tə (ðə (**dɔg**)$_\omega$)$_\varphi$)$_\varphi$	*!					

AlignL/R (Lex,; PWd)
Left/right edge of a Lexical Word coincides with the Left/right edge of a Prosodic Word
AlignL/R (PWd; Lex)
Left/right edge of a Prosodic Word coincides with the Left/right edge of a Lexical Word
AlignR (Lexmax; PPh)
The right edge of a maximal phrase projected from a lexical head coincides with the right edge of a PPh
AlignR (PPh; PWd)
the right edge of a PPh coincides with the right edge of a PWd
HP
Align the right boundary of every P-phrase with its head(s). (Fery and Samek-Lodovici 2006)

We see from the tableau how requirements of Focus force function words to assume PWd status in order to be able to bear PA, and the otherwise optimal candidate (7b), with the reduced function word and the right-aligned head of the Prosodic Phrase, yields to (7a).

In the account presented here it is argued that it is not the prominence that drives tone placement, but the other way around. Focus is spelled out by a H* tone[4], which then attracts the main prominence of the sentence due to prosodic well-formedness constraints requiring pitch accents to be realized on the head of the intonational domain. Using the Lexicon subcategorisation approach of Šurkalović (to appear), we can state that different affixes and function words form lexicon subsets. 'prefix', 'suffix' and 'fnc' (function word) are shorthand for a phonological input consisting of a string of segments with a specific index indicating its membership in a Lexicon subset, while alignment constraints listed in (8) below specify their position. In (8) below we see a tableau parallel to (7) where it is shown that, if we assume that the H* is present in the input as a suprasegmental affix, and specified as e.g. a suffix, the presence of this Focus-marking Pitch Accent requires the presence of prosodic structure that satisfies AssocPA, and the optimal candidate in (8a) has the stressed/strong form of the pitch-accented function word (boldface indicates location of main stress). It is assumed that some form of Realize Morpheme or Contiguity prevents the relocation of H* onto '*dog'*, by any formal means that militate against relocation of segmental affixes.

(8)

Throw it to_{fnc}-H*$_{Suff}$ the_{fnc} dog_R (not at it)	Assoc PA	AlignR (suffix; PWd)	Align (fnc,R; PWd, L)	AlignL/R (Root; PWd)	AlignL/R (PWd; Root)	HP
a. H* ☞((**tʊ**)$_\omega$ (ðə (dɔg)$_\omega$)$_\varphi$)$_\varphi$					**	*
b. H* (tə (ðə (**dɔg**)$_\omega$)$_\varphi$)$_\varphi$	*!	*				

Align (suffix, R; PWd, R)
right edge of a suffix coincides with the right edge of a Prosodic Word
Align (fnc, R; PWd, L)
right edge of a fnc coincides with the left edge of a Prosodic Word
AlignL/R (Root; PWd)
Left/right edge of a Root coincides with the Left/right edge of a Prosodic Word
AlignL/R (PWd; Root)
Left/right edge of a Prosodic Word coincides with the Left/right edge of a Root

Büring (2007) argues that, in English, CTs are characteristically marked by a fall-rise contour, what Jackendoff (1972) calls the B-accent (whereas focus is A-accent), and what has been described as an H* or L+H* followed by a L-H% boundary sequence.

A further example from Büring (2007:16) illustrates the non-exhaustive meaning of CT:

(9) (What did the pop stars wear?)

L+H* **L- H%** **H*** L- L%
The $FEMALE_{CT}$ pop stars wore $CAFTANS_F$.

Here, female pop stars are contrasted with male pop stars, suggesting that the male stars wore something else, thus giving a non-exhaustive answer with respect to 'all pop stars'. In the account presented here, the input to phonology is /fi:meil L+H* L-H%/. The prosodic well-

[4] Or L+H*, if we follow Selkirk (2002), distinguishing it from the default clausal prominence marker H*.

formedness constraints I propose be used are the AssocPA constraint and the AssocBT constraint given in (10) below:

(10)

	/fi:meil L+H* L-H%/	AssocPA	AssocBT	FtForm
☞a	L+H* L-H% [**fi:** meil]			
b	L+H* L-H% [**fi:** meil]		*!	
c	L+H*L-H% [**fi:** meil]	*!		
d	L+H* L-H% [fi: **meil**]	*!		*
e	L+H* L-H% [fi: **meil**]			*!

AssocBT-R/L
A right/left Boundary Tone associates to (aligns with) a right/left edge of a constituent it associates to
FtForm(**Trochaic**) [5]
The head of a Ft is aligned with the Left edge of a Ft

In candidate (10a) the PA from the suprasegmental affix is associated with the initial syllable and the BT is associated with the right boundary, resulting in a well-formed structure. Candidates (10b, c, d) are not optimal due to the misalignment of the two components of the contour, whereas candidate (10e), in an attempt to not split up the contour, violates FtForm-Trochaic.

As we see from the examples above, if we assume that there are no IS features present in phonology, but that IS marking is present in the input in the form of suprasegmental affixes, there is no need for modularity-violating constraints, and with slight modifications in form of introducing the AssocBT constraint, the current system of prosodic well-formedness constraints is equipped to account for the realization of those prosodic markers.

6. Conclusion

This paper has argued that modularity can be maintained, unlike in the current theories of the syntax-phonology interface, if we utilise Nanosyntax and assume the Lexicon to be the only means of communication between syntax and phonology and the only source of information used in phonological computation. We can derive the effects of information structure on prosody without referring to that structure in the phonological computation by using lexical entries to translate syntactic structure into phonological material. Input to phonology is purely phonological information, with no reference to syntactic or information structure categories or features. It is a linearized string of phonological underlying forms of lexical items. Phonology operates only on phonological primitives, not syntactic F, T, CT features in the constraints. The connection between intonational contours and their meaning is encoded in the Lexicon as the only means of communication between syntax and phonology.

[5] This constraint is used as shorthand for whatever formal way of achieving trochaic feet is in English, abstracting away from different stress-assignment theories.

However, this approach presents certain challenges to both syntactic and phonological theory. If all features are terminals and information structure markers are encoded as lexical items/prosodic affixes, and we know that e.g. in English any word can be focused, what is the position of the information structure features in the f-seq? Do they freely adjoin at any point or is there a fixed functional hierarchy? Furthermore, there has been resistance in the literature so far to encoding prosodic markers of IS in the lexicon because the exact correlations between prosody and the various meanings has not been fully explored, and there is much variation present in the prosody. On the phonological side, thus, the challenge is to strive for a better understanding of the correlation between prosody and the variation in IS meanings it encodes, as well as to explore the extent to which prosodic information is encoded in the lexicon.

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