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About *SinSpeC*

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The SFB 732 brings together scientists from the areas of linguistics, computational linguistics and signal processing at the University of Stuttgart. Their common scientific goals are to achieve a better understanding of the mechanisms that lead to ambiguity control/disambiguation as well as the enrichment of missing/incomplete information and to develop methods that are able to fully describe these mechanisms.

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Preface

This volume is a collection of papers that were presented on the occasion of JeNom 4, *The 4th Workshop on Nominalizations* (*4èmes Journées d'étude sur les nominalisations*), which took place at the University of Stuttgart, June 16-17, 2011, within the frame of a DAAD-Aurora mobility project between University of Stuttgart, University of Paris 8, and University of Lille 3. The workshop continued a tradition initiated in France, which explains its French acronym. Each paper in the volume has been reviewed by one internal and one external reviewer.

The contributions in this volume are concerned with nominal constituents of various complexity, starting with the relation between the phonology and the syntax of deverbal nouns in Arabic, continuing with the morphological makeup of simple and derived nouns, and ending with the syntax of nominalized sentential constituents in Turkish and Japanese. They thus cut across different levels of linguistic analysis: morphology, morphophonology, morphosyntax, conceptual structure, syntax, and semantics. In particular, Joost Kremers offers a way to link the morphophonology and the morphosyntax of Arabic verbal nouns by deriving the phonological structure from their syntactic structure, Antonio Fábregas presents the theoretical advantages of a morphosyntactic approach to the often idiosyncratic morphological marking of noun classes in Spanish, with focus on simple event nouns, while Sascha Alexeyenko's paper proposes a syntax-semantics interface for *-er* nominals in English, by assuming the presence of a relative clause structure in which the suffix *-er* is a generic head noun. Neil Myler gives a syntactic account for the unavailability of control into and raising from *to*-infinitives in the context of English derived nominals and offers a related explanation for the few apparent exceptions, and Jaklin Kornfilt & John Whitman are concerned with the syntactic study of two subvarieties of TP nominalizations with genitive subjects that are instantiated in Turkish and Japanese.

The organization of the JeNom 4 workshop was supported by the SFB 732 *Incremental Specification in Context*, funded by the German Science Foundation (DFG), and came about as a result of the cooperation between the projects B1 (*The Formation and Interpretation of Derived Nominals*), B4 (*Lexikalische Information und ihre Entfaltung im Kontext von Wortbildung, Satz und Diskurs* "Lexical Information and its Unfolding in the Context of Word Formation, Sentence, and Discourse"), B5 (*Polysemy in a Conceptual System*), B6 (*Underspecification in Voice Systems and the Syntax-Morphology Interface*) and B7 (*Konversion zwischen Syntax und Lexikon im Französischen und Italienischen* "Conversion between Syntax and Lexicon in French and Italian").

On behalf of the organizers – Artemis Alexiadou, Gianina Iordăchioaia, Marcel Pitteroff, and Florian Schäfer – I would like to thank the speakers, the reviewers, and our student assistants (Nils Hirsch, Irina Krüger, and Alexandra Negri) for making the workshop a fruitful and successful event.

Gianina Iordăchioaia
Stuttgart, August 2012

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English *–er* Nominals: A Case of Relative Clause Structure in Morphology*

Sascha Alexeyenko

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The aim of this paper is twofold. First, it shows that a non-decompositional analysis of English *–er* nominals fails to account for a number of their properties. Building on this, it proposes a decompositional analysis in terms of relative clause structure in which the suffix *–er* is a generic head noun.

1. Introduction

The view on English *–er* nominals as a result of a systematic and productive word formation process is fairly well accepted in some areas of linguistic thought, mainly within *syntactic* approaches to nominalizations. These are frameworks that strive for structural decomposition of *–er* nominals and argue for the presence of verbal projections within their structure (e.g. van Hout & Roeper, 1998; Ntelitheos, 2006; Harley, 2009; Alexiadou & Schäfer, 2010). The majority of these analyses consider the suffix *–er* as a nominalizer of a verbal projection of one or another level (but see Ntelitheos, 2006, for a different view).

By contrast, *semantic* approaches to *–er* nominals are prevailingly non-decompositional. Both on the traditional analysis in terms of properties of individuals and on Chierchia's (1995) analysis of individual-level predicates as inherent generics, *–er* nominalizations are treated on a par with non-deverbal nominals, cf. the respective lexical entries of *smoker* according to these two analyses:

(1) a. $\lambda x.\mathbf{smoker}(x)$
b. $\lambda x.\text{GEN}s[\mathbf{in}(x, s)][\mathbf{smoker}(x, s)]$

Despite the dominance of non-decompositional analyses, the lack of the semantic connection between *–er* nominals and their base verbs is sometimes perceived as an intuitively undesirable loss. Accordingly, there is a (limited) number of analyses that seek to establish this connection deriving the semantics of *–er* nominals from the semantics of their base verbs to which the suffix *–er* is applied (Egg, 2008; Baker & Vinokurova, 2009; see also Larson, 1998; Cohen, 2009).

Differing in details, these approaches share two important basic aspects. On

* I wish to thank Peter Bosch and Yael Greenberg, as well as Ariel Cohen, Stefan Hinterwimmer, Gabriella Lapesa, Roberto Zamparelli, and two anonymous reviewers for their helpful comments and suggestions. I am also grateful to the audiences at *JeNom4* and *GeniusIII*, and to the audience of the Linguistics Colloquium at the Institute of Cognitive Science in Osnabrück. Special thanks go to the organizers of the *JeNom4* workshop: Artemis Alexiadou, Gianina Iordăchioaia, and Florian Schäfer.

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the one hand, all of them analyze the suffix *–er* as a nominalizer of a verbal structure, in accordance with the syntactic approaches mentioned above. On the other hand, they assume that *–er* nominals have only a generic reading, that is, they denote agents (or bearers of other thematic roles) of generic events. Subsequently, the suffix *–er* is assigned the semantics of a nominalizing operator containing a generic quantifier, as intuitively the most adequate place to put it.

This paper aims to provide counter-evidence with respect to both of these aspects. First, I will discuss the ambiguity of *–er* nominals between a generic and an episodic reading. With this shown, I will argue that the analysis of *–er* nominals as containing a relative clause structure headed by the suffix *–er* as a generic head accounts best for the generic/episodic ambiguity and avoids some compositional problems of the analysis of *–er* as a nominalizer.

Thus, the aim of this paper is twofold, which determines its structure. One issue it addresses is whether there is some evidence which supports the intuition that it is undesirable to miss the semantic connection between *–er* nominals and their base verbs. Section 2 provides some arguments that missing this connection is indeed a weakness of non-decompositional analyses, which fail to account for a number of data due to this feature. Another question this paper aims to answer concerns the internal structure of *–er* nominals and the semantics of the building blocks. After a discussion of the ambiguity of *–er* nominals between a generic and an episodic reading in section 3, this question is addressed in section 4, in which I argue for an analysis of *–er* nominals in terms of relative clause structure and provide details of the compositional semantics. Section 5 finishes the paper with some concluding remarks and directions for further research.

2. Problems with Non-decompositional Analyses

2.1 The *i-within-i* Constraint

According to Chomsky's (1981) 'i-within-i' condition, pronouns within complements of (relational) common noun phrases cannot be coindexed with the head noun. This sharply contrasts with semantically similar cases containing a relative clause (full or reduced), cf. the following examples from Jacobson (1994):

(2) a. *The wife$_i$ of her$_i$ childhood sweetheart left.
b. *The wife$_i$ of the author of her$_i$ biography left.

(3) a. The woman$_i$ who$_i$ married her$_i$ childhood sweetheart left.
b. The woman$_i$ who$_i$ married the author of her$_i$ biography left.

(4) a. The woman$_i$ married to her$_i$ childhood sweetheart left.
b. The woman$_i$ marrying her$_i$ childhood sweetheart next month left.

c. The woman$_i$ still in love with her$_i$ childhood sweetheart left.

The licit binding relation in (3) and (4) is usually attributed to the presence of a mediating binder in the subject position of a relative clause (a trace), which escapes the 'i-within-i' constraint. By contrast, the absence of such mediating binder in common nouns (due to the absence of a relative clause altogether) leads to a violation of the 'i-within-i' constraint.

More importantly for this paper, Jacobson (1994) observed that at least for some speakers[1] so-called 'i-within-i' effects tend to disappear with "transparently agentive nominalizations", such as *builder*, *owner*, or *writer*, but not with nominals like *wife* in (2) or *author* in (6a):

(5) a. ?The builder$_i$ of his$_i$ house left.
b. ?The builder$_i$ of her$_i$ mother's house left.
c. ?The owner$_i$ of his$_i$ mother's condo left.

(6) a. *The author$_i$ of her$_i$ mother's biography left.
b. ?The writer$_i$ of her$_i$ mother's biography left.

Even if acceptability of the examples in (5) and (6b) is subject to personal and/or dialectal variation, in general they are judged to sound much better than the examples with non-deverbal nominals in (2) and (6a).

In other words, *–er* nominals pattern together with relative clauses and not with common nouns with respect to 'i-within-i' effects. This fact can be easily accounted for by an analysis that assumes the presence of some verbal or possibly clausal projection in the internal structure of *–er* nominals which hosts a mediating binder (also see Ferreira, 2005; Ntelitheos, 2006, for argumentation along these lines). By contrast, non-decompositional analyses, which treat *–er* nominals and non-deverbal nominals alike, would need to employ extra explanations in order to account for the behavior of *–er* nominals with respect to 'i-within-i' effects.

2.2 Manner Modification

Another argument in favor of a decompositional analysis of *–er* nominals that pays tribute to their deverbal nature comes from manner modification.

It has often been argued that modification by manner adjectives, such as *good* or *careful*, is not restricted to events suggested by the lexical semantics of modified nouns—even if these hints are as strong as in nouns like *king*, *soldier*, or *lutist* (e.g. Hare, 1957; Beesley, 1982; Croft, 1984). The following passage from Beesley

[1] Note that the examples in (5) and (6b) are not accepted by all speakers. Jacobson herself did not find these examples impeccable.

(1982, p. 221) offers an eloquent description of the point:

> Hare (1957), Sampson (1970) and Keene (1961) have shown the futility of trying to derive standards of evaluation from the meaning of modified nouns, and they have shown how context can override even the strongest hints of functional nouns. Consider the hypothetical case of a chess school which specialises in teaching musicians. When asked how lutists, as opposed to oboists, take to chess, an instructor might say, 'We get some good lutists and some bad lutists'. In this context, the goodness will be relative not to lute playing but to chess playing.

In other words, manner modification in a sentence like *John is a good lutist* is not restricted to the events of John's playing the lute, but to any contextually relevant events. That is, even if the interpretation 'good at playing the lute' is probably the most natural one in most contexts, it is not the only available one.

Note, however, that *lutist* is not a deverbal nominalization. The situation with deverbal *–er* nominals appears to be more complicated than what is described in Beesley (1982) for a non-deverbal nominal like *lutist*. First of all, modified by manner adjectives, *–er* nominals have two interpretations and not one:

(7) John is a good teacher.
   a. John is a teacher and **contextually relevant events** in which he is the agent are in general events that are carried out well.
   b. **Events of teaching** in which John is the agent are in general events that are carried out well. ('Whenever John teaches, he does so well.')

Reading (a) displays the sort of contextual variability of events discussed in Beesley. However, (7) has another interpretation paraphrased in (b). Reading (b) does not imply that John is a teacher (professionally). It only says that when John teaches, he does so well. Thus, the truth conditions of the two readings are different. For instance, (7) would have reading (b) in a situation in which John, being a student, helps his fellow students skillfully explaining them some complicated material. Since John is not a teacher in this situation, (7) cannot be interpreted as in (a).[2]

[2] In order to disentangle the two readings in a sharper way, one can make reading (a) unavailable by adding a restriction over events which is incompatible with the *–er* nominal in the absence of a manner adjective, as in (ia):

(i) a. John is a good teacher when he is in a cheerful mood.
   b. #John is a good lutist when he is in a cheerful mood.

Note that non-deverbal nouns like *lutist* cannot take such restrictions even when manner modified, cf. (ib). This supports the assumption that they lack a reading parallel to (b) in (7).

An analysis of the ambiguity between these two readings goes beyond the scope of this paper. What is important at this point is that the set of events modified by *good* in (7) on reading (b) is restricted to teaching events by John. Thus, unlike non-deverbal nouns, *–er* nominals modified by manner adjectives have a reading which necessarily involves events denoted by their base verbs. This restriction on the set of events presents a problem for non-decompositional analyses of *–er* nominals, requiring additional explanations in order to account for it.

3. Interpretations

Now that we have argued in favor of a decompositional analysis of *–er* nominals which makes reference to the underlying events denoted by their base verbs, the question is how the event argument in the internal structure of the *–er* nominal is saturated.

Among the existing semantic analyses that approach *–er* nominals from a decompositional perspective, there is unanimous agreement that these nominals have a generic interpretation, i.e., that they are semantically similar to verbal habituals. Accordingly, the event argument inside their structure is bound off by a generic quantifier, which, unsurprisingly, is suggested to be located in the semantics of the suffix *–er*. See (8) for the denotations of *dancer* and *manager of the company* in Egg (2008) and Baker & Vinokurova (2009), respectively, and (9) for the truth conditions of sentences containing predicatively used *dancer* and *smoker* in Larson (1998) and Cohen (2009), respectively:

(8) a. $\lambda y.\text{GEN}[e, x](x \textbf{ in } e \;\&\; y = x, \textbf{dance}'(x)(e))$ (Egg)
b. $^{\cap}\lambda x.\text{GEN}e(\textbf{manage}(e) \;\&\; \textbf{theme}(e, company) \;\&\; \textbf{agent}(e, x))$ (B&V)

(9) a. $\text{GEN}e[\textbf{Con}(e, olga)][\textbf{dancing}(e, olga)]$ (Larson)
b. $\text{GEN}w[w \in W][\text{GEN}e[e \leq \textbf{int}(t_0)][\textbf{smoke}(mary, e, w)]]$ (Cohen)

However, the assumption regarding the monopoly of the generic interpretation in *–er* nominals does not withstand scrutiny. An obvious set of counter-examples to this assumption are *–er* nominals used with quantized complements, which refer to participants of episodic events, as in the examples below:

(10) a. John is a murderer.
b. John is a murderer of a prominent politician.

(11) a. John is an inventor.
b. John is an inventor of a musical instrument.

According to a common view (Rappaport Hovav & Levin, 1992; van Hout &

Roeper, 1998; Alexiadou & Schäfer, 2010), the presence of complement structure is decisive for an *–er* nominal to be interpreted as a so-called [+event] nominal, i.e., as presupposing the unfolding of at least one actual event. Episodically interpreted *–er* nominals are a subset of [+event] nominals since episodic interpretation necessarily requires the event to be actualized (on the other hand, [+event] nominals also include nominals based on actualized generic events, cf. *saver of lives*). Therefore, one could assume that it is the complement structure that is responsible for triggering the episodic interpretation in *–er* nominals, as in (10b) and (11b), that is, that the episodic interpretation of *–er* nominals needs to be evoked in a special way, while their basic interpretation is generic.

However, the data suggest otherwise. On the one hand, the relevant complements of *murderer* and *inventor* in (10) and (11) may be provided by the context remaining implicit. But even in this case, i.e., with no overt complement structure, the nouns in (10) and (11) can be interpreted episodically. On the other hand, *–er* nominals which are derived from intransitive verbs and therefore lack complement structure can be interpreted episodically as well, as in the following examples:[3]

(12) In the parlors extending along the eastern side of the house there was a single sound: the audible but healthful breathing of a **sleeper** lying on a sofa in the coolest corner.[4]

(13) When I arrived, it was impossible to tell who was playing, given that the DJ was placed at floor level behind a heaving crowd. [...] When I asked a **dancer** next to me who was playing, he only grinned and slurred, "I don't know, and I don't [...] care."[5]

(14) Sitting outside SBUX on a glorious fall afternoon when a **smoker** at the table next to me ruined the experience.[6]

Summing up, these examples demonstrate that there are two interpretations equally available to *–er* nominals: the episodic and the generic one. This said, it is possible that for some *–er* nominals the generic interpretation is more common and therefore more easily accessible, as it is the case with "occupational" nominals, such as *teacher* and *dancer*. Apart from occupational nominals, the same probably holds for some other *–er* nominals, e.g., in cases when the lexical semantics of the base verb implies that if the event in question occurred once, it occurs generically, cf.

[3] Unsurprisingly, examples of episodically interpreted *–er* nominals with the definite determiner are much more numerous. In order to show that it is not a matter of determiners and for the sake of uniformity, all examples cited here contain indefinite *–er* nominals.

[4] http://arthursclassicnovels.com/allen/mepas10.html

[5] http://pitchfork.com/features/techno/6785-techno/

[6] http://twitiq.com/_/t/127095906393800704

snorer, *stutterer*, possibly *smoker*. Nevertheless, even if the episodic interpretation is less salient or less easily accessible for these nominals, examples such as in (12)–(14) demonstrate that it is still available in general.

For a decompositional analysis of *–er* nominals, the availability of these two interpretations means that the event argument in the internal structure of the nominal may be bound by a generic or an existential quantifier. If the quantifier is located in the semantics of the suffix *–er*, as it is assumed in Egg (2008) and Baker & Vinokurova (2009), this means that *–er* is ambiguous between two versions differing in the quantifier. In the next section, I suggest a more economical analysis with a uniform semantics of *–er* as a head noun of a relative clause structure, assuming that various quantifiers are contributed by an aspectual projection.

4. Analysis

Summing up the discussion in the previous sections, the semantics of *–er* nominals is compositional, and the events denoted by their base verbs are accessible in it. Furthermore, we have seen that *–er* nominals are ambiguous having a generic and an episodic interpretations. The data discussed suggest that a successful analysis would assume the presence of verbal projections in the internal structure of these nominals where the event argument is bound off either by a generic or an episodic quantifier. In this section, I argue that *–er* nominals contain relative clause structure with the suffix *–er* being its generic head.

As already discussed at the end of the last section, the assumption that the event quantifier comes from the semantics of the suffix *–er* forces us to introduce two distinct *–er*'s differing only in the quantifier. However, it is more plausible to introduce the episodic/generic ambiguity in the aspectual layer, as suggested in Alexiadou & Schäfer (2010), and keep the semantics of the suffix *–er* uniform without populating the lexicon with multiple entries for it.

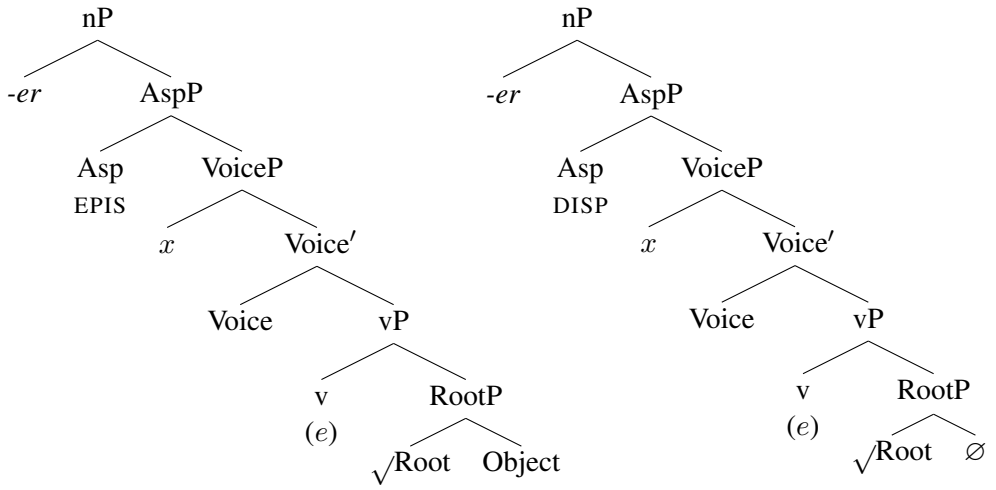
In a recent syntactic analysis of *–er* nominals, Alexiadou & Schäfer (2010) made a suggestion along these lines in order to account for the distinction between [+event] and [–event] *–er* nominals. They argue that the difference in interpretation with respect to the actualization of events is due to the presence of different AspP heads ("episodic" or "dispositional") and suggest the structures in (15) for [+event] and [–event] nominals.

The analysis in Alexiadou & Schäfer (2010) follows a well-established tradition within syntactic approaches to *–er* nominals in treating the suffix *–er* as a nominalizer of a verbal structure. The differences between various analyses in this tradition concern the question which verbal projections are dominated by the nominalizer. Unlike van Hout & Roeper (1998), Alexiadou and Schäfer do not assume the presence of TP in the structure of *–er* nominalizations. But contra their previous work in Alexiadou & Schäfer (2008), they argue for the presence of AspP on top of VoiceP. It is the various heads of AspP (episodic or dispositional) that are argued

to be responsible for the difference in interpretation between [+event] and [–event] *–er* nominals, such as *mower of the lawn* and *lawn-mower*.

(15) [+event]-*er*: $\text{Asp}_{episodic}$ [–event]-*er*: $\text{Asp}_{dispositional}$

mower of the lawn *lawn-mower*



Regarding the last point, I concur with Alexiadou & Schäfer (2010) that issues like actualization of events, discussed in their work, or event genericity/episodicity, discussed in this paper, belong to aspectual information, which suggests the presence of AspP in the structure of *–er* nominals. However, I will argue against their general framework in which *–er* is a nominalizer of AspP. Instead, I will present arguments in favor of an alternative architecture according to which *–er* heads a relative clause structure inside the nominal.

An initial motivation for a revision of Alexiadou & Schäfer's analysis comes from what may seem a minor issue concerning compositional semantics. According to their analysis, the event variable in vP is bound either by an episodic aspect head or by a dispositional aspect head, cf. (15). However, it is not clear how this is supposed to work out semantically as the individual argument in [Spec,VoiceP] is not saturated at this point yet. Moreover, this individual variable has to percolate up and be free for the subject of predication at the level of nP after the suffix *–er* nominalizes the verbal structure.[7]

Intuitively, this configuration of compositional demands alludes to a relative clause structure. In a relative clause, the individual argument in [Spec,VoiceP] is saturated by a trace which is a variable bound by the lambda operator introduced by

[7] Note that analyses that do not assume the presence of verbal projections higher than VoiceP obviously do not suffer from this compositional problem, as, e.g., Baker & Vinokurova (2009) who treat *–er* as "a nominal version of the Voice head". However, their analysis neglects the episodic/generic ambiguity which originates in AspP, as argued above.

the relative pronoun (Heim & Kratzer, 1998). Thus, the presence of a trace would enable the aspect head to bind the event argument in vP.

The assumption that *–er* nominals embed a relative clause structure is also supported by some general conceptual considerations. On the one hand, such an architecture matches the fact that *–er* nominalizations are interpreted (and paraphrased) as relative clauses with a generic head:

(16) a. *smoker* = one who smokes/is smoking
b. *teacher* = one who teaches/is teaching
c. *murderer of John Kennedy* = one who murdered John Kennedy
d. *mower of the lawn* = one who mowed/is mowing the lawn

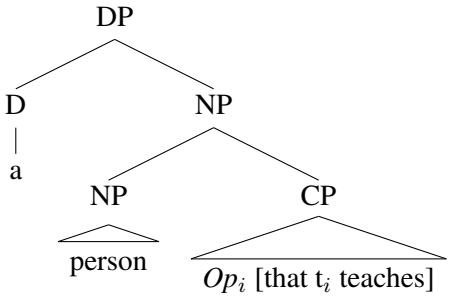
This in itself is not an argument in favor of the relative clause analysis strictly speaking. However, an analysis which pays tribute to parallelism in interpretations and paraphrases scores higher than an analysis which does not, with other factors being equal. In fact, paraphrases of the sort cited in (16) were one of the main motivations in early transformational grammar to treat *–er* nominalizations as transformationally derived from underlying strings that contain relative clauses. This fact has been overlooked in subsequent literature, as pointed out by Ntelitheos (2006) referring to the work by Vendler (1968) and Bach (1968).

On the other hand, an analysis of *–er* nominals in terms of relative clause structure makes a clear and intuitive difference between the roles of the suffixes *–er* and *–ing*, which is blurred in the analyses of van Hout & Roeper (1998) and Alexiadou & Schäfer (2010). Accordingly, the suffix *–ing* is a true nominalizer of a verbal projection, i.e., it labels a property of events as a nominal. By contrast, *–er* is a semantically empty head noun of a relative clause, similar to *person* or *one* in "a person/one who teaches", i.e., it provides a property of an individual in terms of its role in an event. The difference between relative clauses headed by *one* and *–er* is that the latter are morphologically merged.

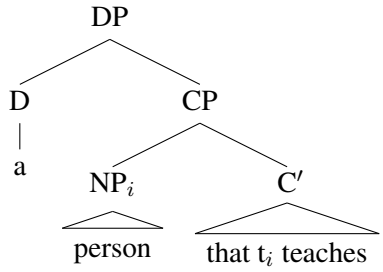
There have been proposed various syntactic analyses of relative clauses, most notably, a *head-external analysis* (Chomsky, 1977) and a *raising analysis* (Kayne, 1994). In my account of *–er* nominals as containing relative clause structure, I follow the head-external analysis, which is standardly implemented in the semantic literature (Heim & Kratzer, 1998). The structures in (17) and (18) schematically represent the differences between the two views on relative clauses.

On the head-external analysis, the head of the relative clause merges outside the relative clause, which right-adjoins to its head NP. It is a null operator that merges in the gap position inside the relative clause, from which it undergoes A′-movement to [Spec,CP]. On the raising analysis, by contrast, the head of the relative clause merges in the gap position inside the relative clause, from which it raises to [Spec,CP]. There is no nominal projection above CP, which serves as the complement of a determiner.

(17) *head-external analysis*

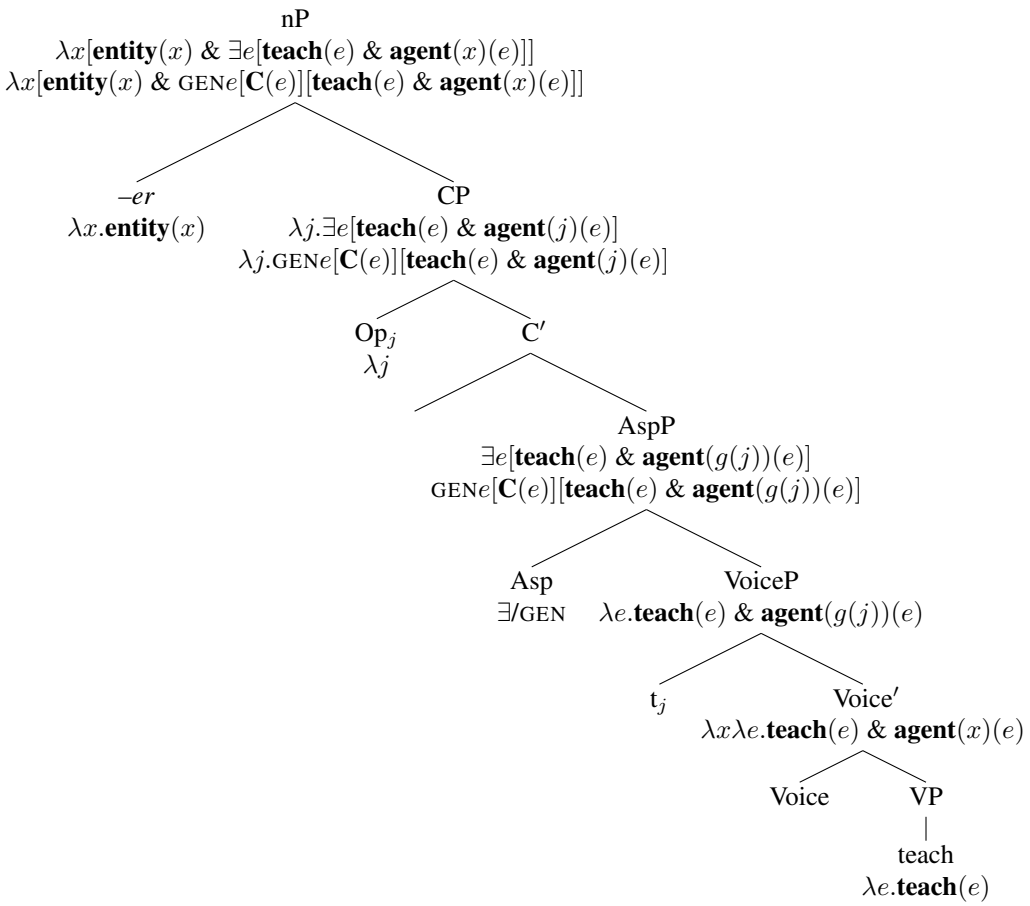


(18) *raising analysis*



Thus, based on the head-external analysis of relative clauses, I propose the following internal syntax and compositional semantics for *–er* nominals:

(19) *teacher* [episodic and generic readings]

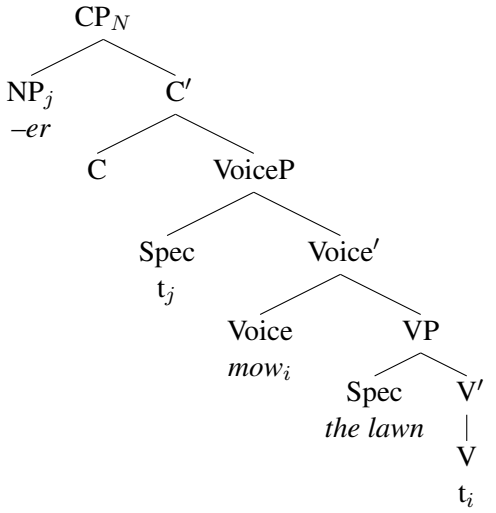


The structure in (19) has the following basic characteristics. Semantically, the suffix *–er* combines with the CP (both of type $\langle e, t \rangle$) via Predicate Modification.

The individual variable of the external argument in [Spec,VoiceP] percolates up to the level of CP, as the trace in the external argument position is bound by *Op*. The semantics of *–er* is as general as to cover the domain of individuals: $\lambda x.\textbf{entity}(x)$. This allows *–er* nominals to have both animate and inanimate referents, as desired. Finally, the interpretative diversity of *–er* nominals with respect to specific thematic roles of the external argument is captured due to the variation in the semantics of the Voice head: agent (*teacher*), instrument (*toaster*), experiencer (*admirer*), holder (*owner*), etc.

Concluding this section, I will briefly discuss the differences of the analysis presented here from the analysis in Ntelitheos (2006), which takes a similar stance on *–er* nominals. To the best of my knowledge, the only other precedent of a modern syntactic analysis of nominalizations such as English *–er* nominals in terms of relative clause structure has been suggested in Ntelitheos (2006) for Malagasy "participant nominalizations" and extended to English *–er* nominals. However, the syntactic architecture proposed here differs from the one advocated by Ntelitheos in some respects. First of all, Ntelitheos follows the raising analysis of relative clauses in the spirit of Kayne (1994), cf. (18). Accordingly, *–er* merges in [Spec,VoiceP] and subsequently moves to [Spec,CP], and there is no NP dominating the clausal structure. Furthermore, and more importantly, no AspP is assumed to be present in the CP. Thus, Ntelitheos suggests the following structure for *–er* nominals:

(20) *mower of the lawn*



The fact that Ntelitheos (2006) employs an analysis of relative clauses different from the one implemented in this paper is not crucial for the properties of *–er* nominals discussed in earlier sections. In fact, semantic derivations in (19) would differ insignificantly under the raising analysis. A more important difference con-

cerns the status of AspP. Ntelitheos suggests that *–er* nominals lack AspP arguing that they cannot have an episodic interpretation. However, data in section 3 offer evidence for the opposite view.

5. Conclusions

Summing up, the proposed analysis successfully accounts for a number of phenomena in connection with English *–er* nominals, such as the lack of 'i-within-i' effects discussed in section 2.1 and the ambiguity between episodic and generic readings discussed in section 3. Furthermore, it captures the diversity of *–er* nominals with respect to various thematic roles corresponding to the external argument, and stands up to the fact that they are naturally interpreted and paraphrased as relative clauses. Finally, it makes a clear semantic (and structural) difference between *–er* nominals and *–ing* nominalizations.

In concluding this paper I would like to discuss two issues concerning the proposed analysis that may cause controversy and potentially call for further research. One of them concerns differences in use of *–er* nominals and their base verbs. Another has to do with the so-called External Argument Generalization for *–er* nominals and the differences between *–er* and *–ee* nominals.

On the analysis advocated in this paper, sentences containing predicatively used *–er* nominals are predicted to be truth-conditionally equivalent to the episodic or generic uses of their base verbs, insofar as *–er* nominals are argued to contain the corresponding verbal structures packed as relative clauses inside them.

(21) a. John teaches.
b. John is a one who teaches. (≡ John is a teacher.)

Despite the widely admitted semantic similarity between the two forms, the claim about their truth-conditional identity may appear controversial. For instance, Cohen (2009) argues that *–er* nominals on their generic reading and the corresponding habituals are truth-conditionally different on the basis of the following data:

(22) Mary is constantly harassed by a militant smoker who forces her to smoke at gunpoint. Consequently, she smokes several cigarettes every day.
a. "Mary smokes" is true.
b. "Mary is a smoker" is false.

(23) Mary is very fond of cigarettes. But she lives in a building where no smoking is allowed, and never leaves it.
a. "Mary smokes" is false.
b. "Mary is a smoker" is true.

From this data Cohen concludes that *–er* nominals and habituals differ in the ordering source. He argues that *–er* nominals, being sensitive to *inherent* properties, have a *stereotypical* ordering source, while habituals, being sensitive to *stable* properties (observed repeated events), have a *uniform* ordering source.

However, it is not clear how robust the data in (22) and (23) are (native speakers are not unanimous in their judgements and not sure about them) and whether these examples are generalizable to other nominal-habitual pairs, such as the one below, in which both the nominal and the habitual are equally appropriate:

(24) Mary is forced by the KGB to betray her friends. Although she doesn't want to, she betrays them all the time.
   a. Mary is a betrayer.
   b. Mary betrays her friends.

Furthermore, it is not clear how the claim that habituals are sensitive to stable properties (observed behavior) and not to essential ones can account for often cited examples of the sort as the one in (25). Such generalizations do not require a single instance of observed behavior to be true (cf. Krifka et al., 1995).

(25) Mary handles the mail from Antarctica.

Yet, *–er* nominals and their base verbs seem to differ with respect to other factors. For instance, the lack of 'i-within-i' effects with *–er* nominals is not as robust as with relative clauses proper, and is not readily accepted by all speakers of English. However, I believe that differences of this sort are effects of lexicalization: the derivational history of some frequently used *–er* nominals may have become less transparent and less accessible over time.

The final issue to be discussed concerns the External Argument Generalization for *–er* nominals and the differences in semantics of *–er* and *–ee* nominals. It is often argued that *–er* nominals refer to the external argument of the base verb, usually denoting agents and instruments (cf. Rappaport Hovav & Levin, 1992), while *–ee* nominals most frequently refer to the patient or theme of their base verbs (cf. the discussion in Lieber, 2004). On the proposed analysis visualized in the structure in (19), nothing in the semantics of *–er* prevents it to be the head noun of a relative clause with an open variable from the internal argument position. In other words, neither the semantics of *–er*, which is virtually unconstrained, nor the structure of the relative clause itself disallow *–er* nominals to refer to internal arguments of their base verbs.

This is, however, an advantage of the analysis, rather than a weakness. Although the suffix *–er* does indeed most productively form nouns referring to the ex-

ternal argument[8], the External Argument Generalization appears untenable in view of numerous counter-examples. Ryder (1999) offers a detailed overview of possible thematic roles that referents of *–er* nominals may have in the thematic grid of their base verbs. Counter-examples against the External Argument Generalization include *–er* nominals referring to the internal argument of transitive (e.g., *scratcher* 'a lottery ticket that is scratched') and unaccusative verbs (e.g., *vanisher*, *dyer*, *resembler*).

In this sense, the proposed analysis is similar to the account of *–er* in Lieber (2004). She argues that the semantic content of *–er* is merely [+material, dynamic], that is, it forms concrete and processual nouns (in contrast to *–ation* or *–ment* which are [–material, dynamic] and form abstract processual nouns). Moreover, *–er* is argued not to impose any specific semantic requirements on its co-indexed arguments (in contrast to *–ee* which requires its co-indexed arguments to be sentient and non-volitional). Thus, Lieber's [+material, dynamic] features together with the absence of other semantic constraints come very close to the semantics of *–er* as general as to denote entities, proposed in this paper.

A potential direction for further research is the extension of the proposed analysis to *–ee* nominals. The general architecture in terms of relative clause structure seems suitable for them as well, for similar reasons as in the case of *–er* nominals. In fact, *–ee* nominals are not restricted to refer to patients and themes of their base verbs, but only have a preference for them (cf. Barker, 1998; Lieber, 2004, for examples like *attendee* and *signee* that refer to subjects of transitive verbs, and for doublets like *escapee/escaper* and *arrivee/arrive*). Therefore, an analysis in terms of relative clauses is again flexible enough, as it is not restricted to external or internal arguments.

However, this general architecture should be further modified in order to be extended to *–ee* nominals, as they impose specific semantic constraints of sentience and non-volitionality, as discussed in Barker (1998) and Lieber (2004), and because they are restricted to the episodic interpretation ("episodic linking", in Barker's terminology). These issues, as well as the question why *–er* nominals tend to refer to the external argument, while *–ee* nominals tend to refer to the internal one, are left for further research.

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[8] This tendency was the motivation to spell out the structure of *–er* nominals concentrating on examples that refer to the external argument.

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Integrating Desinences in the (Syntactic) Analysis of Event Nouns*

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One of the most problematic aspects to integrate morphology and syntax inside the same set of rules and principles is the case of desinence and noun class marking. This paper is an attempt to determine what aspects of the grammar of desinences can be explained from structural principles and to show how such structural analysis that puts desinence marking in the syntax is able to restrict the possible and impossible idiosyncratic configurations. Even if a big part of the grammar of desinences has to be accounted lexically — where 'lexicon' means 'list of items' without presupposing any generative power —, we show that a structural account at least can predict which item will be responsible for the idiosyncratic behaviour of the desinence. The study concentrates on Spanish and takes simple event nouns (such as *guerra*, 'war') at its center, and uses aspects of their behaviour to argue about the structure proposed and its conceptual interpretation.

1. Can Desinences be Analysed in a Syntactic System?

Morphological studies have recognized a kind of unstressed morpheme called 'desinence', which some languages (like Spanish and Italian) have in their lexicon but others (like English or Japanese) don't. The desinences are marked in the following Spanish nouns (1) and adjectives (2):

(1)	a.	vas-o	(2)	a.	desnud-o
		glass-des			naked-des
	b.	cam-a		b.	idiot-a
		bed-des			idiot-des
	c.	clas-e		c.	alegr-e
		class-des			happy-des

The study of this part of the Spanish vocabulary has implication for long-standing questions about the way in which morphology, semantics and syntax interact. As observed several times already in the literature (Corbett 1991, Harris 1991), although the grammatical tradition has associated desinences to the

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expression of gender (Bello 1847: §168, §170), they cannot be analysed as gender markers. There are nouns with the desinence *-o* that belong to the masculine (3a) or the feminine (3b) gender; there are also masculine and feminine nouns with *-a* (3c, 3d) and with *-e* (3e, 3f). Moreover, nouns without a desinence also are associated to specific genders, again both masculine and feminine (3g, 3h).

(3)	a.	el sac-o		e.	el puent-e
		the.masc sack-des			the.masc bridge-des
	b.	la man-o		f.	la muert-e
		the.fem hand-des			the.fem death-des
	c.	el problem-a		g.	el papel
		the.masc problem-des			the.masc paper
	d.	la cas-a		h.	la pared
		the.fem house-des			the.fem wall

The different exponents allowed to function as desinences do not directly associate to the syntactically relevant category of gender under agreement.[1]

They do not biunivocally associate either with any grammatically relevant meaning notion. This is particularly noticeable in the case of nouns that can be associated to two desinence exponents. In some pairs, when the noun is animate, the two desinences reflect a difference in biological gender (4a, 4b), but it is not true that all animate nouns alternate between two exponents with a difference in meaning (4c, 4d). In some other pairs, the contrast is interpreted as the distinction between fruits and trees (4e, 4f) or differences in size (4g, 4h), among many others. (4c) is feminine and takes *-a* even when the victim is a man; this kind of mismatch between meaning and gender is different from mismatches such as those seen in (3c), between the desinence marking and gender.

(4)	a.	niñ-o	e.	manzan-a
		child-des		apple-des
		'boy'		'apple'
	b.	niñ-a	f.	manzan-o

[1] One anonymous reviewer suggests that desinences could match gender one-to-one if the proper analysis of *mano* is that the final /o/ is part of the root and the desinence is actually *-ø*; *manual*'manual', segmented as*manu-al*, would be evidence for this proposal. We do not adopt this suggestion for several reasons. First, it can be shown that the proper segmentation of *manual* is *man-ual* and *-ual* is an allomorph of *-al* used in words of Latin origin. In words not ending in /o/, -ual is also found: *mes* 'month' >*mens-ual* 'monthly'. Secondly, notice that even if the proposal is adopted it would still be the case that feminine is not regularly expressed with the exponent *-a*; although this irregularity could be accounted for phonologically banning two consecutive unstressed vowels, the question is why is the desinence, rather than the final segment of the noun, deleted. Finally, with diminutives, words that have a desinence *-ø* must use *-a* or *-o* as their desinence. If the masculine noun *problema* 'problem' was to be analysed as *problema-ø*, the diminutive would be expected to be ***problem(a)-it-o* (just as in *maná* 'manah' >*mana(c)-ít-o*), when the attested form is *problem-it-a*.

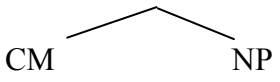
	child-des		apple-des
	‘girl’		‘apple tree’
c.	víctim-a (*víctim-o)	g.	bols-o
	victim-des		bag-des
	‘victim’		‘handbag’
d.	person-a (*person-o)	h.	bols-a
	person-des		bag-des
			‘bag’

Conceptual categories like ‘fruit’ vs. ‘tree’ or ‘big’ vs. ‘small’ are unlikely candidates to be expressed in the grammar as features active in the syntactic computation that could give content to the desinence alternations independently of gender. Moreover, it is not possible to biunivocally associate desinences in Spanish — or any other language, to the best of my knowledge — to semantic notions. The same marker expresses sometimes ‘male’, sometimes ‘tree’ and sometimes ‘small’; a marker associated sometimes to females can be found in words that apply both to males and females. No one-to-one correspondence between exponents and syntactic or semantic behaviours seems possible. This makes it very unlikely that the different exponents for the desinence can be understood as the spell out of different underlying syntactic structures or features. The fact that only some languages mark nouns and adjectives with desinences, the fact that nouns and adjectives seem to select desinences in a way not directly related to their gender value or semantic information and the fact that some nouns alternate between two desinences while others don’t have been jointly taken to point to a lexical analysis of the phenomenon. Under this light, desinences are arbitrary morphological markers, not accounted for by syntactic structures — which are assumed to be identical or sufficiently similar across languages—, and they must be listed idiosyncratically in the lexical entries of individual nouns and adjectives, associated in each case to whatever meaning they might get when they alternate. Some tendencies might emerge in this listing, but they are not free of exceptions and, from a lexical perspective, are taken to reflect processes of analogy (see Corbett 1991 for an overview of such cases), but they do not reflect structural processes.

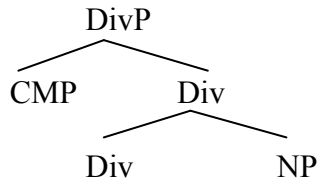
This paper is an attempt to explore how the lexical properties of desinences can be reconciled with the structure of the noun phrase. We will propose a particular structure to explain how desinences are combined with noun phrases; this structure treats desinences in the same way as other related morphosyntactic objects, like noun classifiers in languages such as Chinese or Japanese.Then, we will argue that the structure proposed can be used to limit the situations where idiosyncratic properties emerge. We will show, in particular, that it accounts for (a) the relations and differences of desinences with syntactic gender, (b) how to restrict which lexical item idiosyncratically selects an exponent for the desinence, and (c) why count nouns can be classified in a wider range of conceptual domains than mass nouns. The language that we will use for this study will be Spanish.

This is our proposal in a nutshell. We argue that the desinence is, structurally, a class marker which, in a mass noun, directly combines with NP (5a) and, in a count noun, is introduced as the specifier of a Divisor Phrase (DivP), which partitions the substance denoted by NP (Borer 2005)[2] (5b).

(5) a.

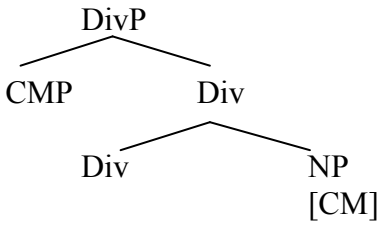


b.



In the syntax, there is only one CMP, that is, there is only one desinence, whose role is to assign the set of properties denoted by NP to a particular class. Div and CM enter into feature checking.

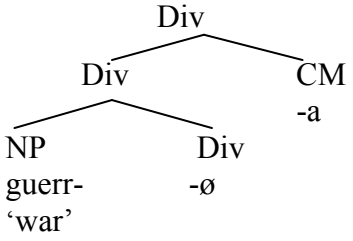
(6)



Then the structure is transferred to the interfaces. It is at this point that the different 'values' for the desinence emerge in the form of a series of idiosyncratically selected exponents. At PF, the structure is linearized as a mirror of the syntactic structure (Brody 2000) and, on the resulting configuration, the closest phonologically-overt lexical item in the structure will select for a desinence exponent (Embick 2010), based on its idiosyncratic lexical entry. When selection is independent of the lexical exponent used, 'regular' gender marking emerges; when it depends on the lexical exponent —like *man-* 'hand'—, 'irregular' marking takes place.

[2] It should be said right away that our analysis, to the extent that (a) associates countability to a specific syntactic head and (b) associates class marking to that head, assumes parts of Borer's (2005) analysis of classifiers in languages like Japanese or Armenian. That said, our analysis parts ways with Borer's in a number of ways. Most crucially, in our proposal the head that performs division and the head that spells out as the classifier have some autonomy, while in Borer, as far as we understand it, both heads are present at the same time or absent at the same time. In consequence, in our analysis, desinences can be taken as classifiers of sorts, even if they occur also in mass nouns. In order to avoid confusion, we will not use *classifier* as a label in the syntax, and will use instead CM (standing for Class Marker).

(7)



Once the exponents have been inserted, the conceptual meaning is accessed. It is at this point that, for example, the distinction between *niño* and *niña* is determined to be 'biological gender' and the one between *manzano* and *manzana* is defined as 'tree vs. fruit'. In a count noun, CM combines with Div and not directly with NP. This structural configuration gives the conceptual system some freedom, as now –thanks to the intermediate head– the noun can be assigned to a conceptual domain which does not directly reflect the normal semantic categorization of nouns. Even though the kind of properties that NPs express are not normally conceptualized as events (Croft 1991, Langacker 1991), the intermediation of Div allows the noun to be classified as an 'event', see §3.2 for a discussion about this part of the analysis.

(8) $[_{DivP}$ [CM] ø] ←→ 'event of' if NP= 'guerr-'

To further illustrate the line of argumentation, take, for instance, the opposition between *cesta* 'basket' and *cesto* 'large basket'. The proposal is that in both cases, the desinence is the same head: a specifier of a projection that makes the NP count. At PF, the exponent is chosen. In this case, the correspondence with gender is 'regular' because the vocabulary item *cest-* does not select idiosyncratically any particular exponent. The exponent is determined, by default, on the base of gender.The root √cest- can combine with Ns of both genders, $N_{[masc]}$ and $N_{[fem]}$. When the N contains the information [masculine], *-o* is chosen as exponent; when the N contains the information [feminine], it is *-a*. Once the vocabulary items have been put together, *cest-o* and *cest-a* are interpreted in the encyclopaedia, where each one of them behaves as an idiom and the exponents are assigned, in the context of the vocabulary item *cest-* (among others), the meaning 'small' for *-a* and 'large' for *-o*. In other words: their structure is the same, their spell out is determined by the grammatical gender information and their interpretation is assigned idiomatically attending to the other exponents in their environment.

2. Desinences, Noun Classifiers and Gender from a Structural Perspective

One — to our mind — unnoticed fact that we will use to introduce the problemis that there are empirical similarities between the notion of countability and the behaviour of desinences. As shown in the previous section, desinences have three main properties which make their analysis problematic: the selection of an

exponent for the desinence is idiosyncratic, some nouns can alternate between two desinence exponents and these alternations have unsystematic conceptual effects (male vs. female, fruit vs. tree, etc.). It can be shown that countability has the same three properties.

Consider, to begin with, idiosyncratic selection. In the same way that it is unpredictable which exponent a noun takes to express the desinence, whether a noun is normally count or mass cannot be derived either from systematic rules in a language. In Spanish, the noun *gente* 'people' behaves as a mass noun, as witnessed by the fact that it rejects modification by the adjective *medio* 'half' (9a) —which modifies only count nouns (9b)— and its availability in the singular as a subject of a collective predicate like *amontonarse* 'to pile up' (9c). The fact that this notion is categorized as a mass noun and not as a collective noun does not seem to follow from inherent properties of the concept expressed. In contrast, English categorises the same concept as count (*many people*).

(9) a. *media gente
half people
b. *media agua vs. media mesa
half water half table
c. La gente se amontonaba en el concierto.
the people SE piled.up in the concert
'People piled up in the concert'

Secondly, it is possible for some (perhaps most; Pelletier 1975) nouns to alternate between mass and count; a typical example is the noun café 'coffee', which can denote the substance (10a) or the portion of it that normally fills a cup (10b).

(10) a. Bebí café.
I-drank coffee
b. Bebí un café.
I-drank a coffee

But not all nouns can alternate; it is typically difficult to turn some mass nouns into count. An example of this is *ropa* or *gente*, which we have already presented, but nouns denoting psychological states typically behave like this as well (11).

(11) a. *media hambre
half hunger
b. *media sed
half thirst
c. *medio sueño
half sleepiness

Finally, it can be shown that presence vs. absence of countability has conceptual and unpredictable effects. Notice first the variety of meanings that can be associated with countability in the case of alternating nouns. To begin with, mass vs. count can be associated with the alternation between substance and measurable portion of a substance. This is the case of *café* 'coffee', but also, for instance, the case of *vino* 'wine': in its count form it denotes the quantity that fills a glass.

(12) Se bebió medio vino.
SE drank half wine
'He drank half a glass of wine'

In other alternating nouns, the presence of countability triggers a taxonomic interpretation('subclasses of the substance denoted by the mass noun'). This is the case of the examples in (13), which are interpreted as subclasses of water and rice, respectively (cf. also Borer 2005).

(13) a. Hay cuatro aguas distintas en este restaurante.
Are four waters different in this restaurant
'In this restaurant there are four different kinds of water'
b. Hay cuatro arroces distintos para hacer paella.
Are four rices different to make paella
'In order to make a paella, there are four different kinds of rice'

2.1 Simple Event Nouns: Events and Countability

Additional evidence that countability has conceptual effects comes from the study of simple event nouns. Such nouns, some examples of which are given in (14), denote events, as witnessed by the fact that they can be subjects of the predicate tener lugar 'take place' (15).

(14) Some underived event nouns
fiesta 'party', boda 'wedding', funeral 'funeral', ceremonia 'ceremony', juicio 'trial', Navidades 'Christmas', aniversario 'anniversary', velatorio 'vigil', banquete 'banquet', campaña 'campain', misa 'mass', tormenta 'storm', tempestad 'tempest', sequía 'drought', huracán 'hurricane', tornado 'tornado', epidemia 'epidemic', accidente 'accident', terremoto 'earthquake', maremoto 'tidal wave', catástrofe 'catastrophe', desastre 'disaster',crisis 'crisis', conflicto 'conflict', follón 'mess', incidente 'incident', hambruna 'famine', examen 'exam', guerra 'war', batalla 'battle', carrera 'race', periplo 'journey', tregua 'truce', huelga 'strike', motín 'moutiny', boicot 'boycott', clase 'class', congreso 'conference',broma 'joke', feria 'fair', festival 'festival', carnaval 'carnival', coloquio 'colloquium', debate 'debate', serenata 'serenade',

espectáculo ‘show’, discurso ‘speech’, torneo ‘tournament’, campeonato ‘championship’…

(15) a. La guerra civil tuvo lugar en 1936.
the war civil took place in 1936
‘The Civil War took place in 1936’
b. *La mesa tuvo lugar en Barcelona
the table took place in Barcelona
*‘The table took place in Barcelona’

Crucial for our purposes, there is evidence that their event interpretation is due to their conceptual entry and not to their internal structure, because they do not show the behaviour expected of objects that contain verbal projections (as noted by Grimshaw 1990). In the first place, these nouns do not contain verbal morphology inside; sometimes, they can be used as bases to build verbs by adding extra morphology (16), but never the other way round.

(16) a. tormenta > a-torment-ar
storm Prfx-storm-ThV.inf
‘to torment’
b. broma > brom-e-ar
joke joke-sfx-ThV.inf
‘to joke’

If these nouns contained verbal projections, we would expect them to introduce arguments. Spanish gives us a formal test to determine if a noun has argument structure: prepositions. The range of prepositions that a non derived noun allows is very restricted, and, crucially, prepositions used to introduce agents and directionals are not licensed. Verbal structures license these prepositions. If we compare simple event nouns like *batalla* ‘battle’ or *guerra* ‘war’ with nouns derived from verbs, we see a contrast precisely in these properties: simple event nouns do not license agent prepositions, but deverbal nouns do (17), and the same contrast arises with directional prepositions (18).

(17) a. *la batalla de Sagunto por (parte de) los cartagineses
the battle of Sagunto by (part of) the Carthaginians
b. el ataque a Sagunto por (parte de) los cartagineses
the attack to Sagunto by (part of) the Carthaginians

(18) a. *la ola de inmigrantes a Alemania desde España
the wave of immigrants to Germany from Spain
b. la huida de inmigrantes a Alemania desde España
the escape of immigrants to Germany from Spain

If there is verbal structure in the verb, we expect that there are positions to host arguments and modifiers of those arguments. There are contrasts between derived nouns and simple event nouns when it comes to the possibility of introducing depictive modifiers of a PP and when it comes to licensing anaphoric items. Only some arguments can have depictive modifiers, adjuncts never allow them. Simple event nouns cannot host depictive modifiers of a PP, but event nouns related to verbs can host them (19).

(19) a. el ataque de [los corsarios] [desarmados]
the attack of the pirates unarmed
a'. su ataque desarmados
their attack unarmed
b. la guerra de [los corsarios desarmados]
the war of the pirates unarmed
b'. *su guerra desarmados
their war unarmed

All this evidence shows that the event reading of a noun like *war* cannot be due to the presence of verbal structure. On the assumption that events are introduced inside a structure by verbal projections and that the natural locus of eventivity are verbs (Croft 1991, Langacker 1991, among many others), the consequence is that the event reading of these nouns comes from their conceptual entry, not their structure. With this in mind, consider the following piece of data. Some deadjectival nominalizations (20) can be used to denote events (21).

(20) locura 'madness', infidelidad 'infidelity', crueldad 'cruelty'

(21) Su última locura tuvo lugar el viernes pasado.
His last madness took place the Friday last
'His last mad action took place last Friday'

This event reading is only possible when the noun is count. When it is mass, the deadjectival noun just denotes a quality (22). This property extends to the non-deadjectival simple event nouns as well (23).

(22) a. Juan muestra mucha locura (quality reading)
Juan shows much madness
b. *Mucha locura tuvo lugar aquel verano (event reading)
Much madness took place that summer

(23) a. Una guerra tuvo lugar en 1936.
A war took place in 1936
b. *Mucha guerra tuvo lugar en 1936.
Much war took place in 1936

It can be shown that when the noun is deverbal there is no problem in being mass and denoting an event at the same time. That is: there is no general principle that forces an event to be count. It only applies when the event meaning is not due to the structure. Some derived event nominalizations, coming from verbs whose aktionsart denotes an activity, behave like mass nouns. An example of this is the noun aprendizaje 'learning'. It accepts the quantifier mucho 'much' in the singular, even when it is the subject of *take place*.

(24) Mucho aprendizaje tiene lugar durante los primeros años del bebé.
Much learning takes place during the first years of-the baby

2.2 Classifiers and Desinences

The similar behaviour of desinence and countability suggests that there is a connection between them. When it comes to countability, this notion has been related to a descriptively different class of items that combine with nouns in some languages of the world: noun classifiers. These items are necessary in some languages for countability. In languages like Chinese, a noun does not combine directly with numerals and other quantifiers that require the noun to be count. In order to combine with a numeral, an additional lexical item, a classifier, needs to be present in the structure.

(25) Chinese
a. y *(l) mi
one CL rice
'one grain of rice' (Borer 2005: 86)
b. yi *(ge) ren
one CL person
'one person' (Borer, *ibidem*: 86)

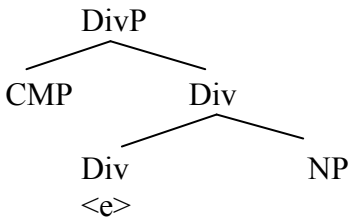
(26) Japanese
a. denwa ni *(dai)
telephone two CL
'two telephones' (Borer, *ibidem*: 87)
b. denwa ni *(hon)
telephone two CL
'two telephone calls' (Borer, *ibidem*: 87)

One significant property immediately associates classifiers with desinences: the fact that different nouns require different classifiers (see the contrast between 25a and 25b) and the fact that the same noun might alternate between two classifiers with differences in conceptual meaning (the pair in 26). Thus, we have empirical connections between classifiers and desinences and desinences and countability.

To put all these properties together, it is useful to remember that it has been argued, most recently in Borer (2005), that classifiers are introduced in projections immediately dominating nouns and whose semantic job is to act as 'divisors' of the substance denoted by the noun itself. In languages such as Chinese and Japanese, absence of a classifier triggers a mass reading of the noun. This suggests that the NP is always mass, and that it only becomes count when dominated by an additional projection.

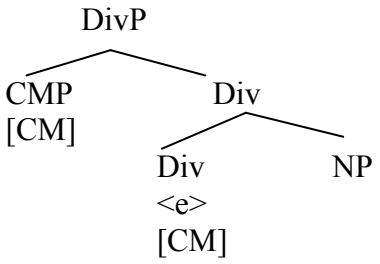
In Borer's (2005: 95) analysis, the morpheme glossed as the classifier is in the specifier position of a syntactic projection whose head is interpreted as a semantically underspecified partition of the substance denoted by the noun in its complement position. We will part ways with Borer's proposal in a number of ways, and therefore it is useful to label the elements in a different way in order to remember that our heads do not directly correspond to Borer's. The structure we assume for count nouns is represented in (27); we label the projection responsible for partition as Div(ision)P, and the extra morpheme represented as a classifier in Chinese and as a desinence in Spanish, as C(lass) M(arker) Phrase.

(27)



In Borer's analysis, the classifier and the divisor head enter into a formal relationship. We will represent this relationship as a form of feature checking. When present, the divisor head needs to copy the class feature introduced by the class marker. Therefore, if DivP is present but the class marker is not, the derivation will not be convergent.

(28)

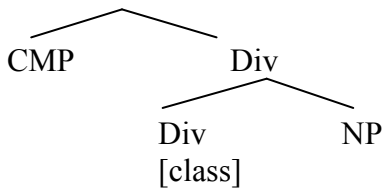


It is tempting to extend this analysis to desinences, but such extension must solve an obvious problem: in Chinese and Japanese, mass nouns appear without the classifier. In Spanish, on the other hand, mass nouns also have desinences (29).

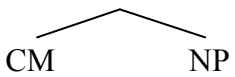
(29) mucha agu-a
much water-des
'much water'

The solution that we would like to proposeis that noun class markersin Spanish do not partition the substance denoted by the noun—that is, they are not the spell out of the projection that makes a noun count—, but can be introduced in the specifier of DivP. It is in principle possible that the desinence appears without the Div head. That is, in principle, we can have a derivation like (30a), corresponding to a count noun (ideally, cross-linguistically), and a derivation like (30b), corresponding to a mass noun. As Div needs a [class] feature, Div will never appear without CM.

(30) a.



b.



From this perspective, the class marker is not very different from Zamparelli's (2000) KindP. Further research will be necessary to determine if both heads can be subsumed under the same label or there are crucial differences that argue for keeping them distinct.[3]

At the encyclopaedic semantics level, the kind defined by CMwill be specified as belonging to a particular conceptual domain (events, human beings, fruits, trees, small things, big things, among many others inside the wide array of conceivable conceptual classes that human experience might come up with).

[3]Clearly, the identification of the heads cannot be identical when the desinence combines with adjectives, as Div does not have any obvious equivalent in the adjectival functional hierarchy. What adjectives do have are (morphological) classes, some of them marking gender and number distinctions — *guapo* 'beautiful' (*guap-o, guap-a, guap-o-s, guap-a-s*) —, some of them only number distinctions — *pobre* 'poor' (*pobr-e, pobr-e-s*) — and some not marking any distinction — *tecno* 'techno' —. It does not seem weird to propose that, if adjectives in Spanish agree with nouns, a classification system parallel to the one exhibited by nouns was used to structure subclasses of this category. Two possibilities suggest themselves to integrate adjectival classifiers into the analysis, and both of them can only be sketched at this point, as they are provisional. The first is that all adjectives have the structure of mass nouns, and the classifier directly selects AP. The second is that adjectival classifiers are specifiers of an adjectival projection that deals with the properties of the adjectival scale (closed vs. open scale, for instance). This projection would be the parallel of Div in the adjectival domain, and 'countability' would be interpreted here as 'closed scale', as both notions share the idea of having a boundary. Adverbs, if they can be analysed as carrying desinences, would not be problematic to the extent that they can be reduced to nouns or adjectives embedded in special syntactic contexts. It would, of course, be desirable to be able to integrate verbal theme vowels into this same story, treating them as specifier of some aspectual projection.

Notice furthermore that, depending on our assumptions about the formal operation that takes place between the CM and the Div head, the two structures might be more similar than they look at first sight. If feature checking implies identifying the features of the probe with those of the goal (Pesetsky & Torrego 2007), [Class] will be copiedinto Div with the result that, in both configurations, NP will be selected by a head that contains [Class].[4]The adjacency relations between the lexical items in both structures are different, but with respect to the hierarchical relations between features inside the structurethey will be essentially the same.

2.3 Desinences and Gender

One further question having to do with the structure is how desinences relate to genders. We need to capture two empirical differences: the first is that whenever an adjective or any other agreeing modifier combines with a noun, agreement copies the gender value, not the exponent for the desinence.

(31) la man -o izquierd-a
the.fem hand.fem -des left-fem

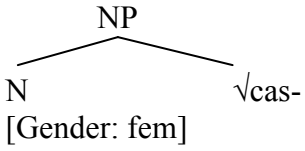
The second property is that the desinence might coincide with the gender value of the noun, but not necessarily so.

Our proposal is, first, that the different exponents used for desinences do not reflect different features in the head CM. CM does not have different values in the syntax. At this level it acts as a Kind Phrase that packs the set of nominal properties into a class. It only has one feature without a value, [class], and the different exponents are simple allomorphs of the same head, selected idiosyncratically by lexical items at PF. The second part of our proposal is to associate gender to the head N. In Spanish there are only two gender values, traditionally called 'masculine' and 'feminine'. Even if this nomenclature wrongly suggests that gender values reflects biological sex differences, we will follow it for convenience.

A root combines with a head N that contains a gender value.

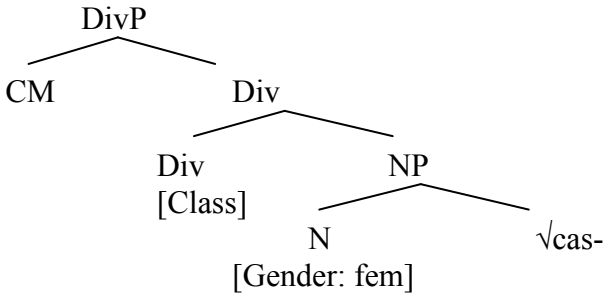
[4] An anonymous reviewer, to whom we are grateful, notes that this proposal is problematic, because in a derivational system by the time the specifier is introduced, Div must have already selected NP. This, however, depends on the timing of label assignment. If we follow Chomsky's (in press) proposal that labels are not assigned immediately when a set is formed, assignment of the label to the merge of [Div] and [NP] could be simultaneous to the point in which [CM] and [Div] are merged, in practice being equivalent to stating that selection of NP by Div does not happen until CM is introduced and the feature [Class] copied.

(32)



See also Kihm (2005) and Svenonius (2007) for proposals about the connection between gender and noun; here we will assume that [gender] is part of the information that N carries as part of its structural contribution.In a count noun, Div is introduced and CMP is merged in its specifier. As Div checks features with CM, the [Class] feature is copied under Div.

(33)



Keeping CM and gender as different pieces of information associated to different heads also determines that agreement does not target the two pieces of information at the same time. Of course, the question arises of why agreement targets gender and not classifiers in Spanish and Italian.

Here we can conjecture that the reason has to do with whether the goal of agreement has only one value or it can express different values, and therefore these values are contrastive. Gender has different values that can be copied under agreement, but we are treating CM as a head which in the syntax always has the same value. Overt agreement has been understood as playing a functional role in languages, copying information that is already present to minimize ambiguity and parsing of a sequence. For instance, in the following Spanish sentence (34), the only hint about which one of the two participants was tired is agreement on the adjective.

(34) El policía persiguió a la criminal, {cansado / cansada}.
The policeman followed ACC the criminal {tired.masc / tired.fem}

If one motivation to have overt agreement is disambiguation, clearly agreement with a feature that has no distinctive values does not fulfil this role. Thus, we expect, under our analysis, that languages will agree in gender rather than in classifier.

3. The Lexical Aspects of Desinences

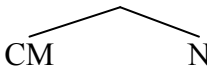
Some aspects of the grammar of desinences do not seem to be derivable from a structure, and therefore have to be listed in specific lexical entries as part of the idiosyncratic information that relates morphophonology, morphosyntax and conceptual semantics to each other. This section is concerned with these non-structural aspects that must be listed. Its goal will be to show that even if the structure proposed cannot explain these differences, it can be used to restrict the power of the information contained in the lexical entries, correctly predicting which one of the lexical items involved in the structure will idiosyncratically select for a desinence value and under which circumnstances the enriched conceptual semantics can be found.

We will show now that languages like Chinese, with noun classifiers, and languages like Spanish, with desinences, do not need to be differentiated by different syntactic trees: the differences can be reduced to contrasts on the exponents used to spell out the same structures: in each class of languages, exponents spell out cumulatively different groups of syntactic heads. When additional heads intervene between the varios heads spelled out by one exponent, extra exponents are inserted to lexicalise the remaining features.

In late insertion systems, there are different technical procedures to lexicalise more than one structural terminal at the same time. Among some others, we have head movement and fusion (Distributed Morphology; see Bobaljik 1994), procedures that spell out series of adjacent heads (Ramchand 2008) or phrasal spell out that allows lexical items to be inserted in non-terminal nodes (Neeleman & Szendroi 2007, Caha 2009). In our analysis, we will try to be as neutral as possible between these procedures, as choosing between them is orthogonal to our goals here.

When we consider the surface spell out of a language with traditional noun classifiers, we have the following pattern:there is an extra exponent when the noun is count. This can be accounted for if in this type of languages the exponent that spells out the noun also lexicalises CM—that is, the two elements are synthetically spelled out by the same exponent—. In the mass noun, when there is no Div, we correctly predict that no extra morphemes are used, as the same exponent takes both heads.

(35)

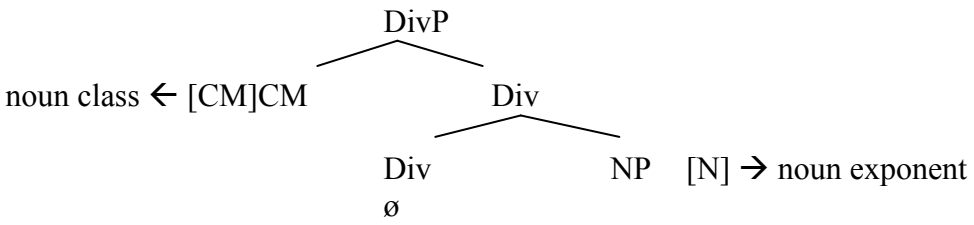


[CM+N]→ noun exponent

When the noun is count, however, CM and NP are separated by an extra head, Div. This prevents the same exponent from lexicalizing at the same time N and CM, because the intermediate head Div is in its way. In such situations, the solution that seems to be adopted is to lexicalize CM and N with two separate exponents. The aditional exponent used here is what has been called ‘the noun

classifier' in descriptive studies: it only appears when the noun is count because Div intervenes between CM and N. We assume that Div is lexicalized by zero in these languages.

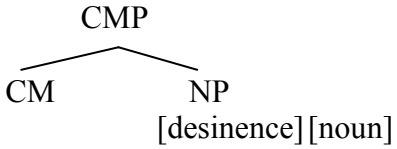
(36)



In other words, we argue that in noun classifier languages, syntactically, the classifier is always present, but it is only morphophonologically visible in the presence of the head Div.

Consider now languages with a desinence, like Spanish. The surface pattern of data is that, both in mass and count nouns, an overt desinence can appear. This can be accounted for if in these languages, noun exponents are introduced in N and it is always necessary to use a different exponent for the CM. These second lexical items have been called 'desinences'.

(37)



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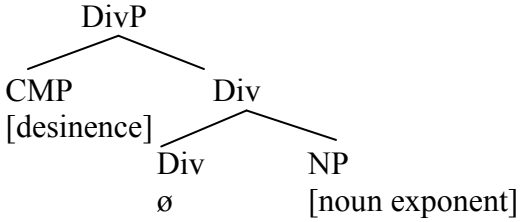


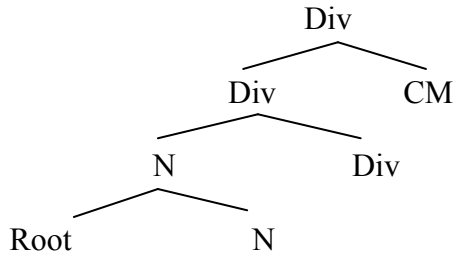
The situation does not change when the noun is count. Here, we assume that in the general case Div is lexicalized by a zero exponent (but see the next section for cases where Div is overtly materialized as a different exponent).

3.1 Restricting Selection of Desinences by other Lexical Items

We have suggested that in the syntax, the head CM does not have different values. The surface differences between different desinences are a case of what traditionally has been called 'allomorphy', and the different exponents have to be chosen on the basis of idiosyncratic lexical entries.Our first concern is, therefore, how allomorphic selection is performed. It has been noticed that idiosyncratic selection of lexical items by other lexical items has to be performed in an

adjacency situation. This has been argued, most recently, in Embick (2010).Embick shows that allomorphy of a terminal is determined in the context of the structure, by the hierarchically closest node that gets spelled out by an overt lexical item. If we go back to our structure, we see that it makes predictions about which lexical item will select for the unpredictable form of the desinence. If we transform our structure (which was defined syntactically) as a morphological structure using any of the available technical procedures, we obtain the following representation in the case of a count noun.

(39)



This predicts the following: if the only exponent introduced in the structure is the one corresponding to the root, it will select the value for the desinence. If there is an overt nominalizer, in N, but the divisor is spelled out as zero, then the overt nominalizer will select for the desinence. But if there is an overt lexical item introduced in Div, this will be the one that, independently of all other lexical items introduced, will select the desinence. A mass noun would make the same predictions except that in this case, Div will not be present. These predictions are borne out.[5]

(40) [[[[√] N] Div] [CM]]

a. **man-** -o
‘hand’

b. loc- **-ur-** -a
loc-ur-a, ‘madness’
vs. *loc-o*, ‘madman’

c. chocolat- **-in-** -a
chocolatin-a, ‘chocolate bar’ (count)
vs. *chocolat-e*, ‘chocolate’ (mass)

d. azucar- **-ill-** -o
azucar-ill-o ‘sugar cube’ (count)
vs. *azúcar-ø* ‘sugar’ (mass)

[5] An anonymous reviewer notes that the fact that CM and Div can be spelled out by distinct morphemes can be seen as a counterargument to the idea that the feature [class] is passed to Div. The fact that the items are spelled out differently, indeed, must mean that CM must have some additional feature which is not copied into Div, to ensure that it still counts as an independent insertion position at PF. If CM is Kind Phrase, then perhaps that feature is [kind].

Our theory cannot predict which desinence value each lexical item takes. This must be listed as idiosyncratic information in the lexicon. However, the structure that we have proposed does predict which lexical item, when the noun is complex, selects the arbitrary value for the desinence. We take this predictive capacity as evidence in favour of the structure proposed.

Now that we have shown that our structure predicts which one of the exponents selects the allomorph used to spell out the CM, we will say more about what kind of lexical entries we will have in the lexicon in order to state which desinence is used in each case.

Masculine nouns ending in *-o* are more frequent than feminine ones, and feminine nouns frequently end in *-a*. This suggests that gender information in N is used to state the context of insertion of the allomorphs *-o* and *-a*. If we make the exponent for the desinence sensitive to gender information, we capture a big part of the data: all feminine nouns ending in *-a* and all masculine nouns ending in *-o* (remember that zero exponents do not count for the vocabulary item selection).

(41) a. Insert *-a* in CM in the context [[NP <fem>] [___]]
b. Insert *-o* in CM in the context [[NP <masc>] [___]]

This entry can account for cases in which the NP is the noun stem, but also those cases where NP is lexicalised as an affix (like *-ur-, -mient-*, etc.), as both would be associated with one gender. Specific lexical entries have to be used in the irregular cases. The list of nouns that take *-o* although they are always feminine is very restricted: *mano* 'hand' is one such case. For such cases, we would have an entry like this for the spell out of CM, which being more specific will take precedence over (41a):

(42) Insert *-o* in CM in the context [[NP *man-*] [___]]

Nouns that take *-e* and *-ø* as exponents for the desinence will also have to be listed in the lexicon, as they are not directly associated to any gender value.

(43) a. Insert *-e* in CM in the context [[NP *clas-*] [___]]
b. Insert *-ø* in CM in the context [[NP *papel-*] [__]]

This format where the gender value can be used to select for a specific exponent in CM, but where these general entries can be overrun by individual vocabulary-item entries can account for the data, where there are tendencies relating gender and desinence allomorphy next to a noticeable number of exceptions.

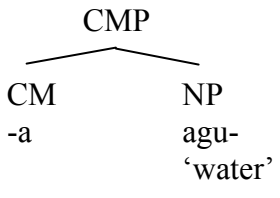
3.2 Conceptual Entries

Let us now see how conceptual meaning is assigned. There is a generalisation that we believe can be made with respect to the conceptual kinds where mass and count nouns are assigned.

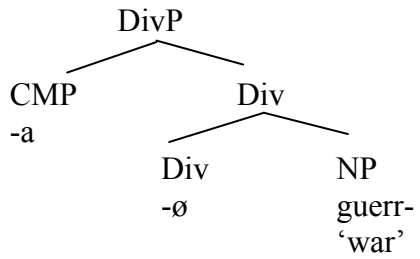
(44) Mass nouns tend to be classified as substances, while count nouns allow for a wider set of meanings (different kinds of discrete objects, events, etc.)

We suggest that this difference is partially a product of the structure that we have proposed. We assume with Borer (2005) that the classifier's role at the conceptual interface is to assign the set of properties denoted by the noun to some class of objects. If we consider our proposed structure, we see that there is a substantial difference in the position of the CM. In a mass noun, the CM combines directly with the noun (45a); in a count noun, the CM restricts Div, which in turn takes the noun as its complement (45b).

(45) a.



b.



We expect that these two structures should have different 'flexibility' at the conceptual level. To begin with, (45b) has an extra head to which conceptual meanings can be associated, and that can be used to specify contextually idiomatic meanings. Additionally, in that configuration the CM restricts the divisor, not directly the noun. The expected result is that the conceptual domain to which the noun is assigned will be more independent of the conceptual properties of the noun base itself, resulting in a wider range of possible conceptual meanings.

Consider why. Borer (2005) bases her explanation of the semantics of nouns in the idea that, without a divisor (classifier in her terminology), all nouns mean, by default, a substance. This is directly reflected in our structure: as the CM directly combines with a noun in a mass configuration, the class of items to which the noun is assigned directly has to reflect the conceptual properties of the noun. We can take this a bit further. To the extent that they can be argued to be distinct, in the domain of mass nouns one concept can be differentiated from 'substance': 'quality'. Thus, if a mass noun like (46a) can be considered a physical substance, one like (46b) is rather classified as a quality. They can be differentiated by a possible reading of a quantifier: the first gives us a simple physical quantity meaning ('a lot of') and the second gives, with the same quantifier, a degree reading.

(46) a. mucha arena
much sand
'a lot of sand'
b. mucha fidelidad
much faithfulness
'intense faithfulness'

However, the availability of the quality reading of mass nouns is always dependent on the elements below NP. More in particular, an adjectival base is generally visible in such cases. These cases where the concept used is not substance provide further evidence that in a mass noun the conceptual domain where the noun is classified depends directly on the kind of properties contained in NP.

This is not what happens when the noun is count, because in such cases the divisor intervenes between CM and NP. It is in such cases that the array of conceptual domains gets expanded.

Let us consideran illustrative case: simple event nouns, which we discussed in §2.1. Remember that the event meaning of a noun without verbal structure can only appear if the noun is count. In contrast, the desinence value can vary. Among simple event nouns, we have all possible desinence values (remember the list in 14).

These two properties suggest that the event meaning is associated to DivP, not directly with the CM. We can implement this if we have in our lexicon a conceptual entry like (47), where Div is used to classify (not the desinence). This is possible because in the syntax, Div and Class entered into a feature checking operation and the [class] feature was passed from CM to Div before the structure was transferred to the lexicon.

(47) $[_{DivP}ø]$ ←→ 'event of' in the context of NP= 'guerr-'
'fiest-'
'tornad-'
'golp- de estado'

Notice that the reason why we expect that such an entry would not be able to be associated to a mass noun is not only because we have associated it with Div in the idiosyncratic entry; if this was only the case, the property would be accidental and therefore uninteresting. The reason is that the kind of properties denoted by NPs are not event properties with a time extension. In a mass context, where the CM directly combines with NP, the conceptual domain where the noun is ascribed directly depends on the meaning of the noun and nominal meaning is not able to denote events. Only when an intermediate head is introduced and the CM does not directly classify the noun, but a partition of it, can these 'non-nominal' meanings arise.

4. Conclusions

In this paper we have explored the grammatical behaviour of desinences in Spanish, considering their structural and lexical properties. We have argued that, structurally, desinences spell out structures that in other languages are spelled out by noun classifiers, and we have suggested that languages without desinences or noun classifiers share the same underlying structure. We have argued that the relations between gender, desinence marking and countability can be explained if these three notions are associated to distinct heads which form one constituent. Furthermore, we have argued that this structure can help delimit the possible and impossible idiosyncrasies associated to desinences both in their allomorphic variation and their role in the conceptual system.

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Genitive Subjects in TP Nominalizations*

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Japanese and Turkish are the best-studied examples of TP nominalizations with genitive subjects (cf. Kornfilt & Whitman 2011): no features of nominalization below TP, but nominalization above TP (Borsley & Kornfilt 2000). In B&K, TP nominalizations are derived by merging a nominal functional category above TP. The literature on TP nominalization has proposed both a nominal functional head, D, as the licenser of the genitive subject (Hale 2002, Miyagawa 2011), and a [nominal] C directly above TP (Hiraiwa 2001, Kornfilt 2003). We concur that these options define two subvarieties of TP nominalization, as originally proposed by Miyagawa (2008). [Nominal] C is the structure for Turkish factive nominalizations, as proposed by Kornfilt (2003). For Japanese, analyses divide up into those supporting [nominal] C (Watanabe 1996, Hiraiwa 2001) and those supporting D as the nominal functional head (Miyagawa 1993, 2011) licensing genitive case on the subject. In this paper we argue for a unified D-licensing approach for Japanese, but one distinct from earlier proposals. We propose that the presence in Japanese but not in Turkish of a "transitivity condition" which disallows an overt accusative-marked direct object when a genitive subject is present in relative clauses follows directly from the presence of the licensing head outside the highest clausal projection.

1. Background

Japanese and Turkish are perhaps the best-studied examples of TP nominalizations with genitive subjects in the specific sense of Kornfilt & Whitman (2011): nominalized clauses that show no features of nominalization below the TP level, but an external syntax indicating nominalization above TP (Borsley & Kornfilt 2000). In the B&K approach, TP nominalizations are derived by merging a nominal functional category immediately above TP.[1] The literature

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[1] It is important to realize that both languages have TP nominalizations, despite the differences that this paper addresses. One of the anonymous reviewers asks us how we are to think about "genitive marking in the context of an ergative language as Turkish as opposed to a non-ergative one like

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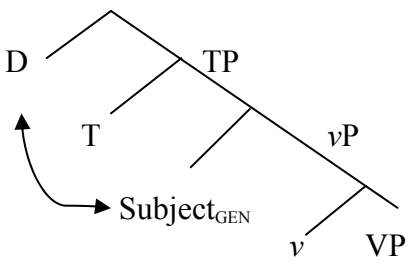
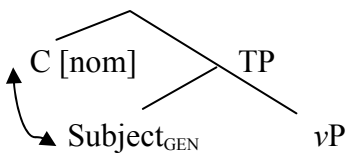
on this type of nominalization has proposed both a standard nominal functional head, D, as the licenser of the genitive subject (Hale 2002, Miyagawa 2003, 2008 2011 for Dagur and Japanese respectively), and a [nominal] C directly above TP (Hiraiwa 2001 for Japanese, Kornfilt 2003 for Turkish). These two structural possibilities are shown in (1).

(1) a.



b.



We follow the view of Miyagawa (2008, 2011) that (1a-b) defines two subvarieties of TP nominalization. In section 2 we modify (1b) slightly to claim that the genitive subject Agrees with T, which inherits a [nominal] feature from C, following the basic insight of Kornfilt (2003). In contrast, Miyagawa (1993, 2011) argues that the genitive subject in Japanese is licensed by D (see also Saito 1983), that is, the licensing configuration in (1a). There are two prima facie pieces of support for this difference between Turkish and Japanese. First, in Turkish, genitive subjects appear in a variety of embedded clausal constructions (cf. (2) below), while in Japanese, they are limited to complex NPs. In section 5 we reaffirm this syntactic difference between the two languages, citing previous research. Second, while TP nominalizations are marked by a verbal suffix which might be interpreted as a spellout of the [nominal] feature, in modern Tokyo Japanese, clauses containing genitive subjects are morphologically indistinct from matrix clauses.[2] While it would be hasty to assume a simple correlation between morphological exponence and syntactic structure, the Japanese pattern presents a challenge for the language learner: the only evidence for the "nominalized" nature of the Japanese construction is the genitive subject itself. Since genitive subjects always occur with material associable with a DP projection, it makes sense for the learner to acquire a grammar in which the licensing of the genitive subject is

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Japanese". This query appears to be based on a misunderstanding about the level of the nominalization this paper studies. Ergativity in nominalizations arises in "low" nominalizations, i.e. at *v*P. Given that the clausal nominalizations addressed here are higher, i.e. are TP nominalizations, Turkish, or rather its relevant nominalized clauses, are not any more ergative than their Japanese counterparts.

[2] Through the end of the Late Middle Japanese period, approximately 1600, the morphological marking of predicates in nominalized clauses (the so-called adnominal inflection) was distinct in several conjugations that were of particularly high frequency among auxiliaries. It is plausible that prior to the loss of this distinct inflection, subjects marked with genitive *no* were licensed in a manner similar to Turkish genitive subjects.

associated with D.

As we show below, there are a number of differences between the Turkish and Japanese genitive subject constructions. The best known of these is the presence in Japanese but not in Turkish of a "transitivity condition" which disallows the co-occurrence of an overt accusative-marked direct object and a genitive subject. We discuss this topic in section 4, but prior to that, in the next two sections, we examine a heretofore unremarked difference between genitive subjets in the two languages, and an additional feature of Japanese NP modifying constructions that favors the D-licensing analysis.

2. The Surface Position of the Genitive Subject and Material to its Left

On our approach, genitive subjects are a feature of TP nominalizations. These are found in both Japanese and Turkish:

(2) a. Hasan [uşağ -ın oda-yı temizle-diğ -in] -i **Turkish**
Hasan servant-gen room- acc clean -fn-3.sg-acc
söyle-di.
say -pst (null 3.sg) (fn: Factive Nominalization)
'Hasan said that the servant cleaned the room.' **Turkish**

b. Hasan [[uşağ -ın temizle-diğ -i] oda-yı]
Hasan servant-gen clean -fn-3.sg room-acc
gör -dü
see -pst (null 3.sg.)

(3) Haruo ga [[zyotyuu no soozisi-ta] heya] o mi-ta. **Japanese**
Haruo nom maid gen clean-past room acc see-pst
'Haruo saw the room that the maid cleaned.'

However, there are obvious surface differences between the genitive subject constructions in the two languages. As noted in section 1, in Turkish TP nominalizations are morphologically marked. The morphological exponence of nominalization in Turkish takes a number of forms in addition to the nominalizing suffix itself (e.g. *-DIK-*, which we have glossed as '-fn-' in (2)): Turkish TP nominalizations also show nominal agreement (with forms from the nominal possessive agreement paradigm) on the nominalized verb, and overt case marking (e.g. accusative *–i* in (2)) on the nominalized clause.

All of these are absent in modern Tokyo Japanese. The verb ending is the normal indicative ending (Past *–ta* in (3)) found also in matrix clauses, there is no agreement morphology, and clauses with genitive subjects may not be marked with accusative *–o*. In most contexts, the sole cue for the [nominal] status of the

clause containing the genitive subject in (3) is the genitive case marking itself.[3]

In this section we focus on a subtler difference between the Turkish and Japanese patterns. A number of linguists have argued that in Japanese, genitive subjects appear in a relatively low position in the clause. Miyagawa (2011), making this argument, cites data like the following from Nakai (1980).

(4) [[Kyonen made danroo no atta] heya] wa benkyoo-beya tosite
last year until fireplace gen existed room top study-room as
tukaw-are-ru.
use-pass-npst
'The room where there was a fireplace until last year will be used as a study room.' (adapted from Miyagawa 2011: 1268)

Nakai's original point with examples like (4) is that the genitive subject in such examples cannot be construed as occupying Spec, DP, since in Japanese bare adverbs cannot adjoin to DP.

Miyagawa (2011) makes the additional argument that the genitive subject in Japanese remains in Spec, *v*P. This argument is based on the observation of Harada (1971) that material intervening between the genitive subject and the verb results in degraded acceptability (5a). Miyagawa observes that this effect is not observed if the intervening element is a VP adverb (5b).

(5) a. [[kodomotati ga/*no minna de ikioi yoku kake-nobotta] **Japanese**
children nom/gen together vigorously run-climb-pst
kaidan]
stairway
'the stairway which the children ran up together vigorously.'
(Miyagawa 2011: 1274)

b. [[Koozi ga/no mattaku sir-ana-i] kakudo **Japanese**
Koji nom/gen completely know-npst angle
'the angle that Koji completely doesn't know about.' (Miyagawa 2011: 1274)

Miyagawa suggests that (5a) shows that the genitive subject does not move out of Spec, *v*P, on the assumption that the adverbs in this example are attached to *v*P. (5b) shows that adverbs may intervene when they are attached lower than *v*P.

In contrast with the evidence that genitive subjects in Japanese are below T, Kornfilt (2003, 2006, 2008) argues that genitive subjects in Turkish occupy Spec, TP. This difference between Japanese and Turkish is supported by the facts in (6). In Turkish, examples parallel to (4) where the genitive subject occurs to the right

[3] The one exception is the NP-modifying form of the Nonpast copula, which is realized as *na* (contracted from Middle Japanese adnominal *naru*) in relative clauses and other noun-modifyng constructions.

of temporal PPs are degraded.[4]

(6) a. ??/*[[Geçen sene-ye kadar Ali-nin ekmek al-dığ ı] **Turkish**
last year-dat until Ali-gen bread buy-fn-3.sg
fırın
bakery
'the bakery where Ali used to buy bread until last year' (ill-formed with neutral intonation on the genitive subject)

b. [[Ali-nin geçen sene-ye adar ekmek al-dığ -ı] **Turkish**
Ali-gen last year-dat until bread buy-fn -3.sg
fırın
bakery
'the bakery where Ali used to buy bread until last year'

The degradation is clearly due to the nominalized nature of the clause.[5] Speakers who either do not accept such examples at all, or for whom they are much worse than examples like (6b) with the adverb following the genitive subject, accept both orders when the clause is not nominalized:

(7) a. Geçen sene-ye kadar Ali bu fırın -dan **Turkish**
last year-dat until Ali (nom) this bakery -abl
ekmek al -ır -dı.
bread buy-aor-pst
'Until last year, Ali used to buy bread in this bakery.'

b. Ali geçen sene-ye kadar bu fırın-dan **Turkish**
Ali (nom) last year-dat until this bakery-abl
ekmek al -ır - dı.
bread buy-aor-pst
'Ali used to buy bread in this bakery until last year.'

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[4]The fact that adjoining material to the left of the genitive subject results in degraded acceptability was first brought to our attention by Esra Kesici.

[5] In Turkish, the external noun in relative clauses plays no role, or at most a minor role, in the relevant judgments; even without such an external noun, a nominalized clause is degraded, when the genitive subject is preceded by clause-initial material:

(i) ?(?) [Geçen sene-ye kadar Ali-nin bu fırın-dan ekmek al-dığ-ın]-ı
past year-dat until Ali-gen this bakery-abl bread buy-fn-3.sg-acc
duy-du-m
hear-pst-1.sg
'I heard that Ali bought bread from this bakery until last year'.

(ii) [Ali-nin geçen sene-ye kadar bu fırın-dan ekmek al -dığ -ın]-ı
Ali-gen past year-dat until this bakery-abl bread buy -fn -3.sg-acc
duy -du-m
hear -pst-1.sg
'I heard that Ali bought bread from this bakery until last year'. We will return to such examples later in the paper.

In non-nominalized matrix clauses as well, it is generally argued that the surface position of the subject is Spec, TP (Kornfilt 2003, 2008). The exception to this generalization are certain types of existential clauses, where the subject may appear to the right of a locative argument, as well as PPs such as 'until last year,' as shown in (8a). As shown in (8b), this word order possibility also exists in nominalized clauses with genitive subjects, although in this case genitive marking on the subject forces a [specific] reading.

(8) a. Geçen sene-ye kadar bu fırın-da bir kedi **Turkish**
last year-dat until this bakery-loc a cat
var-dı
exist- pst
'Until last year there was a cat in this bakery.'

b. [Geçen sene-ye kadar bu fırın-da bir kedi-nin **Turkish**
last year-dat until this bakery-loc a cat- gen
ol-duğ-un]-u duy-du-m
be-fn-3.sg-acc hear- pst -1.sg
'I heard that until last year there was a cat in this bakery.'

c. [Geçen sene-ye kadar bir kedi-nin ol-duğ -u] **Turkish**
last year-dat until a cat-gen be-fn -3.sg
fırın
bakery
'the bakery where until last year there was a cat'

(8b) shows that there is not a general restriction on PPs and other material preceding the genitive subject in factive nominalizations. Instead, the restriction is specifically on fronting material to the left of the subject in Spec, TP in this construction. This restriction is open to several possible explanations. One is simply that nominalized C does not select the functional projection(s) that host scrambled or topicalized material. Another, more interesting, possibility is that scrambling or topicalization to TP is blocked because TP itself is a [nominal] category. As pointed out by Borsley & Kornfilt (2000), it is a well-known property of nominalizations that material associated with the extended verbal projections (adverbs, PPs etc.) do not attach above the locus of the [nominal] feature. This property is visible in the contrast between the acc/*-ing* gerund in (9a) and the poss/*-ing* gerund in (9b)

(9) a. *Yesterday Ken's winning the game will be big news today today.
b. (?)Yesterday Ken winning the game will be big news today.

While speakers vary as to the acceptability of (9b), no speaker accepts (9a); this is because poss-*ing* gerunds are nominalized at the level of possessive*'s*, while *yesterday* attaches above that level in (9a). The unacceptablity of movement to the left of the subject in Turkish TP nominalizations suggests that something

similar is going on.

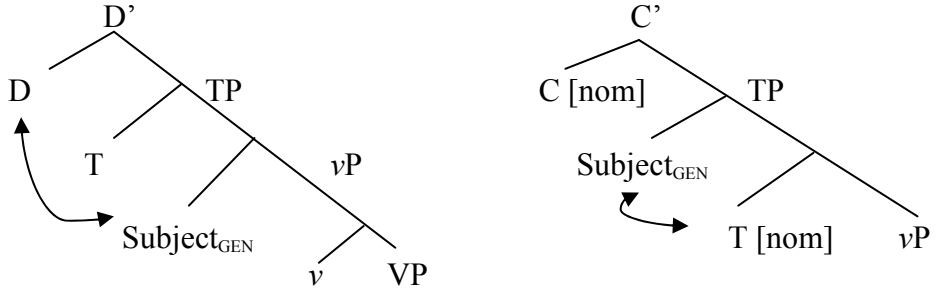
We can make this proposal concrete by adopting the hypothesis of Chomsky (2008) that T inherits its formal features from C. In the case of Turkish TP nominalizations, this would include nominal agreement features, an impoverished set of tense features (cf. section 6), and a [nominal] categorial feature. Once T bears the latter feature, scrambling to TP is blocked. Under this proposal the genitive subject checks its case and EPP feature with [nominal] T, as in Kornfilt (2003, 2008), but the specifically [nominal] features are inherited from C.

Returning to the crucial empirical point of this section, while Turkish does not allow attachment of material to the left of a nonexistential genitive subject, Japanese allows this possibility, as in (10):

(10) [[Kyonen made Eri no tabete ita] pan] wa moo hanbai kinsi da.
last year until Eri gen eating was bread top already sale forbidden is
'The bread that Eri was eating until last year is now prohibited for sale.'

This contrast between Turkish and Japanese is consistent with the claim of numerous authors that genitive subjects remain in a position below T, e.g. Spec, AgrSP (Watanabe 1996) or *v*P (Miyagawa 2008, 20011). It is specifically consistent with Miyagawa's (2008, 2011) proposal that raising to Spec, TP (Turkish) and remaining in Spec, *v*P (Japanese) is a core difference between genitive subjects in the two languages. Thus while the Turkish genitive subject Agrees with [nominal] T and checks its EPP feature as in Kornfilt (2003, 2008), the Japanese genitive subject in relative clauses remains in spec, *v*P and is licensed under Agree with the D associated with the entire relative clause:

(1)' a. Genitive subjects in Japanese relatives b. Turkish–*DIK* nominalizations



Furthermore, the contrast between Turkish nominalized clauses (6) and non-nominalized clauses (7) suggests that in Turkish there is a transfer of the [nominal] feature from C to T. There is no evidence for such a transfer in Japanese. This last piece of evidence also suggests that the locus of the [nominal] feature in Japanese is not C. We turn to more evidence in favor of this conclusion in the next section.

3. The licenser for Japanese genitive subjects is higher than the extended clausal projection

Support for the locus of the licenser of genitive case being above C comes from a construction first discussed by Soga & Fujimura (1978). In certain complex NP contexts, Japanese can realize the particle *no* between the clause and the nominal head:

(11) a. [[kanarazu katu **no**] sinnen]
definitely win no conviction
'the conviction that (one) will definitely win' (Soga and Fujimura 1978: 41)

b. …seisan nooka ga sitekisita '[ume santi ga hattensuru
producer farmer nom brought.up plum orchard nom develop
no tame] no kadai'
no sake cop topic
'…"topics for the sake of the development of plum-producing areas" brought up by producer farmers.' (http://www.pref.wakayama.lg.jp/prefg/070109/news/001/news1005.html)

Speakers vary as to the acceptability of this S *no* NP pattern, with some rejecting them out of hand. However it should be noted that the examples in (10) are both from texts produced by native speakers, and that the pattern was first noted by Soga and Fujimura, native speaker linguists.[6]

Two facts about the S *no* NP pattern are relevant to our discussion. First, as observed by Frellesvig & Whitman (2008), whatever speakers' judgments about examples such as (11), all speakers agree that examples of this pattern involving gapped relatives are unacceptable, as shown in (12):

(12) [[Kyonen made Eri ga tabete ita] (*no) pan] wa moo hanbai
ast year until Eri nom eating was no bread top already sale
kinsi da.
forbidden is
'The bread that Eri was eating until last year is now prohibited for sale.'

Second, all speakers agree that examples such as (11b) are completely impossible with a genitive subject, as shown in (11):

(13) …seisan nooka ga sitekisita [ume santi *no/ga hattensuru **no**
producer farmer nom point.out plum orchard gen/nom develop no
tame] no kadai

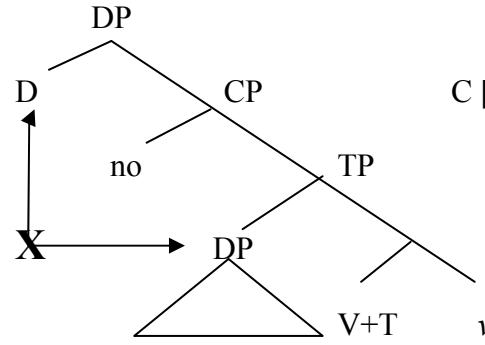
[6] Part of the problem in eliciting judgments about the S *no* NP pattern is that this pattern is a well-known feature of early child speech (Murasugi 1991), and is also a characteristic of the speech of adult imperfect learners of Japanese, and is stigmatized in association with both contexts. (10a) is an example from a famous wartime song, while (10b) is from the official home page of Wakayama prefecture.

sake cop issue
'…"issues for the sake of development of plum-producing areas" pointed out by producer farmers.'

These two facts can be explained in the following way. First, the impossibility of gapped relatives indicates that the presence of *no* blocks relativization. Frellesvig & Whitman, adopting the analysis of prehead relatives due to Kayne (1994), suggest that *no* blocks relativization because it is a complementizer. On Kayne's analysis, the head NP is first extracted from the relative TP and adjoined to CP; then the remnant TP is fronted and adjoined above the head NP. But the presence of a complementizer *no* between the relative TP and the nominal head rules out this derivation. While a complex NP with a prehead gapless clause might be derived by fronting the whole CP, gapped relative clauses require that only TP be fronted.

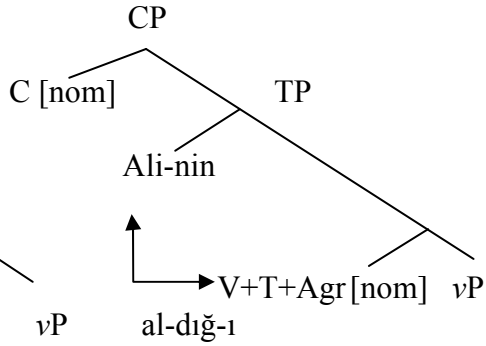
The same analysis of *no* as complementizer explains the unacceptability of genitive subjects in the S *no* NP pattern, on the assumption that Japanese genitive subjects are licensed by D. Presence of an overt complementizer blocks the possibility of establishing an Agree relation between D and the genitive subject. This contrasts with the Turkish situation, where the licenser of the genitive subject is [nominal] T, and the genitive subject in Spec, TP is accessible to it. We contrast these two configurations in (14).

(14) a. Japanese S *no* NP construction



ume santi *no hattensuru
plum orchard producer GEN develop

b. Turkish–*DIK* nominalization



al-dığ-ı
buy-PST/PRS-3.SG

For ease of comparison, we show the same stage in the derivation, where C c-commands TP and thus the genitive subject. At this stage in Turkish (14b), T inherits its formal features, including a [nominal] feature, and licenses genitive case in Spec, TP under Agree. However a similar relationship between D and the genitive subject in Japanese (14a) is interrupted by the intervening complementizer *no*, resulting in unacceptability. This contrast between Japanese and Turkish strongly supports the contention that the licenser for genitive subjects Turkish is C, while in Japanese it is D.

The attentive reader will notice that in a derivation of complex NPs with

prehead clausal modifiers, as proposed by Kayne (1994), the next step in the Turkish derivation should be movement of TP to the left of the complementizer. This is exactly what is proposed by Kornfilt (2005) for languages such as Uighur, Turkmen, Uzbek, and Sakha, i.e. in Turkic languages of Central and East Asia.[7] In these languages, gapped RCs that have modifying clauses with genitive subjects exhibit agreement morphology with that subject that appears to be non-local, i.e. such morphology shows up to the right of the head of the relative clause, similar to what Hale (2002) describes for Dagur Mongolian. We return to this issue in section 7.

4. The Transitivity Condition

In Japanese, but not in Turkish, overt direct objects are disallowed in relative clauses containing genitive subjects, as first noticed by Harada (1971). This observation is usually referred to in the literature as the Transitivity Condition (Watanabe 1996, Miyagawa 2008, 2011):

(15) [[Eri ga/*no pan **o** katta] mise] **Japanese**
Eri nom/gen bread **acc** bought store
'the store where Eri bought bread'

The Transitivity Condition is not observed in corresponding nominalized relative clauses in Turkish:

(16) [[Ali-nin ekmeğ-in **-i** al -dığ -ı] fırın **Turkish**
Ali-gen bread-3.sg-**acc** buy-fn -3.sg bakery
'the bakery where Ali buys/bought his bread'

Miyagawa (2011), following an insight of Watanabe (1996) relates the Transitivity Condition in an elegant way to (1) licensing of genitive case on the subject from D and (2) the evidence that Japanese genitive subjects do not move to Spec, TP. The main elements of Miyagawa's proposal are the following:

(17) The Transitivity Condition (Miyagawa 2011)
a. Japanese relative clauses do not contain C (TP is directly selected by D)
b. As a consequence of (a), no formal features are transferred to T.
c. D licenses genitive case on the subject. As a consequence of (b), no formal features intervene.
d. As a consequence of (b), T does not attract the subject (or any other argument) to Spec, TP.
e. As a consequence of (d), complex NPs retaining both a subject and an

[7] Actually, Kornfilt (2005) analyzes the modifying clause in the RCs of those languages as a Tense-Aspect-Mood phrase, while such clauses in Turkish RCs are analyzed as *Agr*-phrases.

object in the relative clause violate the Subject-in-Situ Generalization (SSG) of Alexiadou and Anagnostopoulou (2001, 2007).

(18) The subject-in-situ generalization (SSG; Alexiadou & Anagnostopoulou, 2007)
By Spellout, *vP* can contain only one argument with an unchecked Case feature.

As noted by Miyagawa and Alexiadou & Anagnostopoulou, the SSG is designed to capture the effects of Watanabe's (1996) account of the Transitivity Condition. This account assumes that the object moves to Spec, AgrO as soon as that projection enters the derivation, and that the genitive subject moves to Spec, AgrS. In a transitive clause, however, the movement of the genitive subject is blocked by the object in Spec, AgrO under Relativized Minimality.

The elegance of Miyagawa's proposal in (17) is due to the fact that it relates the absence of C, the absence of formal features in T, and the low position of the subject to account for the Transitivity Condition. However the proposal is not without problems. As acknowledged by Miyagawa, one problem is that the Transitivity Condition does not hold in object relatives, as originally observed by Harada (1971):

(19) [[Eri ga/no [e] katta] pan] **Japanese**
Eri nom/gen bought bread
'the bread that Eri bought'

In fact the acceptability of (19) conforms to the pattern of the constructions treated by Alexiadou & Anagnostopoulou. In these constructions as well, A' movement beyond *v*P results in acceptability, as in the French Stylistic Inversion example in (20):

(20) Que crois-tu que manquent un grand nombre d'étudiants?
what believe-you that lack a great number of students
'What do you believe that a great number of students lack'

According to Alexiadou & Anagnostopoulou (2001, 2007), examples such as (20) escape the SSG because the object has moved out of *v*P through its case checking position. On a standard cyclic Agree account of an object wh-question like (20), the object first has its case features checked under an Agree relation with *v*, then is attracted by an EPP feature of *v* to Spec, *v*P, then moves on to Spec, CP. At first glance the same account would seem to be available for the Japanese object relative (19). However the Japanese data raise a problem for this account of object relatives. The second step of the preceding derivation, movement of the object into Spec, *v*P, may be available, but under (17a) there is no C to attract the relativized object out of *v*P.

Perhaps because of this difficulty, Miyagawa (2011) speculates that the empty category related to the nominal head in Japanese relative clauses is *pro*, not trace, and suggests adopting Baker's (1995) proposal that *pro* does not require case. This proposal predicts that contexts where the object is *pro* do not violate the Transitivity Condition. However this prediction, too, is not borne out:

(21) [[Heizitu ni Eri ga/*?no pan o kau] mise] to
weekday on Eri nom/gen bread acc buy store and
[[syuumatu ni dannasan ga/*?no pan o kau] mise] wa tigau.
weekend on husband nom/gen bread acc buy store top different.
'The store where Eri buys bread on weekdays and the store where (her) husband buys bread on weekends are different.'

(22) Pan wa, [[heizitu ni Eri ga/*?no *pro* kau] mise] to
Bread top weekday on Eri nom/gen buy store and
[[syuumatu ni dannasan ga/*?no *pro* kau] mise] wa tigau.
weekend on husband nom/gen buy store top different.
'Bread, the store where Eri buys it on weekdays and the store where (her) husband buys it on weekends are different.'

(21) is a straightforward Transitivity Condition violation in a relative clause. (22) involves the same pattern with the object 'bread' topicalizated. As is well known, topics in Japanese can be derived by movement or base generation; in the latter case they bind a resumptive *pro*. Since (22) involves topicalization out of a complex NP, the standard assumption is that the *ec* bound by the topic is *pro* (Saito 1985). However replacement of the overt accusative marked object in (22) by *pro* still results in degraded acceptability. That is, the Transitivity Condition applies to *pro* as well as overt objects.

A second problem is posed by the theoretical status of the Subject-in-Situ Condition. Alexiadou & Anagnostopoulou (2007: 21) observe that the SSC is unstatable in a system involving cyclic Agree (Chomsky 2001). This is because in such a system, the case feature of the object will always be checked within the *v*P. To solve this problem, Aleixadou & Anagnostopoulou (2007) propose adopting countercyclic Agree. Their formulation of countercyclic Agree is specified by the following T-*v*-Agree Hypothesis (Alexiadou & Anagnostopoulou 2007: 22):

(23) *T-v-Agree Hypothesis:*
v enters Agree with T and *then* Case valuation takes place, creating a configuration of Case checking ambiguity (*v* and T could value the Case of SUB or OBJ).

(23) is designed to replicate the effects of the SSG as stated in Alexiadou & Anagnostopoulou (2001), where the illicitness of leaving two arguments inside *v*P was related to the 'lethal ambiguity' incurred when *v* and T, with their distinct

case features, are combined. Alexiadou & Anagnostopoulou propose that the ambiguity created by Agree between *v* and T is resolved by reference to the distribution of EPP features, according to the following algorithm (Alexiadou & Anagnostopoulou 2007: 22):

(24) (a) First, *v* Agrees with T, resulting in a Case checking ambiguity/ indeterminacy (what will Agree with what first?).
(b) EPP provides a guideline for ordering the Agree relations:
- If T bears an EPP feature, the first Agree relation involvesT and SUBJ.
-If *v* bears an EPP feature, the first Agree relation involves *v* and OBJ.
(c) If both *v* and T bear EPP features, Agree proceeds strictly cyclically.

By assumption (according to both Alexiadou & Anagnostopoulou and Miyagawa), T bears no EPP features in Japanese genitive subject constructions. In object relatives such as (19), the relativized object is first attracted by an EPP feature on *v*. Then under the second clause of (24), Agree takes place between *v* and the object, and the SSG is not violated. However when neither T nor *v* bear an EPP feature, both subject and object remain in *v*P with their case features unchecked, and the SSG is violated. This is designed to cover Transitivity Condition violations such as (15).

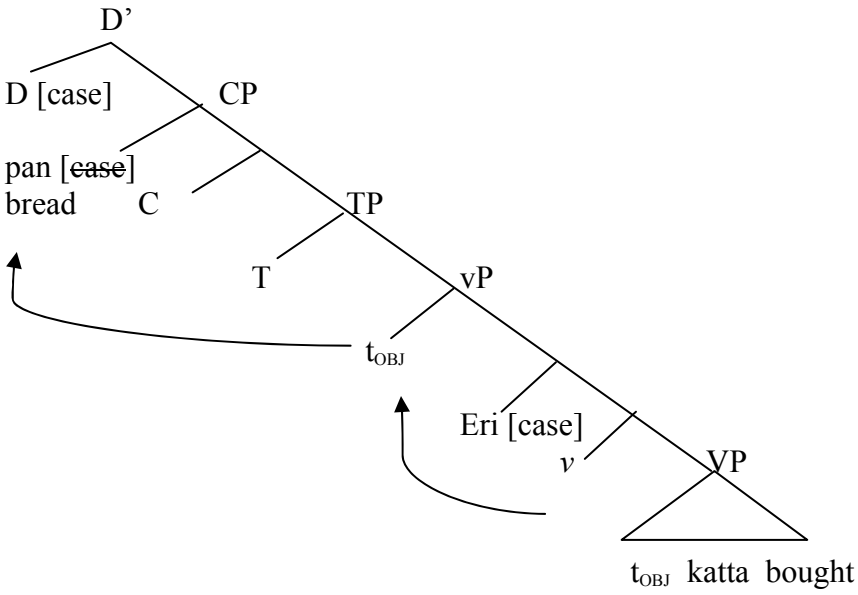
However, the revised SSG still leaves open a major question. The original version of the SSG in (18) assumed a single level of spellout. In the cyclic Agree version as revised in (23) and (24), it is not clear at which level spellout occurs. It cannot occur at the *v*P cycle (phase), because neither subject nor object case features are ever checked at this phase (prior to (24a) Agree between T and *v*). If spellout occurs at the CP phase, in transitive clauses such as (15) the case feature on *v* and the object will always have been checked once T enters the derivation, thus predicting incorrectly that Transitivity Condition violations such as (15) are licit.

Because of these difficulties (which may reflect an inadequate understanding of the framework on our part), we would like to propose a somewhat different approach which still maintains what we take to be the main insights of Watanabe (1996), Miyagawa (2003, 2011): the low position of the genitive subject, and genitive case licensing from D. This approach focuses on the case featural status of the head nominal in Japanese complex NPs.

Consider an object relative with a genitive subject such as (19). For concreteness, we assume the head extraction analysis of relative clauses (Vergnaud 1974, Kayne 1994; see Hoshi 2004 and Frellesvig & Whitman 2008 for Japanese, and Kornfilt 2005 for Turkish). The direct object first enters into an Agree relation with *v* and checks its case feature. The object is then moved successive cyclically through Spec, *v* to Spec, C. Under a Kaynean derivation of

head-final relatives, TP is raised out of CP through an additional specifier of CP.[8] At this stage D enters the derivation and seeks to check its case feature. Once TP has been moved to the edge of CP, the subject in Spec, vP is the closest DP with an unchecked case feature accessible to D. After the subject checks its case feature with D, TP moves on to Spec, DP, deriving the surface order of relative clauses.

(25)



'the bread that Eri bought'

(25) shows this derivation just prior to raising of TP. Note that the intermediate trace of the extracted object in Spec, *v* intervenes between D and the subject. Were the extracted object to bear an unchecked case feature, it would check the case feature on D under Closest Agree, leaving the feature on the genitive subject unchecked. However since the case feature on the object has already been checked, such an intervention effect does not occur.

Let us now consider the case of an extracted adjunct, such as our original Transitivity Condition violation in (15), repeated as (26) below:

(26) [[Eri ga/*no [e] pan **o** katta] mise] **Japanese**
Eri nom/gen bread **acc** bought store
'the store where Eri bought bread'

Here the head of the relative clause *mise* 'store' is related to an empty category interpreted as a locative adjunct. It is inconsequential for our purpose whether this empty category is trace or *pro*; the crucial question is how this *ec* checks its case feature. This question arises because Japanese, like Turkish, systematically

[8] We assume throughout that movement on each cycle is to an outer specifier, contrary to the "tucking in" approach of Richards (2001), at least in the case of non-final landing sites.

disallows both P-stranding (27b) and pied-piping (27c).

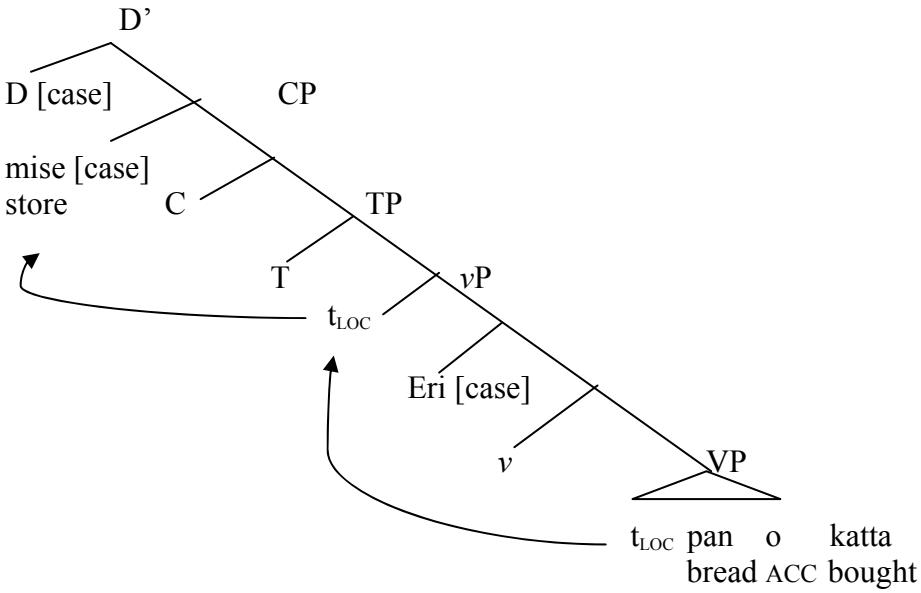
(27) a. [[kyonen made Eri ga/no [e] hataraite ita] mise] **Japanese**
last year until Eri nom/gen working was store
'the store where Eri worked until last year'

b. [[kyonen made Eri ga/no [e] *de hataraite ita] mise] **Japanese**
last year until Eri nom/gen at working was store

c. [[kyonen made Eri ga/no [e] hataraite ita] mise *de] **Japanese**
last year until Eri nom/gen working was store at

We propose that the case feature on the head of adjunct relative clauses such as (27a) is checked by *v* in the relative clause. Here a language-particular property of Japanese becomes relevant to our discussion. It is well known that Japanese allows only a single instance of accusative case per clause, the so-called Double *o* Constraint (Harada 1973, Poser 1981). We interpret this to mean that *v* in Japanese checks at most one case feature. The consequence of this is that in a transitive clause with a relativized adjunct such as (26), either the relativized head or the object reaches spellout with its case feature unchecked. Let us consider the derivation corresponding to our original Transitivity Condition violation (15), where the locative adjunct has been extracted. Again, we look at the point in the derivation where the extracted head is between D and the TP containing the genitive subject:

(28)



'the store where Eri bought bread'

In (28), assuming that *v* has checked its sole case feature with the direct object 'bread', the adjunct head 'store' is extracted from *v*P with an unchecked case feature. When the extracted head is moved to Spec, *v*P, it intervenes between D

and the genitive subject. Under Closest Agree, the extracted head blocks a checking relationship between D and the genitive subject.

Like previous accounts, the account sketched here is based upon the licensing of genitive subjects by D, rather than T or C. it also relies on the Double *o* Constraint, an independently motivated language particular property of Japanese, and the head extraction account of relative clauses. The account leaves a number of questions open, in particular the status of the Transitivity Condition in Japanese noun complement constructions. We hope to return to these questions in further research, but we conclude this section with an observation about another difference between Japanese and Turkish relative clauses that is consistent with our account of the case licensing of adjunct relative heads.

Kuno (1972) notes that the range of adjuncts that can be relativized in Japanese is restricted. Thus while (29) is acceptable, (30) is not (examples based on Kuno 1972 244-245).

(29) [[Tegami ga/no [e] takusan kita] tomodati] (ga oozei ita.) **Japanese**
letter nom/gen many came friend no many were
'There were many friends from whom letters came (to me)'

(30) * [[Eri ga/no [e] kita] mura] **Japanese**
Eri nom/gen came village
'the village where Eri came (from)'[9]

Kuno relates the contrast between (29) and (30) to the possibility of topicalizing the source argument 'letters' in a main clause corresponding to the relative clause in (29), while such topicalization is unacceptable in the case of (30). But from the standpoint of our account of relativization, a more relevant contrast is the possibility of 'letters' appearing in a multiple nominative construction corresponding to (29):

(31) Sono tomodati ga tegami ga takusan kita. **Japanese**
that friend nom letter nom many came
'It is that friend that many letters came from.'

In contrast, a multiple nominative counterpart of (30) is unacceptable:

(32) *Sono mura ga Eri ga kita. **Japanese**
that village nom Eri nom came
'It is that village that Eri came from.'[10]

[9] As Kuno (1972: 244, footnote 2) notes, (30) is acceptable on the reading "the village Eri came to". Kuno's original examples involve only nominative-marked subjects, but we have added genitive marking to make the point that in cases of adjunct relativization such as these, the case marking of the subject does not affect acceptability.

Hoshi (2004) points out that many instances of apparent relativization from positions normally inaccessible to this operation, such as islands, are in fact relativization from the higher or 'major' subject. Such a source is available in (29), but not in (30). This suggests that relativization of source adjuncts is in fact impossible in Japanese; apparent counterexamples such as (29) involve relativization from the major subject position, not from the position of the source adjunct.

This contrasts with the situation in Turkish. In Turkish, relativization of source adjuncts is generally acceptable, including examples corresponding to (30):

(33) [[Ali-nin [e] gel -diğ -i] köy] **Turkish**
Ali- gen come -fn -3.sg village
'the village where Ali came (from)'

Since neither language allows P-stranding or pied-piping, and the Japanese example (30) and Turkish are nearly morpheme-for-morpheme identical, the difference cannot be a semantico-functional one, such as the recoverability of the morphological information indicating that a source argument has been relativized. Instead, we suggest that the difference is due to the status of adjunct case in the two languages.

In Japanese, matrix adjunct arguments are marked by the ablative postposition *kara* 'from' as in (34a). In Turkish, in contrast, adjunct arguments are marked by the ablative case suffix *-DAn*.[11]

(34) a. Eri ga sono mura kara kita. **Japanese**
Eri nom that village from came
'Eri came from that village.'

[10] Two factors are at work in the unacceptability of the multiple nominative construction in (32). First, multiple nominal constructions are most felicitous when the 'major' (leftmost) subject corresponds to a possessor of the 'minor' or rightmost subject, or a higher (TP level) adjunct. Whitman (2000), focusing on the parallel construction in Korean, attributes this restriction to Relativized Minimality: possessors of the subject and higher adjuncts can move to subject position without crossing over the subject. In (31) the theme subject 'many letters' is existential and plausibly occupies its base position in VP. In (32), the definite subject 'Eri' occupies a surface position outside the VP, on normal assumptions. A second factor applies to a broader range of multiple nominative constructions, which may in some instances involve a major subject related to an argument to the right of the minor subject. These require a salient property reading. That reading is available in (31) "The friend has the property that many letters came from her", but difficult to obtain in (32) "The village has the property that Mary came from it".

[11] The fact that the Turkish ablative morpheme is a case suffix rather than a postposition is shown by the morpheme's inclusion in the phonological word of the noun stem: the ablative morpheme's vowel obeys Vowel Harmony [VH], and it bears regular word-final stress, when the morpheme is word-final. Postpositions, in contrast, are not stressed, nor are they included in the noun's VH-domain. Furthermore, those postpositions that can cliticize onto the noun stem (e.g. the instrumental/comitative *ile*, whose cliticized form is *–(y)lA*) can't bear stress, either—even when in word-final position (although they do undergo VH when cliticized). Japanese postpositions, in contrast, show clitic or even dependent word-like behavior (Vance 1993).

b. Ali bu köy-den gel-di. **Turkish**
Ali.nom that village-abl come-pst
'Ali came from that village.'

Although the details of ablative case licensing are beyond the scope of this paper, the status of *-DAn* as a case affix, that is, as the morphological exponent of ablative case, suggests that ablative case in Turkish may be licensed by a functional head, such as the high applicative head proposed by Pylkkänen (2008). The impossibility of relativization in Japanese (30) suggests that a corresponding functional head, able to license higher adjuncts such as source DPs, is absent in Japanese. Given this absence, relativized adjuncts must be checked by some other device such as the multiple nominative structure in (31).[12]

5. Genitive subjects and the status of the external head

So far we have focused on the evidence that the genitive subject in Japanese TP nominalization is licensed by a higher functional head, D. We have discussed a number of contrasts which suggest that genitive subjects in Turkish are licensed within the extended verbal projection, specifically by [nominal] T which inherits this feature from C. In this section we defend this view in detail, arguing specifically against the proposal that Turkish TP nominalizations involve an unpronounced nominal head external to CP. Our discussion addresses claims made to the contrary in the literature, pointing out empirical problems associated with those claims.

Aygen (2002) and, in older work, Lees (1965) claim that an external noun (either concrete, or phonologically unrealized) is responsible for the clause-internal nominal properties in Turkish nominalizations, e.g. for the genitive case of the subject. According to this proposal, e.g. (35) is claimed to be similar in structure to (36): both are claimed to have a clause-external nominal head:

(35) Ben [Hasan-ın gel **-diğ-in] -i** bil -iyor -um. **Turkish**
I Hasan-gen come **-fn-3.sg -acc** know -prprog -1.sg
'I know that Hasan came'

(36) Ben [[Hasan -ın gel **-diğ-i] gerçeğ-in]-i** bil -iyor-um. **Turkish**
I Hasan -gen come **-fn-3.sg fact-cmpm-acc** know-prprog 1.sg
'I know the fact that that Hasan came'

[12] Inspection of the examples of Japanese adjunct relativization in Kuno (1972) suggests that they are limited to goals, locations, and instruments. These are thematic role types associated with Pylkkänen's (2008) lower Applicative Phrase position, and they also correspond to role types that are crosslinguistically subject to noun incorporation (Baker 1988). On both of these criteria the adjuncts in question are located inside VP. This is consistent with our suggestion that such "lower" adjuncts may be licensed by *v* when no other case checking head is available, and that Japanese lacks a high applicative-type projection capable of licensing "higher" adjuncts, in contrast to Turkish.

There are numerous empirical problems with the proposal that nominalized indicative argument clauses are *externally* headed DPs. We illustrate just two of these in the examples below, focusing on differences between overtly headed versus non-headed nominalized clauses with respect to scrambling and to selection of different types of nominalization.

5.1 Problems with post-verbal scrambling

(37) ?[Hasan -ın **t_i** nihayet kaç -tığ -ın] -ı
Hasan -gen finally escape -fn -3.sg -acc
duy -du -m **karı -sın -dan$_i$**
hear -pst -1.sg **wife -3.sg -abl**
'I heard that Hasan finally ran away from his wife'

This example illustrates the ease with which constituents of embedded clauses can scramble to post-verbal positions in the root clause. However, similar post-verbal constructions are degraded when the nominalized embedded clause is overtly headed:

(38) ??/*[[Hasan -ın **t_i** nihayet kaç -tığ -ı] söylenti -sin] -i
Hasan -gen finally escape -fn -3.sg rumor -cmpm -acc
duy -du -m **karı -sın -dan$_i$**
hear -pst -1.sg **wife -3.sg -abl**
'I heard the rumor that Hasan finally ran away from his wife'

This contrast is even clearer when the whole argument clause is scrambled to verb-final position in the root clause:

(39) t_j Duy-du-m [[Hasan-ın nihayet karı-sın-dan kaç -tığ-ın] -ı]$_j$
hear-pst -1.sg Hasan-gen finally wife-3.sg-abl escape-fn-3.sg-acc
'I heard that Hasan finally ran away from his wife'

In these examples, post-verbal scrambling of a constituent of the subordinate clause is completely well-formed:

(40) t_j Duy-du-m [[Hasan-ın nihayet t_i kaç -tığ -ın] -ı]$_j$
hear-pst -1.sg Hasan-gen finally escape-fn-3.sg -acc
karı-sın-dan$_i$
wife-3.sg-abl
'I heard that Hasan finally ran away from his wife'

This is just as expected in any analysis in which this type of subordinate clause is *not* headed.

Corresponding examples where there is an *overt* head are ill-formed:

(41) ??/*t_j Duy -du -m [[Hasan -ın nihayet t_i
hear -pst -1.sg Hasan -gen finally
kaç -tığ -ı] söylenti -sin -i]$_j$ karı -sın -dan$_i$
escape -fn -3.sg rumor -cmpdm -acc wife -3.sg -abl
'I heard the rumor that Hasan finally ran away from his wife'

For the External Noun Hypothesis (ENH), there should be no difference between the perfectly acceptable (40) and the ill-formed (41) — unless one makes scrambling dependent upon the phonological properties of the external head — clearly an undesirable move.

5.2 Problems with distribution

TP nominalizations in Turkish can differ in their distribution according to whether they have an external nominal head or not. Only two systematic differences (among a number of similar selectional differences) are considered here: (So-called) factive (*-DIK-*) versus (so-called) non-factive (*-mA-*) [13] nominalized clauses as objects versus subjects of psychological predicates.

5.2.1 Psychological predicates allow both the factive and the non-factive nominalization types as complements, without any difference in semantics.

(42) a. [Ali -nin ev -den kaç -ma -sın] -a üzül -
Ali -gen home -abl flee -nfn -3.sg -dat sadden
-dü -m
past-1.sg (nfn: non-factive nominalization)
'I was saddened at Ali's running away from home'

b. [Ali -nin ev -den kaç -tığ -ın] -a
Ali -gen home-abl flee- fn -3.sg -dat
üzül -dü -m
sadden -past -1.sg
'I was saddened at Ali's running away from home'

However, when an external noun shows up, only the factive gerund is well-formed for factive semantics:

(43) a. ??/*[Ali-nin ev -den kaç -ma (-sı)] söylenti-sin-e
Ali-gen home-abl flee -nfn -3.sg rumor-cmpdm-dat

[13] We follow Lees (1965) in using these labels for these two main types of Turkish nominalizations, although they do not reflect the semantics of those clauses in each and every instance.

üzül -dü -m
sadden-past-1.sg
Intended reading:'I was saddened at the rumor of Ali's running away from home'

b. [Ali -nin ev -den kaç -tığ -ı] söylenti-sin -e
Ali -gen home-abl flee- fn -3.sg rumor-cmpdm-dat
üzül -dü -m
sadden-past-1.sg
'I was saddened at the rumor of Ali's running away from home'

5.2.2 With the same type of predicates, only the non-factive gerundive is well-formed as subject, despite indicative semantics; however, when such a sentential subject is externally headed, only the factive gerund is well-formed for indicative semantics:

(44) a. [Ali -nin ev -den kaç -ma -sı] ben -i
Ali -gen home-abl flee -nfn -3.sg I -acc
üz -dü
sadden-past
'Ali's running away from home saddened me'

b. *[Ali -nin ev -den kaç -tığ -ı][14] ben -i
Ali -gen home-abl flee -fn -3.sg I -acc
üz -dü
sadden-past
Intended reading: 'Ali's running away from home saddened me'

(45) a. ??/*[Ali-nin ev -den kaç-ma (-sı]) söylenti-si ben-i
Ali-gen home-abl flee-nfn-3.sg rumor-cmpdm I-acc
üz-dü
sadden-past
Intended reading: 'The rumor of Ali's running away from home saddened me'

b. [Ali -nin ev -den kaç -tığ -ı] söylenti-si ben -i
Ali -gen home-abl flee -fn -3.sg rumor -cmpdm I -acc
üz -dü
sadden -pst
'The rumor of Ali's running away from home saddened me'

[14] The language appears to be changing with respect to examples such as (44b), inasmuch as it is our impression that younger speakers tend to allow the factive gerundive *–DIK* in sentential subject positions, while also allowing the non-factive *–mA* clauses in the same positions, as well.

5.3 Word order: Genitive subject before or after adverbs—slight differences, depending on presence of external noun

We saw earlier that in Turkish relative clauses with nominalized modifying clauses, the genitive subject cannot follow adverbs; we repeat the relevant examples:

(46) a. ??/*[[geçen sene-ye kadar Ali-nin ekmek al-dığ -ı] **Turkish**
last year-dat until Ali-gen bread buy-fn -3.sg
fırın
bakery
'the bakery where Ali used to buy bread until last year'

b. [[Ali-nin geçen sene-ye kadar ekmek al-dığ-ı] **Turkish**
Ali-gen last year-dat until bread buy-fn-3.sg
fırın
bakery
'the bakery where Ali used to buy bread until last year'

We also saw that nominalized embedded clauses exhibit a similar contrast, although the contrast is less striking:

(47) ?(?) [Geçen sene-ye kadar Ali-nin bu fırın -dan ekmek
past year-dat until Ali-gen this bakery-abl bread
al -dığ - ın]-ı duy -du -m
buy-fn-3.sg-acc hear-pst-1.sg
'I heard that Ali bought bread from this bakery until last year'

(48) [Ali-nin geçen sene-ye kadar bu fırın-dan ekmek al -dığ -ın]-ı
Ali-gen past year-dat until this bakery-abl bread buy-fn-3.sg-acc
duy -du -m
hear-pst.-1.sg
'I heard that Ali bought bread from this bakery until last year'

Noun-complement constructions pattern with relative clauses, rather than with the nominalized embedded clauses without an external nominal head:

(49) ??/*[[Geçen sene-ye kadar Ali-nin bu fırın-dan ekmek al -dığ -ı]
past year-dat until Ali-gen this bakery-abl bread buy- fn -3.sg
söylenti-sin-i] duy -du -m
rumor-cmpd-acc hear-pst-1.sg
'I heard the rumor that Ali bought bread from this bakery until last year'

(50) [[Ali-nin geçen sene-ye kadar bu fırın -dan ekmek al -dığ -ı]
Ali-gen past year-dat until this bakery-abl bread buy- fn -3.sg
söylenti-sin -i] duy -du -m
rumor-cmpdm-acc hear-pst-1.sg
'I heard the rumor that Ali bought bread from this bakery until last year'

While the distinction is subtle, it is there, as we verified with four native speakers, whose intuitions about these examples were clear and robust. If nominalized

clauses such as (47) and (48) had an (abstract) external noun (whose existence were responsible for the licensing of the genitive subject, rather than the nominalized C and, by inheritence, the—defective—T and nominal *Agr*), we should have expected for the judgments of (47) and (48) to pattern more closely with those for (49) and (50).[15]

5.4 External heads: The Turkish facts contrasted with Japanese

So far in this section we have seen that genitive subjects in Turkish nominalizations are licensed independently of an external lexical nominal head. This is exactly the prediction made by the analysis in (1b=9b), where [nominal] C, a nominal functional head internal to the extended clausal projection, is responsible for genitive case on the subject. In contrast, in Japanese we have endorsed and provided further support for the hypothesis of Miyagawa (2003, 2011) that it is the D head associated with the external lexical head noun that licenses genitive case on the subject of the relative. In this section we discuss evidence adduced in previous research in favor of the D-licensing analysis for Japanese, and contrast it with the facts in Turkish.

Maki & Uchibori (2008) argue against Hiraiwa's (2001) hypothesis that nominal C licenses genitive subjects in Japanese. They point out that in all of the contexts where Hiraiwa shows that genitive subjects are possible without an overt external nominal head, an overt head can be realized. Some of the relevant examples are below from Maki & Uchibori (2008: 203-4):

(51) a. John wa [Mary ga/no yonda (teido/no) yori] **Japanese**
Johntop Mary nom/gen read extent/no than
takusan no hon o yonda.
many gen books acc read
'John read more books than (the extent/what) Mary did.'
(Gloss modified from Maki & Uchibori 2008: 203)

b. John wa [toki ga/no tatu (no) to tomo ni] **Japanese**
John top time nom/gen pass no with together loc
Mary no koto o wasurete itta.
Mary gen matter acc forgetting went

[15] The facts of examples (46) through (48), while adding to the evidence against the "external noun hypothesis" for Turkish nominalized clauses, may be seen to undermine our initial, and central, claim that the properties of Turkish clausal nominalizations (such as a genitive subject) are not determined by any clause-external noun, but by the clause-internal nominal C—and, via inheritance, by the clause-internal *T+nominal Agr* complex. However, note that what is most important about these examples is the contrast between all of the nominalized clauses, whether with or without an external noun, on the one hand, and non-nominalized clauses on the other, where the relevant adverbs may freely either precede or follow the nominative subject. Note also that one reason for the ill-formedness of (49) may be the fact that the clause-peripheral adverb is being accessed by the clause-external nominal head, leading to categorial incompatibility. If correct, this hypothesis would add to our arguments against an abstract external noun in bare TP-nominalizations in Turkish, given the relative well-formedness of (47) against the clear ill-formedness of (49).

'John forgot about Mary as time went by.'
(Gloss modified from Maki & Uchibori 2008: 203)

However in fact this argument is rather weak; in Turkish, too, nominal heads can be supplied for most of the contexts where bare TP nominalizations appear, like 'extent' in (51a), but as we have shown earlier in this section, the argument against a covert external head as licenser in Turkish is overwhelming. Furthermore, one of the overt nominal heads cited by Maki & Uchibori is *no*, which has an analysis as a complementizer (cf. section 3). Maki & Uchibori point out that *no* also occurs, under certain restrictions, in pseudoclefts, where it has been analyzed either as a pronoun or a complementizer:

(52) [[John ga/no sikarateta] no] wa Mary ni da. **Japanese**
John nom/gen scolded no top Mary by is
'How John was scolded is by Mary.' (Maki & Uchibori 2008: 204)

Maki & Uchibori suggest, following Murasugi (1991), that genitive subjects are acceptable in pseudoclefts only when *no* can be interpreted as a pronoun denoting an action or an event. According to Murasugi, (53) is degraded in acceptability:

(53) [[Mary ga/??no nigedasita] no] wa gakkoo kara da. **Japanese**
Mary nom/gen ran.away no top school from is
'Where Mary ran away is from school.'
(Maki & Uchibori 2008: 204, cited from Murasugi 1991)

However, it is unclear in what respect (52) is more event-denoting than (53) The analysis presented in section 4 provides an account of the contrast between (52) and (53) while confirming the analysis of *no* in pseudoclefts with genitive subjects as a pronoun, thus supporting the external head hypothesis for Japanese. On an extraction account of pseudoclefts, the pronoun *no* is extracted from its underlying position in the presupposition. As we argued in section 4, lower adjuncts such as the agent in (52) may check their case feature with *v* prior to extraction. We suggested that higher adjuncts such as source adjuncts cannot be licensed in this way; instead apparent source adjunct relatives are formed from multiple subject constructions. The multiple subject construction with corresponding to (53) is equally unacceptable:

(54) ??Sonogakkoo ga Mary ga nigedasita.
Mary nom/gen ran.away no top school from is
'It is that school that Mary ran away from.'

These facts suggest that even in the case of pseudoclefts, Maki & Uchibori's contention is correct. Pseudoclefts with genitive subjects have external heads, associated with the item extracted from the position of the gap in the presupposition.

In contrast to evidence like this for Japanese, as we have shown in this section, nominalized clauses with external nouns in Turkish have different properties than similar clauses without (overt) external nouns. Furthermore, if an external head (or D) were responsible for licensing the genitive subject in Turkish, as in Japanese, we might expect – again parallel to the Japanese facts – that the presence of such a head alone is sufficient to trigger selection of nominalized

morphology and license genitive subjects. But such is not the case. As shown in Kornfilt (2003), non-nominalized clausal complements of external nouns have nominative, rather than genitive subjects:

(55) [Ali/*Ali -nin karı -sın -ı terket -ti] söylenti -si.
Ali/*Ali-gen wife-3.sg.-acc leave-pst rumor -cmpdm
'The rumor that Ali left his wife'

We take the ill-formedness of examples such as (55) with a genitive subject to support our approach to genitive subjects in Turkish nominalizations, i.e. to support our claim that the licenser of genitive is clause-internal, i.e. a nominal C, rather than clause-external, i.e. the external noun and a higher nominal projection headed by such a noun.

6. The content of defective T in TP nominalizations

In our account of TP nominalizations in Japanese and Turkish, we have assumed, following earlier analyses, that T is defective in both languages. In this section we take a brief look at the morphological and semantic restrictions which support this contention.

Turkish nominalizations with genitive subjects contain only a subset of Tense, Aspect, and Mood features. In Turkish fully tensed, i.e. fully verbal, clauses, it is possible to distinguish a reported past, a definite past, a general present, a present progressive, and a future tense, by means of single tense/aspect morphemes (i.e. not via complex tense formations involving light verbs or auxiliaries); some of these are illustrated below:

(56) Ali ekmeğ-i fırın-dan al -dı
Ali bread -acc bakery-abl buy-pst
'Ali bought the bread from the bakery'

(57) Ali ekmeğ-i fırın-dan al -ır
Ali bread -acc bakery-abl buy-aor
'Ali buys (in general, habitually) the bread from the bakery'

(58) Ali ekmeğ-i fırın-dan al -ıyor
Ali bread -acc bakery-abl buy-presprog
'Ali buys (currently) the bread from the bakery'

(59) Ali ekmeğ-i fırın-dan al -acak
Ali bread -acc bakery-abl buy-fut
'Ali will buy the bread from the bakery'

In contrast, in embedded nominalizations, only a future versus non-future distinction can be made in nominalized indicatives (glossed as factive here), and no tense distinctions can be made at all in nominalized subjunctives (which may

actually be just inflected infinitives, and are glossed as non-factive here):

(60) Ali-nin ekmeğ-i fırın-dan al -dığ-ın]-ı bil -iyor -um
Ali-gen bread-acc bakery-abl buy-fn-3.sg-acc know-presprog-1.sg
'I know that Ali buys/bought/has bought the bread from the bakery'

(61) Ali-nin ekmeğ-i fırın-dan al -acağ-ın]-ı
Ali-gen bread-acc bakery-abl buy-nfut-3.sg-acc
bil -iyor -um
know-presprog-1.sg (nfut: nominalization of future)
'I know that Ali will buy the bread from the bakery'

(62) Ali-nin ekmeğ-i fırın-dan al -ma-sın]-ı isti -yor -um
Ali-gen bread-acc bakery-abl buy-nfn-3.sg-acc want-presprog-1.sg
'I want that Ali should buy the bread from the bakery' (Ambiguous between present and future.)

In order to make the kind of finer distinctions with respect to tense and aspect which are made morphologically in fully verbal clauses, complex, periphrastic constructions involving light verbs or the auxiliary must be used.

Providing a partial parallel, Miyagawa (2008) observes that Japanese relative clauses with genitive subjects do not have the tense properties of normal finite clauses in Japanese. The difference is salient in clauses with past tense; with genitive subjects, such clauses seem to have a property-like reading akin to participial modifiers, as shown in (63).

(63) [[Taroo no tatai-ta] kabe **Japanese**
Taroo gen hit-pst] wall
'the wall hit by Taroo' or 'the wall with the property of having been hit by Taroo'

Miyagawa provides as evidence for this claim the fact that examples like (64) with a punctual adverb such as *3 zi-ni* 'at 3 o'clock' are degraded with a genitive subject.

(64) [3 zi ni Taroo ga /??no tatai-ta] kabe **Japanese**
[3 o'clock Taro nom /??gen hit-pst] wall
'the wall that Taro hit at 3 o'clock'
(adapted from Miyagawa 2008, example (26))

Turkish *–DIK* also expresses, in addition to defective tense, imperfective aspect. When presented with data similar to Japanese (63), Turkish speakers do not reject but disprefer temporal point-denoting adverbs:

(65) ?(?) [Ali-nin tam saat üç -te at -tığ -ı] gol **Turkish**
Ali-gen exactly hour three-loc throw-fn -3.sg goal
'the goal which Ali shot at exactly three o'clock'

A periphrastic construction, involving a perfect(ive) participial main verb and an auxiliary in *-DIK* is needed instead:

(66) [Ali-nin tam saat üç -te at - mış ol -duğ -u] gol
Ali-gen exactly hour three-loc throw- perf.part. aux -fn-3.sg goal
'the goal which Ali shot at exactly three o'clock'

No such complexity is needed when the adverb denotes an interval, and is thus compatible with the imperfective aspect of *-DIK*:

(67) [Ali -nin bütün gün boyunca oyna - dığ -ı] oyun
Ali -gen entire day during play -fn -3.sg game
'The game which Ali played during the entire day'.

We see thus that T in TP nominalizations in Turkish and Japanese is defective along several dimensions. The exact syntactic consequences of this similarity await further research. While in the Turkish case T inherits a [nominal] feature from C and bears only a reduced set of tense features, it still bears (nominal) agreement features, and attracts the subject, as well as licensing genitive case on the subject. In the Japanese case T also bears a reduced set (or perhaps no) tense features, but lacks a nominal feature, and does not attract the subject.

7. TP nominalizations and the structure of complex NPs

At several places throughout this paper we have touched on the relationship between Japanese and Turkish TP nominalizations and the structure of complex NPs. We conclude with a direct comparison of complex NPs, particularly relative clauses, not just in Japanese and Turkish, but in other Turkic languages as well, based on the work of Kornfilt (2005, 2008, 2009).

One piece of data demonstrating that in Turkish, there are two levels of nominal functional structure, D and C/T, is the fact that RCs can be "possessed", with a possessor distinct from the subject marked genitive; each instance of genitive is licensed by its own local nominal head, D in the case of the possessor, and T inheriting its [nominal] feature from C:[16]

(68) Ben **-im** [Rembrandt **-ın** çiz -diğ -i] resm -im **Turkish**
I **-gen** Rembrandt **-gen** draw -fn-3.sg picture-1.sg
'my picture which Rembrandt drew'

[16] Japanese, too, allows both a genitive possessor and genitive subject, but this is to be expected, since Japanese D licences multiple genitives.

In some other Turkic languages, non-subject relative clauses are similar to their counterparts in Turkish, in that the subject of the modifier clause is also in the genitive, and the clause is also nominalized. However, the agreement marker which agrees in terms of phi-features with the subject is placed not on the nominalized predicate, but on the external noun (cf. Kornfilt 2008, 2009):

(69) Ali-**nin** öl-tür-gön öküz-**ü** **Kirghiz**
Ali-**gen** die-caus-p ox-**3.sg**
'The ox which Ali killed'

There are two possible analyses of this agreement pattern, both proposed by Kornfilt—one in (2005), and the other in (2008). Either one could apply, a priori, to either relative clauses or to noun-complement constructions. In her 2005 paper, Kornfilt applies a Kaynean derivation to complex NPs in Eastern Turkic languages, to account for the fact that, as in (69), the morphology expressing agreement with the genitive subject appears to the right of the external head. In this account, first nominal AGR is raised from T to C. Next, in a noun-complement construction, the external head (e.g. 'fact') is merged with C. Finally, the complement TP is moved around C into the DP projection, stranding nominal agreement. A similar, if not identical, derivation would apply to a relative clause. After AGR has raised from T to C, the relative clause head moves to Spec,CP; the complement TP moves into the DP projection, stranding C with its nominal AGR occupant. This AGR then cliticizes to its closest phonological host, i.e. the head of the relative clause.[17]

Kornfilt (2008) presents an alternative derivation for the nominalized clause in gapped relatives in these Turkic languages. In this approach, the clause itself is not a (nominal) CP, and the genitive of the subject is licensed by the external noun (which agrees with the subject—a local Agree relationship made possible by the defective, i.e. reduced, non-CP nature of the clause). This analysis holds that there is, as in Japanese complex NPs, only a single nominal functional projection, D. On this analysis, as in Japanese, D checks its formal features with the subject of the relative clause. A prima facie piece of evidence for this analysis is the fact that in contrast with Turkish (68), the nominal agreement morphology cannot license a possessor distinct from the subject:

[17] Note that Kornfilt (2005) addresses only relative clauses; here, we extend the account proposed there to noun-complement constructions. Note also that we assume that the cliticization of AGR takes place at the very end of a derivation. This explains why it cliticizes to the external noun in constructions with such an external nominal head, after the TP has moved up and leftwards, while the same type of AGR cliticizes to the (nominalized) verb in constructions without an external nominal head (such as in direct nominalized clausal complements of matrix verbs), given that in the latter type of constructions, it is the nominalized verb which is the closest phonological host for the AGR.

(70) a. *Ali-**nıŋ** öl-tir-gen buqa-**m** **Kazakh**
Ali-**gen** die-CAUS-NML ox-**1.sg**
Intended reading: 'my ox which Ali killed'
b. *Sen-**iŋ** öl-tir-gen buqa-**m** **Kazakh**
you-**gen** die-caus-nml ox-**1.sg**
Intended reading: 'my ox which you killed'

(71) *Ali-**nin** öl-tür-gön öküz-**üm** **Kirghiz**
Ali-**gen** die-caus-nml ox-**1.sg.**
Intended reading: 'My ox which Ali killed'

(72) a. *Äli-**niŋ** öl-tür-gän kala-**m** **Uighur**
Ali-**gen** die-caus-nml ox-**1.sg**
Intended reading: 'My ox which Ali killed'
b. *min-**iŋ** öl-tür-gän kali-**si** **Uighur**
I-**gen** die-caus-nml ox-**3.sg**
Intended reading: 'His/her ox which I killed'

The facts in (70-72) might be taken to suggest that such languages have a structure similar to the Japanese genitive subject structure, with the genitive subject licensed under Agree with D.

However a further set of facts shows that the parallel between Eastern Turkic and Japanese cannot be complete. Eastern Turkic complex NPs do not obey the Transitivity Condition. (73) shows this for Kirghiz:

(73) Bül [Ali-**nin** nan sat-ïp al-gan dükön-ü].
This Ali-**gen** bread sell-ing take-nml store-**3.sg.**
'This is the store where Ali bought bread.'

Our consultant tells us that (73) is perfectly acceptable.[18]
Furthermore, as pointed out by Kornfilt (2005), the posthead agreement morphology in Eastern Turkic languages differs from Turkish in being a clitic.

Summarizing these facts, complex NPs in Eastern Turkic resemble Turkish in not observing the Transitivity Constraint, but they differ in that (i) their nominal agreement is a clitic (ii) nominal agreement is placed to the right of the head noun in complex NPs (iii) double nominal agreement, with an external possessor and the genitive subject, is disallowed. We propose that these last three facts are related, and that in particular (i) accounts for the other two.

Our account is as follows. In our analysis of Turkish, we invoked the proposal of Chomsky (2008) that the formal features of T are inherited from C. Suppose that this holds for Eastern Turkic as well, except that agreement is

[18] An anonymous JeNom reviewer tells us that the same is true for Kazakh: the Transitivity Condition does not hold in this language either. We are grateful to Akmatalieva Jakshylyk for confirmation and analysis of the Kirghiz data.

realized in C as a lexical item, a clitic, and thus is unable to undergo inheritance to T (which in this case would constitute lowering of a lexical item). Nevertheless we assume that T in Eastern Turkic bears an EPP feature which attracts the subject out of *v*P, as suggested by the absence of Transitivity Condition effects. When C is merged, it checks its formal features with the genitive subject, and these are spelled out on the agreement clitic in C. Next, as in Kornfilt's (2005) analysis, the complex NP head in a relative clause is raised from TP to Spec CP (or in the case of a noun complement, directly merged with C). Finally D is merged, and TP is raised to Spec, DP stranding the agreement clitic in C, as in Kornfilt (2005). The ill-formedness of doubled ageemeent, with clitic agreement in C Agreeing with the genitive subject and agreement with an external possessor spelled out in D, is blocked by the 'Stuttering Prohibition' motivated in Kornfilt (1986)' for Turkish and extended to Eastern Turkic in Kornfilt (2009). Very briefly, this prohibition rules out (among others) immediate sequences of agreement morphemes (whereby the default third person singular agreement morpheme used as a nominal compound marker also counts as an agreement morpheme). Thus, possessed compounds in Turkish exhibit only the agreement morpheme for the possessor, but not the compound marker:

(74) a. yarış araba -sı
race car -cmpdm
'race car'

b. (ben -im) yarış araba (*-sı) -**m**
I -gen race car (-cmpdm) -**1. sg**
'my race car'

We claim that in Eastern Turkic, the following example in Uighur is ruled out by the same Stuttering Prohibition:

(75) *Äli-**niŋ** öl -tür -gän kali -**si**-**m**
Ali-**gen** die-caus-nml ox-**3. sg-1.sg**
Intended**:** 'My ox which Äli killed' (nml: nominalization marker)

Note that in the Turkish possessed compound in (74b), the ill-formed example could be rescued by eliminating one of the suffixes violating the Stuttering Prohibition, namely the compound marker (i.e. the default third person singular agreement suffix). Note further that the agreement morpheme for the possessor cannot be omitted in favor of the compound marker:

(76) *(ben -im) yarış araba -sı
I -gen race car -cmpdm
Intended: 'My race car'

The reason proposed in Kornfilt (2009) for the difference between the omission of

the genuine agreement marker and the omission of the compound marker is based on Case: the noun *yarış* 'race' is viewed as incorporated into the head, and thus is not a DP in need of Case. Therefore, the default agreement marker (=the compound marker) is not needed as a Case licenser. However, the possessor does need its genitive case to be licensed by the agreement marker which it Agrees with. Therefore, the only way to rescue the version of (74b) which violates the Stuttering Prohibition is to elide the compound marker.

No such rescue operation is possible in (75), however. Both of the agreement markers are needed as licensers of separate instances of genitive: the third person singular agreement morpheme is needed as the licenser of the subject of the relative clause, and the first person singular agreement marker is needed as the licenser of the possessor. Thus, neither one of the logically possible rescue operations are possible to save examples such as (75) from the ill-formedness due tot he Stuttering Prohibition. The result is the one we have seen: relative clauses cannot be possessed in Eastern Turkic.

Thus Eastern Turkic, like Turkish, differs crucially from Japanese and Kirghiz in that the subject is raised from *v*P to Spec, TP. Thus as in Turkish, no intervention effect blocks licensing of genitive case on the subject.

8. Conclusion

In this paper we have reviewed a number of similarities and differences between TP nominalizations – structures with a nominal functional projection directly above TP – in Japanese and Turkish, and in section 7, East Turkic languages. We have shown that the two structural subtypes of TP nominalizations, one involving the D layer associated with an external head, the other a [nominal] C/TP have a cluster of distinct properties. The pattern involving a D head as the licenser of the genitive subject appears to be associated with the Transitivity Condition, although so far only Japanese has emerged as a clear example of this pattern. The pattern involving [nominal] C/T is associated with movement of the subject out of *v*P, and thus no Transitivity Condition. T in this pattern appears to inherit the [nominal] feature of C. Agreement in this pattern may appear on either side of the external head, depending upon whether agreement morphology is realized as an independent lexical item, or as features which may be inherited by T.

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Arabic Verbal Nouns as Phonological Head Movement

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Verbal nouns in Arabic have a complex morphophonological structure, as discussed by McCarthy & Prince (1990). Syntactically, on the other hand, they appear rather straightforward, since they behave essentially identical to gerunds in English, so that the analysis of Abney (1987) carries over to Arabic without much modification (cf. Fassi Fehri 1993). However, the two analyses are separate and not directly compatible. Fassi Fehri (1993) assumes an abstract *Ev* affix that nominalizes the verbal stem, without trying to account for the way the actual verbal noun form is derived. McCarthy & Prince (1990) discuss the morphophonological structure without linking it to a morphosyntactic analysis. The goal of this paper is to link a morphophonological and a morphosyntactic analysis of verbal nouns in Arabic and to show how we can derive the phonological structure from the syntactic structure. The basis for the analysis is the observation that syntactic or morphological principles do not play a role in the construction of the phonological form: the form is construed by phonology on the basis of phonological principles only. The morphosyntactic structure only plays an indirect role, through principles governing the mapping from syntax to phonology. Specifically, it is shown that it is not necessary to assume head movement operations that solely serve to enable word formation. It is the mapping from syntax to phonology and the phonology itself that bring about the effect that more traditional analyses try to analyze through syntactic head movement.

1. Introduction

At first sight, Arabic verbal nouns — called *masdars* in Arabic — seem rather uninteresting. Their properties mimic those of English gerunds, with the exception that there is no equivalent to Abney's (1987) Acc-*ing* construction. However, from a morphological / phonological perspective, the picture is quite different. Masdars have an intricate morphological structure, discussed for example by McCarthy & Prince (1990), Fassi Fehri (1993) and Kremers (2007). This structure is interesting in and of itself, but when one considers the implications for the syntax underlying masdars, it becomes clear that masdars are very relevant to syntax and to theories on the syntax/phonology interface.

Like Fassi Fehri (1993), I follow Abney's analysis of English gerunds and assume that masdars are in essence *syntactic* structures: they are formed in syntax by converting a verbal projection into a nominal projection. As McCarthy & Prince (1990) argue, the nominalizer is overt and consists of a vocalic 'melody' of the form /i.a/. By attaching the nominalizer at different levels in the structure, we obtain different constructions: when the nominalizer is attached to V, turning it into an N head, the derivation yields a purely nominal construction (Ing-*of* in Abney's terminology). When the nominalizer is attached to VP, it yields a

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construction that is externally a noun but internally a verb (Poss-*ing*, as Abney calls it).[1]

In both structures, the morphemes that constitute the Arabic masdar are spread throughout the syntactic tree. There is no distinct subtree that contains all morphemes in the masdar form. The standard answer in syntactic analyses to such a situation is to assume that head movement takes place. However, head movement of this type[2] is driven by the need to build a word form; that is, it is essentially phonologically motivated, there is no inherent *syntactic* reason why it should take place.

In this paper, I show that there is in fact no need to assume syntactic head movement in this case. We do not need to create a distinct syntactic subtree containing all and only the morphemes that form the masdar. Rather, we can obtain the correct result by assuming a process of *phonological composition*, which takes the morphemes and combines them into a single word form. The way in which this process operates yields an effect that gives the impression that head movement has taken place in syntax, even though in fact it has not.

2. Theoretical Background

Before starting the discussion of verbal nouns in Arabic, it is necessary to discuss the main theoretical assumptions that I make.

2.1 Bare Phrase Structure and Morphology

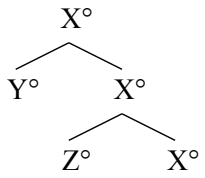
I assume a minimalist framework with merge as the single structure-building operation and with bare phrase structure (BPS). As Chomsky (1995) makes clear, BPS is essentially the kind of structure that we get when we adopt merge and moreover, it is *all* we get. Specifically, traditional X-bar related notions such as 'minimal' and 'maximal' projection are derivative, they are not primitive notions of the theory. A minimal projection is simply the lowest element in a projection chain, an element that is not itself generated by merge. A maximal projection is the highest projection in a projection chain.

One important consequence of this is that there can be no such thing as a complex head. That is, a structure such as the following cannot exist:

[1] As just mentioned, there is no equivalent in Arabic of the Acc-*ing* construction, which is the result of attaching the nominalizer at the level of IP. Why this should be the case is an open question.

[2] I explicitly do not wish to claim that *all* types of head movement are phonological. Head movement that has semantic effects must take place in syntax (cf. Lechner 2006).

(1)



This structure is supposed to be a complex head, i.e., a head that consists of three separate heads, X, Y and Z, which together constitute a complex word. Embick & Noyer (2001), working in the framework of Distributed Morphology, define such a structure as a Morphological Word (MWd),[3] which operates as a unit in syntax and may be subject to DM's morphological operations.[4] The structure in (1) is impossible in BPS because as soon as the head X merges with Z, the resulting projection is no longer minimal, i.e., it is no longer a head in the sense that Embick & Noyer (2001) require. In the structure here, the merger of X and Z yields an intermediate projection X, and the subsequent merger of Y yields a maximal projection of X.[5]

Since BPS does not allow us to single out a structure such as the one in (1), we are forced to adopt an even more radical unification of syntactic and morphological structures than DM proposes. There can be no separate morphological derivational operations other than those that can be defined in either syntactic or in phonological domains. Although extensive discussion of this conclusion would go beyond the scope of this paper (but see Kremers in preparation for details), the analysis that I propose in this paper is inspired by and in line with it.

2.2 Parallel Architecture

Another important assumption that I make is the idea of a parallel architecture. Although at first sight this may seem a rather radical departure from standard minimalism, I believe the idea follows quite naturally, even in current minimalist thinking. Chomsky (1965, 214, fn. 15) states that a linguistic sign is composed of semantic, syntactic and phonological features. This is a rather obvious statement, of course, but it does imply that once a syntactic head is introduced into the syntactic derivation, its semantic and phonological features become immediately available as well.[6]

[3] Furthermore, the individual segments are defined as Subwords (SWd).

[4] Embick & Noyer's (2001) definition of MWd is all the more surprising given the fact that they do explicitly refer to Chomsky's bare phrase structure proposal.

[5] Of course, the structure in (1) may merge and X may project again, in which case the maximal projection would lose this status in favor of the newly created projection.

[6] Note that in DM, this is clearly not the case. What that means is that in DM, the statement that a linguistic sign is composed of semantic, syntactic and phonological features is not so obviously true. This is one reason why, even though the analysis that I develop has a lot of affinity with DM, I do not consider it a DM-style analysis.

If this is indeed the case, there is no reason to assume that the semantic and phonological features are not immediately processed. Why would the linguistic system postpone processing these features if they are available immediately? I therefore assume that as soon as two syntactic elements are merged, their phonological representations are combined by the phonological system.[7] Or, to be more exact, the phonological system *tries* to combine them. It does not always succeed, there are particular cases in which combining two phonological 'chunks' does not yield a licit phonological form. In these cases, the phonological system will postpone spelling out the two chunks until more material becomes available with which they can be combined to form a licit phonological form.

The parallel architecture proposed here has some important differences with the architecture proposed by Jackendoff (2002). Primarily, I assume that there is only one generative system, which is syntax. Jackendoff argues that semantics and phonology form generative systems in their own right, but in the architecture proposed here, phonological (and semantic) operations are still triggered by a syntactic merge operation. The difference with more traditional minimalist models is simply that they are instantaneous, rather than delayed.

Another difference with Jackendoff's system is that the current proposal does not require indices to connect semantic, syntactic and phonological representations. Jackendoff argues that a semantic or phonological structure receives an index which links it to a syntactic structure. Freidin (2003) rejects these indices on the basis of Full Interpretation, and I follow his assessment. Since there is only one generative component in the system that I propose, there is no need for such indices. A head that is merged is at all times linked to its semantic and phonological features. Crucially, there are only two ways to introduce semantic and phonological structure: such structure is either introduced through the merger of a syntactic head, or by principles governing the mapping of syntactic structure to semantic or phonological structure. There is no other way to introduce ("generate") semantic or phonological structure; specifically, the semantic and phonological subsystems cannot generate structure on their own.

Note that this does not mean that the semantic and phonological features are *available* to the syntactic component. The three groups of features are of a different nature and are therefore processed by different subsystems of the grammar. That is exactly what it means to say that semantics, syntax and phonology are different grammar modules: they operate on different types of features and do so by different combinatorial principles. It does *not* mean that the three types of features are separate and must be combined or linked at some point during or after the derivation.

From a minimalist perspective, a parallel architecture of the type sketched here makes sense for another reason: Spell-out is the operation that transfers (partial) structures to the interfaces of the Conceptual-Intentional and the Sensorimotor systems. Note, however, that these systems are in fact non-

[7] And the same goes for the semantic features, although I do not discuss those here.

linguistic. That is, they do not generate linguistic (i.e., semantic or phonological) representations, they *interpret* them. But in order for such structures to be interpreted, they must be created first. It seems reasonable to assume that they are created as soon as their component parts become available, i.e., at the moment when the relevant syntactic heads are merged. Assuming anything else, e.g., that they are created as part of Spell-out, seems stipulative.[8]

2.3 Syntax-Phonology Mapping

As a final point, I make some specific assumptions about the syntax-phonology mapping. Specifically, I adopt two principles proposed by Ackema & Neeleman (2004):[9]

(2) Input Correspondence (IC)
If X selects (a projection of) Y, then Φ(X) selects ΦY).

(3) Linear Correspondence (LC)
If a node X is structurally external to a node Y, then Φ (X) is linearly external to Φ(Y).

Input Correspondence crucially depends on Beard's (1988) *Separation Hypothesis*, which I adopt and which essentially states that the morphosyntactic features of an affix are independent from its phonological form. We can (and should) therefore consider the syntactic and phonological behavior of elements separately. In this vein, Ackema & Neeleman (2004) argue that an affix must not attach to a head in syntax; it can attach to any element of the right category, regardless of its projection level. Only in the phonology is the affix required to attach to a prosodic word. They capture this observation by saying that if an affix X attaches in syntax to a structure Y, the phonological form associated with the affix attaches to the phonological form associated with the *head* of Y. Note that this is essentially the same claim that Abney (1987) makes in his analysis of English gerunds. In Abney's analysis, the affix *-ing* attaches to a projection of V (even an extended projection). Because Abney does not distinguish between syntactic structure and phonological form, he has difficulty ensuring that *-ing* attaches phonologically to the verb, but this is exactly the problem that Input Correspondence is meant to solve.

[8] A parallel architecture as sketched here would also be better equipped to account for look-ahead effects from syntax to phonology of the type described in Richards (2010). An operation in syntax (merge or remerge) may trigger an operation in phonology that leads to an illicit structure. To remedy such a situation, the syntactic operation may simply be blocked, or an additional operation may be required in syntax in order to save the phonological structure.

[9] But see also Sadock (1992) for two very similar principles. The notation Φ(X) refers to the phonological material associated with the syntactic head X.

The second principle that Ackema & Neeleman (2004) propose, Linear Correspondence, is a version of Partee et al.'s (1993) *Nontangling Condition*. In essence, Linear Correspondence says that two sister nodes in the tree are adjacent in the linear structure. If A is a head mapping onto the phonological string «a», and B is a non-head mapping onto «bcd», then the node K(A,B) maps onto «abcd» or onto «bcda», but not onto «bacd» or «bcad». That is, Φ(A) cannot interrupt Φ(B).

For Ackema & Neeleman (2004), these principles are morphological principles (they make the explicit claim that morphology and syntax are distinct structure-building components of the grammar) but as I explain in Kremers (to appear), the principles apply to syntactic structures as well.[10] For Linear Correspondence, this is easy to see: it is a version of the Nontangling Condition, which is foremost a principle that holds between syntactic structures and the linear structures they are mapped onto. The issue is a bit less obvious for Input Correspondence, given that Ackema & Neeleman (2004) propose it specifically to deal with affixes. However, as I discuss in Kremers (to appear), Input Correspondence does not apply to *all* kinds of structures: it only applies to those structures that have a specific prosodic requirement in their phonological forms. Affixes have such a requirement: they require alignment with the right or left edge of a prosodic word. "Words" (in the traditional sense) usually do not have such a requirement, but there are syntactic elements that *do* have such requirements and are therefore subject to Input Correspondence. They occur abundantly in sign languages: elements of this type are realized on an autosegmental phonological tier and are associated with more than one single manual sign, which precludes the possibility of a morphological analysis (see Kremers to appear for examples and discussion).

3. The Data

With the theoretical assumptions out of the way, let us now turn to the data to be discussed. Arabic verbal nouns essentially allow two types of constructions (Fassi Fehri 1993, Kremers 2003):

(4)	a.	ʔaqlaqa-nī	-ntiqād-u	-l-rajul-i	-l-mašrūʕ-a
		annoy-1sg.obj	criticizing-nom	the-man-gen	the-project-acc
		'The man's criticizing the project annoyed me.'			
	b.	ʔaqlaqa-nī	-ntiqād-u	-l-rajul-i	
		annoy-1sg.obj	criticizing-nom	the-man-gen	

[10] Of course, under the assumption that there is only a single structure-building mechanism underlying both syntactic and morphological structures, this follows automatically. But even if one were to maintain a syntax-morphology dichotomy, it would be necessary to assume that Input Correspondence and Linear Correspondence apply to syntactic structures.

li -l-mašrūʕ-i
to the-project-gen
'The man's criticizing the project annoyed me.'

The data discussed in this paper are from Modern Standard Arabic (which is in essence a continuation of Classical Arabic).[11] The properties of masdars can be summarized as follows:

- Regular form (in most verb classes).
- Event structure.
- The subject takes genitive case.
- The object takes genitive case when no subject is present.
- Otherwise, the object takes accusative or PP.

The fact that masdars usually have a regular form is important, as it indicates that they are derived through rules. Masdars have event structure in the sense of Grimshaw (1990), which indicates that they do indeed have a verbal core. When a subject and/or object is present, masdars appear in the so-called *construct state* (e.g., Borer 1999, Fassi Fehri 1993, Siloni 2001, Kremers 2003): the highest argument (subject when present, otherwise object) receives genitive case and the masdar itself takes no definite article. If the object cannot be assigned genitive case due to the presence of a subject (the head of a construct state in Arabic can only assign genitive to one noun), it is realized as a PP with the preposition *li* 'to, for', or it is assigned accusative case.
Masdars can also occur without arguments or with merely a prepositional object. In such cases, the masdar does not appear in construct state (it would not have anything to enter into a construct state with). Instead, it takes a definite article:

(5) al-iʕtirāḍ-u ʕalā -l-ḥukm-i
the-objecting-nom on the-judgment-gen
'the objection against the judgment'

4. Morphological Structure

In Arabic, as in other Semitic languages, a root consists of (usually) three consonants. Stems are derived from such roots by inserting templates consisting of vowels and additional consonants. In this way, a total of 15 verb stems can be derived from a single root. These verb stems, or *classes*, as I will call them, are

[11] Spoken varieties differ substantially from Standard Arabic in some respects, but are also heavily influenced by it. The use and formation of masdars is by and large the same, although details differ.

usually numbered with Roman numbers I-XV.[12] Often, a verb class contributes a specific meaning aspect to the basic meaning of the root (e.g., intensive, reflexive, reciprocal, applicative, causative). However, this system is not completely productive and there are many verb classes whose meanings are lexicalized and no longer related to the root meaning in any regular way. For example, class II expresses intensivity or causation, but the verb *ḥaddaṯa*, which is the class II form of the root ḤDṮ 'to happen' means 'to speak', not 'to make happen' or something similar.

Table 1 provides a list of all verb classes and their masdar forms modeled on the root KTB ('to write'). Note that these forms are for illustration purposes only. It is not the case that all of these forms are lexicalized as verbs. For the root KTB, classes I, II, III, IV, VI, VIII and X are, but the others are not.

Table 1: Masdar forms

class	perfective	masdar	class	perfective	masdar
I	katab	(irregular)	IX	iktabb	iktibāb
II	kattab	taktīb	X	istaktab	istiktāb
III	kātab	mukātaba	XI	iktātab	iktītāb
IV	ʔaktab	ʔiktāb	XII	iktawtab	iktiwtāb
V	takattab	takattub	XIII	iktawwab	iktiwwāb
VI	takātab	takātub	XIV	iktanbab	iktinbāb
VII	inkatab	inkitāb	XV	iktanbay	iktinbāy
VIII	iktatab	iktitāb			

The initial *i-* in classes VII through XV is epenthetic and not part of any morpheme. Looking at the masdar forms in table 1, one thing is immediately obvious: in ten classes (IV and VII—XV), the masdar has the vowel pattern *i-ā* or, in class XI, *ī-ā*. Since the first (morphemic) vowel in the verbal stem of class XI is also long, we may assume that the vowel length is part of the class pattern, not of the masdar. In fact, this is exactly what McCarthy & Prince (1990) assume. They analyze the masdar forms and come to the conclusion that they contain four morphemes:

(6) masdar morphemes:
  a. nominalizer

[12] The Hebrew term for these verb stems is *binyan* (pl. *binyanim*), a term which has gained some use in international linguistic discourse. The corresponding Arabic term is *wazn* (pl. *ʔawzān*) 'weight, measure'. Western Arabist tradition usually uses the terms *stem, form* or *pattern*. I prefer the term *class* because the stems denote different derivational classes (different 'classes of verbalizers', as one reviewer puts it). This use of the term *class* differs slightly from its use in the sense of 'morphome' (i.e., an element added to a root/stem without any link to syntax or semantics) that is common in lexical morphology. One important difference is that in those cases, the root/stem itself is marked as belonging to a specific class (requiring a specific morphome), while here any class marker can in principle combine with any root. Note that the numbering from I-XV is a Western tradition.

b. non-finiteness marker
c. class marker
d. root

The root and class marker together form a lexical entry. For example, the root KTB 'to write' has a class I stem *kataba* 'to write', a class II stem *kattaba* 'to make s.o. write', a class III stem *kātaba* 'to correspond with s.o.', a class IV stem *ʔaktaba* 'to dictate', and several others.

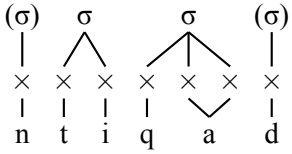
For McCarthy & Prince (1990), the nominalizer is realized in most verb classes by the vowels /a.i/. That is, even though in those masdar forms that have /a.i/ the vowel /i/ is long, McCarthy & Prince assume that the vowel length is not part of the morpheme. Rather, they analyze vowel length as a marker of finiteness: a long stem-final syllable marks non-finiteness, while a short vowel marks finiteness. Although it is true that most masdar forms have a long stem-final syllable, this is only true of one other non-finite verb form: the passive participle of the first class. No other participle has a long stem-final syllable. (Other non-finite verb forms do not exist.) That is, the evidence for a separate non-finiteness marker is rather weak in my opinion, and I therefore assume that the long vowel is in fact part of the nominalizer. As we shall see below, the assumption of a separate non-finiteness marker actually runs into two problems, one of which is discussed in the next section, the other in section 9.

Let us for the moment proceed on the basis of McCarthy & Prince's analysis, including the non-finiteness marker. Once we look at the syntactic structure, it will become clear why this morpheme is problematic. Obviously, the four morphemes are not put together into a single word form by simple affixation. The best way to see how word formation works is to consider an example. The word form *intiqād* in (4) is the masdar of the class VIII verb *intaqada* 'to criticize'. Its morphemes are the following:

(7) Root: /nqd/ Nominalizer: /i.a/
Class VIII: $(\sigma)\sigma_{\mu}$ Non-finite: $-\sigma_{\mu\mu}$
|
t

The phonological structure of *intiqād* is given in (8):

(8)



As discussed by McCarthy & Prince (1990), in Arabic it is necessary to distinguish a prosodic autosegmental tier on which syllable structure is

represented. In (8), the syllabic tier is represented at the top, the segmental tier at the bottom. The structure is built up as follows: the class VIII marker, a syllabic morpheme with one segmental position filled, combines with the non-finiteness marker. Note that this marker is a suffix, as indicated by the hyphen.[13] Therefore, it is suffixed to the class VIII marker. Additionally, an extrametrical syllable is added. This is a language-specific rule of Arabic: all Arabic stems end in an extrametrical syllable.[14]

The segmental elements are intercalated into this syllabic template according to the principle of Left-to-Right Association. The first root consonant /n/ is linked to the coda of the initial extrametrical syllable (which is syllabified with the preceding word in a postlexical process or otherwise an epenthetic /i/ is added, as mentioned above). The second root consonant is linked to the onset of the third syllable, which is the non-finiteness marker, because the onset of the second syllable is already filled by /t/. The third root consonant could in principle be associated with the coda of the third syllable (that is, Arabic phonology allows this) but this would mean that the final extrametrical syllable remains empty. Instead, then, the third root consonant is linked to the onset of the extrametrical syllable (and is then syllabified with either a case ending or with the following word, depending on the formal level of the language utterance). The vowels of the nominalizer are also distributed from left to right: the /a/ is linked to the nucleus of the first full syllable, the /i/ to the nucleus of the second full syllable. Because the second nucleus consists of two positions, the vowel spreads, yielding a long vowel.

What is important to note here is that the form *intiqād* is composed through phonological principles: Left-to-Right Association orders the segments, Alignment ensures that the non-finiteness marker is suffixed to the class VIII marker and the language-specific requirement that each p-word end in an extrametrical syllable ensures that the third root consonant is not contained in the second full syllable (i.e., the third syllable overall). No reference to morphological or other principles are necessary. Ideally, this is always the case: the phonological forms of the elements involved, combined with universal and language-specific phonological principles, determine what the final form looks like. Principles regulating the morphosyntactic structure do not play a direct role: they can only influence the phonological form through the mapping of syntax to phonology.

5. Syntactic Structure

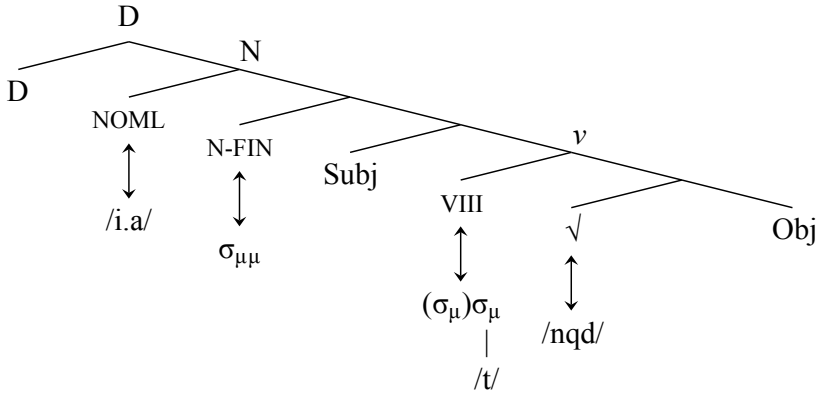
With McCarthy & Prince (1990)'s morphological analysis in mind, let us look at the syntactic structure of masdars. If we want to accommodate all four

[13] In actual fact, I assume that pre- and suffixes are characterized by an alignment requirement (cf. Kremers in preparation). The hyphen is just a convenient way of indicating this.

[14] It may be possible to implement this as a general requirement that the third consonant of a root is right-aligned with the prosodic word, but I will not pursue this option here.

morphemes that McCarthy & Prince (1990) propose, we may assume the following tree structure for the (equivalent of) the Poss-*ing* construction:[15]

(9)



Three of the four morphemes are easily identifiable: the root is obviously the a-categorial lexical element; the class VIII marker is a verbalizing element, so we can identify it with the verbalizer *v*. It is the combination of root plus verbalizer that carries a lexical meaning.[16] Furthermore, the nominalizer is obviously the head that nominalizes the verbal projection, so it must merge last.

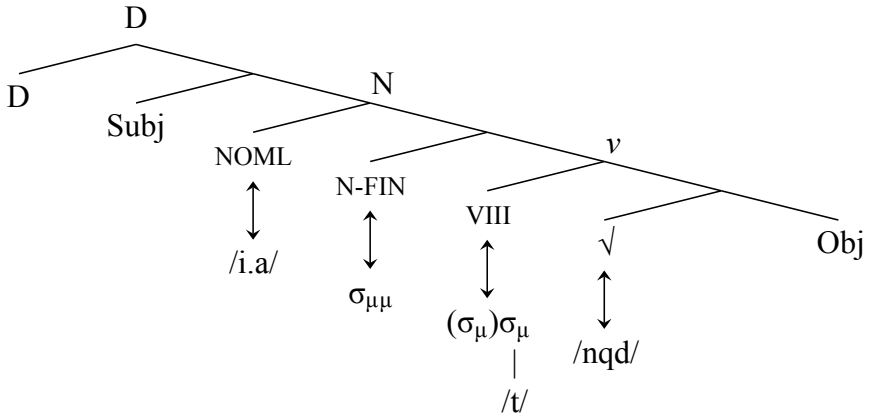
The non-finiteness marker presents us with a bit of problem, however. Although this marker is associated with finiteness, it does not seem feasible to identify it as a T head, because T would be much higher in the structure. It would then merge higher than the nominalizer, but this does not make sense, because once the structure is nominal, it is no longer compatible with a finite/non-finite feature. Alternatively, we could assume that the nominalizer merges higher than T, but then we would expect the equivalent of an Acc-*ing* construction. Since this construction does not exist in Arabic, this analysis is not an option.

The problem recurs in the equivalent of the *Ing-of* construction. Here, the nominalizer merges lower in the structure:

[15] Note that this structure differs somewhat from the one I proposed in Kremers (2007). The structure in the text seems more feasible to me now, but in actual fact, for present purposes it does not really matter which structure we assume. As mentioned in the introduction and as I discuss more extensively below, the crucial point is that there is no distinct subtree containing all four morphemes. No matter what structure we assume for Arabic masdars, it will always have this property.

[16] Which conforms to Marantz' (1997) claim that "[t]he syntactic head that projects agents defines a locality domain for special meanings."

(10)



The problem is that not only the nominalizer but consequently also the non-finiteness marker must be assumed to merge low in the structure. In fact, it would seem that the non-finiteness marker always needs to merge just below the nominalizer. For this reason, we may as well assume that the two form a single head. Let us assume, then, that there is no non-finiteness marker in the structure and that the nominalizer has the following phonological form:

(11) $\sigma_{\mu\mu}$
/i . a/

With that assumption, the syntactic structures of the masdar constructions in (9) and (10) changes, of course, but not dramatically. The non-finiteness marker is removed, other than that the structures remain the same.

The highest head in the trees in (9) and (10) is the determiner D. In Kremers (2003), I argue that construct state nominals are headed by a phonologically null D head that has a [+poss] feature which enables them to assign genitive case. Specifically, I argue that genitive case in Arabic is a structural case that is assigned through a standard Agree process between the D head and the highest nominal in its c-command domain. In the case of masdars, this is the subject if one is present and otherwise the object.

Longobardi (1994) argues that an empty D head cannot survive in syntax. The noun must move to it in order to provide it with semantic content. I adopt this assumption, although in a somewhat different form. First, the notion of an "empty D head" is ill-defined in the current model, and in the sense it was intended in Longobardi (1994), it is useless here. For Longobardi (1994), an empty D head is a head with no phonological content. However, in this sense, *all* heads are empty in the current model, because the phonological features are not part of the

syntactic structure. Morphosyntactically, the construct state D head is definitely not empty, because it contains at the very least a [+poss] feature.[17]

I therefore assume that a D head requires an index, a syntactic feature modeled on the equivalent feature in HPSG: the index feature allows the nominal to be identified syntactically; it consists of a set of φ-features that enable this identification and that are available for agreement. A D head that does not possess an index must obtain one, normally from the noun that it embeds. The D head in a construct state lacks this index feature but obtains it through movement of N to D. When the nominal is a masdar, however, the index is not provided by the lexical V head. Rather, it is provided by the head that converts the projection into a nominal one, i.e., by the nominalizer. I therefore assume that the nominalizer moves to D in order to provide it with an index.

Note that this movement is clearly syntactically driven. The D head lacks an index feature but requires one.[18] Crucially, however, it is not necessary for *all* the heads in the projection to move to D. The root and the class marker are not able to provide D with an index and therefore there is no syntactic trigger for moving them.[19]

6. Syntax-Phonology Mapping in Masdars

With the syntactic structure in place, we can now look at the way in which the syntax is mapped onto the phonology. As mentioned in the introduction, the tree structure in (9) does not contain a distinct subtree containing all three morphemes that are part of the masdar and excluding everything else. The root and the class VIII marker are visually close in the tree, but this is irrelevant, because they do not form a distinct subtree: the subtree encompassing the class VIII marker also contains the object.

This is in fact an important point. The root and the class VIII marker appear to be adjacent in the tree. Note, however, that in BPS, no order is defined in syntactic trees. Even if we take the mapping to phonology into account, the root and the class VIII marker would appear adjacent in the linear string only if two additional conditions are also met: first, the order of linearization would have to be spec-head-comp,[20] and second, the two elements would both have to be

[17] In my analysis in Kremers (2003), it also contains an unvalued [def] feature, which accounts for the so-called definiteness effect: in a construct state, the definiteness of the dependent (genitive-marked) noun determines the definiteness of the entire construct state construction.

[18] More precisely, it would probably be better to say that the D head has an unvalued index feature, which is valued by head movement. The index feature of the nominalizer is valued, as masdars are generally third person singular.

[19] Note also that I assume that syntactic head movement is actually reprojection (Georgi & Müller 2010). As a result of the impossibility of complex heads in BPS, head adjunction would actually create a new complement, raising the original complement to specifier status. Reprojection structures do not suffer from this problem.

[20] Which is of course a given under the LCA, but the LCA is not without its problems. I do not adopt the LCA, mainly because phonological features may factor into the final form a phrase takes

realized on the same autosegmental tier. The first condition is arguably met in Arabic, as Arabic is overwhelmingly a head-initial language, but the second is not: the class VIII marker is realized on the syllabic tier and the temporal extents of both elements overlap.

Additionally, the nominalizer is also not close enough to the root and the class VIII marker to form a distinct subtree. That is, the three morphemes making up the masdar are all separated in the syntactic tree, they do not form a single structure. This of course raises the question how the phonology "knows" that they have to be combined into a single word form. The more or less standard answer in such cases is to say that head movement takes place, but as already explained, I do not wish to take this step, because the relevant movements, V° to VIII and V°+VIII to NOML, have no syntactic trigger.

The solution to this problem, however, is straightforward. The principle of Input Correspondence gives us exactly the tool we need to ensure that the phonology knows that the four morphemes need to be combined into a single word form: the class VIII marker selects the verb, and by virtue of Input Correspondence, Φ(VIII) combines with Φ(V), even though VIII merges not with the V° head directly, but with a projection of V. The same holds for the nominalizer (or rather, the D+NOML complex).

That is, VIII selects V and NOML selects VIII. As a result, the phonological elements linked to these three heads are combined into a single form by the phonology. In the syntax, the heads remain separate, but in the phonology, they end up as a single prosodic word. In other words, we do not need a distinct subtree in syntax in order to ensure that the four morphemes are combined in the phonology. Input Correspondence ensures that this happens.

7. Phonological Composition

Through Input Correspondence, there is a requirement in the phonology that the three masdar morphemes are combined into a single form. The next question we must answer is how this happens. Because each syntactic merge makes available the phonological features of the merged elements, phonological composition takes place in parallel with the syntactic derivation. In this section, I discuss this process in more detail, to see how exactly this happens.

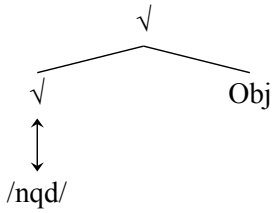
I assume that the phonology does its job in the following fashion: there is a work space of sorts, in which phonological forms are built. Anything that is not a complete phonological form is kept here. Additionally, the phonology builds a representation of the eventual linear string. It is important to note that this string is only an *initial* string. It is not the exact phonetic representation of the string to be

(for discussion, see Kremers in preparation). Furthermore, Abels & Neeleman (2009) show that the LCA is too strong a condition on linearization and that a more permissive system using linearization parameters combined with a restrictive theory of movement provides the same empirical coverage.

uttered. Postlexical phonological processes, for example, do not take place until the derivation (or a phase) is complete.

Let us see what happens when a masdar structure is derived. First, the object and the root are merged, yielding the following syntactic structure:

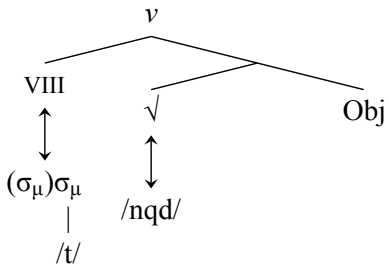
(12)



What happens exactly in the phonology in this step is not relevant for our purposes. I assume that the object is a phonologically complete unit and that it is placed into the phonological string to be formed. The root is not a phonologically complete unit: it does not constitute a licit phonological form, consisting of three consonants only. The root of course selects its complement, but there is no way in which the root can be phonologically integrated with it: the object does not provide any empty slots in which the consonants could be placed. Therefore, we may say that the root is kept in the phonological work space until it can be combined with other elements to create a licit form.

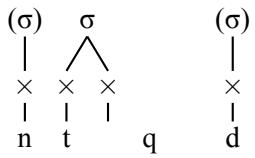
The next step is the merger of the class VIII marker. This yields the following syntactic structure:

(13)



The class VIII marker is also a phonologically incomplete form and is therefore also kept in the temporary work space. Because the class VIII marker selects the root in syntax, the two forms must be combined. Doing this yields the following phonological structure, which, however, is still incomplete:

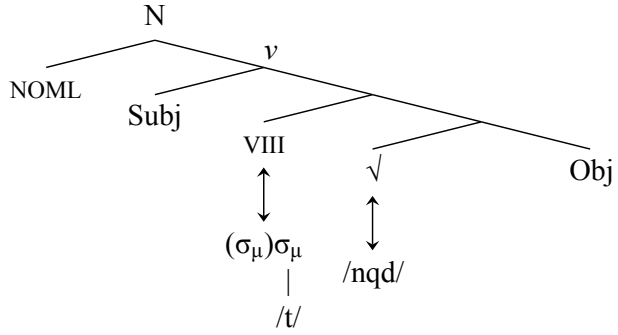
(14)



In this structure, the nucleus of the first full syllable is not filled and the root consonant /q/ is not associated with a slot position. Note that /q/ cannot be associated with the nucleus position, because Arabic phonology does not allow consonants in syllable nuclei. Furthermore, I have already added the stem-final extrametrical syllable. Since this is a general requirement on stems in Arabic, it seems safe to say that it is immediately added.

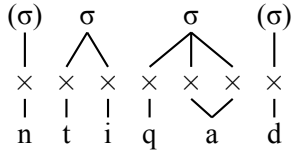
After the class VIII marker, the subject is merged. Phonologically, the subject is treated the same way as the object: it is placed in the linear string, while the class VIII marker and the root, now combined, are kept in the temporary work space. The next step is of course the merger of the nominalizer. This yields the following syntactic structure:

(15)



In the phonology, the vowels /i.a/ and the long syllable are added to the structure. The phonology can now fill the empty nucleus position of the first full syllable and it can link /q/ to a slot position. The resulting structure is (16):

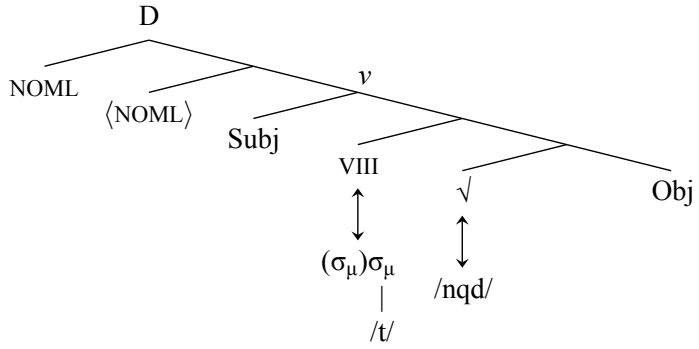
(16)



This structure is complete, there are no unsatisfied phonological requirements. At this point, the form will be placed in the linear string, where the subject and the object are already present.[21] However, this does not complete the syntactic structure yet. There is still the D head that must be merged. Because the structure is a construct state, as described above, this D head requires NOML to D movement. As discussed, only the NOML head moves:

[21] I have ignored the question of linearization here. Every time an element is placed in the linear string, it is necessary to take into account the requirements on linearization, but since Arabic is rather straightforwardly spec-head-comp, we do not need to dwell on this issue here.

(17)



Obviously, when movement takes place in syntax, it should have the ability to change the phonology. Because the element to be moved is already in the linear string, there must be some way for the phonology to delete it again. I will leave the details of this process for future research, but it should be relatively straightforward: since phonology and syntax are built up in parallel, the links between the various syntactic heads and their phonological counterparts remain extant during the derivation (at least until spell-out). Movement consists of a remerge of the moved element not only in syntax, but also in phonology (and of course semantics). Because of the still existing links, it is easy to identify the correct phonological structure that corresponds to the moved head or phrase.

One important assumption must be made here: I assume that phonology can only move *phonological* constituents. In syntax, it is the nominalizer that is moved. This head corresponds to the vowels /i.a:/, but since these do not constitute a phonological constituent, the phonology must move the entire p-word *intiqād*; it cannot just move the vowels.

The phonological effect of the movement operation in the case at hand is actually not visible: the movement is vacuous. This is different for the equivalent of the *Ing-of* construction, in which the nominalizer is merged lower than the subject. In this case, the word form *intiqād* is completed before the subject is merged, so that its initial position in the linear string is in between the subject and the object. It is therefore the syntactic head movement of NOML to D that places the masdar in its final position.

8. The other Masdar Forms

As table 1 shows, the masdars of verb classes IV and VII through XV are all composed in the same manner as the class VIII masdar. The masdars of classes II and V-VI are also formed regularly, but with different morphemes, which are discussed here. I do not discuss the masdars of classes I and III, because these do not follow the regular masdar pattern. Masdars of class I are irregular, they need to be memorized. Masdars of class III are actually not masdars but feminine passive participles. In Classical Arabic, this was an optional way of forming

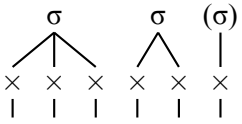
masdars for verb forms generally. In Modern Arabic, only class III uses this masdar formation.[22]

8.1 Class II

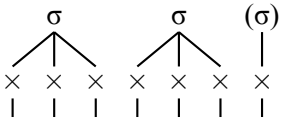
Let us first look at class II. In this class formation, the verbal stem and the masdar appear to have very little in common: the verbal stem for class II of the root KTB is *kattaba*, that is, the second consonant is doubled. The masdar form is *taktīb*, which has a /t/ prefix and does not show the doubling of the second root consonant, which is otherwise typical for class II.

Nevertheless, as I discuss in Kremers (2007), we do not need to assume different class II markers for the verbal and the nominal stem. McCarthy & Prince (1990) argue that the class II marker is a long syllable: $\sigma_{\mu\mu}$. We can use this class marker for both forms. The nominalizer of class II is obviously not /i.a:/ but /ta.i:/. It includes the /t/ prefix, which only appears in the masdar of class II, and an alternative vowel pattern. (18) shows the syllabic templates for both the perfective and the masdar:

(18) a.

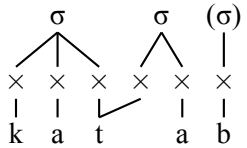


b.



The perfective stem, being a finite verb form, contains the finiteness marker σ_{μ}, hence the short second syllable in (18a). The perfective stem contains two further morphemes: the root and the perfective marker, which is /a/. Adding these morphemes to the template gives us the following structure:

(19)



The /t/ of the root occupies the coda of the first syllable. Note that the /b/ of the root cannot occupy the onset of the second syllable, for the reason that we have already seen in the masdar form *intiqād*: the third root consonant must be

[22] Some class III verbs actually have a regular masdar; e.g., *jāhada* ‘to exert oneself’, ‘to strive’. The masdar of this verb is *jihād*, which shows the regular /i.a:/ pattern.

associated with the final extrametrical syllable. In order to fill the onset of the second syllable, the /t/ spreads, creating the characteristic geminate consonant of class II verbs.

When we insert the nominalizer into the masdar template, Left-to-Right Association ensures that the element /ta/ is associated with the first syllable. The /i/ cannot be associated with the third slot position in the first syllable, because a syllable in Arabic cannot contain two vowels.[23] It must therefore be associated with the nucleus of the second syllable. The third slot position of the first syllable is then taken by the first root consonant, the second root consonant is associated with the onset of the second syllable and the third root consonant with the extrametrical syllable, as usual. In order to fill the third slot of the second syllable, the vowel /i/ spreads. The resulting word form is *taktīb*.

Note that it is not possible to associate the first root consonant with the onset of the first syllable: if that were to happen, it would not be possible to insert the nominalizer /ta.i:/ into the template. Because the first part of this morpheme consists of the segments /t/ and /a/, which must additionally appear in the same syllable (in effect, /t/ must be in the onset), the only way to accommodate the nominalizer and the root is to have /ta/ associate with the first syllable.

We see, then, that even though the verb stem and the masdar form seem very different, they are actually based on the same class II template. The gemination that occurs in the verb stem is not as such a characteristic of class II. Rather, it results from the fact that class II is characterized by a prosodic morpheme $\sigma_{\mu\mu}$. Because of this, the second root consonant occupies the coda of the first syllable, forcing it to spread to the onset of the second syllable. In the masdar form, the onset of the second syllable is filled, so that no gemination can occur.

One remark should be made here: the class III perfective form is *kātaba*, and McCarthy & Prince (1990) argue that the class III marker is $\sigma_{\mu\mu}$ as well. class II and class III are differentiated, McCarthy & Prince (1990) claim, by a lexical rule that associates the second root consonant (/t/ in the case of KTB) with the third slot position in the class marker for class II but not for class III. That is, unlike me, they claim that the second root consonant is associated with the onset of the second syllable. I assume, on the other hand, that in the class III marker, the third slot is lexically marked as a vowel position, so that the root consonant cannot be associated with it. I believe this assumption is supported by the fact that in the class II masdar, the coda of the first and the onset of the second syllable are not linked. McCarthy & Prince (1990) need to argue that their lexical rule does not apply in the masdar. This seems rather stipulative, since it does apply in all other forms of class II, including participles, which, like the masdar, are non-finite. If, on the other hand, we assume that the class III marker is lexically specified as a having a long vowel, we avoid this stipulation.

[23] Arabic does have long vowels (/a:/, /i:/, and /u:/) and diphthongs (/aɪ/, /aʊ/), but these are the result of spreading or of the combination of a vowel plus a glide, never of two vowels.

8.2 Classes V and VI

Let us cast a quick glance at the masdar forms of classes V and VI. The verbal forms of these classes are identical to classes II and III, with an additional prefix /t/.[24] The masdar forms are different, however: they do not contain the characteristic long vowel, and they do not have the vowel pattern /i.a:/. Instead, they are characterized by a vowel pattern /a.u/. Importantly, the /u/ appears in the final position of the word form, while all other syllables have /a/. We may assume that the nominalizer of classes V and VI consists of a short syllable and the vowel pattern /a.u/, of which the second vowel is linked to the short syllable. The first vowel is not linked to any slot position. Additionally, the syllable has an alignment requirement, fixing it to the right edge of the p-word. The /a/ is exempt from this requirement, so that it occupies the first syllable and then spreads.[25]

9. Lexically specified Morpheme Forms

As we have seen, the regular masdar morpheme is /i.a:/. There are, however, a few masdar forms that have an idiosyncratic masdar morpheme: /ta.i:/ for class II and /u.a/ for classes V and VI. How does the grammar "know" when to use which form?

In order to encode this information into the grammar, we obviously need different lexical entries for each masdar morpheme. The default morpheme can be represented as in (20):

(20)
$$\text{MASDAR} \leftrightarrow [\text{N},\text{–cnt}, u\text{V}\ ] \leftrightarrow \begin{matrix}\sigma_{\mu\mu}\\ |\\ \text{/i . a/}\end{matrix}$$

This masdar morpheme selects a projection of category V in syntax. This means that it applies to any verb stem, regardless of its class. For the class II and class V/VI masdars, we need idiosyncratic masdar morphemes, which can be represented with the following lexical entries:

(21) a.
$$\text{MASDAR} \leftrightarrow [\text{N},\text{–cnt}, u\text{V}_{[\text{II}]}] \leftrightarrow \begin{matrix}\sigma_{\mu\mu}\\ |\\ \text{/ta . i/}\end{matrix}$$

[24] Note that the vowel /a/ is not part of the prefix: in the passive of the perfective, which is characterized by a vowel pattern /u.i/, the prefix has the vowel /u/: active *takattaba*, passive *tukuttiba*.

[25] Alternatively, one could assume that the alignment requirement applies to the entire morpheme and that the /a/ is able to spread leftward. I prefer the analysis in the text because it puts the "odd" behavior of the morpheme in the lexical entry of the morpheme itself, rather than having to extend a general principle such as spreading.

b.

$$\text{MASDAR} \leftrightarrow [\text{N},\text{–cnt}, u\text{V}_{[\text{V/VI}]}] \leftrightarrow \begin{array}{c}\sigma_{\mu}\\ |\\ \text{/u . a/}\end{array}$$

These masdar morphemes also select elements of category V, but crucially, they select only elements that have the additional class II or class V/VI feature. Obviously, a variant of the *Elsewhere*-Principle applies: the more specific morpheme is chosen in any given context.

Idiosyncratic morphemes are morphemes that are realized in a specific context. In the current example, the idiosyncratic morphemes are realized in the context of specific verb class features: class II and class V/VI. The way in which this is implemented here puts a clear restriction on the structural environment on which idiosyncratic morphemes may depend. Specifically, an idiosyncratic morpheme can only depend on the category of the element it selects. That is, we cannot posit an idiosyncratic form for a syntactic head X if the context on which X depends is higher in the structure than X itself.

This is an additional reason why I have abandoned the non-finiteness marker: non-finiteness is not only marked in masdars, but also in participles. Arabic has two participles for each verb class: an active and a passive participle. As already mentioned in section 4, only the passive participle of class I has a long vowel, all other participle forms have a short vowel.

That is, we would have to assume an idiosyncratic non-finiteness marker for all participles except one. This marker would be independent of verb class but would instead depend on the conversion morpheme: nominalizer vs. adjectivizer.[26] However, as argued above, both these morphemes would be merged *higher* than the non-finiteness marker, because marking non-finiteness is only compatible with a verbal structure. Once the category of the projection has been changed to nominal or adjectival, it does not make any sense to mark (non)finiteness in the structure.

However, if the non-finiteness marker is structurally lower than the nominalizer or adjectivizer, the current model does not provide for a way to have its realization be dependent on these heads. Merging the non-finiteness marker also means its phonological realization is added to the phonological structure being built up and since at this point the nominalizer or adjectivizer is not part of the structure yet, it is not possible to base the choice for an idiosyncratic morpheme on them.

In short, then, part of the idiosyncrasy we see in the realization of the non-finiteness marker would be impossible to account for. The idiosyncrasy is lexically determined, therefore it must depend on information that is already part of the structure when the non-finiteness marker is merged. Since this is not the case for all relevant information, positing a non-finiteness marker is not possible.

[26] On the assumption that all participles are adjectival in Arabic, which seems a fair assumption, given that they are morphologically so and given the fact that there are no analytic verb forms that include participles (unlike Germanic and Romance languages).

Instead, the idiosyncrasies have to be included in the nominalizer and adjectivizer morphemes directly.

10. Summary and Conclusions

In this paper, I have developed an analysis of Arabic verbal nouns that accounts for both their syntactic and their morphological / phonological structure. The phonological structure largely follows the proposal by McCarthy & Prince (1990), except for the fact that I do not assume the existence of a non-finiteness marker, partly because the empirical evidence for it is weak (the only other non-finite verb forms in Arabic, participles, do not have it), and partly because it is not clear where in the morphosyntactic structure it is located.

Crucial to the current analysis is that the formation of the actual word form is a phonological process. Once it is "known" to the phonology that the relevant morphemes — specifically, the nominalizer, the verb class marker (a.k.a. verbalizer) and the root — have to be combined into a single word form, the phonology can construe this form without requiring further access to morphosyntactic principles.

In the morphosyntactic structure, the three heads that make up the masdar do not form a distinct subtree. In order to let the phonology "know" that they have to be combined into a single word form, however, it is not necessary to assume head movement in syntax. It suffices to assume the principle of Input Correspondence (Ackema & Neeleman 2004), which states that an affix that attaches to a category X in syntax, must attach to the phonological form associated with the head of X in phonology. Because the verb class marker selects the root and the nominalizer selects the verb class marker, the phonology combines these three morphemes into a single form.

This does not mean that *all* head movement is phonological. A verbal noun is a nominal form and as such can (and in Arabic in fact *must*) be embedded in a D projection. The relevant D head may lack an index feature, for example in the case of a construct state, which will trigger syntactic head movement of NOML to D. This head movement may obviously have an effect on the phonological form, made possible by the fact that syntactic structure is linked to phonological structure until the derivation (or at least a phase) is completed.

The idiosyncratic properties of the masdars of verb classes II and V/VI, which have masdar forms that do not follow the general pattern but which are regular for each verb class, can easily be accounted for by assuming idiosyncratic masdar morphemes that select not just an element of category V, but additionally also a class feature. Because of the way the model is set up, such idiosyncratic morphemes can only be sensitive to the feature content of the category that they select, not to the feature content of categories that are not merged yet.

As a whole, the model provides an integral analysis of Arabic verbal nouns, accounting for their syntactic and phonological effects by assuming that word

formation is a phonological process and that head movement operations that serve word formation are phonological in nature.

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Light Verbs, Hidden Relatives, and Control: The Case of Derived Nominals*

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This paper will argue that certain well-known restrictions on raising from and control into *to*-infinitives in derived nominal contexts receive a natural account under the following assumptions: (a.) derived nominals as a default never allow control into or raising from a *to*-infinitive, and (b.) derived nominals that seem to allow control are actually instances of a hidden relative clause containing a silent light verb corresponding to *make*, *have* or *give*. Assumption (b.) will be supported by the novel observation that all derived nominals that allow control into *to*-infinitives are also allowed to appear in light verb constructions involving *make, give* or *have* in control contexts, whereas those that disallow such control are unable to appear in light verb constructions of this sort. Assumption (a.) is derived if nominalising derivational morphemes are functional heads with nominal features which select a verbal substructure (following Marantz 1998, Alexiadou 2009, Borsley & Kornfilt 2000, Borer 2009, Kornfilt & Whitman 2011, amongst others) and if, following Kayne (1999/2000), infinitival *to* is introduced as a functional head above the matrix vP level and is related to the infinitival verb by movement.

1. Introduction

The literature on derived nominals in English has uncovered a striking contrast between the behaviour of raising and control verbs in derived nominal contexts. It has been noted by Chomsky (1970:205) and Kayne (1981/1984:142) that raising out of a *to*-infinitive is uniformly impossible when the raising verb is nominalised.

(1) a. John is likely to leave
    b. *John's likelihood to leave

(2) a. Mary appears to have left
    b. She proved to be a good companion
    c. Your book is certain to be a success

(3) a. *Mary's appearance to have left

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b. *Her proof to be a good companion
c. *Your book's certainty to be a success

Kayne (1981:151, his (71)) also observed that the same impossibility extended to derived nominals in raising to object contexts (judgements on the sentential equivalents in (4) are my own):

(4) a. John believed Mary to have left
b. The editor assumed the article to contain several errors
c. The Board judged your book to be of little interest
d. ?John knew Mary to tell lies
e. The doctor estimated the baby to weigh about 8 pounds

(5) a. *John's belief of Mary to have left
b. *The editor's assumption of the article to contain several errors
c. *The Board's judgment of your book to be of little interest
d. *John's knowledge of Mary to tell lies
e. *The doctor's estimation of the baby to weigh about 8 pounds

Subject control verbs, on the other hand, are not uniform in their behaviour. Some subject control verbs still permit control into a *to*-infinitive under nominalization, but others do not (Kayne 2010; Pesetsky 1991). Object control verbs are also not uniform in their behaviour (*pace* Kayne 1981/1984:154; see Pesetsky 1991:142), although we forgo discussion of such cases until Section 4.

(6) a. John decided to go first
b. Mary attempted to quit her job
c. Bill desires to eat brownies
d. Guy Fawkes planned to blow up parliament
e. John picked to go first
f. Mary continued to annoy me
g. Bill loves to eat brownies
h. Bill hates to eat bananas

(7) a. John's decision to go first
b. Mary's attempt to quit her job
c. Bill's desire to eat brownies
d. Guy Fawkes's plan to blow up parliament
e. *John's pick to go first
f. *Mary's continuation to annoy me
g. *Bill's love to eat brownies
h. *Bill's hatred to eat bananas

Two questions arise from the foregoing data. One is, why does this basic difference between control and raising exist? The second is, what explains the split within the class of subject control verbs? In this paper, I propose a novel answer to the second question which has the welcome side-effect of providing an answer to the first question. In particular, I argue that the contrasts in (7) correlate with the (in)ability of the derived nominals in question to appear in a light verb construction of the form *have (a(n)) X*, *give (a(n)) X* or *make (a(n)) X* in a control context (see (8)). I refer to this correlation as the Light Verb Generalization (given in (9)).

(8) a. John made a decision to go first
b. Mary made an attempt to quit her job
c. Bill had a desire to eat brownies
d. Guy Fawkes had a plan to blow up parliament
e. *John had/made/gave (a) pick to go first
f. *Mary had/made gave (a) continuation to annoy me
g. *Bill had/made/gave (a) love to eat brownies
h. *Bill had/made/gave (a) hatred to eat bananas

(9) The Light Verb Generalization
Those derived nominals which allow subject control into a *to*- infinitive have the following properties:
(a.) Their underlying verbs allow subject control into a *to*-infinitive, and
(b.) They are able to appear in a light verb construction of the form *have (a(n)) X*, *make (a(n)) X* or *give (a(n)) X* in a control context.[1]

My account of the generalization in (9) will have the following steps. First, following Kayne (1999/2000), I will assume that infinitive *to* is an inflectional head introduced in the extended projection of the matrix verb and related to its infinitival verb by movement, rather than selection. I will also adopt the assumption, by now quite widespread in the literature (see *inter alia* Marantz 1998; Alexiadou 2009; Borer 2009; Borsley & Kornfilt 2000; Kornfilt & Whitman 2011) that nominalising derivational morphemes are nominal functional heads that select a verbal substructure. Since such morphemes nominalise the structure, they prevent the introduction of clausal functional heads above them, including infinitive *to*.[2] Hence, by default derived nominals never allow control into a *to*-infinitive. However, I shall argue that those derived nominals which are compatible with a light verb can also be selected by a silent counterpart of the relevant light verb. The introduction of such a silent light verb "reverbalises" the

[1] Thanks to Jim Wood and Marcel den Dikken for urging me to add the proviso *in a control context*.

[2] See Borsley & Kornfilt (2000), where the assumption that nominalization prevents the introduction of clausal functional heads is shown to derive a rich set of correct predictions for the morphosyntax of nominalised clauses.

structure, permitting infinitive *to* to be introduced and allowing for control. When this happens, a relative clause derivation reminiscent of Collins (2006) ensues, with the controlling subject raising into a DP case position to be licensed. In a sense, then, the claim of the present paper is that an example like *John's attempt to leave early* is derivationally close to *the making of an attempt by John to leave early*.

The remainder of this paper is structured as follows. Section 2 introduces and motivates the Light Verb Generalization in more detail. Section 3 describes the analysis sketched above step by step, showing how the resulting system automatically derives the result that raising out of *to* infinitives is invariably impossible in derived nominal contexts in English. Section 4 explores the extension of this analysis to nominalised object control verbs. In Section 5, I show that an important distinction from the literature on derived nominals that might have been thought relevant to this question, namely that drawn by Grimshaw (1990) between event nominals and result nominals, is in fact irrelevant for the control facts. This section also compares the present approach with that of Pesetsky (1991). Section 6 is a short conclusion.

2. Introducing the Light Verb Generalization

The main claim of this section is that the Light Verb Generalization, given in (9) above and repeated below, makes the right empirical cut between those subject control verbs that still allow control into a *to*-infinitive under nominalization and those that do not.

(10) The Light Verb Generalization
Those derived nominals which allow subject control into a *to*- infinitive have the following properties:
(a.) Their underlying verbs allow subject control into a *to*-infinitive, and
(b.) They are able to appear in a light verb construction of the form *have (a(n)) X*, *make (a(n)) X* or *give (a(n)) X* in a control context.

Part (a.) of (10) is unsurprising: it is widely acknowledged that the argument structure properties of derived nominals are usually 'inherited' from their underlying verbs (see Grimshaw 1990, Alexiadou & Grimshaw 2008, *inter alia*). Part (b.) is novel, and is motivated in detail below. Note that the formulation of (a.) sets aside cases of control into *to*-infinitives from nominals derived from adjectives, which do not fall under (10) — unfortunately, I must leave deadjectival cases aside entirely for space reasons.

That (10) is a correct generalization is suggested by the following facts. Firstly, a range of subject control verbs that reject control in their nominal form, as in (11), also reject a light verb construction, as in (12).

(11) a. *John's hatred to leave early

b. *Mary's love to play football
c. *Bill's continuation to annoy me
d. *The Queen's disdain to come to the ball
e. *Sharon's pick to go first
f. *Tim's dare to defy the king[3]
g. *Manchester United's contrivance to lose to Manchester City
h. *Bert's management to open the door
i. *Her friend's condescension to help her plant some corn

(12) a. *John made/gave/had (a) hatred (to…)
b. *Mary made/gave/had (a) love (to…)
c. *Bill made/gave/had (a) continuation (to…)
d. *The Queen made/gave/had (a) disdain (to…)
e. *Sharon made/gave/had (a) pick (to…)
f. *Tim made/gave/had (a) dare (to…) (but see footnote 3)
g. *Manchester United made/gave/had (a) contrivance (to…)
h. *Bert made/gave/had (a) management (to…)
i. *Her friend made/gave/had (a) condescension (to…)

Conversely, subject control verbs that allow control under nominalization are compatible with a light verb construction.

(13) a. John's decision to leave early
b. Mary's aspiration to play football
c. Bill's tendency to annoy me
d. The Queen's refusal to come to the ball
e. Sharon's choice to go first[4]
f. Tim's threat to defy the king
g. ?/%Herbert's regret to leave so early[5]

---

[3] Tim Leffel and Mike Solomon (pc) point out a second sense of *dare* which allows control in nominal contexts, namely when the word refers to a *dare* that the subject has in mind to challenge someone else. In this usage, the subject of *dare* is not construed as the controller of PRO:

(i) Only Bill was foolish enough to take up *Tim's dare to climb the church roof*

This use of *dare* is grammatical in a light verb construction, as expected on the present account.

(ii) Tim made a dare to climb the church roof

[4] For some speakers, the subject of *choice* cannot be construed as controlling PRO in a derived nominal context (Richard Kayne and Jim Wood, pc). For other speakers, including the author, this restriction does not hold. I have no explanation for this variation.

[5] Some examples of control into a *to*-infinitive with the nominal form of *regret* appear somewhat marginal, but others seem much more natural. If the reader dislikes (13g), s/he may compare it to the following example found via a Google search:

h. Bert's intention to open the door
i. Her friend's offer to help her plant some corn

Other derived nominals that fall into the paradigm of (12) and (13) include *desire*, *preference* (for some speakers), *attempt*, *plan*, *plot*, *conspiracy*, *need*, *request*, *promise*, *hope*, *agreement*, *arrangement*, *demand*, *wish* and *struggle*.

Another source of evidence for the Light Verb Generalization is the existence of certain nouns that seem to have no corresponding underlying verb, but which nonetheless appear to allow subject control. Some of these are exemplified in (14).

(14) a. John's idea to sail his supertanker near the coast of Somalia
b. Bill's brainwave to wear his trousers inside-out to save on laundry bills
c. Mary's yen to go to the movies
d. Fonzie's mission to free the squares

Without going into detailed speculations on the structure of examples like (14), which cannot be as simple as they look if it is true that nouns never truly take complements (see Kayne 2008/2010; Collins 2006; Hale & Keyser 2002:13, 250), it is striking that such nouns are also grammatical in light verb constructions.

(15) a. John had an idea (to…)
b. Bill had a brainwave (to…)
c. Mary had a yen (to…)
d. Fonzie had a mission (to…)

We will also see in Section 4 that a subset of cases of object control in derived nominal contexts fall under the Light Verb Generalization.

Having introduced the Light Verb Generalization, we are now in a position to explain the split within the class of subject control verbs exemplified by a comparison of (11) and (13). We will see that the proposed account generalizes straightforwardly to the raising facts introduced in (1), (2), (3) and (5). This is the purpose of the next section.

(i) Former Newcastle defender Hughes expressed his regret to leave Villa, although he is now looking to a fresh challenge in West London.
http://englishbarclayspremiership.blogspot.com/2007_07_01_archive.html

I will proceed on the assumption that such examples are grammatical, although I have no explanation for the marginality of some of them compared with the other examples in (13). *Regret* also has the problematic property of being ungrammatical in a control context with an overt light verb- I have no explanation for this fact.

3. The Analysis, and an Extension to Raising

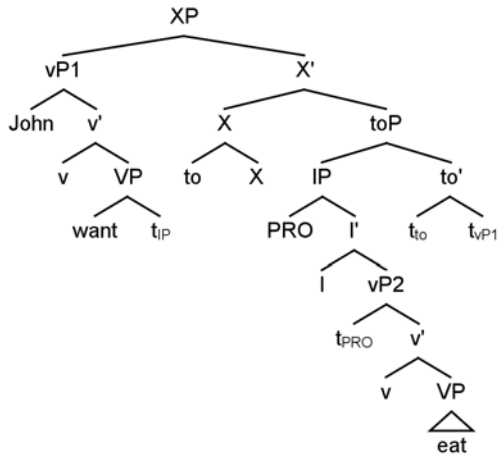
3.1 Infinitive *to*

The first building block in our explanation of the Light Verb Generalization is the theory of infinitive *to* introduced in Kayne (1999/2000). Departing from the traditional assumption that *to* is an element of the embedded clause in *to* infinitives (perhaps an exponent of non-finite T, as in Radford's textbook (2004:42-44)), Kayne argues that *to* is instead introduced in the extended projection of the matrix verb, and is therefore related to the non-finite embedded verb by movement rather than by c-selection. The derivation envisaged by Kayne is given in (16) below (leaving out later stages such as the introduction of matrix T and C).

(16) a. $[_{vP}$ John v $[_{VP}$want $[_{IP}$ PRO I $[_{vP}\ t_{PRO}$ v $[_{VP}$eat]]]]]
b. merge of infinitive *to*:
to $[_{vP}$ John v $[_{VP}$want $[_{IP}$ PRO I $[_{vP}\ t_{PRO}$ v $[_{VP}$eat]]]]]
c. embedded IP moves to spec-*to*:
$[_{toP}$ $[_{IP}$ PRO I $[_{vP}\ t_{PRO}$ v $[_{VP}$eat]]] [to $[_{vP}$ John v $[_{VP}$want t_{IP}]]]]
d. merge of X^0:
X $[_{toP}$ $[_{IP}$ PRO I $[_{vP}\ t_{PRO}$ v $[_{VP}$eat]]] [to $[_{vP}$ John v $[_{VP}$want t_{IP}]]]]
e. head movement of *to*:
to+X $[_{toP}$ $[_{IP}$ PRO I $[_{vP}\ t_{PRO}$ v $[_{VP}$eat]]] $[t_{to}$ $[_{vP}$ John v $[_{VP}$want t_{IP}]]]]
f. remnant movement:
$[_{XP}$ $[_{vP1}$ John v $[_{VP}$want t_{IP}]] [to+X $[_{toP}$ $[_{IP}$ PRO I $[_{vP}\ t_{PRO}$ v $[_{VP}$eat]]] $[t_{to}$ t_{vp1}]]]]

This derivation yields a tree of the sort seen in (17).

(17)



With this theory of infinitive *to* as background, the next subsection makes clear the crucial role of light verbs in licensing control in the context of certain derived nominals.

3.2 Nominalization, Light Verbs and Reverbalization

An established tradition in Distributed Morphology and related frameworks (see Alexiadou 2009, Borer 2009 and others) treats nominalising derivational morphemes as categorizing heads that select a verbal substructure which does not contain any case-assigning functional heads. For the purposes of the exposition below, I will assume that this substructure includes the head responsible for introducing external arguments, little-*v* (implying that this head is distinct from the accusative case assigner, as argued by Koopman 2006), although this assumption is not crucial to the analysis. Hence, the structure of a derived nominal with an embedded infinitive will be as shown in (18).

(18) $[_{nP}$ –NMLZ $[_{vP}$ John $[v$ $[_{VP}$ hate/decide $[_{IP}$ PRO $[I$ $[_{vP}$ t_{PRO} $[v$ $[_{VP}$ eat]]]]]]]]]

Recall that, on Kayne's (1999/2000) theory, the embedded IP must be related to *to* by movement if it is to be licensed. The structure in (18) therefore immediately presents a problem: since the derivational morpheme has nominalised this structure, it should be impossible for infinitive *to*, a clausal functional head, to be introduced. Therefore, any derivation involving control in a derived nominal context is doomed to ungrammaticality unless some way of "reverbalizing" the structure is available.

My claim is that this is precisely why light verbs are crucial to the availability of control in these structures. More specifically, I argue that such a way of "reverbalizing" the structure is available to precisely those derived nominals that are compatible with a light verb: they will allow a silent counterpart of the relevant light verb to be merged, as shown in (19). Those derived nominals that are incompatible with a light verb will not allow this, and so derivations involving derived nominals of this sort inevitably crash (explaining the ungrammaticality of the examples in (11)).

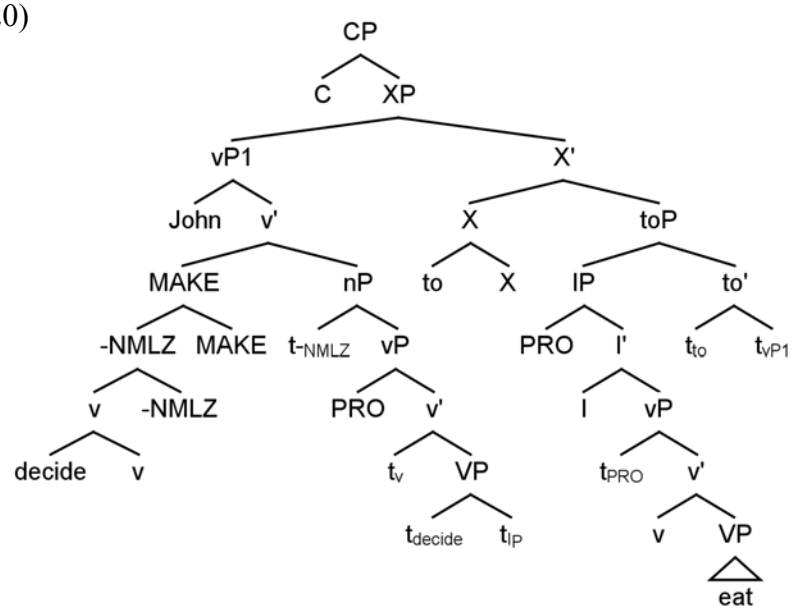
(19) $[_{vP}$ John $[$MAKE $[_{nP}$ –NMLZ $[_{vP}$ PRO $[v$ $[_{VP}$ decide $[_{IP}$ PRO $[I$ $[_{vP}$ t_{PRO} $[v$ $[_{VP}$ eat]]]]]]]]]

We now pursue the derivation of the grammatical cases of control in more detail. I will assume that the silent light verb in (19) is defective in being unable to license finite tense, and hence nominative Case can never be assigned to the matrix external argument (*John* in the case of (19)). However, a grammatical result can be attained if a relative clause derivation ensues, with this external argument receiving Case from one of the nominal projections above the CP level

of the relative clause (cf. Lees 1963; Collins 2006; Koopman 2006 and Kayne 2008/2010, 2010, who also attribute sentential structure to derived nominals).

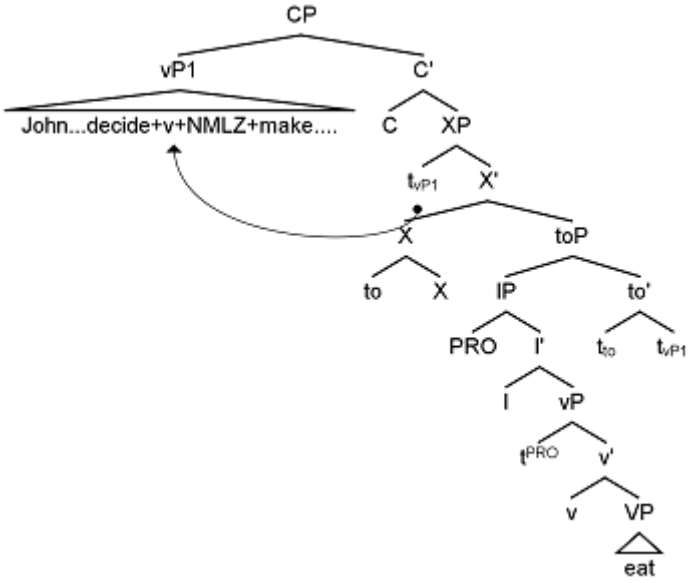
Beginning from the structure in (19), assume that *decide* incorporates into *v*, which in turn incorporates into –NMLZ, which incorporates into MAKE. Thanks to the presence of MAKE, infinitive *to* is introduced, and [$_{IP}$ PRO [I [$_{vP}$ t_{PRO} [v [$_{VP}$ eat]]]]] will raise to be licensed. Merger of the C head will then yield the representation in (20).

(20)



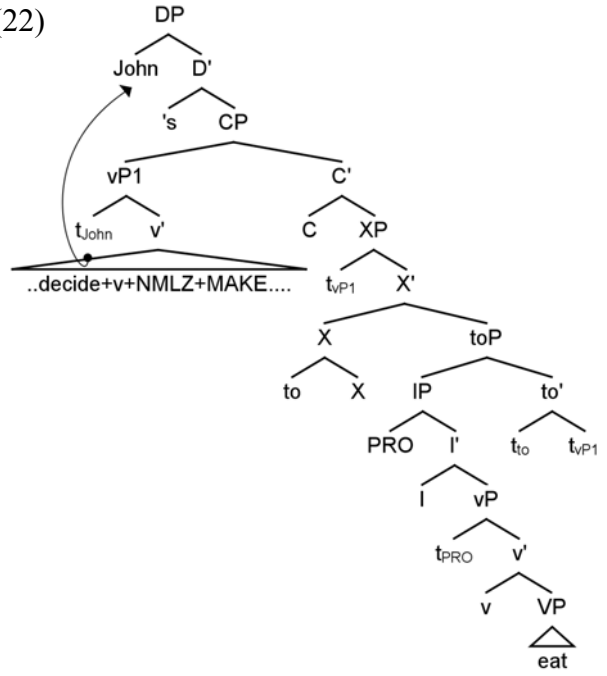
From this point, I follow Collins (2006) in assuming that the vP headed by the light verb moves into spec-CP (I depart from Collins in not assuming that the nominalising morpheme moves to C, since this creates problems in deriving the correct word order in certain object control cases discussed in Section 4). This movement produces the result in (21).

(21)



This movement places the constituent containing the external argument *John* at the edge of the CP phase. Hence, when the nominal projections above the CP of the relative clause are introduced, it will be possible for *John* to be probed by a DP Case assigner, such as the head associated with genitive *'s*. With this, the derivation is complete, as shown in (22).

(22)



The movements in (21) and (22) also make it clear why raising to subject and raising to object from a *to*-infinitive are impossible in English in derived nominal contexts. In raising verb contexts, the vP movement to spec-CP in (21) will not carry the would-be raised argument with it. This follows because the argument in question will still be in its theta position, inside the non-finite IP. Probing and/or moving this argument across the C head will be impossible, so the argument will end up Caseless and the derivation will crash, even if the verb in question is compatible with a light verb construction (as seems to be the case with some such verbs, like *believe* and *assume* — cf. *have a belief*; *make an assumption*).

This section has presented an account of why the Light Verb Generalization holds, thus explaining the split in behaviour within the class of subject control verbs in terms of the licensing of control in derived nominal contexts. The resulting account generalizes straightforwardly to explain the general impossibility of raising in such contexts. In the next section, we consider an extension to object control.

4. An Extension to Object Control

Kayne (1981/1984: 154, his (84)) gave examples of the following sort as evidence that object control is generally impossible in derived nominals.

(23) a. *Mary's compulsion of her husband to quit his job
b. *her encouragement of John to take up linguistics
c. *his conviction of Mary to take up linguistics
d. *their obligation of John to join the army
e. *his inducement of Mary to run away with him

There are two classes of exception to this generalization that I am aware of, however. One, which I shall call the *recommend* class, involves a set of object control verbs whose derived nominals have the following properties: (a) their derived nominal is able to appear in a light verb construction of the form *make (a(n)) X (to…)* or *give (a(n)) X (to…)*; and (b) the preposition introducing the indirect object is *to*, rather than *of*.

(24) a. John recommended to us to take the A-train
b. The general ordered the soldiers to storm the fort
c. The superintendent commissioned the artist to paint his portrait
d. The teacher instructed the students to tidy up the classroom
e. The Queen commanded her armies to defend the realm
f. Bill advised Mary to arrive on time

The examples in (25), with their accompanying light verb constructions, confirm that this class of verbs falls under the Light Verb Generalization.

(25) a. John's recommendation to us to take the A-train (*make a recommendation*)
b. The general's order to the soldiers to storm the fort (*give an order*)
c. The superintendent's commission to the artist to paint his portrait (*give a commission*)
d. The teacher's instruction to the students to tidy up the classroom (*give an instruction*)
e. The Queen's command to her armies to defend the realm (*give a command*)
f. Bill's advice to Mary to arrive on time (*give advice*)

However, the distinction between object control verbs of the *recommend* class and those like *compel*, *encourage*, etc. in (23) cannot be reduced to the Light Verb Generalization. This is shown by the fact that the derived nominal *encouragement* is compatible with a light verb construction, but is nonetheless ungrammatical with object control.

(26) a. *Mary made/gave compulsion (to…)
b. She gave encouragement (to…)
c. *he made/gave conviction (to…)
d. *they made/gave (an) obligation (to…)
e. *he made/gave inducement (to…)

It seems natural to attribute the difference between cases like *encouragement* and the *recommend* class to the fact that the indirect object is preceded by the preposition *of* in the former but by the preposition *to* in the latter (cf. *his recommendation to John* vs. *his encouragement of John*). This idea can be implemented as follows. In the case of derived nominals of the sort in (23), suppose that *of* can be introduced only in the nominal projections above the C head of the relative clause. Then, the problem with *encouragement* might be that it is impossible to extract the object from within the fronted vP headed by the light verb (subjects are at the edge of this vP, and are thus expected to be easier to extract from this position). The preposition *to*, on the other hand, can be thought of as being introduced in the clausal extended projection (as it is in Kayne 2001/2005, for example). Hence, it is expected that it should be possible for *to* to be introduced in the extended projection of the light verb, below the level of CP. The question of extraction from CP to get Case no longer arises, and so the grammaticality of object control with the derived nominal forms of the *recommend* class is predicted.

This line of reasoning will not extend to the second class of exceptions to Kayne's (1981/1984) claim, though. This class of exceptions is exemplified by the verb *endorse* in contexts like the following (brought to my attention by Anna Szabolcsi (pc)):

(27) my enthusiastic endorsement of Chris Barden to become Minnesota's next Attorney General[6]

Other verbs that appear to pattern with *endorse* in this respect are *choose*, *select* and *designate*. All have in common a semantic core involving picking out some individual to fulfil some role.

(28) a. I choose John to lead the expedition
b. He selected Mary to teach theology
c. She designated Bill to be the store manager from now on

(29) a. My choice of John to lead the expedition
b. His selection of Mary to teach theology
c. Her designation of Bill to be the store manager from now on

It is clear that the Light Verb Generalization does not cover this class in its entirety- in particular, *designation* appears to be an exception to it. In addition, even the cases that accept a light verb in some contexts degrade significantly if the indirect object introduced by *of* is included.

(30) a. I made a choice (*of John) (to…)
b. He made a selection (*of Mary) (to…)
c. *He made/gave (a) designation (to…)
d. He made an endorsement (*of Chris Barden) (to…)

One property that differentiates the *endorse* class from those verbs like *compel* which obey Kayne's (1981/1984) generalization is that the former allow a paraphrase involving an infinitival relative clause of the following sort:

(31) a. I choose John as the one to lead the exhibition
b. He selected Mary as the one to teach theology
c. Her designation of Bill as the one to be the store manager from now on

(32) a. *Mary compelled her husband as the one to quit his job
b. *She encouraged John as the one to take up lingustics
c. *He convinced Mary as the one to take up linguistics

Perhaps, then, the *endorse* class are not true object control verbs at all. Rather, sentences like *I choose John to lead the exhibition* might involve a non-finite relative clause in which the portion corresponding to *as the one* is silent. I leave

[6] barden4ag.com/blog/?cat=11

further development of this idea aside for space reasons. If this analysis of the *endorse* class is plausible, then the problem presented by them disappears.

This section has outlined how the approach developed here can be extended to cases of object control, with additional explanatory factors being identified in cases where the Light Verb Generalization does not cover all of the empirical ground. In Section 5, we consider alternatives to the present approach, concluding that Grimshaw's (1990) distinctions between (complex) event nominals and result nominals is irrelevant to the data at hand, and that Pesetsky's (1991) approach also faces some empirical difficulties.

5. Potential Alternatives

Grimshaw (1990) established a distinction between *complex event* nominals and *result/individual* nominals.[7] Complex event nominals are the most 'verbal' in that they are interpreted as events (thus licensing PPs related to events, such as *for an hour* and *in an hour*) and have argument structure. Result nominals lack both of these properties. The following example of the contrast is from Alexiadou & Grimshaw (2008:2, their (1a&c)).

(33) a. The examination of the patients took a long time (Complex event)
b. The examination was on the table (Result/Individual)

This distinction has a number of morphosyntactic correlates which can be exploited as diagnostics for the two classes. Complex event nominals cannot take indefinite determiners, or plural morphology (at least in English — cf. Szabolcsi 1994; Zubizarreta 1987 for exceptions to this in other languages).

(34) a. *an examination of the patients
b. *We demanded the replacements of the broken cups (bad on eventive interpretation)

(Adapted from Alexiadou & Grimshaw 2008:2)

[7] I leave aside the category of *simplex* event nominals- those which seem to denote an event and yet lack argument structure, as they are not crucial to the argument I am about to make. The following example of this class is given by Alexiadou & Grimshaw (2008:2; their (1b)).

(i) The examination took a long time.

One wonders whether these might be structurally identical to result/individual nominals, with the eventive interpretation being coerced, as it clearly can be even for common nouns in examples like (ii) (which might be uttered by a tailor or a dry-cleaner, for example).

(ii) The shirt took a long time.

Result/Individual nominals are compatible with indefinite determiners and plural morphology, and are incompatible with event-related PPs.

(35) a. An examination is on the table
b. Some examinations are on the table
c. *An examination in ten minutes

Furthermore, derived nominals which do not take an overt affix differentiating them from their verbal form (so-called zero-derived nominals) almost always denote results or individuals rather than events (examples adapted from Alexiadou & Grimshaw 2008:3).

(36) a. *(The) frequent report of looting
b. *The guard's stop of the train
c. *Global warming's change of the climate.

If the distinction between complex event nominals and result/individual nominals were the important criterion for whether a derived nominal allows control into a *to*-infinitive or not, one would expect that complex event nominals should be the only ones that permit it. These are, after all, the only type of derived nominal that takes arguments, hence the expectation should be that only complex event nominals can take complement clauses.

However, we can quickly see that this is not borne out. First of all, many zero-derived nominals allow control, although some don't, suggesting that status as a result or individual-denoting nominal is orthogonal to the issue of control into a *to*-infinitive.

(37) a. John needs to have friends
b. John's need to have friends

(38) a. Bill loves to eat brownies
b. *Bill's love to eat brownies

In fact, a great many zero-derived nominals which accept control can be cited, including *desire, attempt, plan, plot, request, promise, hope, demand, regret, wish, offer* and *struggle*.

Similarly, there are derived nominals which can be pluralized and/or appear with an indefinite article while still accepting control into a *to*-infinitive.

(39) a. John's many attempts to woo Sue
b. An attempt to climb Everest
c. Bill's aspirations to go to college and get a degree

The case of *offer* is interesting. Alexiadou & Grimshaw (2008:3, their (4a)) show that *offer* cannot have a complex event interpretation in its non-control use (see (40a)). Yet *offer* readily accepts control into a *to*-infinitive (40b).

(40) a. *The constant offer of credit cards to students
b. Bill's offer to babysit the kids

One could at this point take the opposite tack and suggest that, counter-intuitively, the correct generalization is that only result/individual nominals allow control. But this will not explain why the likes of *love, pick* and *dare* do not allow control into a *to*-infinitive in their derived nominal forms when *desire*, *attempt* and *need* do. Furthermore, at least some derived nominals with *to*-infinitives are compatible with event-related PPs, so that one cannot argue that complex event nominals never permit control into a *to*-infinitive.

(41) The jury's decision in only one hour to acquit the defendant

The same point is made by the existence of object control in some derived nominal contexts, since the presence of an indirect object would imply that the nominal is a complex event nominal (see the examples in Section 4 above).

I conclude that there is no direct mapping between how a derived nominal behaves with respect to Grimshaw's distinction and how it behaves with respect to control into a *to*-infinitive. Pesetsky (1991:138) comes to a similar conclusion, and offers an approach to this matter couched in a general theory of complementation. It is to Pesetsky's theory that we now turn.

Pesetsky (1991) gives an account of the conditions under which control into a *to*-infinitive from a derived nominal is allowed which has the following properties:

(42) a. Verbs s-select various types of complement clause depending on their semantics.
b. The different types of infinitival complement clause are headed by different null complementizers.
c. Some of the null complementizers are [+affix], forcing them to incorporate into the matrix verb.
d. Affixation of a derivational morpheme to a form which already has a null affix is impossible (Myers' Generalization). Therefore, verbs into which a null complementizer has been incorporated will be unable to take nominalising morphology.

Summarizing briefly, Pesetsky (1991) argues that factive verbs and implicative verbs (those verbs for which the entailments concerning the embedded clause

depend upon the exact content of the matrix[8]) take complements whose complementizer is null and [+affix], and that these verbs therefore should not permit control into a *to*-infinitive under nominalization. The two verb classes that should permit control into a *to*-infinitive on Pesetsky's account are his *want* class (a class of verbs which permits raising to object and control but disallows passives of raising to object cases, as shown in (43)) and his *demand* class (a class of verbs which rejects raising to object and passives of raising to object cases, but accepts subject control, as shown in (44)).

(43) *want*-class Paradigm (Pesetsky 1991:17; his (63))
  a. Mary wanted Bill to read the book
  b. *Bill was wanted to read the book
  c. Bill wanted to read the book

(44) *demand*-class Paradigm (Pesetsky 1991:18; his (68))
  a. *Mary demanded Bill to read the book
  b. *Bill was demanded to read the book
  c. Bill demanded to read the book

The non-factive members of the *want* class include *desire*, *need*, *wish*; these are correctly predicted to allow control into *to*-infinitives in their derived nominal forms. Members of the *demand*-class include *choose, consent, decide, demand, endeavour, hope, intend, need, offer, petition, plan, prepare, promise, propose, refuse, request, resolve, struggle* and *undertake*, which are also correctly predicted to allow control into a *to*-infinitive under nominalization. However, *contrive* and *strive* also fall into this class, and, at least in my judgement, these verbs do not allow such control:

(45) a. *John's strife to finish his homework
  b. %John's contrivance to bang his head on the doorframe[9]

Another problem for Pesetsky's approach is that, while some factive verbs (such as *love* and *hate*) do indeed reject control into a *to*-infinitive under nominalization, at least in my judgement there are some that do not. These include *prefer* and *regret*.

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[8] An example would be *manage*:

(i) I managed to open the door (⊨ I opened the door)

(ii) I didn't manage to open the door (⊭ I didn't open the door)

[9] Pesetsky (1991:99) notes that *contrivance* is not accepted in control contexts by all speakers, but he does not note the issue caused by *strife*. The fact that there exist some speakers who accept control with *contrivance* may turn out to be problematic for the Light Verb Generalization, if it turns out that those speakers reject, as I do, examples like **he made/gave/had a contrivance (to…)*.

(46) a. %John's preference to stay up late
b. %His regret to be leaving Villa

Pesetsky (1991:99) cites an example similar to (46a) as ungrammatical, however, so that it seems that *preference* causes problems for the Light Verb Generalization too in the case of some speakers (unless it turned out that speakers who reject (46a) also reject *John has a preference (to…)*).

Another problem shared by both Pesetsky's approach and mine is provided by the implicative verbs *fail* and *neglect*.

(47) a. John failed to win
b. John neglected to fill out the form

(48) a. John's failure to win
b. %John's neglect to fill out the form[10]

These are problematic for Pesetsky since implicative verbs are predicted to reject control, and they are problematic for the present approach because the derived nominals in (48) cannot appear in a light verb construction:

(49) a. John *made/*gave/%had (a) failure (to…)[11]
b. *John made/gave/had (a) neglect (to…)

Pesetsky's (1991:166) solution to this problem from his perspective begins from the observation that *fail* licenses negative polarity items in its complement clause (he does not consider *neglect*, but the same reasoning will apply to this case).[12]

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[10] Examples with *neglect* are at best marginal for me, but a number of the attendees at CUNY Syntax Supper accepted them. In addition, a Google search uncovers many examples, many but not all of which seem to come from the legal context. Take the following example from http://www.facebook.com/group.php?gid=2201526889

(i) Noting his neglect to accredit this phrase to its rightful owner…

[11] Jim Wood (pc) has brought to my attention web examples which seem to show that some speakers allow *have a failure (to…)*. The challenge presented by speakers who do not allow this still remains, however.
http://www.wired.com/gadgetlab/2009/01/finally-guitar/

(i) Did Disney have a failure to come through with this hyped product?

[12] As Jim Wood points out (pc), NPIs are something of fallible test for the presence of negation, since they are licensed in numerous non-negative contexts. Thankfully, however, Pesetsky's argument can be made on the basis of more secure negation tests. Wood observes that *not even* is grammatical in the complements of these verbs, for example.

(i) *John did his homework, not even the easy parts

(ii) John didn't do his homework, not even the easy parts

(50) a. John failed to ever do anything about the problem.
b. John neglected to ever do anything about the problem.

To explain this fact, he proposes that *fail* selects not the normal complementizer that goes with implicative verbs, but rather a special negative complementizer. Since this complementizer is semantically contentful, it need not incorporate into the matrix verb, hence nominalization is not prevented and (48) is correctly predicted to be grammatical. We could adapt this idea to our account in the following way. Assume that the *to* introduced above verbs like *fail* and *neglect* is a special, negative *to*, which I will term to_{NEG}. There is reason to believe that the head that hosts sentential negation in English can be introduced lower than infinitive *to*, as can be seen from examples like (51).

(51) I want to not have to go to this party

I propose that to_{NEG} shares with ordinary English negation the ability to be introduced at a position lower than ordinary *to*, in such a way that to_{NEG} can be introduced and related to the embedded non-finite verbs in examples like (48) before the nominalising morpheme is merged. This will explain how these examples can be grammatical despite the ungrammaticality of (49).

I conclude that Pesetsky's (1991) approach, while interesting, is not without counterexamples, and that it is worthwhile to try to build an account on an alternative generalization.

This section has reviewed two alternatives to the analysis pursued in this paper, and concluded that neither is without problems. [13,14]

6. Conclusion

In this paper, I have given an account of well-known restrictions on control into and raising from infinitives in derived nominals in English. As a default, derived nominals cannot license infinitives at all, because nominalization prevents the introduction of infinitive *to*, which is a functional element of the extended

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(iii) John failed to do his homework, not even the easy parts

[13] I wish to emphasize, however, that it may also be fruitful to attempt to update Pesetsky's approach, perhaps by recasting complementizer incorporation as domain-extending head movement. I leave such an attempt for future work.

[14] A further alternative was suggested to me by Louise McNally (pc) during the question period after this paper was given at JeNom 4. She suggests that the relevant distinction might be between derived nominals that are count nouns (which would allow control) and those that are mass nouns (which would not). While we have seen a few counterexamples to this generalization, including mass nouns that accept control such as *yen*, *advice* and *neglect*, and count nouns that do not such as *love*, this hypothesis otherwise matches up with the data very well, and is certainly worth pursuing. I must leave such pursuit for future work, however, since it is not yet clear to me how to account for McNally's suggested generalization theoretically.

projection of the matrix verb (Kayne 1999/2000). However, those derived nominals which can be combined with a light verb can be "reverbalized" by a silent light verb, allowing *to* to be introduced, whereupon a relative clause derivation ensues. These derived nominals thus allow control into a *to*-infinitive, but derived nominals which cannot combine with a light verb will not allow this (this is known as the Light Verb Generalization). Raising to subject and raising to object are never allowed in derived nominal contexts, however, because would-be raised arguments cannot be extracted out of the relative clause from their positions deep within the embedded clause. An interesting consequence of this is that it derives the asymmetry between control and raising in a way compatible with movement approaches to control (Hornstein 1999 et seq.).

A number of open questions remain. In the case of English, there are at least two major ones. The first is that of the conditions under which deadjectival nominalisations are permitted, which we set aside for space reasons at the beginning of Section 2. The second, raised by two anonymous reviewers, is that of gerundive nominalizations. As shown in (52), these seem to be more permissive than derived nominals in allowing raising, and also allowing control with verbs whose derived nominal forms do not allow control.

(52) Someone joked about **me seeming to have a weight on my stomach**.[15]

(53) ?**Him hating to play football** is understandable.

I cannot address this issue in full here, but it is clear that my approach will have to rely on the "clausal" part of the structure of gerunds being larger than that of derived nominals, such that infinitive *to* is able to be introduced before nominalisation by *–ing* takes place. That gerunds do indeed have more clausal structure than derived nominals is already suggested, of course, by the fact that the former allow accusative Case assignment while the latter do not.

Crosslinguistically, even the basic descriptive work remains to be done. According to Tom Leu and Marcel den Dikken (pc), in German and Dutch only a handful of derived nominals allow control into an infinitive, such that it is difficult to make any generalizations about when control is allowed and when it is not. Inna Livitz (pc) informs me that Russian derived nominals pattern to a large extent with those of English in terms of which allow control into an infinitive and which do not, although whether this can be correlated with the ability of the derived nominals in question to be selected by a light verb in Russian is unclear at present. Beyond this, little is known, so a great deal of crosslinguistic work is called for.

On the basis of the present account, one would expect languages which have more general options for covert reverbalization to be more liberal than English in allowing control in nominalizations, but that raising should be disallowed in all

[15] http://flyladyforum.blogtalkradio.com/index.php?showtopic=18378&mode=threaded&pid=441567

languages in which argument extraction from relative clauses is unavailable so long as the infinitives in the language in question are comparable to those of English in the relevant ways (relevant here will be Hebrew, which, as shown by Sichel (2007), allows raising in derived nominal contexts- the present account leads to the expectation that this difference from English will be traceable to a difference in the structure of Hebrew infinitives or Hebrew relative clauses, or both).

Since the particular properties of infinitive *to* in English play an important role in the account, one would also expect the possibility of control in derived nominal contexts to covary crosslinguistically with the position of infinitive morphology in the clause. Whether any of these expectations are met or not is a question I must leave for future research.

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