

On the derivation of nominals in *-(y)lş* and *-mE* in Turkish

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Abstract.

In this paper we address the problem presented by the syntax and semantics of two types of nominals derived by the suffixes *-(y)lş* and *-mE* in Turkish. We show that each derived nominal form in *-(y)lş* and *-mE* can be considered as originating either in a verb or in a clause and we identify the criteria that can allow to determine what kind of derivation a given form is an example of. Adopting a lexicalist stance, we then show how a Generative Lexicon can provide an adequate representation of the semantics of the base verb and how lexical rules we designed capture the semantics of the derived nominals. We finally show how these rules allow various predictions to be made regarding productivity and compatibility with matrix predicates.

Key words: Turkish; nominalizations; Generative Lexicon; lexical rules.

1. Introduction

The aim of this paper is to investigate the syntax and semantics of two nominalizing Turkish suffixes, which are realizations of the morphemes $\{-lş\}$ (whose allomorphs are *-(y)uş*, *-(y)üş*, *-(y)lş* *-(y)iş*) and $\{-mE\}$ ¹ (with allomorphs *-me* and -

¹ Capitals are used to indicate an underspecified vowel or consonant in the representation of a morpheme. The realisation of the vocalic nucleus in the suffixes mentioned is ruled by vowel harmony: E is realized as /e/ or /a/, depending whether the base ends in a front (/i,e,ü,ö/) or back (/ı,u,a,o/) vowel respectively, and I is realized as a high vowel /u,ü,i/ depending whether the base ends with /o,u/, /ö,ü/, /a,ı/ or /e,i/ respectively. Other underspecified representations include D, which is underspecified for voice and whose value is given by assimilation (and is consequently realised as /t/

ma), and to analyze the correlated opposition between the syntax and semantics of the nominalized forms derived by the affixation of these suffixes, which *prima facie*, are very productive. The phonology of the allomorphs is constrained by vowel harmony, and *y* is an optional linking consonant generally in between two vocalic phonemes². (1) (2) (3) and (4) are examples of nominals derived by these suffixes:

- (1) yaz-ma
write -mE
manuscript
- (2) gör --üş
see lş
sight / point of view
- (3) Ahmet'in araba -s -i -n -i kullan-ma -s -i
Ahmet GEN car LC POS LC ACC drive mE LC POS
Ahmet's driving of his car

or /d/), and K which is realised as /k/ when it is in word final position (or coda of a suffix), or /ğ/ when it is followed by the vocalic onset of a suffix. The suffix *-DIK* is an example of a suffix whose phonological realisation is completely underspecified, see example (6). It must be added that if an accusative or dative suffix is attached to *-mEK*, the expected /ğ/ undergoes palatalization and is spelt *y*, like in (5) below.

² Linking consonants appear between the final vowel of a base and the initial vowel of a suffix. More specifically, *y* appears before accusative {I} and dative {E} suffixes:

- (a) ev-i vs. baba-y-ı (b) ev-e vs. bahçe-y-e
house -ACC father y-ACC house-DAT garden-y-DAT

The other linking consonants are *s*, which appears before 3rd person possessive suffixes (see 2.2.1), *n*, which appears before genitive suffixes and is obligatory in between the 3rd person possessive suffix *-i* and all case morphemes :

- (c) ev -i (d) ev -i -n -de
house POS PER3 house POSPER3 LC LOC
his/her house in his/her house

Finally before the distributive suffix *-Er*, the linking consonant is *ş*:

- (e) üç -er (f) iki-ş-er
three-Er two-ş-Er
three each two each

- (4) Ahmet'in araba-s -ı -n -ı kullan-ış -ı
 Ahmet GEN car LC POS LC ACC drive ış POS
 Ahmet's driving of his car

In (1) and (2) above *yaz-* and *gör-* are the verbal roots to which various other affixes can be attached, and both forms *yaz-ma* and *gör-üş* are the derived forms, which unambiguously have nominal properties. The same goes for *kullan-ma* and *kullan-ış* in (3) and (4) with *kullan-* as the verbal root.

The picture is not as clear as this simple presentation might suggest though, as it has been known for quite a long time now, following observations going back to [Chomsky \(1970\)](#), that derived nominals of form $[[X]_{V\text{-affix}}]_N$ can either be derived from a verb (in which case they are lexically derived) or from a clause (in which case they are syntactically derived). Therefore, it is necessary to examine whether nominals such as those in (1) to (4) are either lexically derived or syntactically derived³. Consequently, in section 2, after showing that these derived elements of form $[[X]_{V\text{-affix}}]$ undoubtedly have noun properties, we will then briefly present the empirical data and the various criteria that can help us decide what kind of derivations (lexical or syntactic) the forms in (1) to (4) are examples of. In section 3, we will provide an outline of a Generative Lexicon, which is the framework in which our theoretical modelling is cast. We will then propose in section 4, a modelling of the empirical phenomena described, and show how lexical rules can generate the two nominalized forms, provide an explanatory account for their semantics, and allow various predictions. Section 5 is a brief comparison between relevant English and Turkish derived nominals and section 6 is a discussion and an assessment of our theoretical stance and of our analyses. Section 7 concludes.

2. The derived nominals in *-me* and *-ış*

³ The theoretical stance of this analysis, in which there are two distinct potential origins for the derived nominals studied here (one in the lexicon, the other in syntax), is used in the presentation of the phenomena, but it will not be followed in our theoretical approach. We will show that both nominals can be analyzed as originating in the lexicon, the so-called “lexically derived” nominal consisting of an unexpanded word, the so-called “syntactically derived” nominal heading a clause.

2.1. Nominalization suffixes

The two suffixes under study here, which are exemplified by (1) to (4) above, are not the only nominalizing suffixes of Turkish. The other relevant⁴ suffixes that Kural (1998) recognizes are the suffixes *-mEK*⁵, *-DIK* and *-EcEK*, illustrated by (5) (6) and (7) respectively (all examples from Kural (1998)):

- (5) Ahmet araba kullan-may-ı ist-iyor.

A.-NOM car use -mEK-ACC want-ASP-PER-3RD.

Ahmet wants to drive a car.

- (6) Ayşe Ahmet-in uyu-duğu-n-u anla-dı.

Ayşe Ahmet-GENsleep-DIK-SG 3rd -LC-ACC realize-PT- PER-3RD

Ayşe realized Ahmet had slept / was sleeping.

- (7) Ahmet okul-a gid-eceği-n-i unut-tu.

Ahmet school-DAT go-EcEK SG 3rd- LC-ACC forget-PT- PER-3RD

Ahmet forgot that he would go to school.

⁴ We say “relevant” because the nominals derived with these suffixes head clauses just as the two suffixes *-mE* and *-(y)Iş* do. Yet, they are not the only nominalizing suffixes, as some other suffixes, most of which are not productive, derive nouns from verbs (for a list of these suffixes see Göksel and Kerslake (2005, 53)).

⁵ It is necessary to state how *-mE* and *-mEK* differ. First *-mE* can receive plural, genitive and possessive suffixes (see table1), whereas *-mEK* cannot. Second, *-mEK* is used in PRO control clauses, whereas clauses in *-mE* have a subject (examples from Göksel and Kerslake (2005 : 413):

- (a) Sokağ-a çık-mak ist-iyor-um.

[street-DAT PRO go out-mEK] want ASP PER1st

I want to go out.

- (b) Sokağa çık-ma-n-ı ist-iyor-um.

[street-DAT go out-mE-PERS2ndSG]ACC want ASP PER1st

I want you to go out.

(the absence of case marking on the object of (a) is possible with the verb *iste*-(want)).

Another difference is that *-mEK* is the suffix used in citation forms.

Kural's taxonomy, (in which *-mE* and *-mEK* are infinitives, *-DIK* and *-EcEK*⁶ reflect tense opposition (past and future respectively), and *-(y)lş* is a gerundive morpheme), is a reassessment of Underhill's previous analysis (Underhill (1976)), in which the suffixes *-mE*, *-DIK* and *-EcEK* were analyzed as gerundive morphemes, *-mEK* as an infinitive morpheme and *-(y)lş* as a nominalizer. Erguvanlı Taylan (1997), whose inquiry focuses on the syntactic, semantic and pragmatic factors that explain the distribution of three of these suffixes (*-mE*, *-DIK* and *-EcEK*) argues that the relevant factor in the choice of these nominalizers is the notion of deontic and epistemic modality. Other authors have provided analyses of these morphemes, notably Kornfilt (2003), Csató (2010), Kornfilt and Greenberg (2000), Borsley and Kornfilt, (2000) and van Schaaijk (1999). Most of these studies were devoted to more than two suffixes, whereas our focus here will be only the two suffixes *-mE* and *-(y)lş*. The forms derived by affixation of *-mE* and *-(y)lş* undoubtedly are nominals. We first briefly present the nominal properties of all these nominalized forms. They are affixation of nominal possessive suffix, case marking and genitive marking of subjects.

2.2. The nominal properties of all derived nominals in *-mE* and *-(y)lş*

2.2.1. Affixation of the nominal possessive suffix

The various forms of the possessive suffix are shown in table 1 below:

Possessive suffix	Person 1	Person 2	Person 3
Singular	<i>(l)m</i>	<i>(l)n</i>	<i>(s)l</i>
Plural	<i>(l)mlz</i>	<i>(l)nlz</i>	<i>(lEr) l</i>

Table1. Possessive suffixes

A characteristic property of nouns in Turkish is that they can receive a possessive suffix. An example of attachment of the possessive suffix to a noun is given in (8) below:

⁶ In his study, Kural convincingly argues that *-K* in these suffixes is the realisation of COMP.

- (8) araba -m
car POS
my car

As indicated by (3) and (4) above (repeated here under (9) and (10)), and also by (11) and (12) below, the possessive suffix can be attached to both nominals derived by *-mE* and *-(y)Iş*:

- (9) Ahmet'in araba -s -ı -n -ı kullan-ma -s -ı
Ahmet GEN car -LC - POS -LC-ACC drive -mE -LC-POS
Ahmet's driving of his car
- (10) Ahmet'in araba-s -ı -n -ı kullan-ış -ı
Ahmet GEN car LC POS LC ACC drive Iş POS
Ahmet's driving of his car
- (11) Ahmet'in çalış-ma -s -ı
Ahmet GEN work mE-LC-POS
Ahmet's work / Ahmet's working
- (12) Ahmet'in gör -üş -ü
Ahmet GEN see Iş POS
Ahmet's point of view / Ahmet's seeing

2.2.2. Case marking

In the same way as non-derived nouns are case-marked, both nominals derived by *-mE* and *-Iş* receive case affixes such as ablative and accusative, *-DEn* and *-I* respectively, as indicated by (13) (14) (15) and (16) below⁷:

- (13) aç- -ıl -ış -tan sonra
open PAS Iş ABL after
after the opening

⁷ We only provide examples of ablative and accusative suffixes, but both nominals in *-(y)Iş* and *-mE* receive the full range of case suffixes, genitive, accusative, locative, ablative, dative.

(14) aç -ıl -ma -dan önce
 open PAS mE ABL before
 before the opening

(15) Ahmet'in araba -s -ı -n -ı kullan-ış-ı -n -ı gör -dü -
 m.

Ahmet GEN car LC POS LC ACC drive 1st POS LC ACC see- PT
 PER 1st

I saw Ahmet drive his car.

(16) Ahmet'in gel -me-s -i -n -i ist -iyor -um.

Ahmet GEN come mE LC- POS LC ACC want ASP PERS 1st

I want Ahmet to come.

2.2.3. Subjects: genitive vs nominative

Generally the subject of a finite clause is in the nominative case (phonologically null \emptyset) as exemplified by (17):

(17) a. Su- \emptyset ılık -tı.

water-NOM tepid PT

the water was tepid.

b. Bugün Ahmet \emptyset Ankara -y -a gid -iyor.

Today Ahmet NOM Ankara LC DAT go ASP

Today Ahmet is going to Ankara.

Contrary to the subjects of verbs which head the VP of a finite clause, the subjects of nominals in *-mE* and *-(y)lş* bear the genitive case whatever the form of the nominal, as exemplified by (9) to (12).

The three properties above (affixation of possession affix, case marking and subject in the genitive) clearly show the nominal nature of the forms in [V-mE] and [V-(y)lş].

Some derived nominals, along with the three properties above, display other properties: number marking, insertion of a determiner, and genitive case on the internal argument of the base verb. These properties typically characterize nominals which are generally analyzed as lexically derived, for instance in [Kural, \(1998\)](#),

Borsley and Kornfilt (2000), or Kornfilt and Greenberg (2000). It must be emphasized that the opposition between lexically and syntactically derived nominals does not correspond to the opposition between nominals in $-mE$ and nominals in $-(y)/\text{ş}$. Consequently, lexically derived nominals can belong either to the $-mE$ or to the $-(y)/\text{ş}$ type. We now present the specific nominal properties of nominals that are generally analyzed as lexically derived. The study of the relevant factors that are responsible for the difference among individual lexical items is deferred until section 4.2.

2.2.4. Number

The plural morpheme $\{-lEr\}$ (with allomorphs $/ler/$ and $/lar/$) can be attached to lexically derived nominals as exemplified by (18) and (19) but it cannot be attached to syntactically derived nominals as shown in (20) and (21)⁸:

(18) yaz-ma-lar

write -mE -PL

manuscripts

(19) gör-üş-ler

see -ış -PL

sights / points of view

(20) *Ahmet'in araba -s -ı -n -ı kullan-ma -lar -ı

Ahmet GEN car LC POS LC ACC drive mE -PL POS

(21) *Ahmet'in araba-s -ı -n -ı kullan-ış -lar -ı

Ahmet GEN car LC POS LC ACC drive ış -PL-POS

2.2.5 Nominal determiner

A nominal determiner is accepted by nominals which are lexically derived, as indicated below by (22) and (23), and, *ceteris paribus*⁹, it is not so easily accepted by syntactically derived nominals, as exemplified by (24) and (25):

⁸ For reasons that are not clear, it seems, as noted by one anonymous reviewer, that the degree of unacceptability of (20) and (21) is reduced if the internal argument of the base verb of the nominal is omitted. However, for most speakers, these examples remain awkward at best without the internal argument of the verb.

- (22) bu gör-üş
 this see-Iş
 this sight/point of view

⁹ It must be noted however that a change in the word order brings about changes in acceptability. As one of the reviewers remarked, (a) and (b) are fine whereas (c) and (d) are not:

- (a) bu uzun bekle-y-iş
 this long wait-LC-Iş
 this long waiting
 (b) bu uzun bekle-me
 this long wait-mE
 this long waiting
 (c) *uzun bu bekle-y-iş
 (d) *uzun bu bekle-me

Moreover, we say that a determiner is not so *easily* accepted by syntactically derived nominals because linearization facts seem to be relevant for (24) and (25) too, as (e) and (f) below are grammatical:

- (e) Bu Ahmet'in araba -s -ı -n -ı kullan-ma s-ı yok mu?
 This Ahmet GEN car LC POS LC ACC drive mE LC POS NEG-INT
 Can you see how (this) Ahmet is driving his car?
 (f) Bu Ahmet'in araba-s -ı -n -ı kullan-ış -ı yok mu?
 This Ahmet GEN car LC POS LC ACC drive Iş POS NEG-INT
 Can you see how (this) Ahmet is driving his car?

Also, as noted by a reviewer, in these examples *bu* is more like a modal or a discourse marker than a real determiner, which explains why it is in brackets in the English translations.

The position of *bu* before the object NP is also licensed in (g) and (h) below (whether a verbal modifier is present or not):

- (g) Ahmet'in bu araba -s -ı -n -ı (hızlı) kullan-ma -s -ı
 Ahmet GEN this car LC POS LC ACC (fast) drive mE LC POS
 Ahmet's (fast) driving of this car
 (h) Ahmet'in bu araba-s -ı -n -ı (hızlı) kullan-ış -ı
 Ahmet GEN this car LC POS LC ACC fast drive Iş POS
 Ahmet's (fast) driving of this car

- (23) bu yaz-ma
this write -mE
this manuscript
- (24) *Ahmet'in araba -s -i -n -i bu kullan-ma -s -i¹⁰
Ahmet GEN car LC POS LC ACC this drive mE LC POS
(intended) this (instance of) Ahmet's driving of his car
- (25) ?Ahmet'in araba-s -i -n -i bu kullan-ış -i
Ahmet GEN car LC POS LC ACC this drive ı POS
(intended) this (instance of) Ahmet's driving of his car

2-2-6 Argument structure and case assignment

Syntactically derived nominals in *-mE* and *-(y)ış* inherit the argument structure of the base verb and they retain its verbal force as their internal argument can be case-marked in the accusative as indicated by examples (9) and (10) repeated here under (26) and (27)¹¹, but lexically derived nominals mark their internal argument in the genitive, as indicated by (28)¹²:

¹⁰ Here a few words are in order about the judgements of (24) and (25). One reviewer thinks that they are not that bad, but our judgement is different. So we carried out tests on a sample of 160 native speakers, and it turns out that things are more complicated than this, as there seems to be some difference in the acceptability of the two types. Only 6 speakers (3,75 %) accepted (24) whereas 51 speakers (31,8%) accepted (25). 15 speakers (9,3 %) judged that (24) is very unlikely, and 38 (23,7 %) judged that (25) is very unlikely. 139 speakers (86,8%) judged (24) as impossible, 71 (44,3 %) judged that (25) is impossible. We subsequently paired an integer with each type of judgment, “accept” with 1, “very unlikely” with 2 and “impossible” with 3. Then the mean of acceptability for (24) and (25) is given below, where n is the number of speakers tested, and $\bar{x}(24)$ and $\bar{x}(25)$ the rating paired with (24) and (25) respectively:

$$\bar{x}(24) = \frac{\sum_{i=1}^{i=160} nix_i}{n} = 2,83 \text{ and } \bar{x}(25) = \frac{\sum_{i=1}^{i=160} nix_i}{n} = 2,12$$

Although we do not add any statistical significance tests to this result, and although (a) to (d) in footnote 9 show that word order is relevant in lexically derived nominals too, we can fairly safely conclude that if there is no modifier, the presence of a determiner adjacent to a nominal is not so easily accepted by syntactically derived nominals.

¹¹ We are not going into detail here about the way case is assigned.

¹² (28) is taken from Kornfilt and Greenberg (2000: 54).

- (26) Ahmet'in araba -s -i -n -i kullan -ma -s -i
 Ahmet GEN car LC POS LC ACC drive mE LC POS
 Ahmet's driving of his car
- (27) Ahmet'in araba -s -i -n -i kullan -ış -i
 Ahmet GEN car LC POS LC ACC drive ışı POS
 Ahmet's driving of his car
- (28) bu sonat-ın çal -ma -s -i zor.
 this sonata-GEN play-mE-LC-POS difficult
 this sonata is difficult to play.

Very interestingly, Kornfilt and Greenberg (2000:54) remarked that when the nominal is lexically derived, the presence of the morpheme *-mE* obviates that of the passive morpheme. Consequently, both (28) and (29) in which the externalized argument bears the genitive case are grammatical, whether they bear overt passive morphology (as in (29)) or not, as in (28)):

- (29) bu sonat -ın çal -ın -ma -s -i zor.
 this sonata -GEN play- PAS-mE LC POS difficult
 this sonata is difficult to play.

This correlation between some derived nominals and passive morphology, along with the other morphosyntactic properties listed in 2.2.3 to 2.2.6 above¹³, will be analyzed in 4.2.

As is well known, the distinction between lexically and syntactically derived nominals goes back to Chomsky's (1970) influential analysis, whose main insights are summed up now.

2.3. Two types of derivation

¹³ Another property might have been listed here. Typically, the predicate of syntactically derived nominals can be modified by adverbs rather than by adjectives. However it is sometimes difficult to distinguish between the two in Turkish, and the judgments of native speakers are often contradictory in this respect. This criterion is hard to use then and consequently, it has not been used here.

Chomsky (1970) noted that nominalized forms such as those in (30) and (31) below display different properties:

- (30) a. John's being eager to please
b. John's refusing the offer
c. John's criticizing the book

- (31) a. John's eagerness to please
b. John's refusal of the offer
c. John's criticism of the book

The nominalized forms in (30) and (31), differ in their productivity (the forms in (30) are much more restricted than those in (31)), in their semantics (the relation between the nominal forms and the verb is more regular with forms in (30)). Moreover the gerundive forms in (30) do not have the internal structure of an NP contrary to those in (31) since *John's* in (30) cannot be replaced by a determiner and no adjective can be inserted within the gerund as indicated by (32):

- (32) a. *The refusing the offer *vs* the refusal of the offer
b. *John's recent criticizing the book *vs* John's recent criticism of the book

What this shows, Chomsky concludes, is that the nominals in (30) and (31) have different origins: the nominals in (31) are lexically derived from the verb of their base, whereas those in (30) are derived from the sentences in (30'):

- (30') a. John is eager to please.
b. John has refused the offer.
c. John criticized the book.

It is the application of these insights to Turkish that is found in works like those of Kural, (1998), or Borsley and Kornfilt (2000), and Kornfilt and Greenberg (2000).

Now, as was stated before, the problem is a bit more complex in Turkish because a form derived by one of the morphemes *-mE* or *-(y)Iş* can have two distinct origins, syntactic or lexical, whereas in English the form of the derivational morpheme is an indication of the nature of the derivation¹⁴, as nominals in *-ing* are syntactically derived, and nominals in *-ness*, *-al*, *-ism* are lexically derived. Consequently the criteria that oppose the two types of derivation are of utmost importance in Turkish. These criteria have been listed in 2.2.4 to 2.2.6 above and the correlated morpho-syntactic phenomena will be given an explanatory account in our modelling presented in 4.2 below.

2-4 The semantics of derived nominals

It has generally been acknowledged that derived nominals in *-(y)Iş* whether syntactically or lexically derived, specialize in the expression of the manner of the event identified by the verbal root. As for syntactically derived nominals in *-mE* they specialize in the expression of the event itself as shown by (33) to (35) below:

- (33) a. Kışkırtıcı bir bak-ış -ı -yla çılgın-a dön - düğ -üm kadın -lar.

Provoking a look at Iş POS with mad DAT become NOM PER1st woman PL

women by whose provoking/seductive glance I turned wild.

- b. *Kışkırtıcı bir bak -ma -s -ı -y -la çılgın-a döndüğ-üm kadın-lar¹⁵
(34) a. Vergi-ler-in azal-ma-s ı gerek.

Tax- PL -GEN decrease -mE LC POS necessity.

A decrease in taxes is a necessity/Taxes must decrease

- b. * Vergi-ler-in azal-ış -ı gerek

¹⁴ A study of the three forms of English gerunds will be presented in 5.1.1.

¹⁵ However, as was observed by one of the anonymous reviewers (33b) becomes grammatical if the determiner *bir* precedes the modifier *kışkırtıcı*. Linearization facts are relevant for these examples as well (see note 9).

(35) a. unут -ma -n -in zorluğ -u gibi hatırla -ma -n -in da
zorluğ -u var -dı.

forget mE LC-GEN difficulty-POS like remember mE-LC-GEN also
difficulty POS be PT

there was difficulty both in remembering and in forgetting.

b. * unут-uş-un zorluğ -u gibi hatırla -y -iş -in da zorluğ -u var -dı

This analysis is borne out by the fact that in some cases the presence of the noun *biçim* (manner) is necessary for the grammaticality of nominals in *-(y)ış* as shown by examples under (36):

- (36) a. Sizin yaz -ış biçim -iniz -i çok beğen -iyor -um.
your write İŞ manner POS ACC much appreciate ASP PER 1st
I very much appreciate your writing.
- b. ?Sizin yaz -ma biçim -iniz -i çok beğen -iyor -um.
- c. ??Sizin yaz -ış -ınız -ı çok beğen -iyor -um.

As for lexically derived nominals in *-mE*, they mostly have a result reading as noted by Kornfilt and Greenberg (2000: 51). This is illustrated for instance by (37a) (repeated from (1) above and (37b):

- (37) a. yaz -ma
write-mE
manuscript
- b. kavur-ma
fry-mE
fried meat

These nominals are then result nominals not only in the sense of Grimshaw (1990) but also because they denote (concrete) objects and not events, contrary to syntactically derived nominals in *-mE*.

2-5 Theoretical option of our analysis

The basic task of any adequate theorization of the empirical phenomena just described should probably be to elucidate the kind of relationship that exists between a derived nominal and its verbal or clausal counterpart. So this is what we will aim at now: we will focus on the modelling of the syntax and semantics¹⁶ of nominals that are syntactically derived and of those which are lexically derived, and we will try and show both how the morpho-syntactic properties of each type of derivation can be accounted for, and how they inherit their semantics.

In order to account for the empirical phenomena displayed by nominals which are syntactically derived, Kornfilt (2003) (2002), and Borsley and Kornfilt (2000) suggest that the structure of syntactically derived nominals is like in (38):

$$(38) \quad [_{FN1P} \dots [_{FNk-1P} [_{FNk} [_{FV1P} \dots [_{FVn-1P} [_{FVnP} [VP [V' [O \ V]]] FV_n] FV_{n-1}] FV_1] FN_k] FN_{k-1}] \dots FN_1]$$

Basically the idea is that the VP whose head is the base verb of the nominal, is dominated first by n verbal functional categories (here FV with $n \geq 0$) and then by k nominal functional categories (here FN with $k > 0$), in which¹⁷:

$FV \in \{AGR(eement)S(ubject), T, A(spect), M(ood)\}$

and

$FN \in \{AGR(eement)N, D(eterminer), -mE, (y)/s\}$

In other words, syntactically derived nominals have the same lower structure as that of fully- fledged sentences, most relevantly the complete VP and the functional heads, which accounts for their case-marking abilities, but the highest layer of the whole string is nominal.

In syntactic derivations then, each affix ($-mE$ or $-(y)/s$) heads a functional node, the nominal functional nodes of the higher layer giving their nominal status to the derived forms, which explains some of their nominal properties, the genitive case of their subjects, the possessive agreement on the nominalized predicate, and most

¹⁶ This means that no phonological analysis will be attempted here.

¹⁷ Subject noun agreement is what we have called the nominal possessive suffix given in table 1. It must be underlined yet that the label N AGR is fully justified as it strictly parallels V AGR, the only difference being the nature of the case assigned by AGR: nominative with V AGR, genitive with N AGR (see supra 2.1.3).

importantly the case morphology on the entire clause. It is now easy to understand why this hybrid type of nominal, which is both verbal and nominal, involves what has been labelled a “mixed extended projection” (Kornfilt and Whitman (2011: 1160)) and why the underlying thesis is the “Functional Nominalization Thesis” (Kornfilt and Whitman (2011: 1298)). Of course the main problem with this approach is that it involves a relaxing of the strict requirements of endocentricity. Various solutions can be suggested to solve this problem. One is to assume that the head of the entire structure is not specified, or that it is bivalent or neutral, and thus projects an indeterminate phrasal structure. This is in essence Grimshaw’s proposal in Grimshaw (1991), which assumes the existence of extended and perfect heads¹⁸. Another option is feature sharing. In the framework of LFG, it also leads to the “Extended Head Theory”, which allows different categories to share the same head in f-structure, but not in c-structure, (see Bresnan (1997:11) for the exact formulation and the details of the theory).

In the phrase structure and unification framework of GPSG, Pullum (1991) provides an analysis of English verbal gerunds¹⁹ (which are another example of mixed

¹⁸ F being a functional feature, X is the perfect head of Y (and Y is the perfect projection of X) iff:

- Y dominates X,
- X and Y share all their categorial features,
- all the nodes in between X and Y share the same categorial features,
- the value of F for X and Y is identical.

If the value of F for Y is superior to that of X, X is an extended head (and Y is an extended projection of X).

For instance, (the integer being the indication of bar level),

V=[+V-N-F,0] is the perfect head for VP=[+V-N-F,2],

and V=[+V-N-F,0] is the extended head for VP=[+V-N+F,2].

¹⁹ Pullum labels this type of gerund N(ominal) G(erund) P(hrase). An example is the NGP in (a):

- (a) _{NGP}[your breaking the record] was a surprise.

Pullum’s analysis leads to the following structure for this gerund (*prp* is the abbreviation for present participle. Note then that he departs from the traditional analysis that distinguishes present participle from gerunds):

[NP [.NP(POSS+) [your]][VP(VForm:prp [V(Vform:prp[breaking]])[NP_{det}[the] N[record]]]]]

In this study, Pullum focuses only on this type of gerund, and does not provide any analysis of other types of gerunds like [you breaking the record] traditionally labelled *ACC-ing gerund* or of [your breaking of the record] known as *-ing of gerunds*. He suggests that these gerunds must be analyzed differently but does not provide any suggestion for an analysis.

constructions) that maintains the constraint of endocentricity²⁰ but also the principle of strong lexicalism.

Lexicalism, assumes that the interaction between the word formation component and syntax is constrained by the Lexical Integrity Hypothesis. This hypothesis has been expressed in various forms, for instance in the form of the Atomicity Thesis in [Di Sciullo and Williams \(1987\)](#), but whatever the form in which it is expressed, it always assumes that the block of rules of the word formation component is ordered before any syntactic operation. It leads to a principle of “morphology-free syntax” ([Pullum \(1991:775\)](#)) i.e. the assumption that syntax cannot affect the internal structure of words. One of the strongest objections to mixed extended projections is provided by [Bresnan \(1997:7\)](#) who argues that “The putative syntactically derived words are subject to the same morphological principles of structural formation as lexically derived words, and they both share properties of syntactic structural opacity referred to as “lexical integrity”. [Kornfilt and Whitman \(2011: 1305-1306\)](#) however, show that in syntactically derived nominals, the affixation of *-mE* can be suspended, whereas in lexically derived words it cannot, as indicated by (39) and (40) below:

(39) Ali-nin ördeğ-i kızar-t-ıp krema-yı don-dur-ma -sın-ı söyle-di-m.
Ali-GEN duck-ACC roast-CS-and cream-ACCfreeze-CS-mE-3.SG-ACC tell
PT.PERS1st

I said for Ali to roast the duck and freeze the cream.

(40) *don-dur-up kızar-t-ma
freeze- CS-and roast-CS-mE

(Ill-formed under the intended reading: ‘Ice cream and roast meat’ but good under the reading ‘freezing and roasting’)

The argument seems compelling, but it must be noted that this phenomenon is similar to other counter examples that have been provided against the Integrity Hypothesis such as *pre and post war II*, where two affixes appear in conjunction. [Bresnan \(1995: 189\)](#) notes that several solutions to this problem have been offered: [Di Sciullo and Williams \(1987\)](#) consider these affixes are ambiguously analyzable as

²⁰ Pullum adds a third constraint that he labels “null licensing”, a principle that rules out null elements which are neither semantically contentful nor syntactically bound ([Pullum 1991:776](#)).

prefixes or independent words, [Simpson \(1991\)](#) and [Alsina \(1993\)](#) explain this phenomenon by the phonological salience of the prefixes involved, and [Nespor \(1985\)](#) and [Booij \(1985\)](#), analyze this type of phenomenon in German and Italian, suggesting that the elements that are conjoined are real complete nouns.

Our analysis will consider that both nominals in *-mE* and *-(y)lş* originate in the lexicon, the difference being the way each type of nominal feeds the syntax: nominals that have been identified as lexically derived are unexpanded words, whereas nominals that have been identified as syntactically derived, head clauses.

The motivation for analyzing the derivational process as lexical rather than syntactic is first very general and theoretical. The lexical rules we will design, which can be seen as generative mechanisms to expand the lexicon, will handle both the morphology and the semantics of bases and derived words. Crucially, as lexical information is encoded in the base word, there will be no overgeneration of the rules, as the derived forms are largely dependant on, and constrained by, local semantic information of the base. The motivation is not only theoretical-dependant though.

Consider the data in (41), in which a verb receives first the reciprocal suffix *-lş* (which is homophonous with the nominalizer suffix *-(y)lş* and second the nominalizer *-(y)lş* :

	Verbal base	V+reciprocal suffix- <i>lş</i>	[[V+reciprocal suffix- <i>lş</i>]+nominalizer- (y)lş]
(41) a.	anla- understand	anla-ş understand+lş	*anlaşış anlaş+lş
b.	sev- love	sev-iş love+lş	*sevişiş seviş+ lş
c.	döv- fight	döv-üş fight+lş	*dövüşüş dövüş+lş
d.	bak- look	bak-ış look+lş	*bakışış bakış+lş

At first blush, it seems that the generalisation that might be drawn from (41) is that whenever the coda of the potential base of affixation of the nominalizer is the voiceless fricative */ş/*, the attachment of this nominalizer is ungrammatical. This

generalisation however is not entirely correct, as in the following examples under (42), the affixation of $-(y)/\text{ş}$ to a verb with a coda in $/\text{ş}/$ is not impossible²¹:

	Verb with coda in $/\text{ş}/$	[[Verb with coda in $/\text{ş}/$] +nominalizer- $-(y)/\text{ş}$]
(42) a.	dolaş-	dolaşış
	(take a) walk	walk+Iş
	v[walk]	N[walk]
b.	çalış-	çalışış
	work	work+Iş
	v[work]	N[work]
c.	düş-	düşüş
	fall	fall+Iş
	v[fall]	N[fall]
d.	alış-	alışış
	adapt/get used to	adaptation

If we consider the data in (41) and (42) above, it appears then that words cannot be formed first by the affixation of the reciprocal suffix, then by the affixation of the nominalizer $-(y)/\text{ş}$ suffix. In a theoretical framework in which voice affixation is syntactic, this fact is an indication that the nominalization process we are analysing here is lexical rather than syntactic. In a theoretical framework in which voice affixation is also dealt with as a lexical phenomenon, then there is a blocking effect in the lexicon²².

This lexicalist approach is also implicit in Göksel and Kerslake (2005: 53) (2005: 90), who consider that the former type is derived by “derivational suffixes” and the latter by “subordinators”. This is the option that will be chosen here too, and it is the syntax and semantics of both types of nominal that will be modelled, after a presentation of our theoretical framework.

3. The theoretical framework of our analysis

²¹ For some speakers, some derived forms in (42) are awkward, but they are all judged better than those in (41).

²² We thank one of the anonymous reviewers for this remark.

3.1. A Generative Lexicon

The theoretical framework in which our analysis is cast is the Generative Lexicon Theory (from now on GL) as expressed, for instance, in [Pustejovsky \(1995\)](#). In a GL the meaning of a lexical item α consists of three levels of representation: the Argument Structure (ARGSTR), the Event Structure (EVESTR) and the Qualia Structure (QSTR) as indicated below. The lexical entry of an item α is then represented in figure 1 below:

$$\left[\begin{array}{l} \alpha \\ \text{Phonetic form} = \pi \\ \text{Orthographic form} = \varpi \\ \text{Category} = \kappa \\ \text{Sub - cat} = \kappa' \\ \text{Semantics} = \left[\begin{array}{l} \text{ARGSTR} = \\ \text{EVESTR} = \\ \text{QSTR} = \dots \end{array} \right] \end{array} \right]$$

Fig. 1. A lexical entry

3.1.1 The Argument Structure

The Argument Structure describes the arguments and their types (τ, τ', τ'' , in our representation in figure 2) which are involved in the predicates of the Qualia Structure: they are identified as true arguments (ARG_i) if they are denoted by the lexical item, or if they must be syntactically realized (for instance in the case of verbs) but they are identified as default arguments (D-ARG_i) if they participate in the semantics of the item via the predicates of the Qualia Structure without being denoted by this item. Conventionally, the type of the item is encoded as the type of ARG₁. The general representation of an Argument Structure is given in figure 2:

$$\left[\begin{array}{l} \text{ARGST} \left[\begin{array}{l} \text{ARG}_1 = x : \tau \\ \dots \\ \text{D - ARG}_1 = y : \tau' \\ \text{D - ARG}_2 = z : \tau'' \\ \dots \end{array} \right] \end{array} \right]$$

Fig. 2. Argument Structure

3.1.2 The Event Structure

In the same way as the Argument Structure describes the arguments and their types, the Event Structure, whose origin can be found in [Kamp and Reyle, \(1993: 668\)](#), describes the events and their types (according to Vendler's classification ([Vendler \(1967\)](#)) which are involved in the predicates of the qualia structure (i.e. states, activities, accomplishments, or achievements²³, ε , ε' in our representation in figure 3). Then they are identified as true events (E_i) if they are denoted by the lexical item, or default events (D- E_i) if they are involved in the Qualia Structure, and hence are part of the semantics of the lexical item, without being denoted by this lexical item. They are ordered by a precedence relation R , which can be a precedence relation ($<$) such that $e_1 < e_2 < e_3 < \dots < e_n$, with overlap of two events e_i and e_j possible, (noted ($e_i O e_j$)).

Events are not only ordered by a temporal relation, but one of the sub-events involved in the Event Structure is also headed: this event headedness is a way of indicating the relative prominence of sub-events and is relevant in the representation of the aspectual properties of predicates. Events typed as accomplishments are left-headed events, (the initial process sub-event is the head of the Event Structure and the Event Structure is then $_e[*e_1, e_2]$), achievements are right-headed (the final resulting state sub-event is the head and the Event Structure is then $_e[e_1, *e_2]$), and headless event structures admit of two possible syntactic projections (for instance the causative/ unaccusative alternations). More formally, an Event Structure is then a tuple $\{E, \leq, O, *\}$ where E is the set of events, \leq is a precedence relation, O is an overlap relation and $*$ indicates the headed event.

The general representation of an Event Structure is then as indicated in figure 3 below:

$$\left[\text{ESTR} \begin{bmatrix} E_1 = e_1 : \varepsilon \\ \dots \\ D - E_i = e_i : \varepsilon' \\ \dots \\ \text{RESTRICTION} = e_1 R e_2 \\ \text{HEAD} = *e_i \end{bmatrix} \right]$$

Fig. 3. Event structure

²³ These types are generally defined by their temporal properties, more importantly telicity. For a comprehensive study of aspectual classes in Turkish and how they are precisely diagnosed, see [Erguvanlı Taylan \(2001\)](#).

The motivation for the heading of a sub-event is that when a modifier is adjoined to an achievement predicate this modifier can take scope over the whole transition or over a particular sub-event as in (43), where the PP has scope over the result sub-event:

(43) the library sent me the book for only three days.

3.1.3 The Qualia Structure

The basic intuition here is that word meaning is organised over qualia roles whose function is to provide the basic behaviour of lexical items in their linguistic context. The information contained in a word is represented by a set of predicates encoded in four roles: the Formal role, (which distinguishes an object from a larger set), the Constitutive role (which defines what the object is part of), the Agentive role, (which indicates the factors involved in the creation of the object) and the Telic role (which defines the function or purpose of the object). The general representation of qualia structure is then as indicated in figure 4²⁴:

$$Q = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{CONSTITUTIVE} = \text{part_of}(y, x) \\ \text{AGENTIVE} = R(e1, z, x) \\ \text{TELIC} = R'(e2, w, x) \end{array} \right]$$

Fig. 4. Qualia structure

As can be seen in figure 4, the sub-events and the arguments of predicates that are involved in the semantics of an item, are bound in the Qualia Structure. Moreover, as each predicate and its arguments are typed (in the Event Structure and the Argument Structure respectively), the Qualia Structure carries information about

²⁴ As can be seen, our representation is Davidsonian as an extra event argument is added in the predicates encoded in the Agentive and Telic roles. However it differs from a strict Davidsonian representation in so far as the main event is decomposed into sub-events.

the types of each element involved in the semantics of any lexical item. This is illustrated by the example of the Qualia Structure associated to the word *bıçak* (knife):

$$\left[\begin{array}{l} \text{bıçak} \\ \text{ARGSTR} = [\dots] \\ \text{EVENSTR} = [\dots] \\ \text{QUALIASTR} = \left[\begin{array}{l} \text{FORM} = x : \text{artifact} \\ \text{CONST} = [\text{part_of}(\text{handle}, x)] \\ \text{TEL} = \text{cut}(e_i, w : \text{human}, y : \text{object}, x) \\ \text{AGENT} = \text{make}(e_j, z : \text{human}, x) \end{array} \right] \end{array} \right]$$

Fig. 5. Qualia structure of the word *bıçak* (knife)

It is the qualia structure that captures the basic properties of lexical types: for instance the nouns *rock* or *stone* are natural types whereas nouns like *novel* or *computer* are artifact types. The difference is that for the former types, as they have no function (except in specific contexts) the telic role is left undefined, whereas in the latter types it is specified and the function of the object is encoded in it. This opposition is manifested in the opposition of the following pairs: *he enjoyed the *rock / novel* or *a good *rock / computer / writer*. This lexical representation thus can be thought of as a reserve of types that will be available to license some syntactic environments.

3.1.4 The general form of a lexical item

The relevant part of the lexical information contained in a word is distributed as indicated in figure 6 which integrates the various structures previously described, so that the general representation of any lexical item α is now:

$$\left[\begin{array}{l} \alpha \\ \text{ARGSTR} = [\text{ARG}_1 = x : \tau] \\ \text{EVENSTR} = \left[\begin{array}{l} E_1 = e_1 : \pi \\ E_2 = e_2 : \pi' \\ \text{REST} = \dots \\ \text{HEAD} = e_i \end{array} \right] \\ \text{QUALIASTR} = \left[\begin{array}{l} \text{FORM} = x \\ \text{CONST} = \left[\begin{array}{l} \text{part_of}(x, y) \\ \text{or} \\ \text{made_of}(x, y) \end{array} \right] \\ \text{TEL} = \text{function_of}(e_i, x) \\ \text{AGENT} = \text{creation_of}(e_j, x) \end{array} \right] \end{array} \right]$$

Fig. 6. The lexical information of an entry

What figure 6 shows is how the semantics of a lexical item is given by the three representational levels previously described. Now if an item β has the representation given in Figure 7,

$$\left[\begin{array}{l} \beta \\ \text{ARGSTR} = [\text{ARG}_1 = x : \tau] \\ \text{EVENSTR} = \left[\begin{array}{l} E_1 = e_1 : \pi \\ \dots \end{array} \right] \\ \text{QUALIASTR} = \left[\begin{array}{l} \text{FORM} = Q(x) \\ \text{TEL} = R(e_i, x) \end{array} \right] \end{array} \right]$$

Fig. 7. The semantics of item β

its interpretation results from the conjunction of the values of the qualia roles and is as in (44) below:

$$(44) \quad \lambda x [Q(x) \wedge \lambda e_i (R(e_i, x))]$$

3.2. Example: the representation of a Turkish verb

In the rest of this paper we will concentrate on the representation of verbs, as they will be the input of the rules generating the nominals under study here. The only additional information contained in the following representation is the Category feature, which contains information about the lexical category of the item. The

representation of the verb *kullan-* (“drive”, cf. supra (3)) of type process is then as indicated in figure 8:

$$\left[\begin{array}{l} \text{CAT} = \text{V} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG}_1 = x : \text{human} \\ \text{ARG}_2 = y : \text{vehicle} \end{array} \right] \\ \text{EVENSTR} = \left[\begin{array}{l} \text{E}_1 = e_1 : \text{process} \\ \text{E}_2 = e_2 : \text{process} \\ e_1 \leq e_2 \end{array} \right] \\ \text{QUALIASTR} = \left[\begin{array}{l} \text{FORM} = \text{move}(e_2, y) \\ \text{AGENT} = \text{kullan}(e_1, x, y) \wedge \text{manner_of}(e_1 \dots) \end{array} \right] \end{array} \right]$$

Fig. 8. Lexical entry of the verb *kullan-* (drive)

As can be seen this representation is a typed feature structure in which the elements of the Argument Structure and the Event Structure are bound in the Qualia structure. Note that as the verb *kullan-* is an activity, its Event Structure contains two sub-events typed as process. The semantics of an achievement verb like the verb *gel-* (come, arrive) is provided below in figure 9:

$$\left[\begin{array}{l} \text{CAT} = \text{V} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG}_1 = x : \text{human} \\ \text{D_ARG}_2 = y : \text{location} \end{array} \right] \\ \text{EVENSTR} = \left[\begin{array}{l} \text{E}_1 = e_1 : \text{process} \\ \text{E}_2 = e_2 : \text{state} \\ e_1 \leq e_2 \\ \text{HEAD} : e_2 \end{array} \right] \\ \text{QUALIASTR} = \left[\begin{array}{l} \text{FORM} = \text{at}(e_2, x, y) \\ \text{AGENT} = \text{gel}(e_1, x) \end{array} \right] \end{array} \right]$$

Fig. 9. Lexical entry of the verb *gel-* (come/arrive)

Here the relevant semantics of this achievement verb is expressed by the head on the resulting state e_2 , and by the expression of the final localisation of the individual x in a place y . The fact that y , the location argument is encoded in the Argument structure as a default argument, corresponds to the fact that its syntactic expression is optional, as shown by (45) below:

- (45) a. dikkat! Gel-iyor.
careful come-ASP
careful! (s)he is coming.
- b. Ev-i- miz -e gel-di.
house-LV-POS-DAT come PT
(s)he came to our place.

3.3. Qualia structure and quantification

Not only does the Qualia Structure of a lexical item provide information about the semantics of this item, but it also differentiates the quantificational force of the elements that are encoded in the various roles. By definition the sub-event that corresponds to the predicate encoded in the Agentive role is existentially quantified. This is summed up in figure 10:

$$\left[\begin{array}{c} V \\ QS = \left[\begin{array}{l} F = \dots \\ A = \exists e R[(e, x, y) \wedge Q(e, z) \dots] \\ T = \dots \end{array} \right] \end{array} \right]$$

Fig. 10. Relevant part of the interpretation of the agentive role

Contrary to the sub-event which corresponds to the predicate encoded in the Agentive, the sub-event which corresponds to the predicate encoded in the Telic role, by definition too, receives a modal interpretation, as indicated in figure 11 below:

$$\left[\begin{array}{c} V \\ QS = \left[\begin{array}{l} F = \dots \\ A = \dots \\ T = \Diamond[\dots] \end{array} \right] \end{array} \right]$$

Fig. 11. Relevant part of the interpretation of the telic role

In other words, this expresses that the Agentive is extensional whereas the Telic role is intensional. This has consequences on the interaction of both types of nominals with matrix predicates as will be seen in 4.4.

4. Modelling of the empirical phenomena

4.1. Rules

Our aim is to design lexical rules, which can be classically defined as dynamic mechanisms that create a lexical entry out of an entry already integrated in the lexicon, so as to capture the morpho-syntactic and semantic generalizations such as those presented in section 2 above. The motivation for such an aim is first that it is theoretically relevant²⁵, and second that the derivational process modelled being extremely productive (with gaps of productivity though as will be seen), these rules would prove relevant too in the lexical acquisition process in the perspective of N.L.P. In this section we present the details of the lexical rules which generate the semantics of the derived nominals studied here, using the representation of lexical entries described above. The basic idea developed is that the type of the output is derived from the lexical information contained in the input and always expressed as the type of ARG₁. The Category feature provides information about the lexical category of the input and of the output of the rule, and captures the properties of the nominals described in 2 above.

We will see now how these rules can be applied to model the properties of the nominals derived by the suffixes *-mE* and *-(y)lş*, first when these nominals are heads of unexpanded NPs and second when they then head clauses. But in all cases, the basic intuition is that the lexical representation of the base verb provides the structural elements that will define the semantics of the derived nominals.

4.2. The derivation of unexpanded nominals in *-mE* and *-(y)lş*

The variation in the morphosyntactic properties of derived nominals detailed in section 2 showed first that this variation is not correlated to the nature of the derivational suffix, as both types of nominals in *-mE* and *-(y)lş* can display these different morphosyntactic properties irrespectively of the suffix type. Secondly, it showed that the difference in these morphosyntactic properties can be analyzed as being related to the origin of the derivation: only lexically derived nominals can take a determiner, number marking and genitive marking on the internal argument of the base verb. However we have shown (in 2.5) that our analysis considers that all the

²⁵ See discussion above in 2.5 and below in 5.1.

derived nominals studied here are derived in the lexicon. Consequently, what must be analyzed now is:

- first the nature of the relevant factors that are responsible for the difference between lexical items that can take a determiner, number marking and genitive marking on the internal argument of the base verb and those that do not display these properties,
- second, how these morphosyntactic constraints applying to certain instances of nominals can be accounted for.

4.2.1. Nominals in *-mE*

The first thing that must be noticed is that some deverbals in *-mE* are derived on an accomplishment verbal base. In the Event Structure of accomplishments, the headed sub-event is the process event (see above 3.1.2). Thus, accomplishments are left-headed verbs. We would like to analyze the suffix *-mE* as a function that shifts the head of the Event Structure from the left process sub-event to the right resulting state sub-event. This is expressed in (46) below:

$$(46) \quad -mE \stackrel{def}{=} e[[*e_1][e_2]] \rightarrow e[[e_1][*e_2]]$$

The rule applying to verbs of this class is illustrated below with the verb *dondur-* (freeze) to give the nominal *dondur-ma* (ice-cream) as indicated in figure 12:

$$\left[\begin{array}{l} \text{dondur- : V} \\ \text{ARGS} = \begin{bmatrix} \text{ARG}_1 = x \\ \text{ARG}_2 = y \end{bmatrix} \\ \text{EVSTR} = \begin{bmatrix} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{state} \\ e_1 \leq e_2 \\ \text{HEAD} = *e_1 \end{bmatrix} \\ \text{QSTR} = \begin{bmatrix} \text{FORM} = \text{frozen}(e_2, y) \\ \text{AGENT} = \text{dondur}(e_1, x, y) \end{bmatrix} \end{array} \right] \rightarrow \left[\begin{array}{l} \text{dondur - ma : N} \\ \text{ARGS} = \begin{bmatrix} \text{ARG}_1 = y \\ \text{D - ARG}_1 = x \end{bmatrix} \\ \text{EVSTR} = \begin{bmatrix} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{state} \\ e_1 \leq e_2 \\ \text{HEAD} = *e_2 \end{bmatrix} \\ \text{QSTR} = \begin{bmatrix} F = \text{frozen}(e_2, y) \\ A = \text{dondur}(e_1, x, y) \end{bmatrix} \end{array} \right]$$

Fig. 12. The rule deriving the nominal *dondurma* (ice cream).

As can be seen in this rule, the head of the Event Structure of the nominal is the result state. Moreover, the type of the result nominal is given by the object of the base verb (*y*) and as the subject argument of the base verb (*x*) is no longer expressed syntactically but still participates in the semantics of the derived nominal, it is present as a default argument in the semantic representation of this word. Other examples (see Kornfilt and Greenberg (2000: 51) are listed in (47):

- (47) a. kavur-ma (fried meat),
 b. buğula-ma (steamed food),
 c. dol-ma (stuffed food)
 d. bas-ma (printed cloth)

Typically, these nominals derived from accomplishments have no counterpart in *-(y)lş*.

Other nominals in *-mE* are derived from a sub-class of motion verbs, some of which are achievements: this class includes nominals such as those in (48) below:

- | | V | V-mE |
|---------|----------------------|----------------------|
| (48) a. | çık- (go out, leave) | çık- ma (marginalia) |
| b. | in- (go down) | in-me (paralysis) |
| c. | dön- (turn) | dön-me (convert) |
| d | gir- (go/come in) | gir-me (entrance) |

As can be seen, the meaning of the derived noun in *-mE* can be highly idiosyncratic, which is not unusual for lexical derivations. The base verbs in (48) are motion verbs and the derived nominals do have a counterpart in *-(y)lş*. We now turn to the study of these nominals in *-(y)lş*.

4.2.2. Nominals in *-(y)lş*

Some examples of derived forms in *-(y)lş* which are counterparts of nominals in *-mE* in (48) are given in (49) below:

	V	V-İş
(49) a.	çık- (go out, leave)	çık-ış (exit)
b.	in- (go down)	in-ış (descent)
c.	dön- (turn)	dön-üş (turn)
d.	gir- (go/come in)	gir-ış (entrance)

A particularity of the verbal bases in (49) is that they are characterized by three roles, labeled in Talmy's framework, (Talmy (2000:184) Figure, Ground, and Path. The Figure is the moving entity, and the Ground is the reference entity with respect to which the Figure's Path is characterized.

Nominals in *-(y)ış* derived on this sub-class of verbs express the Ground as in *çık-ış* (exit) *gir-ış* (entrance) or the Path, in *dön-üş* (turn) *in-ış* (descent).

An example is given in (50), which shows the relevant part of the rule that derives the nominal *çık-ış* of (49a):

(50) $[çık:V..Q=A=[çık(e,x:human) \wedge through(e,y:\tau)]] \rightarrow [çık-ış:N, ARGS=[ARG_1=y: \tau]...]$

4.2.3. An account of the morphosyntactic phenomena associated with these nominals

We noted that nominals in *-mE* derived on an accomplishment verbal base refer to an object, and this object is the result of the process sub-event of the accomplishment. The basic mechanism of the proposed rule for the derivation of this type of nominal is a shift of the head of the Event Structure from the left (the process part) to the right sub-event (the final state). In a GL, this is exactly what the passive does, (Pustejovsky, 1995:104). Kornfilt and Greenberg (2000:51) noted that nominals such as those in (47) above, without any passive morphology, are equivalents of English passives. Our explanation of this phenomenon is that it is precisely the head shifting mechanism postulated for the derivation of these nominals, which is similar to passivization, that accounts for the fact noted by Kornfilt and Greenberg that without any visible passive morphology, they are equivalents of English passives.

Second, as these derived nominals refer to an object, they can take number marking, and they are compatible with determiners. This is also the reason why such

nominals do not mark their syntactically realized internal arguments with the accusative, which is the structural case for complements, but with the genitive, as indicated by (28) above repeated here under (51):

- (51) bu sonat –in çal –in –ma –s –ı zor.
 this sonata –GEN play- PAS-mE LC POS difficult
 this sonata is difficult to play.

Contrary to this, nominals in *-mE* (and *–(y)/ş*) that head a clause have the verbal force of their base verb, and consequently, their internal argument can be case-marked in the accusative as indicated by (52) below:

- (52) Öğretmen kitab-ı oku-ma-m-ı iste-di-Ø.
 Teacher book-ACC read-mA-POS-ACC want-PT-PER3rd
 The teacher wanted/asked me to read the book.

Obviously, this alternance in the case marking of the internal argument of a base verb in a derived nominal is clearly reminiscent of the contrast between the case marking of the internal argument in verbal gerunds (*his signing the contract*) and nominal gerunds (*his signing of the contract*). As can be seen from these two examples, the nominal gerund type lacks the main feature of verbal gerund, which is to assign accusative case to its internal argument. A detailed comparison between the relevant Turkish and English data will be presented in section 5, but an important fact to note is that in Turkish, no alternative strategy of case assignment by a preposition is possible.

4.3. Derivations of nominals that head clauses

We first present the details regarding the morpho-syntactic features common to the outputs of all our rules; they will not be repeated for each rule, and they consequently can be considered as factored out in all derivations below. The daughter (DTR) feature structure below²⁶ captures these morpho-syntactic generalizations. The value of the attribute DTRS is the head-adjunct structure below

²⁶ See for instance Pollard and Sag (1994: 32).

in which irrelevant details are omitted; it expresses that the N derived will not accept a determiner (sub-cat is null), that it is singular, and that it is modified by an adverb:

$$\begin{array}{c}
 \text{phrase} \left[\begin{array}{c} \dots \\ \text{DTRS} \end{array} \right] \text{head-adjunct-str} \left[\begin{array}{c} \text{HEAD - DTR} = \left[\begin{array}{c} 1 \\ \text{Cat} = \text{N} \\ \text{Sub-cat} = \langle \rangle \\ \text{Numb} = \text{sing} \end{array} \right] \\ \text{ADJUNCT - DTR} = \left[\begin{array}{c} \text{Cat} = \text{ADV} \\ \text{modif} = \left[\begin{array}{c} 1 \end{array} \right] \end{array} \right] \end{array} \right]
 \end{array}$$

Fig. 13. Daughter feature structure

We then propose the following rules in 4.3.1 and 4.3.3 below in order to capture the generation of the semantics of the derived nominals in $-(y)/\text{\textit{s}}$ and $-mE$ respectively.

4.3.1 A rule for derived nominals in $-(y)/\text{\textit{s}}$

The general form of the rule is given in figure 14:

$$\left[\begin{array}{c} \text{CAT} = \text{V} \\ \text{ARGS} = \left[\begin{array}{c} \text{ARG}_1 = x \\ \text{ARG}_2 = y \\ \text{D-ARG}_1 = z \end{array} \right] \\ \text{EVSTR} = \left[\text{E}_1 = [1] \right] \\ \text{QSTR} = \left[\begin{array}{c} \text{F} = \dots \\ \text{A} = \text{R_act}(e_1) \wedge \text{manner_of}(e_1, z) \end{array} \right] \end{array} \right] \rightarrow \left[\begin{array}{c} \text{CAT} = \text{N} \\ \text{ARGS} = \left[\begin{array}{c} \text{ARG}_1 = z : \text{manner} \\ \text{D-ARG}_1 = x \\ \text{D-ARG}_2 = y \end{array} \right] \\ \text{EVSTR} = \left[\text{D-E}_1 = [1] \right] \\ \text{QSTR} = \left[\begin{array}{c} \text{F} = z \wedge \text{manner_of}(e_1, z) \\ \text{A} = \text{R_act}(e_1 \dots) \end{array} \right] \end{array} \right]$$

Fig. 14. The rule deriving nominals in $-(y)/\text{\textit{s}}$

In the representation of the base verb, the adjunct of manner is encoded in the Agentive role, and it provides the type of the derived noun. The arguments of the base verb are demoted to default arguments in the derived noun, as they are not necessarily realized syntactically. The Event Structure of the output is the defaulted Event Structure of the input, as nominals in $-(y)/\text{\textit{s}}$ do not receive an event interpretation but a manner interpretation.

4.3.2 Example

As a specific example, the derivation of the nominal *kullan-ış* (“driving”, cf. supra (4)) is given in figure 15:

$$\left[\begin{array}{l} \text{kullan- : V} \\ \text{ARGS} = \left[\begin{array}{l} \text{ARG1} = x \\ \text{ARG2} = y \\ \text{D-ARG1} = z \end{array} \right] \\ \text{EVSTR} = \left[\begin{array}{l} \text{E1} = e1 : \text{process} \\ \text{E2} = e2 : \text{process} \\ e1 \leq e2 \\ \text{HEAD} = e1 \end{array} \right] \\ \text{QS} = \left[\begin{array}{l} \text{F} = \text{move}(e2, y) \\ \text{A} = \text{kullan}(e1, x, y) \wedge \text{manner_of}(e1, z) \end{array} \right] \end{array} \right] \rightarrow \left[\begin{array}{l} \text{kullan-ış N} \\ \text{ARGS} = \left[\begin{array}{l} \text{ARG1} = z : \text{manner} \\ \text{D-ARG1} = x \\ \text{D-ARG2} = y \end{array} \right] \\ \text{EVSTR} = \left[\begin{array}{l} \text{D-E1} = e1 : \text{process} \\ \text{D-E2} = e2 : \text{process} \\ e1 \leq e2 \\ \text{HEAD} = e1 \end{array} \right] \\ \text{QS} = \left[\begin{array}{l} \text{F} = z \wedge \text{manner_of}(e1, z) \wedge \text{move}(e2, y) \\ \text{A} = \text{kullan}(e1, x, y) \end{array} \right] \end{array} \right]$$

Fig. 15. The rule deriving *kullan-ış*

As can be seen, the type of the derived nominal is provided by the Event Structure of the base verb, and in this Event Structure the first sub-event encoded in the Agentive is headed. This rule states that the arguments of the input are demoted to default arguments in the derived nominal, as they are not necessarily realized syntactically as indicated by (53) below:

- (53) Ahmet'in kullan -ış -ı mükemmel.
 Ahmet GEN drive 1ş POS excellent
 Ahmet's driving is excellent.

4.3.3 A rule for derived nominals in -mE

We suggest here that the basic role of the nominalizer *-mE* is to act as a function that shifts the predicates encoded in the Agentive and the Formal of the base verb to the Telic of the derived nominal. As was stated before (see supra 3.3), the Telic is modal, it is intensional, and it is this property of the Telic that is relevant here. The telic becomes complex as it encodes two roles, a Formal and an Agentive role. This, in fact, is a property of the Telic role that is visible in artifact types too: the function of a knife, for instance, is *cut* (Formal of the Telic), but the precondition for this is that the knife must be *used* (Agentive of the Telic) as a knife can only cut if it is used. Consequently in artifacts the Telic includes both an Agentive and a Formal role.

In both of its uses then, $-mE$ is a function. In the case of unexpanded derived nominals as in (46) above, it shifts the head of the Event Structure, whereas in derived nominals that head clauses like in Figure 16 below, it shifts the whole Qualia Structure into the Telic. The general form of the rule for the latter is given in figure 16:

$$\left[\begin{array}{l} \text{CAT} = \text{V} \\ \text{ARGS} = \left[\begin{array}{l} \text{ARG}_1 = x \\ \text{ARG}_2 = y \end{array} \right] \\ \text{EVSTR} = [1] = \left[\begin{array}{l} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{process} \\ e_1 \leq e_2 \end{array} \right] \\ \text{QSTR} = \left[\begin{array}{l} \text{TEL} = \dots \\ \text{FORM} = Q(e_2, y) \\ \text{AGENT} = P(e_1, x, y) \end{array} \right] \end{array} \right] \rightarrow \left[\begin{array}{l} \text{CAT} = \text{N} \\ \text{ARGS} = \left[\begin{array}{l} \text{ARG}_1 = [1] \\ \text{D} - \text{ARG}_1 = x \\ \text{D} - \text{ARG}_2 = y \end{array} \right] \\ \text{EVSTR} = [1] \\ \text{QSTR} = \left[\text{TEL} = \left[\begin{array}{l} \text{FORM} = Q(e_2, y) \\ \text{AGENT} = P(e_1, x, y) \end{array} \right] \right] \end{array} \right]$$

Fig. 16. The rule deriving nominals in $-mE$ that head a clause

As can be observed, other variations from the base verb are brought about by the affixation of $-mE$ to a verbal base, but the Event Structure of the base verb is not defaulted. This means that no event of the Event Structure of the base verb is transformed or shifted into a Default-Event in the Event Structure of the derived nominal, as it is precisely this Event Structure that provides the type of the derived nominal. Contrary to what happens in the derivation of nominals in $-(y)/\text{ş}$, where the events of the Event Structure of the base verb are Default Events, in derived nominals in $-mE$ the type of the derived nominal is inherited from the Event Structure of the base verb.

4.3.4. Example

An example of the derivation of the derived nominal *kullan-ma* (“driving”, cf. supra (3)) is given in figure 17:

$$\left[\begin{array}{l} \text{kullan : V} \\ \text{ARGS} = \left[\begin{array}{l} \text{ARG}_1 = x \\ \text{ARG}_2 = y \end{array} \right] \\ \text{EVSTR} = [1] = \left[\begin{array}{l} \text{E}_1 = e_1 : \text{process} \\ \text{E}_2 = e_2 : \text{process} \\ e_1 \leq e_2 \end{array} \right] \\ \text{QSTR} = \left[\begin{array}{l} \text{TEL} = \dots \\ \text{FORM} = \text{move}(e_2, y) \\ \text{AGENT} = \text{kullan}(e_1, x, y) \end{array} \right] \end{array} \right] \rightarrow \left[\begin{array}{l} \text{kullanma : N} \\ \text{ARGS} = \left[\begin{array}{l} \text{ARG}_1 = [1] \\ \text{D - ARG}_1 = x \\ \text{D - ARG}_2 = y \end{array} \right] \\ \text{EVSTR} = [1] \\ \text{QSTR} = \left[\text{TEL} = \left[\begin{array}{l} \text{FORM} = \text{move}(e_2, y) \\ \text{AGENT} = \text{kullan}(e_1, x, y) \end{array} \right] \right] \end{array} \right]$$

Fig. 17. The rule deriving *kullan-ma*

It can be observed here, that contrary to what happens in the derivation of the nominal *kullan-ış* (Fig. 15), the adjunct of manner is not present in the base verb. This is justified by the fact that an adjunct, contrary to a true²⁷ argument, (which must be expressed in the semantics of the lexical item as it is realized in syntax), is an element that is not tied to the semantics of the lexical item and consequently is optional.

Another important consequence derives from the encoding of the Formal and Agentive roles in the Telic: the temporal value of nominals in *-mE* is underspecified²⁸ and consequently they receive their temporal reading from the matrix predicate.

4.4. Consequences and predictions

4.4.1 Gaps in productivity

By definition, an event typed as a state is an event in which there is no agentive role (Pustejovsky 1995:79). As a nominal in *-(y)ış* is derived from a base

²⁷ In a GL, a true argument is distinct from a shadow argument, which is an argument incorporated in the lexical item like $\mathbf{N}[\text{butter}]$ in the verb $\mathbf{V}[\text{butter}]$ and cannot be syntactically present unless it is modified (**I buttered the toast with butter*, vs *I buttered the toast with an expensive butter*). It is also distinct from a default argument, which is expressed in the qualia as part of the semantics of the item, but is not necessarily realized in syntax like $\mathbf{N}[\text{bricks}]$ in *They built this house out of bricks*, see Pustejovsky (1995: 63).

²⁸ This is exactly what was noted by Erguvanlı Taylan E. (1997) who wrote that *-mE*, is generally considered as “some form of the infinitive marker, having no temporal value”. (The precise number of the page cannot be given as there is no page numbering in Erguvanlı Taylan’s paper).

verb which contains an adjunct encoded in the agentive role (cf. figure 14), no nominal in *-(y)lş* should be derived from a state verb; this is exactly what happens, and as expected, for verbs such as *bil-* (“know”) or *içer-* or *kapsa-* (“contain”), there are no derived nominals in *-(y)lş* (*?biliş*²⁹, **içeriş* or **kapsayış*) but only derived forms in *-mE* such as *bilme*, *içerme* and *kapsama*. (54) is an example of the use of a derived nominal in *-mE* for which there is no equivalent in *-(y)lş*:

- (54) a. *Kapsa -ma alan -ı*
 contain mE surface POS
 surface for which there is a covering / surface covered (by.....)
- b. **kapsa-y-ış alan-ı*

The fact that the noun *?biliş* is only marginally accepted does not preclude the existence of *bilişim* (cognition) formed by affixation of the suffix *-im* on the base *?biliş*.

²⁹ One reviewer nevertheless accepts the derived nominal *biliş* and gives the example of (a) and (b) below:

- (a) *bun -u bil-me- -n-e şaş-t-m*
 this ACC know-mE POS-DAT surprise-PT-PER1st SG
 I am surprised that you know this
- (b) *bun -u bil-iş- i-n -e şaş-t-m*
 this ACC know- -lş -LV-POS DAT surprise-PT-PER1st SG
 I am surprised that you know this

However, our judgment is different and consequently, here again, we carried out tests on our 160 informants (see footnote 10). With the same rating of 1 for “possible”, 2 for “very unlikely” and 3 for “impossible,” the mean of acceptability for (a) is 1,43, and 2,4 for (b). 118 speakers (73,7 %) accepted (a), 14 of them (8,7 %) found it very unlikely and 28 (17,5 %) found it impossible. Only 21 speakers (13,1 %) accepted (b), 54 (33,7 %) found it very unlikely, and 85 (53,1 %) found it impossible. With the same proviso about these results as that mentioned in footnote 10, we consequently can minimally assert that *?biliş* is much more unlikely than *bilme*, its counterpart in *-mE*. Now an explanatory account of the fact that some informants (13,1% in our tests) do accept *biliş* is hard to find. We really have no intuition here, but only observe that *biliş* is derived from a propositional attitude verb, which is also a factive predicate, and we would like to suggest that these two properties may prove relevant in an explanation of the phenomenon.

In this process a word is formed on a base that does not exist in the lexicon. We suggest that this could be analyzed as a process of parasynthetic formation. This word formation process is fairly rare, but it is found for instance in Latin, (_N[pedica] /_N[shackle], *pedica-re, im-pedica-re /_V[shackle])) in French (_N[terre] /_N[land], *_V[terr-ir]/, _V[a-terr-ir] _V[land],) or in Spanish (rojo /red, *roj-ecer, en-roj-ecer / redder). In this process, both a prefix and a suffix are attached to a base, but the relevant fact here is that the base of the last step of affixation is a non-existent word (in the previous examples *pedica-re (Latin), *terr-ir (French) or *roj-ecer (Spanish) respectively). The difference is that in Turkish, as no prefix is productive (apart from prefixes used in reduplications and which are part of the base), the formation involves two suffixes³⁰.

4.4.2 *Realis vs irrealis*

Nominals derived by the rule in figure 16 are of type event: this means that they denote event descriptions. The effect of the affixation of *-mE* on the base verb is that both the Agentive and the Formal roles of the base verb are encoded in the Telic of the derived nominal. Given that the Telic is intensional and modal, this type of nominal should be expected in modal and irrealis contexts.

On the other hand, derived nominals in *-(y)/ş* whose type (manner) is inherited from a predicate encoded in the agentive role, which by definition is existentially quantified, are inherently realis. Consequently, in modal contexts they should be ruled out. This is exactly so as indicated by (55) where only a nominal in *-mE* is possible:

- (55) a. Ahmet'in araba -s -i -n -i dikkatli kullan-ma -s
 -i gerek.
 Ahmet GEN car LC POS LC ACC careful drive mE -LC-
 POS necessary
 Ahmet must drive his car carefully.
- b. *Ahmet'in araba-s -i -n -i dikkatli kullan-ış -i gerek.

³⁰ This word formation process is a problem for morpheme-based theories of morphology as this type of word formation violates either the sequential principle (one affix attached at a time) or the principle according to which each base of affixation must be a word existing in the lexicon.

Ahmet GEN car LC POS LC ACC careful drive Iş -POS necessary

This observation is similar to that of [Erguvanlı Taylan \(1997\)](#) who notes that -*mE* is a nominalizer of object clauses of predicates which express modal notions. With a matrix verb selecting for an irrealis internal argument, nominals in -(y)Iş should be ruled out too. Again, this is exactly what happens, as illustrated by the data under (56) to (58):

- (56) a. Ahmet'in gel -me-s -i -n -i ist -iyor -um.
 Ahmet'GEN come mE LC POS LC ACC want ASP PER 1 SG
 I want Ahmet to come.
- b. *Ahmet'in gel -ış -i -n -i ist -iyor -um.
 Ahmet'GEN come Iş POS LC ACC want ASP PER 1 SG
- (57) a. Öğretmen kitab-ı oku-ma-m-ı iste-di-Ø.
 Teacher book-ACC read-mA-POSS-ACC want-PT-PER3^e
 The teacher wanted/asked me to read the book.
- b. *Öğretmen kitabı oku-y-uş-um-u iste-di-Ø.
- (58) a. Film-in bit-me-s-i-n-i bekl-iyor-um.
 Film GEN finish mE LC POSS LC ACC wait-ASP-PER-1st .
 I am waiting for the end of the film.
- b. * Film-in bit-iş-i-n-i bekl-iyor-um

The construction of a verb selecting for an *irrealis* internal argument can be represented by the rule in figure 14. As stated (see 3.3) the argument that is bound to the Telic role of the matrix verb receives a modal interpretation: here both Formal and Agentive roles of the base verb have been encoded in the Telic of the derived nominal. The selection is made possible by the fact that the matrix verb is expecting an intensional element to fill its Telic, and this element is provided by the matching Telic of the derived nominal argument. This requirement of matching Telics (that of the matrix verb and that of its argument) is the mechanism that blocks the occurrence

of an extensional argument in the scope the intensional matrix predicate: if no intensional element is present in the argument, which is the case for nominals in $-(y)/\text{ş}$, (see figure 15) the construction is blocked. The construction of an intensional matrix predicate and its argument is given below in Figure 18:

$$\left[\begin{array}{c} V'-mE \\ QS=[1]T = \Diamond \left[\begin{array}{c} F = \dots \\ A = \dots \end{array} \right] \end{array} \right] \left[\begin{array}{c} V \\ QS = \left[\begin{array}{c} F = P(e, x, y) \\ A = \dots \\ T = \Diamond[\dots] \end{array} \right] \end{array} \right] \rightarrow \left[\begin{array}{c} V'-mE, V \\ QS = \left[\begin{array}{c} F = P(e, x, [1]) \\ T = \Diamond[1] \end{array} \right] \end{array} \right]$$

Fig 18: construction of a matrix verb selecting for an irrealis argument

In Figure 18 above, V' is the base verb, V is a variable for the matrix verb that can be instantiated by predicates such as *bekle-* (expect), *dile-* (wish), *um-* (hope) or *iste-* (want). As a specific example, for the verb *iste-* (cf. (56)) the relevant construction of the verb and its internal argument *Ahmet'in gel -me-s-i-n-i* is represented in figure 19:

$$\left[\begin{array}{c} gel\ mE \\ QS = [1] \\ [1] = T = \Diamond \left[\begin{array}{c} F = burada/here(e_2, y) \\ A = gel(e_1, y) \end{array} \right] \end{array} \right] \left[\begin{array}{c} QS = \left[\begin{array}{c} ist - /want \\ F = ist(e_1, x : ben/I, [1]) \\ T = \Diamond[\dots] \end{array} \right] \end{array} \right] \rightarrow \left[\begin{array}{c} gel - me - si - ni\ istiyorum \\ QS = \left[\begin{array}{c} F = ist(x : ben/I, [1]) \\ T = \Diamond[1] \end{array} \right] \end{array} \right]$$

Fig. 19. The case of the verb *iste-*

As can be seen, the structure representing the semantics of the nominal in $-mE$ is bound to the Telic of the matrix verb, with the resulting modal interpretations. The resulting Telic is a complex one with both an Agentive and a Formal of its own.

The phenomena just described are predicted by the interaction of the semantics of the base verb and of the matrix predicates. These are cases of complementary distribution between nominals in $-mE$ and in $-(y)/\text{ş}$. In some cases however, overlapping in the distribution of both nominals is possible as will be seen now.

4.4.3 Factive predicates

As by definition, the complement of factive predicates (Kiparsky and Kiparsky (1970)) is existentially presupposed, one would expect the nominals that are

complements of factive predicates to be nominals in *-(y)/ş* and not in *-mE*. Yet, things are not as simple as that. For instance both sentences a) and b) in (59) below are correct, whether the complement of the matrix predicate is a nominal in *-(y)/ş* or in *-mE*:

- (59) a Ben sizin çırpın-ış -ınız-a üzül-üyor-um.
 I your agitate-Is PER2stPL-DAT regret-ASP-1^{er} PER
 I regret your efforts.
- b. Ben sizin çırpın-ma-nız-a üzül-üyor-um.
 I your agitate-mE PER2stPL-DAT regret-ASP-1^{er} PER
 I regret your efforts

This is coherent with what was already noted by some authors, among whom [Erguvanlı Taylan E. \(1997\)](#), or [Csató \(2010 :115\)](#): a nominal in *-mE* in the scope of a factive predicate is not impossible³¹. As an example of a factive predicate that has a nominal in *-mE* in its scope, [Erguvanlı Taylan \(1997\)](#) gives the example of the verb *içerle-* (resent), and (60) is another example with the predicate *önemli* (significant) from [Csató \(2010:115\)](#):

- (60) Türkiye'n-in Avrupa oluş-um-u-n-da yer al-ma-s-ı
 önemli.
 Turkey-LC-GEN Europe form-NOM-POS-LC-LOC place take-mE-LC-POS
 significant

It is significant that Turkey participates in the formation of Europe

All this shows that both nominal in *-mE* and *-(y)/ş* can occur as the complement of a factive predicate. Yet, (61b) below is not grammatical:

- (61) a. Anla-y-ış-ınız için minnettar-ım.
 Understand-y-Is-POS 2^d PL for grateful PER1stSG
 I am grateful for your comprehension.

³¹ The presence of a nominal in *-mE*, which is basically modal, in a factive context is not so surprising as it may seem, given that possibility and facts are closely connected. As [Asher \(1993:29\)](#) put it “the facts of one world are another world’s possibilities”. See also [Asher \(1993:207-214\)](#).

- b. *Anla-ma-nız için minnettarım.

Given what has just been said, it cannot be argued here that the presence of a nominal in *-mE* in the scope of a factive matrix predicate is the only relevant factor that rules out (61b). It can be observed that in (61b), the derived nominal is a complement of the adposition *için* (for)³². The examples in (59) to (61) show that the factivity of the matrix predicate is not the only relevant factor in the grammaticality of the sentences, and that the complement may contribute its part to the grammaticality of the whole sentence too.

In the scope of some factive predicates, nominals in *-DIK*³³ are sometimes preferred to nominals in *-(y)Iş*, but *-mE* is excluded as shown by (62) and (63):

- (62) a. Sinirlen-diğ-i-m için üzgün-üm.
get angry -DIK-LV-POS for sorry-1st PER.SG
I regret having been angry. / I am sorry that I was angry.
- b. ??Sinirlen-iş-i-m için üzgünüm.
- c. *Sinirlen-me-m için üzgünüm.
- (63) a. Ağla-dığ-ı-m-ı itiraf ed-iyor-um
cry -DIK-LV-POS-ACC confession make-ASP-1SG
I confess that I cry (cried).
- b. ??Ağlay-ış-ı-m-ı itiraf ediyorum.
- c. *Ağla-ma-m-ı itiraf ediyorum.

Now it is clear that the factive reading of (59) and (60) is brought about by the matrix factive predicate. In order to analyze this phenomenon we want to observe first that it

³² A phrase headed by *için* selecting a derived nominal in *-mE* expresses non factivity. An example of this, provided by a reviewer, is (a):

- (a) Çocuk-lar-ı dil öğren-me-ler-i için Tayland-a yolla-di-k
Child-PL-ACC language learn -mE PL-POS for Thailand-DAT send PT-PER-1st PL
We sent the children to Thailand to learn the language

³³ As noted by [Erguvanlı Taylan E., \(1997\)](#), *-DIK* is labelled a “factive nominal” marker” by some authors, See also [Kornfilt \(2001:187\)](#), [Göksel \(2001:155\)](#)

is a property of factive predicates to coerce into a factive reading, arguments that may have a non factive reading in non factive environments. Type coercion is defined classically as a semantic operation that changes the type of an argument to the type required by a function to avoid a type failure. Informally type coercion can be seen as an unexpressed function³⁴. This property is a property of some English factive predicates too. For instance, the derived nominal *departure* has a factive reading in a factive environment as in *John informed Sue of Mary's departure* (corresponding to *John informed Sue that Mary had departed*), and a non factive reading in a non factive environment as in *The thief's departure was stopped by the police* (examples from Pustejovsky (1995:176) see also Asher (1993:159)). Pustejovsky notes too that this correlates to the fact that there is no tense anchoring in these nominals, which behave as irrealis expressions. This is exactly the case too for nominals in *-mE* as was noticed above. But in some cases, coercion is not possible and here the nature of the complement in the scope of the factive matrix predicate is relevant too: this is especially the case when the complement is an adpositional phrase headed by *için*, as indicated by (61).

4.4.4 Verba sentiendi and Psych-Verbs.

Two classes of verbs accept both nominals in *-mE* and in *-(y)/ş* as internal arguments: psych-verbs and verba sentiendi. Psych-predicates were defined by Postal (1971: 41) as predicates which a) refer to psychological features of human beings and b) in English have adjectival variants in *-ing* whose postadjectival PP are headed by *to*, and in *-ed* with postadjectival PP headed by *at*, *with*, *of*, *about*. Croft (1991: 213) crucially notes that they are examples of “affective causation”, in which a stimulus causes the experiencer to enter the mental state identified by the verb. This is a property that they share with verba sentiendi as for these verbs too a stimulus triggers the experiencer’s perception. Another feature common to these verbs is then that their subject bears an experiencer thematic role. For verbs belonging to these

³⁴ More formally, Pustejovsky (1995: 111) defines Function application with Coercion as:

If α is of type c , and β is of type $\langle a, b \rangle, \Sigma_\alpha$ being the aliases available (the qualia) then :

- (i) If type $c=a$, then $\beta(\alpha)$ is of type b .
- (ii) If there is a $\sigma \in \Sigma_\alpha$ such that $\sigma(\alpha)$ results in an expression of type a , then $\beta(\sigma(\alpha))$ is of type b
- (iii) Otherwise a type error is produced.

classes, the stimulus is encoded in the agentive as, by definition, it brings about the resulting mental state (psych-verbs) or the experiencer's type of perception (verba sentiendi) that is encoded in the Formal. This is expressed in figure 16 below, which captures the relevant semantics of these verbs³⁵:

$$QS = \left[\begin{array}{l} \dots \\ \text{FORMAL} = Q_state(e_2, \dots) \\ \text{AGENTIVE} = P_stimulus(e_1, \dots) \end{array} \right]$$

Fig. 20. Relevant semantics of verba sentiendi and psych-verbs.

We suggest that the difference between these two classes of verbs is the temporal restriction over e_1 and e_2 , the sub-events arguments of the predicates encoded in the Agentive and Formal respectively. For verba sentiendi the two sub-events overlap as the stimulus encoded in the Agentive cannot be dissociated from the perception of the sub-event expressed in the Formal: this will be noted as $e_1 O e_2$ (see 3.1.2 above). Conversely for psych-verbs, the trigger sub-event which is argument of the predicate encoded in the Agentive, precedes the sub-event argument of the predicate encoded in the Formal which expresses the emotion: this will be noted $e_1 < e_2$ (see 3.1.2 above). Consequently, the semantics of verba sentiendi is as represented in figure 21, whereas the semantics of psych-verbs is as represented in figure 22:

³⁵ This view is consistent with that of phenomenologists. Husserl conceived of feelings and sense experience alike as intentional: the predicate encoded in the stimulus being the “presentation”, the resulting state being the “act” in Husserl’s terminology (among others terms to identify this element).

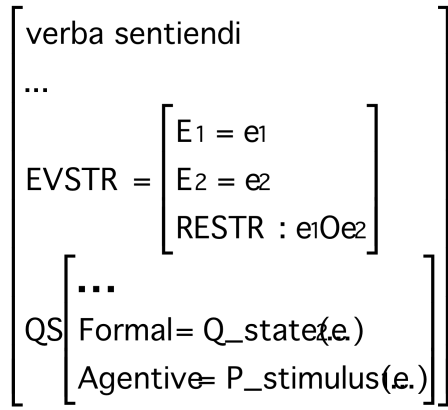


Fig. 21. Semantics of verba sentiendi

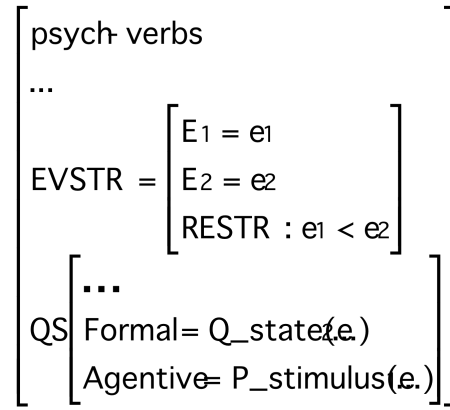


Fig. 22. Semantics of psych-verbs

Nominals in *-mE* can be internal arguments of *verba sentiendi*: this means that they are bound to the Agentive of the verbs of this class. Consequently they are existentially quantified (see 4.2.2 *supra*); as underlined by Göksel and Kerslake (2005: 428) in this distribution they do receive the existential interpretation of nominals in *-(y)lş* and both nominals express that the speaker was a witness of the event described that actually happened. A specific example is (64) in which nominals in *-(y)lş* and *-mE* are arguments of the verb *gör-* (*see*):

- (64) a. Çocuğ-un ağaç-tan düş me -s-i - n -i gör -dü-m.
 Child-GEN tree-ABLfall-mE LC POS-LC-ACC see PT-PER 1st
 I saw the child fall from the tree.
- b. Çocuğ-un ağaç-tan düş üş ü - n -ü gör -dü-m.
 Child-GEN tree-ABLfall-lş POS-LC-ACC see PT-PER 1st
 I saw the child fall from the tree.

In (64a) and (64b) the opposition between both types of nominals is neutralized. This can be accounted for by the fact that *verba sentiendi* convert the type of their internal argument into the type that satisfies their selectional restrictions. This is another example of type coercion. Of course, coercion does not apply without constraints, and for coercion to be possible, the semantics of the coerced argument must contain the type expected by the function. But it was shown previously (3.1.3) that it is precisely the rich representation of lexical items seen as a reserve of types that makes the coercion operation successful, since the expected type is contained in the coerced item.

Coercion is a property of verba sentiendi³⁶, but coercion is not powerful enough to change the meaning of an argument, what it only does is select an available meaning among other possible meanings.

When they are internal arguments of verba sentiendi, nominals, whatever their forms, receive their quantificational force from the role they are encoded in, here the Agentive, hence the existential quantification of events expressed by nominals in *-mE*. This is why in this distribution they are strictly interchangeable with nominals in *-(y)lş*.

Another interesting property of sentences (64a,b) is that they also tend to express *how* the event identified by the derived nominal happened. This reading is unsurprisingly conveyed by the nominal in *-(y)lş*, in accordance with the semantics of this nominal. What is more unexpected is that the nominal in *-mE* also conveys this manner meaning. Our analysis of this phenomenon is as follows: the fact that there is an overlap between the agentive stimulus (identified by the derived nominal) and the state (see figure 21) indicates that the perception of the event holds while the process event encoded in the agentive holds. Consequently, the perception of the event is also the perception of all (homogenous) sub-parts the process event is made of, and pragmatically it is this perception of every single sub-part of an event that gives rise to the meaning of *how* the event unfolds.

Not only are these nominals existentially quantified, but they also appear in sentences that express direct perception reports in that for (64) to be true, the subject must refer to someone who has *actually* witnessed the process identified by the base verb. The logical form of both (64a) and (64b) is then (65):

(65) $\exists e[\text{gör/see}(\text{ben/I}, e) \wedge \text{düş/fall}(\text{çocuk/child}, e)]$

Indirect perception reports are then conveyed by another suffix, the suffix *-DIK*, as this suffix acts as an event sequencer: it expresses (among two possible readings

³⁶ This property of some verbs to create a coercive environment is not restricted to verba sentiendi. As was seen above, (in 4.4.3) some factive predicates have this property too, both in Turkish and in English. Other types of verbs can have this property, for instance English aspectual verbs such as *begin* (see Pustejovsky (1995:117)).

as will be seen later on) that the event described by the internal argument of the matrix predicate happened before the event described by the matrix predicate. This is why (66a) below can have the reading indicated in the English translation:

- (66a) Çocuğ-un ağaç-tan düş -tüğ -ü -n -ü gör -dü-m.
Child-GEN tree-ABLfall-DIK POS-LC-ACC see PT-PER 1st
I saw that the child had fallen from the tree.

Our analysis of (66a) follows that of Göksel and Kerslake (2005: 428): what is expressed here is that the fact was perceived after the event of the fall of the child had taken place. However, the presence of the suffix *-DIK* on the verb may also express that the event described by the internal argument of the matrix predicate is simultaneous³⁷ with that of the matrix predicate. In this case the reading is that which is indicated by the English translation in (66b):

- (66b) Çocuğ-un ağaç-tan düş -tüğ -ü -n -ü gör -dü-m.
Child-GEN tree-ABLfall-DIK POS-LC-ACC see PT-PER 1st
I saw the child fall from the tree.

We suggest that these readings arise from the two possible instantiations of the Agentive (the stimulus) of *verba sentiendi* by the nominal argument: this role is instantiated either by the Agentive of the nominal in *-DIK* (the act of falling) or by the Formal (the result of the fall). The former instantiation gives rise to the “simultaneous” reading of (66b), hence the fall is witnessed, the latter gives rise to the meaning expressed in (66a), in which case what is expressed is the perception of a fact. The same thing goes for cognition verbs³⁸ like *bi-* (know) in (67) below, in which both nominals in *-mE* and *-(y)lş* express *how* the event unfolds, and the nominal in *-DIK* expresses either past or present reference:

³⁷ Integrating the reading of (66a), it is then possible to state, following Erguvanlı Taylan (1997) that *-DIK* “seems to express non-future reference”. A similar analysis is provided in Kural (1998: 411).

³⁸ The class of “psych verbs” includes verbs of cognition, see Croft (1993:55).

- (67) a. Biz çocuğ-un araba kullan-ma-s -ı -n-ı bil -iyor -uz.
 we child-GEN car- use -mA-LC-POS-LCACC know-ASP PER 1st PL
 We know how the child drives the car.
- b. Biz çocuğ-un araba kullan-ış-ı -n-ı bil -iyor -uz.
 we child-GEN car- use -İş POS-LC-ACC know-ASP PER 1st PL
 We know how the child drives the car.
- c. Biz çocuğ-un araba kullan-dığ-ı -n-ı bil -iyor -uz.
 we child-GEN car- use DİK POS-LC-ACC know-ASP PER 1st
 We know that the child drives/drove a car.

Both types of nominals in *-mE* and *-(y)İş* can be internal arguments of psych-verbs too, for the same reason: they express the stimulus that triggers the emotional state and consequently, they are bound to the Agentive role of the matrix verb. The difference is that with psych-verbs, both types of nominals receive dative (or ablative) case as can be seen in (68):

- (68) a. Mehmet, Ali-n-in kendisini çağır-ma-y -ış-ı -n -a gücendi.
 MehmetAli-LC-GEN himself invite-NEG-LC-İş-POS LC-DAT offended
 Mehmet was offended by Ali's not inviting him.
- b. Mehmet, Ali-n-in kendisini çağır-ma-ma -s-ı -n -a gücendi.
 Mehmet Ali-LC-GEN himself invite-NEG-mE LC POS LC DAT offended
 Mehmet was offended by Ali's not inviting him.

The difference between these two classes of nominals is their original type: as nominals in *-(y)İş* are of type manner (see above 4.1.1), it is easy to understand that they are preferred when the sense of manner is intended, as stated in [Göksel and Kerslake \(2005: 429\)](#).

5. Turkish *-mE* / *-İş* and English nominalizations. A comparison.

Given what has been said so far (more specifically in 2.5 and 4.2.3), it is interesting to investigate whether the analysis provided for Turkish nominals in *-mE* and *-(y)İş* can be extended to the well known analyses of English gerunds and other

derived nominals, and to see whether and how the rules designed can be applied to English relevant phenomena.

5.1. The English gerund and nominalizations

5.1.1 An overview

The following cases represent the various types of English nominalizations:

- <i>that</i> -clauses :	s[[that+S]]
- Infinitive sentence nominalization:	s[[for X to V...]]
- Accusative verbal gerund:	s[[him V-ing X]...]
- Genitive verbal gerund:	s[[his V-ing X]...]
- Nominal genitive gerund and <i>of</i> complement:	s[his V-ing of X]...]
- Lexical deverbal Noun:	s[det V-affix of X]...]

5.1.2 Some properties of gerunds

The properties of the three types of gerunds have been well studied and are well known. We briefly sum up the properties that are relevant in this comparative study³⁹.

Kiparsky and Kiparsky (1970: 159) note that gerunds tend to be factive, while other forms of nominalization tend to be non-factive, as illustrated by (69):

- (69) a. I regret John's being ill. (factive)
b. I believe that John is ill. (non-factive)
c. *I believe John's being ill.

It is also well known from works going back to Lees (1963), Rosenbaum (1967) and Frazer (1970), and more recent works like that of Asher (1993), that nominal gerunds are compatible with a determiner (*the chairing of the session by John*), whereas verbal gerunds are not (**the chairing the session* vs *John's chairing the session*, or *John's riding his bicycle* vs **the riding his bicycle*).

³⁹ We are not including *PRO-ing*, gerunds which can be considered as a particular case of accusative verbal gerunds.

Also, space and time anchoring is licit only with nominal genitive gerunds with *of* complements (*the crushing of the rock occurred yesterday* vs **John's crushing the rock occurred yesterday*).

As for Grimshaw (1990), she distinguished 3 types of nominals depending on the availability of an event interpretation: complex event nominals, simple event nominals, and result nominals illustrated by (70a) (b) and (c) respectively:

- (70) a. the identification of the criminal by the police was not easy.
b. many students failed the examination.
c. this assignment is for the students.

A complex nominal such as that in (70a) is ambiguous between an event reading and a non-eventive reading, an event nominal such as that in (70b) denotes an event, and a result nominal such as that in (70c) is non eventive. Among other criteria, complex eventive nominals do not pluralize, they occur with *the* and not *a*, and with *frequent* or *constant* adjectives in singular as shown by (71a), (b) and (c) respectively:

- (71) a. *the constant constructions of cheap houses
b. *a constant construction of cheap houses
c. the constant construction of cheap houses

Moreover, Grimshaw notes that event interpretation is related to the affix attached on the verbal base and that most *-ation* nominals are ambiguous between eventive and non event (see (70) (71) above) readings. It is also admitted that *-ing* nominals are generally eventive. Yet, some derived nominals in *-ing* are not felicitous as shown by *?the finding of the answer*, *?the losing of £10*.

Turkish derived nominals in *-mE* and *-(y)lş* seem to differ from English derived nominals on some aspects, but also exhibit interesting similarities. The first of these is that in their syntactic form, clausal derivations in *-mE* and *-(y)lş* are similar to English gerunds, in that they involve a mixed construction, which has the external (distributional) properties of NPs (case marking), and the internal structure of VPs

(arguments of Vs can be expressed). The semantic properties of gerunds are examined now.

5.2 The semantics of nominals

5.2.1 The treatment of the semantics of English gerunds and nominals

As was mentioned before, English nominals derived by *-al* like *arrival*, *proposal* or *withdrawal* or by *-ation* like *construction*, *examination* or *suggestion*, are ambiguous between a process and a result readings. Formally, in a G L, this property is accounted for by the fact that the suffix introduces a dot object of type process.state. A dot object is an object whose type is not simple (like that of a natural object for instance *stone*), but composed of two types related by a specific relation. The decomposition of lexical items in qualia roles as presented in 3.1.3 above is not adequate to analyze the semantics of items like *book* or *newspaper* or *lunch*. As indicated, for instance, by the licit co-predication in the sentence *The lunch was delicious but took forever*, a single lexical item (*lunch*) refers both to food and to an event. The type of food is thus a dotted type⁴⁰, which is noted as event.food.

In the case of the nominal *construction* in (71) the relation between the two types of the dotted type is a temporal relation of precedence between the two sub-events of the process and of the resulting state respectively, as the process necessarily precedes the result brought about by this process. Each type of the dot type can project to syntax: if it is the process sub-event that projects, the meaning is the event meaning; if it is the state sub-event that projects, the meaning is the result meaning. As long as these nominals have not fed the syntax, their Event Structure is unheaded, which accounts for their polysemy.

English nominal genitive gerunds with *of* complement (see above s[his V-ing of X]...) are not ambiguous between a process and a result readings like nominals derived by affixation of *-ion* or *-al*. For instance, the nominal gerund [the signing of the contract] refers to the process of signing, not to the result (**the signing⁴¹ of the contract is illegible* vs *the signing of the contract took only a few seconds*).

⁴⁰ For an exhaustive presentation of dot objects see [Pustejovsky \(1995:149\)](#).

⁴¹ There is a use of the verb *sign* for which *the signing is illegible* might be accepted: that in which the verb *sign* refers to the gestures used in sign language.

Consequently, as the nominalizing suffix acts as a mechanism that heads the initial process sub-event of the Event Structure, no result meaning is available in these gerunds,

Rather, nominal gerunds are ambiguous between a fact and a manner readings: *John's driving of the car* can either mean the fact that John drives the car (*John's driving of the car was unexpected*) or the manner in which he drives the car (*John's driving of the car was reckless*). Contrary to this, verbal gerunds of type $s[[his V\text{-}ing X] \dots]$ do not convey the manner reading.

5.2.2 Cross linguistic generalizations

As was just noticed, the type of English derived nominals in *-ion* or *-al* is a dot object process.state, whereas the type of Turkish derived nominals in *-mE* that are unexpanded words, is a single type result. These differences are summed up in Figures 23 and 24 below:

- the affixation of *-mE* to a verbal base heads the result state sub-event of the Event Structure of the verb, so that only the result state projects to syntax (see examples in 47). In English no heading is associated with the attachment of the nominalizing suffix: consequently, the type projected depends on the matrix predicate, which selects one particular type of the dotted type process.state, either the process type (*the construction of the house took five months*) or the state (result) type (*this house is of solid construction*).
- The domains of application of the rules are different: in Turkish the rule applies to accomplishment aspectual types, in English it also applies to achievements types.

$$\left[\begin{array}{l} \alpha : V \\ \dots \\ EVSTR = \left[\begin{array}{l} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{state} \\ e_1 \leq e_2 \\ HEAD = *e_1 \end{array} \right] \\ \dots \\ \text{Type: Accomplishment} \end{array} \right] \rightarrow \left[\begin{array}{l} \alpha - ma : N \\ \dots \\ EVSTR = \left[\begin{array}{l} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{state} \\ e_1 \leq e_2 \\ HEAD = *e_2 \end{array} \right] \\ \dots \\ \text{Type: Result} \end{array} \right]$$

Fig. 23. Relevant aspects of the rule that derives Turkish unexpanded nominals in *-mE*.

$$\left[\begin{array}{l} \beta : V \\ \dots \\ \text{EVSTR} = \left[\begin{array}{l} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{state} \\ e_1 \leq e_2 \\ \text{HEAD} = e_1 \text{ or } e_2 \end{array} \right] \\ \dots \\ \text{Type: Accomplishment or Achievement} \end{array} \right] \rightarrow \left[\begin{array}{l} \beta - \text{ion/ -al/... : N} \\ \dots \\ \text{EVSTR} = \left[\begin{array}{l} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{state} \\ e_1 \leq e_2 \\ \text{HEAD} = \text{underspecified} \end{array} \right] \\ \dots \\ \text{Type: process.state} \end{array} \right]$$

Fig. 24. Relevant aspects of the English rule that derives nominals in *-ion/-al*, etc.

The rule that derives nominals in *-(y)/ş* heading a clause, and the rule that derives English nominal gerunds are similar in some respects too. Yet as was observed above in 5.1.2. English nominal gerunds are ambiguous between a fact and a manner reading, whereas Turkish nominals in *-(y)/ş* only convey a manner reading. In Turkish the fact reading then is expressed by another type of derived nominal as was previously noted in 4.4.3. It may be expressed for instance by a nominal in *-DIK*⁴² as illustrated by (72):

- (72) Istanbul-a gel-diğ -i muhakkak.
Istanbul-DAT come-DIK-POS certain
The fact that he came /comes to Istanbul is certain.

Consequently the difference between the rule that derives English nominal gerunds and the rule that derives Turkish nominals in *-(y)/ş* heading a clause, is (as in the rules previously compared in Fig 23 and 24) that the former introduces a dot object, manner.fact, whereas the latter derives only a manner type.

Interestingly, some of the principles and mechanisms at the source of the rules designed for Turkish have a general validity and are not language specific. For instance in Turkish derived nominals in *-(y)/ş* that head a clause, and in English nominal gerunds, a relevant factor is event headedness: in both cases the headed sub-event is the left sub-event in the Event Structure. So both *-ing* in English (in nominal gerunds) and *-(y)/ş* in Turkish are suffixes that act as a left heading mechanism on the Event Structure. This explains why some identical constraints

⁴² As was seen in 4.4.3 a nominal in *-mE* can also have this fact reading.

apply both on English and Turkish nominals. Kural (1998: 407) notes that derived forms in *-(y)lş* such as *?ölüş* or *?çözüş* derived on the verbal bases *öl-* (die) and *çöz-* (solve) respectively, are marginal or infelicitous. The same observation holds for the nominal *?yetişiş* derived on the verbal base *yetiş-* (reach) or *?kaybediş* derived on *kaybet-* (lose). These marginal or infelicitous nominals are derived on achievement verbal bases, and the same thing goes for English verbs like *find* or *lose*, as noted above in 5.1.2. It is a unique constraint that explains the marginality of these forms in both languages: as achievements verbs are headed on the right result sub-event, and as both *-ing* in English and *-(y)lş* in Turkish head the left process sub-event of the Event Structure, this leads to a double headed Event Structure, which is an unlikely structure⁴³. Consequently, this explains why in both languages, it is difficult to derive nominals under discussion here on an achievement verbal base.

There does not seem to be an exact English equivalent for derived nominals in *-mE* that head clauses in Turkish, as no English nominal seems to have the irrealis meaning of Turkish derived nominals in *-mE* that head clauses.

So, a comparison between Turkish nominalizations and English nominalizations shows that to a large extent, the mechanisms postulated for Turkish are not language specific, and that thanks to their rich semantic content, the rules designed can feed a general model of nominalization in natural language.

6. Discussion

What we think must be discussed now is first our theoretical stance including the tools used. An assessment of our analyses is in order too.

6.1 The theoretical stance, the tools used

6.1.1 Lexicalism

Chomsky's paper (Chomsky 1970), which was used here to set the stage for a first pass at an analysis of Turkish derived nominals in *-(y)lş* and *-mE*, came as an assessment and a rejection of the transformationalist hypothesis which had been

⁴³ The only licit types of heading of event structures are $e_e[*e_1, e_2]$ (for accomplishments), $e_e[e_1, *e_2]$, (for achievements) and $e_e[e_1, e_2]$ (for structures that admit of two potential syntactic projections see 3.1.2),

taken for granted in previous works on nominalization, in [Lees \(1960\)](#) for instance. For Lees, the derivation of all nominals was taken to be transformational: for instance the derivation of agentive nominals in *V-er*, ([Lees, 1960: 70](#)), consisted in a two-step process, first a simple transformation to produce an agentivized sentence, and second a generalized transformation to insert the agentive predicate of *be* for a nominal matching the subject. The hypothesis made by [Chomsky \(1970\)](#), that some derivations can take place in the lexicon (basically those which are idiosyncratic), does not necessarily mean however, that those that are (more) regular must be syntactic derivations. In other words admitting that the lexicon is the locus of irregularities and idiosyncrasies does not mean that regularities cannot be captured by lexical rules. This justifies the stance taken here then, that both derivations of nominals in *-(y)lş* and *-mE* can be considered as lexical derivations. With this theoretical stance we also took advantage of the rich semantics provided by a Generative Lexicon.

6.1.2 Generative Lexicon

Basically, a GL is a typed decomposition formalism: as we have seen, in this formalism each predication is distributed into as many sub-predicates as there are sub-events in the Qualia structure. The interpretation of a predicate is then like in (73) in which F, A, T, and C are respectively the Formal, Agentive, Telic, and Constitutive roles:

$$(73) \quad \underbrace{\lambda x_n \lambda_{n-1} \dots \lambda x_1}_{ARGSTR} \underbrace{\lambda e_m \lambda_{m-1} \dots \lambda e_1}_{EVENTSTR} \underbrace{(Q_F \wedge Q_A \wedge Q_T \wedge Q_C)}_{QUALIA}$$

More specifically, given the temporal restriction over the sub-events, the interpretation of a verb such as *kullan-* (drive) (see figure 8) is now (74):

$$(74) \quad \lambda y \lambda x \lambda e_2 \lambda e_1 [kullan(e_1, x, y) \wedge move(e_2, y) \wedge e_1 \leq e_2]$$

This rich lexical decomposition allows us first to capture the meaning of a lexical item that can then be manipulated by semantic operations such as coercion, and secondly

to derive the properties of derived nominals compositionally, via lexical rules instead of listing them in the lexicon.

6.1.3 Lexical rules.

As was previously stated (see supra 5.1.1), [Chomsky \(1970\)](#) provided ample motivations for the lexicalist hypothesis. It must be noted however that he does not use lexical rules as such to relate lexical entries but proposed ([Chomsky 1970:190](#)) that many items in the lexicon such as the pairs *refuse* and *refusal* or *destroy* and *destruction* appear as a single lexical entry underspecified for their categorial features ($\pm V$, $\pm N$). They are later on distinguished by idiosyncratic rules triggered by their distribution so that *refuse* or *destroy* are inserted under a V node and *refusal* and *destruction* are inserted under an N node. Contrary to this, in our framework, each item of the pairs above has its own lexical entry and it is the function of lexical rules⁴⁴ to relate these entries. The rules designed allow a compositional treatment of the meaning of derived nouns as this meaning is entirely built from the lexical information contained in the base verbs. Thus, the relationship between the meaning of verbs and the meaning of corresponding derived nominals is made explicit. These rules also allow some adequate predictions to be made. This will be discussed now.

6.2 Assessment of our analyses.

6.2.1 Distribution and case marking

The lexical rules we have designed account for the data presented, and also allow adequate empirical predictions regarding the distribution of the two types of nominal. We showed that the relevant factor here is the binding of the type of the nominal to a special qualia role of the matrix verb. We have shown that verba sentiendi and psych-verbs analyzed as inherently causative, pattern together in coercing the type of their nominal internal argument, which is bound to the agentive role. They are opposed in that verbs of the former class mark their arguments with accusative, whereas verbs of the latter class mark them obliquely (dative or ablative). We have not attempted any principled explanation of this fact, yet a few words are in

⁴⁴ The first description of lexical rules such as those used here probably goes back to [Leech \(1974: 214\)](#).

order here. The inadequacies of meaning approaches to case are well known: for instance Fillmore (1968: 9) contends that any attempt to find a unified meaning to case marks is bound to fail and consequently, Fillmore concludes, “localistic” theories of case are discredited. However modern grammars of case are still attempted (see for instance Anderson (2006)) and the Turkish case system seems impossible to analyze without integrating meaning. Without going into any detail here, a few facts must be emphasized. Accusative case is limited (among other uses summed up in Göksel and Kerslake (2005: 175)) to definite objects whereas indefinite objects are non-marked. Moreover, recently, Nakipoğlu (2009: 1253) argues that accusative marking also contributes a holistic meaning to a sentence with some classes of verbs and is also linked to presupposition. Kılıçaslan (2006) also links case marking to the informational status of the NP that bears case. In our analyses we have shown that the dative and ablative case can be borne by NP that are internal arguments of psych-verbs, but the ablative case is preferred with verbs that express aversion (Göksel and Kerslake 2005: 179). These facts too, we think, add evidence that case marking is in some way linked to the semantics of the NP.

Other oppositions seem much more difficult to explain. For instance, a principled account of the different case marking properties of the two verbs *sev-* (love) and *hoşlan-* (like) is difficult to imagine. The former assigns Accusative, the latter Ablative to its complement as indicated by (75) and (76):

- (75) Öğrenci-ler sözdizimi-n-i sev-iyor.
 Student-PL syntax- LC-ACC love-ASP
 Students love syntax.

- (76) Öğrenci-ler sözdizimi-n-den hoşlan-ıyor.
 Student-PL syntax-LC-ABL like-ASP
 Students like syntax.

We will not attempt to provide a thorough explanation for this phenomenon. What can be noticed however, is that there is a slight difference in meaning between the two verbs and that the emotional involvement identified by *hoşlan-* is weaker than that indicated by *sev-*. We suggest that the fact that *hoşlan-* assigns the case that is

assigned by verbs that express aversion, is a way of marking the opposition between two verbs with almost similar meanings.

6.2.2 Productivity

The rules designed also account for gaps in productivity. Yet it must be emphasized that gaps in productivity may result from a phonological constraint as shown by examples under (41).

Another fact must be noticed regarding the opposition between these two derived forms of nouns: paradoxically, when no linguistic context is available, (on a notice board or a sign post for instance) the usual form of the noun is the derived form in *-(y)ış* instead of the expected noun in *-mE* and consequently *çıkış* (“way out”) is preferred to *çıkma* or *giriş* (“way in”) is preferred to *girme*. This can probably be explained by the fact that the suffix *-mE* is homonymous with the verbal negation morpheme and consequently words such as *çıkma* or *girme* could be understood as negative forms of the verbs *çık-* (“to go out”) or *gir-* (“to come in”). In situations where there must be no ambiguity, nominals in *-mE* are then regularly replaced by unambiguous nominal forms in *-(y)ış*.

Yet, it is not completely impossible to find nominals in *-mE* in this situation, witness the form *çağır-ma* (call *-mE*) on the call button in lifts.

Our study was an attempt at offering a principled account of the usage and of the distribution of the two nominal suffixes *-mE* and *-(y)ış*, and some basic principles have emerged. It is not impossible that frequency effects may sometimes blur the opposition we established. For some speakers, in frequently used forms, there tends to be an interchangeable use of both nominals, such as in (77) below:

- (77) a. Onu gör-me-m-i engelle-di.
 PERS3 ACC see -mE POS ACC prevent-PT
 (S)he prevented me from seeing him/her.
- b. Onu gör-üş-ü -m-ü engelledi.
 PERS3 ACC see -ış -LV POS ACC prevent-PT
 (S)he prevented me from seeing him/her.

Yet, the opposition is still there. If the verb *engelle-* (to prevent) is replaced by an equivalent N+V (*engel olmak* =put an obstacle to...), then the opposition between the two forms is reestablished and as expected, the form in *-(y)/ş* (*gör-üş*) is almost ruled out⁴⁵.

In this study we have not tried to provide any quantitative analysis. Results of a quantitative study are given in [Mungan \(2002\)](#): suffice it to say here that she shows ([Mungan \(2002: 76\)](#)) that *-mE* is the most productive of all deverbal suffixes including *-(y)/ş*. More specifically, she shows ([Mungan \(2002: 125\)](#)) that nominals in *-mE* represent 39,2% of all deverbal nominals whereas those in *-(y)/ş* represent 26,5%, which justifies our study of this suffix. A possible explanation for the higher productivity of *-mE* is that, according to our hypothesis, it is underspecified for the opposition *realis* *irrealis*, whereas *-ş* is only *realis*.

6.2.3 Levels of adequacy

The work presented in this paper is both an analysis of an empirical phenomena and a possible modelling of these phenomena with the tools provided by a GL. The final question that can be raised is that of the levels of adequacy of the theory used: though initially the three levels of adequacy (*observational*, *descriptive*, *explanatory*) were supposed to apply to syntactic analyses, it seems that a parallel can be drawn with analyses of lexical phenomena, in just considering that the input (see [Chomsky \(1965: 30\)](#)) is a lexical item. We think that *observational adequacy* is met with the nature and amount of lexical information encoded in each lexical entry as it allows an adequate description of the distributional facts encountered. The *descriptive adequacy* would apply to the relation between lexical entries and to the requirement that these relationships should be captured in a principled and explicit way. Basically we think these two goals, corresponding to the requirements expressed in [Chomsky \(1965: 30\)](#) are met. *Explanatory adequacy*, which would

⁴⁵ A google search showed only one attestation for this form and over 1500 for the nominal in *-mE* (*gör-me*).

consist in designing procedures to assess the formalisms competing to account for the data analysed⁴⁶, we consider out of the scope of our paper.

7. Concluding remarks

In this paper we have tried to show how the opposition between the two derived nominals in $-(y)/ş$ and $-mE$ can be accounted for by distinct explicit rules in which the representation of the semantics of the base verb is provided by a Generative Lexicon. These rules account for the data presented, and also allow adequate empirical predictions regarding the distribution of the two types of nominal and gaps of productivity. We showed that the relevant factors are the binding of the nominal to a special qualia role of the matrix verb. Some phenomena have not been dealt with and let alone accounted for: among them is the interesting problem of the ellipsis of derived nominals. It seems that nominals derived by the affixation of $-(y)/ş$ and $-mE$ differ, under conditions that have not been fully elucidated, in that the ellipsis of a nominal in $-(y)/ş$ is sometimes possible whereas that of a nominal in $-mE$ is odd as indicated by (78):

(78) a. ??Ahmet'in araba-s -i -n -i kullan-ma -s -i -n -i gör-dü -m ;
ve baba -s -i -n -in (...) da.

Ahmet'GEN car LC POS LC ACC drive mE LC POS LC ACC see-PT
PER 1st and father LC POS LC GEN (...) too.

I saw Ahmet drive his car and his father too (I saw his father drive his car too).

b. Ahmet'in araba -s -i -n -i kullan-ış -i -n -i gör-dü -m
ve baba -s -i -n -in (...) da.

Ahmet'GEN car LC POS LC ACC drive İŞ POS LC ACC see PT PER 1st
and father LC POS LC GEN (...) too

I saw Ahmet drive his car and his father too (I saw his father drive his car too).

⁴⁶ More formally Chomsky (1965: 31), defines this procedure as the characterisation of a function m such that $m(i)$ is an integer associated to a grammar G_i and defines its value. Thus, each competing grammar receives an evaluation measure.

However, the problem cannot be solved by claiming that the relevant factor is the form of the nominals as the replacement of the matrix verb in (78) by the verb *istemek* (want) would save the grammaticality of the sentence. This is all the more complex as phenomena of backwards ellipsis and forward ellipsis seem to be involved in the grammaticality of these sentences and this suggests that the possibility of this kind of ellipsis may be linked to discourse phenomena, which falls out of the scope of the study presented here.

Finally, the set of suffixes which derive nominals is by no means limited to those that have been studied here. An interesting work then would obviously be to extend the study to these other productive suffixes, for instance the infinitive (formed by attachment of the consonant *-k* to derived nominals in *-mE*), or *DIK* (see 2.1 *supra*). It is very likely that such a study would show that the relevant factors that have been identified in the study of the derivation of nominals in *-mE* and *-(y)Iş*, and the tools used, would still prove relevant and adequate in the study of these suffixes too.

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Glosses

In our glosses the following abbreviations are used:

LC: linking consonant,

LV: linking vowel

PL: plural

SG: singular

GEN: genitive

POS: noun possessive marker,

ACC: accusative

PAS: passive

ABL: ablative

DAT: dative

ASP: aspect

PT: past

PER: person

1st: 1st person

2nd: 2nd person

3rd: 3rd person

NOM: nominalizing suffix (other than *-(y)lş* or *-mE*)

LOC: locative

DAT: dative

CS: Causative

INT: interrogative

NEG: negation

