A PARADIGM GAP IN TURKISH

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A PARADIGM GAP IN TURKISH

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DECLARATION OF ORIGINALITY

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ABSTRACT

A Paradigm Gap in Turkish

In this thesis, I report a paradigm gap in the agreement paradigm of desiderative constructions formed with the suffix -(y)AsI in Turkish. I argue that 3PL agreeing desiderative verbs are defective by providing empirical evidence from an acceptability judgment experiment ($N = 181$) and corpus frequencies. To explain the existence of the gap, I first provide an analogy-based account which states that base identification procedure within the paradigm fails to reliably select a base for producing the 3PL desiderative form. That is, I argue that there is a competition between two surface forms that are both attested in speaker productions due to indeterminacy of base identification. Then, I provide an alternative account that can explain the gap in the framework of Distributed Morphology. Comparing these two accounts, I argue that the analogy-based account is better suited than a Distributed Morphology account to explain the gap in the light of the empirical findings. Besides the desiderative gap, I also discuss other gaps in the paradigm of associative plural constructions in Turkish that require different analyses. Using the tools of Distributed Morphology in this case, I argue that these gaps can be best explained with a combination of a local dislocation operation and a ban on the adjacency of two plural features. Considering the different kind of gaps reported for Turkish throughout the thesis, I suggest that our morphological models should allow for both probabilistic and deterministic generalizations.

ÖZET

Türkçede Dizi Boşluğu

Bu tezde, -(y)ASI eki ile oluşturulan Türkçe istek yapılarının uyum dizisinde bir boşluk olduğunu savunuyorum. Bu iddiamı bir kabul edilebilirlik yargısı deneyinden ($N = 181$) ve derlem sıklıklarının dağılımından edinilen kanıtlara dayandırarak 3. çoğul iyelik uyum eki barındıran istek fiillerinin eksikli olduğunu savunuyorum. Tespit ettiğim boşluğun nedenini açıklamak için öncelikle ilgili dizinin içindeki temel tanımlama prosedürünün 3. çoğul istek formunu üretmek için güvenilir bir temel biçim seçmekte başarısız olduğunu öne sürerek benzetme temelli bir açıklama sağlıyorum. Diğer bir deyişle, temel olarak kulanılacak bir biçim tanımlamadaki belirsizlikten dolayı her ikisi de konuşmacı üretimlerinde gözlemlenen iki sözcük biçimi arasında bir rekabet olduğunu savunuyorum. Ardından, bu çözümlemeye ek olarak, Dağıtılmış Biçimbilim modelini kullarak bu boşluğu açıklayabilecek alternatif bir çözümleme sunuyorum. Eldeki veriler ışığında bu iki çözümlemeyi karşılaştırarak, tespit ettiğim boşluğu açıklamak için benzetmeye dayanan çözümlemenin Dağıtılmış Biçimbilim çözümlemesinden daha iyi olduğunu savunuyorum. İstek yapılarındaki boşluğun yanı sıra, Türkçede çağrışımsal çoğul yapılarının dizisinde, bu sefer farklı bir çözümleme gerektiren bir takım boşlukları tartışıyorum. Bu boşlukların, en iyi, Dağıtılmış Biçimbilim araçlarını kullanarak yerel bir yer değiştirme işlemi ve iki çoğul özelliğin bitişikliğinin yasaklanmasıyla açıklanabileceğini savunuyorum. Bu tezde tartıştığım ve Türkçede tespit ettiğim farklı türlerde bu boşlukları göz önünde bulundurarak, biçimbilim modellerimizin hem olasılıksal hem de gerekirci genellemelere izin verebilmesi gerektiğini öneriyorum.

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1	first person
2	second person
3	third person
ACC	accusative
AOR	aorist
APL	associative plural
COMP	complementizer
COP	copula
DAT	dative
DESID	desiderative
EVID	evidential
GEN	genitive
IMPF	imperfective
INF	infinitive
INS	instrumental
NMLZ	nominalizer
NOM	nominative
PL	plural
POSS	possessive
PROG	progressive
PST	past
REL	relative
SG	singular

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CHAPTER 1

INTRODUCTION

In this chapter, I will (i) state the aim and scope of the thesis, (ii) introduce the main subject of the thesis, which is desiderative constructions formed with the suffix -AsI[1], (iii) define what a paradigm gap is and discuss why 3PL agreeing -AsI desideratives should be considered as a gap, and (iv) provide a summary of the chapter along with a roadmap that will be followed in the remainder of the thesis.

1.1 Aim

The aim of this thesis is twofold: the first one is descriptive and the other is theoretical. The descriptive aim is to report a gap in the agreement paradigm of desiderative constructions formed with the -AsI suffix[2] (henceforth *-AsI desideratives*) in Turkish. That is, based on the findings of an acceptability judgment experiment and corpus search that will be discussed in Chapter 3, I argue that -AsI desideratives do not have an acceptable form for many speakers of Turkish when they are inflected for 3PL possessive agreement.

The theoretical aim is to provide an explanation as to why speakers tend to judge 3PL agreeing desiderative forms as unacceptable even though these speakers can actually produce these inflected forms. In other words, I will try to explain how speakers can inflect verbs bearing the desiderative suffix for 3PL possessive agreement and why they do not find the inflected form they produce acceptable. To this end, first, I review previous accounts offered for paradigm gaps in some other languages (e.g. Spanish, English, and Russian). I classify these accounts into three main groups: (i) gaps as idiosyncratic anomalies, (ii) lack-of-a-productive-rule, and

[1]The capital letters A and I in -AsI represent placeholders for a non-high and a high vowel, respectively. Depending on the backness of the vowel in the final syllable of the stem, A becomes either /a/ or /e/; depending on both backness and rounding of the vowel in the final syllable of the stem, I becomes either /i/, /ɯ/, /u/, or /y/. Furthermore, since there is a one-to-one match in terms of pronunciation between the letters ı and ü used in the orthography of Turkish and the IPA symbols ɯ and y, I will use the letters in the Turkish alphabet for convenience throughout the thesis.

[2]-I do not decompose -AsI into smaller components so as to make as few assumptions as possible before analysing the desiderative constructions. Therefore, I will use the term -AsI desideratives as a label to refer to desiderative constructions that include a predicate following the template V(y)AsI+Poss.

(iii) gaps as morphosyntactic primitives. Then, I discuss which one of these accounts fares better in terms of explaining the gap in -AsI desideratives in Turkish. In a nutshell, I argue that there is a competition between two forms within the desiderative paradigm, namely the 1SG and 3SG, to be the base for producing a 3PL desiderative form and speakers cannot choose either one of them reliably. I show that this is an expected result if we assume that, first, inflected forms are built on another inflected form (i.e. base) within the same paradigm, and second, bases are selected considering multiple criteria such as morphosyntactic markedness (Bybee, 1985) and similarity, type (Yang, 2016) and token frequency (Bybee, 1985) and informativeness (Albright, 2002), and third, there may be multiple bases in a paradigm (contra Albright, 2002). I argue that 1SG is selected to derive all the forms other than those in the third person cells in the paradigm of -AsI desideratives. 1SG is superior to 3SG in terms of some criteria while it is inferior than 3SG in terms of other criteria, and that selecting a different base leads to a different form since there is an irregularity in the form of 3SG desideratives. Thus, I argue that this is why speakers are uncertain about the acceptability of the 3PL desiderative forms: none of these forms are as acceptable as other forms in the paradigm about which speakers are not uncertain.

I will sketch two analyses that can account for the gap in different theoretical frameworks of word-formation (or morphology): Distributed Morphology (Embick & Noyer, 2007; Halle & Marantz, 1993; Harley & Noyer, 1999) and usage-based (Albright, 2002) or Word-and-Paradigm models (Sims, 2015). Then, I will compare them and discuss their strengths and weaknesses. Namely, I will argue that the gap in the 3PL cell of the agreement paradigm of -AsI desideratives can be best explained with a probabilistic model in which what base a novel form will be built on in a paradigm is selected based on several factors such as type/token frequency, informativeness, and morphosyntactic similarity of the forms in the other cells of the paradigm. More specifically, the data show that 3PL desiderative forms are virtually unattested in the corpora — hence, in the input — suggesting that inflecting any desiderative verb for 3PL agreement is most likely a wug-test for most speakers of

Turkish. On the other hand, the data from corpora show that about 95% of the -AsI desiderative forms belong to either 1SG or 3SG agreeing forms. Thus, there are two highly available forms that can be used (i.e. that can be a base) to produce a novel 3PL desiderative form: 1SG and 3SG. Adopting the insights of (Albright, 2002), I posit that the only forms that are available to be considered as a candidate for being the base are the 1SG and 3SG forms when producing a novel 3PL form in the desiderative paradigm.

1.2 -AsI desideratives

To illustrate the gap, let us first start with the properties of -AsI desideratives. -AsI desideratives express the absence or presence of a desire in a given animate subject. They consist of mainly two parts: (i) a nominalized (desiderative) clause that expresses a wish or desire, and (ii) an existential main predicate that expresses the absence or presence of that desire. Consider (1) as an example:

(1) *(Ben-im) yemek yap-ası-m* *var.*
(I-GEN) food make-DESID-POSS.1SG exist[3SG]
'I want to cook.'

The sentence in (1) literally means 'My desire to cook exists.' The information about the content of the desire (i.e., cooking) is provided by the predicate and the information about whom the desire belongs to (i.e., the speaker in this case) is provided by the subject marked with the Genitive case within the nominalized desiderative clause inside the brackets.[3] Furthermore, the verbal stem of the embedded desiderative clause's predicate bears the suffix -AsI, which I call the desiderative suffix and which is followed by a possessive agreement marker that reflects the person and number features of its Genitive subject.

Besides the embedded desiderative clause, there is also an existential predicate in -AsI desideratives, exemplified with *var* in (1), which provides information about whether the desire denoted by the embedded desiderative clause

[3]Note that the subject of the desiderative clause, *benim*, is shown in parantheses given that Turkish is a pro-drop language which does not require a phonologically overt subject or object depending on the context (Kelepir, 2001; Turan, 1995).

exists in the Genitive subject or not. This existential predicate functions as the main predicate and agrees in person and number with its subject, i.e., the desiderative clause. Hence, the existential predicate in any given desiderative construction exhibits only third person singular agreement, which is null[4], since it takes a desiderative clause as its subject and sole argument.

However, given that the possessive agreement marker on the predicate in the embedded desiderative clause is dependent on the person and number features of its Genitive subject, we see different agreement markers on these predicates depending on the person and number features of the Genitive subject. Hence, in sentences where the Genitive subject of the desiderative clause is, for example, the second person plural pronoun like in (2), we see the second person plural possessive agreement marker on the desiderative predicate.

(2) *De-mek ki (siz-in) yemek yap-ası-nız var.*
Say-INF COMP (you(pl)-GEN) food make-DESID-POSS.2PL exist[3SG]
'So, you(pl) want to cook.'

Thus, the verb that bears the desiderative suffix -AsI in desiderative constructions needs to be properly inflected according to the person and number features of its subject. This observation about -AsI desideratives is not remarkable insofar as this pattern is attested also in other Genitive-Possessive constructions (henceforth GPCs) in Turkish (Kornfilt, 1984). For instance, the verbal noun in nominalized clauses formed with the suffix -mA, sometimes labelled as action nominals in previous research (Dietrich, 1995; Kornfilt, 1984; Lees, 1965), agree with their Genitive subject in person and number, which is reflected by the possessive agreement suffix on the verbal noun as exemplified in (3).

(3) *(Biz-im) yemek yap-ma-mız lazım.*
(We-GEN) food make-NOM-POSS.1PL necessary[3SG]
'We need to cook.'

[4]The third person singular agreement marker is argued not to be null in some paradigms such as the possessive agreement paradigm (Kornfilt, 1984; cf. Öztürk & Taylan, 2016) and imperatives/optatives (Göksel & Kerslake, 2005).

To provide some background on the set of possessive suffixes used in these constructions, possessive agreement suffixes in GPCs like -mA nominals all come from the regular possessive paradigm given in Table (1).

Table 1. The Regular Possessive Paradigm in Turkish

	SG	PL
1	-(I)m	-(I)mIz
2	-(I)n	-(I)nIz
3	-(s)I(n)	-lArI(n)

Hence, we see, for example, the suffix -(s)I(n) on the verbal noun or possessee in other GPCs with a 3SG possessor, as illustrated with -mA nominals in (4) and a non-verbal GPC in (5).

(4) *(O-nun) yemek yap-ma-sı lazım.*
(S/he-GEN) food make-NMLZ-POSS.3SG necessary
'She/he needs to cook.'

(5) *(O-nun) araba-sı*
(S/he-GEN) car-POSS.3SG
'His/her car'

However, -AsI desideratives differ from these GPCs in this respect. That is, we don't see an additional -(s)I(n) marker on the verbal desiderative noun in -AsI desideratives[5] when the Genitive subject is 3SG, as shown in (6):

(6) *(O-nun) yemek yap-ası-(*sı) var.*
(S/he-GEN) food make-DESID.POSS.3SG-(*POSS.3SG) exist
'She/he wants to cook.'

As the form suggests, the suffix -AsI on a desiderative verb is not exclusively used to spell out[6] the desiderative feature (i.e., DESID) when the desiderative verb

[5]The reason for this is probably a morphological ban on the suffix sequence -sI(n)+sI(n), similar to what has been proposed by (Kunduracı, 2013, pp.180-182). This ban resembles to the morphological ban (i.e., haplology) on the plural -s followed by the genitive -s in English (e.g., *boys's), where only one -s can be pronounced (Nevins, 2012). Note that a morphological ban analysis for the lack of an additional -sI in 3SG -AsI desideratives implies that the -AsI suffix should be decomposed as -A and -sI. This possibility will be explored when offering an analysis in Chapter 4.

[6]For the most part, "spell-out" is a technical term used within the realizational framework, Distributed Morphology. However, in this thesis, I often use it pre-theoretically to describe the apparent meaning/function-form matching.

agrees with a 3SG Genitive subject. Instead, -AsI is used to spell out both DESID and third person singular possessive agreement (POSS.3SG) features. Of course, it is possible —in fact, I will argue it is rather necessary for producing 3PL desiderative forms— to decompose the 3SG desiderative form in some way to dissociate the exponents of DESID and POSS.3SG. One possible decomposition is that DESID has the exponent -AsI and POSS.3SG has a null exponent, which is shown in (7a); the other is that DESID has the exponent -A (as an allomorph distinct from -AsI) whereas POSS.3SG has its regular exponent, -(s)I(n)[7], from the possessive paradigm, which is shown in (7b).

(7) a. *yap-asɪ-∅*
make-DESID-POSS.3SG

b. *yap-a-sɪ*
make-DESID-POSS.3SG

Although we cannot know which decompositional route speakers follow based only on our knowledge about the regular possessive paradigm and without considering forms other than the 3SG desideratives, given this data, the following inference is very well-motivated: the word form in the 3SG cell of the paradigm of -AsI desideratives is irregular.

The irregularity in the form of 3SG -AsI desideratives is not the only attribute that is remarkable about these constructions. There are at least two more noteworthy aspects about -AsI desideratives that need to be mentioned. The first one of these is the variability in the form of the 3PL desiderative verbs. Turkish speakers disagree about how to inflect a desiderative verb for third person plural possessive agreement. When the intended (i.e., pro-dropped or covert) subject of a desiderative clause is the third person plural pronoun, speakers are divided into two groups in terms of the forms they produce: one group of speakers inflects desiderative verbs for 3PL agreement as in (8a) whereas the other group inflects them as in (8b).

[7]The convention is to write the first and the third element of the (third person singular) possessive marker -(s)I(n) in parentheses since the first segment, s, is deleted when it attaches to a stem that ends in a consonant and the last segment, n, is deleted in word final position (i.e. as long as it is not followed by any other suffix) (Göksel & Kerslake, 2005). Thus, in the decomposition of -AsI in 3SG desideratives where -A is the exponent of DESID, -sI is the only possible exponent for POSS.3SG since the stem it attaches to ends in a vowel (i.e. -A) and it is not followed by any other suffix.

(8) a. * *(Onlar-ın) yemek yap-ası-ları var.*
(They-GEN) food make-DESID-POSS.3PL exist[3SG]
'They want to cook.'

b. * *(Onlar-ın) yemek yap-a-ları var.*
(They-GEN) food make-DESID-POSS.3PL exist[3SG]
'They want to cook.'

Hence, speakers who prefer the form in (8a) think that a verbal root X should have the form X+AsI+lArI when it is used as a desiderative verb inflected for 3PL agreement. I will call this group X+AsI+lArI speakers. On the other hand, for other speakers, it needs to follow the template X+A+lArI. I will call this second group X+A+lArI speakers.

Regarding the second noteworthy aspect of -AsI desideratives, as evinced by the asterisk at the beginning of each sentence in (8), many Turkish speakers tend to judge even the 3PL desiderative forms they prefer as unacceptable. So, there is no acceptable form for desiderative verbs when they are inflected for third person plural possessive agreement for these speakers of Turkish. In other words, the agreement paradigm of -AsI desideratives is incomplete: although there are two 3PL desiderative forms that are attested in forced productions, there is no acceptable word form to fill the 3PL cell of the agreement paradigm of -AsI desideratives in Turkish. This is what I call *a paradigm gap in Turkish*.

1.3 What is a paradigm gap?

Before defining what a paradigm gap is, let us first start with what I mean by a paradigm in this thesis. Following (Haspelmath & Sims, 2013), among others, I define a paradigm as a set of all inflected forms of a lexeme. Hence, a paradigm in this thesis is actually an inflectional paradigm, excluding other paradigms such as derivational ones. However, this definition calls for further explanation since the meanings of *inflection* and *lexeme* are not straightforward.[8]

The term *lexeme* is conventionally used to refer to the meaning shared by all the inflected forms in a paradigm. For instance, the lexeme of the verb "to sit" in

[8] See Erdem (2018) for a paradigmatic analysis of verbal inflectional system of Turkish.

English is represented as SIT, which takes different forms such as *sits* or *sit* depending on its syntactic environment in a given utterance: if the doer of the sitting action is third person singular and the sentence is in the present tense, then it takes the form *sits*; if the doer is first person singular, then it is realized as *sit*. Thus, a lexeme, SIT in our example, does not have a phonological form on its own. It is a label to refer to the 'abstract word' which takes shape only when it is uttered and its shape is governed by the syntactic environment—in addition to morphophonological rules of the language— where it is used.

Regarding inflection, since this thesis is not aimed at providing a detailed discussion of inflection as opposed to derivation, I will make the uncontroversial assumption that case and agreement are types of inflection given that they are governed by the syntactic rules of a language and are highly productive in that they apply to all the members of a syntactic category (e.g. Noun, Verb, etc.). For example, if a verb agrees with the person and number features of its subject in a given syntactic configuration in a given language, then we expect all verbs in that language to exhibit person-number agreement with their subject in the same syntactic configuration. Hence, when a verb fails to agree with its subject although it is required to do so according to the syntactic rules of the language, it would result in a grammatical failure. In this sense, the defining property of inflection is that it serves a syntactic purpose. Since case and agreement are syntactic phenomena and words need to fulfill the case and agreement requirements imposed on them by the grammar depending on the syntactic environment where they occur, it is not controversial to classify case and agreement as inflection.

Each cell in an inflectional paradigm comprises of (i) a unique combination of morphosyntactic features that are well defined (or active) for the syntactic category that a lexeme A belongs to and (ii) a word form that spells out the lexeme A when it is inflected for that set of morphosyntactic features. Hence, what constitutes a paradigm cell is a mapping between a word form and a set of morphosyntactic properties. For instance, building on the regular possessive agreement paradigm

provided in Table (1), the possessive agreement paradigm of the Turkish noun *kafa* 'head' is illustrated in Table (2).

Table 2. The Possessive Agreement Paradigm of *kafa* 'head'

	SG	PL
1	kafam	kafamız
2	kafan	kafanız
3	kafası	kafaları

The paradigm in Table (2) illustrates that Turkish contrasts three person features and two number features, which results in six unique combinations—hence, six cells—in its possessive agreement paradigm. Hence, when a person needs to say 'my head' by using the lexeme KAFA in Turkish, they need to say *kafam*. If this person fails to utter this specific form of KAFA, by saying for example *kafan* or simply *kafa*, then this would lead to ungrammaticality in the utterance with the intended meaning. Then, this raises the question of what would happen if the lexeme KAFA lacked an acceptable form in the 1SG cell? Given that using a form that is exclusively used in another cell (e.g. *kafanız*) would be ungrammatical, how would speakers inflect KAFA for 1SG possessive agreement? The short answer is that, if KAFA lacked an acceptable form in the 1SG cell, speakers would not be able to inflect KAFA for 1SG possessive agreement in the syntactic environments when it is necessary and this would be an instance of paradigm gap or inflectional defectiveness in Turkish.

Various proposals regarding the definition of a paradigm gap (sometimes called as defectivity or ineffability) have been put forward in the literature (Albright, 2003b; Fanselow & Féry, 2002; Halle, 1973; Orgun & Sprouse, 1999; Sims, 2015). Some of these studies have a loose definition of a paradigm gap, classifying each possible derived word form that might have existed in the language but does not exist as a gap. For instance, Halle (1973) considers both non-existent derived forms in English such as **derival* and Russian verbs that lack a first singular agreeing form in the non-past (e.g. **deržu* 'I talk rudely.') as gaps. He labels these gaps as *accidental* since he argues that they do not have any syntactic, semantic, morphological, or

phonological motivation to be anomalous. However, following Albright (2003b) and Sims (2015), I will restrict the definition of a paradigm gap to forms that are required by grammar but are unacceptable. Thus, I define a paradigm gap (or defective cell) as follows: If a word form is missing for a given lexeme to express a morphosyntactically well defined set of properties in a given language, this constitutes a paradigm gap (or defectivity) in the related cell of the related paradigm in that language (Sims, 2015, p.23).

Given the definition above, let us return to -AsI desideratives and explain why the lack of an acceptable form in the 3PL cell of their agreement paradigm is an instance of a paradigm gap in Turkish. But first, some background on possessive agreement in Turkish needs to be provided since it will be relevant for the discussion on the desiderative gap.

If there is a Genitive subject in an embedded clause in Turkish, whether it be a nominalized clause (Kornfilt, 2003) as in (9) or a relative clause (Haig, 1997) as in (10), the predicate of the embedded clause needs to agree with its Genitive subject.

(9) *(Siz-in)* *kitab-ı* *oku-duğ-*(unuz)-u* *bil-iyor-um.*
(You(PL)-GEN) book-ACC read-NOM-*(POSS.2PL)-ACC know-PROG-1SG
'I know that you(pl) read the book.'

(10) *(Sen-in)* *oku-duğ-*(un)* *kitab-ı* *bil-iyor-um.*
(You(SG)-GEN) read-REL-*(POSS.2SG) book-ACC know-PROG-1SG)
'I know the book you(sg) read.'

In these constructions, the agreement marker on the embedded predicate should come from the appropriate cell of the regular possessive agreement paradigm according to the person and number features of the Genitive subject. However, this generalization has an exception: when the embedded clause has an overt 3PL genitive subject, speakers can use on the embedded predicate either POSS.3SG, as shown in (11a), or POSS.3PL, as shown in (11b), but with a significantly higher preference for POSS.3SG.

(11) a. *Onlar-ın kitab-ı oku-duğ-un-u bil-iyor-um.*
They-GEN book-ACC read-NOM-POSS.3SG-ACC know-PROG-1SG
'I know that they read the book.'

b. *Onlar-ın kitab-ı oku-duk-ların-ı bil-iyor-um.*
They-GEN book-ACC read-NOM-POSS.3PL-ACC know-PROG-1SG
'I know that they read the book.'

The observation that 3SG.POS and 3PL.POS can be syncretic (i.e., have the same form) is only valid when there is an overt 3PL possessor. Yet, arguments need not be overt in some contexts in Turkish. Arguments that have been introduced in the discourse before and that are contextually salient can be (pro-)dropped (Göksel & Kerslake, 2005, p.117; see Öztürk, 2005, for a detailed discussion on when arguments can be covert). Therefore, we expect the 3PL genitive subject in sentences like in (11) to be able to be dropped if the pro-drop conditions are met. However, as illustrated in (12), when a 3PL subject is dropped, 3SG agreement marker is no longer allowed on the predicate. Thus, Turkish requires a predicate to bear the 3PL agreement marker if it has a 3PL subject which is null (or covert), meaning that Turkish does not tolerate ambiguity in pro-drop contexts and requires a one-to-one mapping between the dropped pronoun and the person-number agreement suffix on the predicate.

(12) a. * *(Onlar-ın) kitab-ı oku-duğ-un-u bil-iyor-um.*
(They-GEN) book-ACC read-NOM-POSS.3SG-ACC know-PROG-1SG
Intended meaning: 'I know that they read the book.'

b. *(Onlar-ın) kitab-ı oku-duk-ların-ı bil-iyor-um.*
(They-GEN) book-ACC read-NOM-POSS.3PL-ACC know-PROG-1SG
'I know that they read the book.'

We expect to see similar properties also in -AsI desideratives, which are a kind of embedded nominalized clause. Indeed, we observe that when there is an overt 3PL genitive subject in a desiderative clause, using POSS.3SG on the desiderative predicate is completely grammatical, as illustrated in (13).

(13) *Onlar-ın kitap oku-yası var-mış.*
They-GEN book read-DESID.POSS.3SG exist.EVID.3SG
'They want to read a book.'

Given the foregoing discussion, when the 3PL genitive subject is dropped in -AsI desiderative clauses like in (13), we expect to see a well-formed embedded predicate with POSS.3PL on it. However, unlike what is observed in other nominalized verbs, there is no acceptable form for a desiderative verb when it is forced to agree with a covert 3PL genitive subject. Neither of the forms in (14), which are hesitantly produced by speakers when they are forced to do so, are acceptable.

(14) a. * *(Onlar-ın) kitap oku-yası-ları var-mış.*
(They-GEN) book read-DESID-POSS.3PL exist.EVID.3SG
Intended meaning: 'They want to read a book.'

b. * *(Onlar-ın) kitap oku-ya-ları var-mış.*
(They-GEN) book read-DESID-POSS.3PL exist.EVID.3SG
Intended meaning: 'They want to read a book.'

To conclude, a 3PL agreeing desiderative form is required by the inflectional rules of Turkish when the 3PL genitive subject of a desiderative clause is dropped. However, there is no acceptable form that satisfies this requirement. As per our definition of a paradigm gap, which states that a paradigm gap occurs when a word form is missing for a given lexeme to express a morphosyntactically well defined set of properties for the part of speech of that lexeme, there is a gap in the 3PL cell of the possessive agreement paradigm of -AsI desideratives since there is no word form for any lexeme to express the morphosyntactically well defined feature set POSS.3PL. Hence, 3PL agreeing desiderative word forms are systematically defective for all lexemes that can combine with the desiderative suffix -AsI.

1.4 Summary and the roadmap

To summarize this section, the primary focus of this thesis is that there is no acceptable word form in the 3PL cell of the possessive agreement paradigm of -AsI desideratives, which are constuctions that are used to express a wish or desire in Turkish. Agreement is an inflectional process which requires lexemes to be in a certain form depending on their syntactic environment and it is morphologically encoded in Turkish. Thus, a verb bearing the desiderative -AsI suffix is expected to

agree with its genitive subject by the inflectional rules of Turkish, and in the cases where POSS.3PL agreement is required on a desiderative verb, for instance when it has a 3PL genitive subject that is dropped (i.e., null in the surface form), it must be inflected for POSS.3PL agreement. Therefore, the desiderative verb must take the appropriate form required by the agreement between the desiderative subject and verb. However, no desiderative verb has an acceptable form that satisfies the requirements of 3PL agreement at the form level, which means that the 3PL cell of the possessive agreement paradigm of -AsI desideratives is systematically defective for all lexemes that have an acceptable form in all the other cells in the desiderative paradigm.

In the remaining chapters of the thesis, first, I will provide some background on influential accounts of paradigm gaps that have been proposed in the literature in Chapter 2. Then, I will present some empirical data obtained through a corpus search and an acceptability judgment experiment as evidence for the defectivity of 3PL desiderative verbs in Chapter 3. In Chapter 4, I will discuss the results and propose an analogical account in the spirit of Albright (2002) in order to explain the existence of the gap in the 3PL cell of the possessive agreement paradigm of -AsI desideratives. In addition, I will propose an alternative analysis couched in Distributed Morphology (Embick & Noyer, 2007; Halle & Marantz, 1993) which can possibly explain this gap and compare the weaknesses and strengths of these two accounts in the light of the data collected in the experiment and the corpus search. Then, in Chapter 5, I will introduce another gap and discuss how it may be accounted for by using the tools of Distributed Morphology. Finally, Chapter 6 concludes with a discussion of the implications of the reported gaps in Turkish for theories of morphology.

CHAPTER 2

LITERATURE REVIEW

2.1 Albright (2003)

Albright (2003b) focuses on some verbs like *abolir* 'to abolish' in Spanish which do not have an acceptable form in the 1SG present indicative even though they do not have a semantic motivation for their ill-formedness. He names this phenomenon *arbitrary lexical paradigm gaps* and provides an analyses as to why these gaps are found in lexical items like *abolir* but not in some others like *contar.* He argues that 1SG present indicative gaps in Spanish are due to speaker uncertainty caused by both unfamiliarity with the verb and lack of confidence about whether a morphophonological alternation should be applied to its inflected form. Thus, he posits that what constitutes a gap is an extreme lower end of a speaker's certainty about how to construct the 1SG present indicative form of a verb.

2.1.1 Lexical gaps in the verbal paradigm of Spanish

To provide some background on the data, present indicative paradigms of Spanish verbs can be divided into three morphological classes. These classes can be defined based on the vowel in their infinitival form (i.e. a, e, or i) as illustrated in Table (3).

Table 3. Morphological Classes in Spanish (Albright, 2003b, p. 3)

Class 1: [a]	
'to speak'	*hablar*
hábl-o	*habl-**á**mos*
*hábl-**a**s*	*habl-**á**is*
*hábl-**a***	*hábl-**a**n*

Class 2: [e]	
'to eat'	*comer*
cóm-o	*com-**é**mos*
*cóm-**e**s*	*com-**é**is*
*cóm-**e***	*cóm-**e**n*

Class 3: [i] (∼ [e])	
'to live'	*vivir*
vív-o	*viv-**í**mos*
*vív-**e**s*	*viv-**í**s*
*vív-**e***	*vív-**e**n*

However, not all verbs follow the regular patterns observed in the conjugation classes provided above. Some verbs are irregular in that, in some cells, their roots undergo some morphophonological alternations such as diphthongization, mid vowel raising, or velar insertion. For instance, as shown in Table (4), the mid-vowel in the roots of some verbs like *sentir* and *pedir* are diphthongized or raised in those cells where the root bears stress (i.e. 1SG, 2SG, 3SG, 3PL).

Table 4. Diphthongization and Raising (Albright, 2003b, p. 3)

a. Diphthongization of [e]→[je], [o]→[we]

'to feel'	*sentir*
*s***[jé]***nt-o*	*s***[e]***nt-ímos*
*s***[jé]***nt-es*	*s***[e]***nt-ís*
*s***[jé]***nt-e*	*s***[jé]***nt-en*

'to count'	*contar*
*c***[wé]***nt-o*	*c***[o]***nt-ámos*
*c***[wé]***nt-as*	*c***[o]***nt-áis*
*c***[wé]***nt-a*	*c***[wé]***nt-an*

b. Raising of [e]→[i]

'to request'	*pedir*
*p***[í]***d-o*	*p***[e]***d-ímos*
*p***[í]***d-es*	*p***[e]***d-ís*
*p***[í]***d-e*	*p***[í]***d-en*

Moreover, as shown in Table (5), the 1SG forms of some verbs like *crecer* and *salir* exhibit an irregular pattern of velar stop insertion before -o.

Table 5. Velar Insertion (Albright, 2003b, p. 3)

Insertion of [k]	
'to grow'	*crecer*
*cré***[sk]***-o*	*cre***[s]***-émos*
*cré***[s]***-es*	*cre***[s]***-éis*
*cré***[s]***-e*	*cré***[s]***-en*

Insertion of [g]	
'to leave'	*salir*
*sál***g***-o*	*sal-ímos*
sál-es	*sal-ís*
sál-e	*sál-en*

Albright makes the following observations about the relation between irregular form alternations and conjugation classes:

- Class 1: "No alternation" is the dominant pattern; raising is not attested; few verbs exhibit diphthongization; velar insertion is not attested.
- Class 2: Diphthongization is frequent, but raising is not attested; velar insertion is attested.
- Class 3: Each root that includes a mid vowel exhibits either raising or diphthongization; velar insertion is attested.

Having provided this background, Albright moves on to introduce where gaps are attested in Spanish. Following traditional accounts (Butt, 1997; De Gámez, 1973), he divides paradigm gaps into two groups depending on which cells exhibit defectivity. The first group is called the *anti-stress* group, which includes verbs that

lack forms where stress would fall on the root if they existed (e.g., abolir 'to abolish'). Since roots are stressed only in the 1SG, 2SG, 3SG, 3PL forms, verbs in the anti-stress group exhibit defectivity in these four cells. The second group is the anti-egotistic group, which includes verbs that lack forms only in the 1SG cell (e.g. asir 'to grasp').

Table 6. Two Types of Paradigm Gaps in Spanish (Albright, 2003b, p. 4)

a. Anti-stress verbs:

'to abolish'	*abolir*
—	*abol-imos*
—	*abol-ís*
—	—

b. Anti-egotistic verbs:

'to grasp'	*asir*
—	*as-imos*
as-es	*as-ís*
as-e	*as-en*

Albright points out that, first, virtually all gaps belong the the conjugation Class 3 and, second, gaps are observed only in the cells where morphophonological alternations occur (e.g. abol-ir has a mid vowel in its root which can be raised or diphthongized). He also notes that the morphophonological rules observed in gapped cells are idiosyncratic and irregular: they do not apply to all the roots that meet the structural conditions for these alternations. Moreover, he states that a majority of the verbs that have been claimed to be defective are very rarely used overall in modern Spanish. Hence, he hypothesizes that there are two factors that contribute to a form's defectivity in Spanish: a speaker's uncertainty about whether a morphophonological alternation should be applied to a form and their unfamiliarity with a verb.

In order to test the effect of these two factors on paradigm gaps in Spanish and to understand whether paradigm gaps are lexically restricted or are the end result of a gradient effect, Albright ran an experiment where 20 native speakers of Spanish were given the infinitival form of a verb and asked to produce one of its potentially gapped forms in a fill-in-the-blank task. The verbs used in the experiment consisted of a mixture of high-frequency and low-frequency verbs, 28 of which met the structural conditions for mid vowel alternations and 10 of which met the structural conditions for velar insertion. These verbs were either prescriptively defective, alternating (i.e. had velar insertion or mid vowel diphthongization/raising), or

non-alternating so as to understand if there is categorical difference between prescriptively defective and non-defective verbs.

In the case of verbs which met the structural conditions for velar insertion, speakers were asked to produce a 1SG form since velar insertion occurs only in 1SG. However, for verbs that had a potentially alternating mid vowel, participants were asked to produce a 3PL form. In order to disentangle the uncertainty speakers feel about the inflected form itself and the uncertainty caused by the unfamiliarity with a verb overall, speakers were asked in the experiment to provide two different ratings. First, before the production task, speakers were asked to rate how familiar each verb was to them on a scale of 1-7. These ratings were intended to measure the uncertainty caused by the unfamiliarity with a verb. Then, during the production task, speakers were instructed to produce the potentially defective forms, and afterwards, they were asked to rate how confident they were about the form they produced. Since speakers are expected to be less confident when producing a defective form, this is intended to measure the "gappiness" (or defectivity) of a form.

In addition to these measurements, Albright also calculates for each verb a parameter he calls "agreement rate between speakers", which shows how much speakers (dis)agree about what the inflected form should be. This is calculated by dividing 1 by the number of distinct inflected forms of a verb produced by the participants. For instance, if all speakers produced the same inflected form (e.g., A), the agreement rate is 1. On the other hand, if some speakers produced one form (e.g., A) and some others produced a different form (e.g., B) for a given inflection , then the agreement rate is 0.5 (i.e., ½).

Hence, there are three measurements: familiarity, confidence, and between-speaker agreement. Given these measurements, first, the results show that the confidence ratings have a normal distribution, meaning that defectivity is a gradient effect. Recall that only some experimental items were chosen from the set of prescriptively defective verbs while others were not defective. Thus, the observation that the confidence scores speakers provided about the inflected forms they produced

had a normal distribution means that, empirically, there is no evidence for a clear-cut boundary between defective and non-defective forms. Rather, all inflected forms are (non-)defective, but some forms are more (non-)defective than others.

Second, there is a correlation between agreement rate and confidence ratings ($r(35) = .75$). That is, when agreement rate is high for a given verb, confidence ratings tend to be high for its inflected form; and vice versa. This means that when speakers are less confident about the inflected form they produce, they are more likely to disagree about what the inflected form should be. This finding is compatible with the observation that there is usually an overabundance of forms in a cell when that cell is defective (Bermel & Nikolaev, 2022; Sims, 2015).

Third, there is a correlation between the unfamiliarity with a verb and the confidence ratings its inflected form received ($r(35) = .462$). Parallel to this, Albright also calculated the correlation between log token frequencies of the verbs obtained from LEXESP (Sebastián, Cuetos, Carreiras, & Martí, 2000) and the confidence ratings their inflected form received since a verb with a lower token frequency would be more likely to be unfamiliar to a speaker and, thus, low frequency is expected to have a similar effect on the inflected form as unfamiliarity. Not surprisingly, both of the correlation scores indicate that the less frequent and/or unfamiliar the verb, the less confident speakers are about the "correctness" of its inflected form. Based on this result, Albright reasons that speakers would feel more confident about producing an inflected form of a high-frequency verb given that they would have most likely heard it —and even stored it in their mental lexicon— before. However, he also notes that unfamiliarity or low-frequency alone cannot explain why only some forms in the paradigm are defective. That is, if unfamiliarity were the only reason of the paradigm gaps, then we would expect all the forms of a verb to be defective; however, as illustrated in Table (6), only the 1SG forms of anti-egotistic verbs have a gap. Albright also adds that the correlation between unfamiliarity or low log-frequency and confidence ratings is not high enough to be the major determinant of a form's

defectivity. Therefore, he moves on to discuss another possible source of paradigm gaps: uncertainty of speakers about morphophonological alternations.

Given that gaps occur in the cells where irregular morphophonological alternations are abundant, Albright infers that uncertainty about the application of morphophonological alternations must be an important factor in the case of Spanish gaps. He states that virtually all gaps are found in Class 3 verbs, which exhibit the greatest variation in terms of how they are inflected. In order to explain why speakers may feel uncertainty about inflecting verbs in Class 3 but not in other conjugation classes, he compares the verbs in Class 1 and 3. He states that the 1SG inflection of 95% of Class 1 verbs can be formed by adding -o to the root. Hence, there is a *default* rule for speakers when they need to inflect an unfamiliar verb in Class 1 for 1SG: they simply need to add -o to the root. On the other hand, he notes that all Class 3 verbs that have a mid vowel undergo a morphophonological alternation, but this alternation may be either raising or diphthongization. Therefore, speakers need to figure out which alternation occurs in which environment in order to be able to inflect a novel or unfamiliar verb.

Albright points out that solving this problem is extremely difficult for speakers since there is only a handful of verbs that belong to Class 3 (8% of the verbs in LEXESP) which may provide evidence for the environments of specific alternations and that "for some environments, there is hardly any data at all—for example, there are very few class 3 verbs with root vowel [o]" (p.10). Thus, he argues that when speakers are required to produce an inflected form of a Class 3 verb on the fly, multiple outputs might be possible and this would cause uncertainty on the side of the speaker about the correctness of the form they produce. Hence, Class 3 verbs lead to uncertainty in speakers and provide extremely favorable conditions for paradigm gaps in Spanish.

2.1.2 Minimal Generalization Learner

In order to test the hypothesis that lack of a reliable rule correlates with paradigm gaps, he calculates the likelihood of a morphophonological alternation to be observed in a given verb with the help of a rule-induction algorithm called the Minimal Generalization Learner (MGL: Albright & Hayes, 2003). MGL takes pairs of word forms as input and returns the patterns that can be used to derive one word from the other. For instance, if the MGL's input is comprised of pairs such as *hablar*, *hablo* (infinitival, 1SG), it would detect that the most robust pattern of deriving 1SG forms from infinitivals is replacing the final -ar with -o, or vice versa. However, if there are competing patterns in the input to derive, say, the 1SG forms from infinitivals, then it would first detect all the available patterns that can be defined by phonological and morphological rules and then calculate the confidence scores of these patterns so as to determine which one of them is the most robust generalization.

The raw confidence score of a pattern is calculated by dividing the number of verb types that fit the pattern (i.e. hits) by the number of verb types that meet the structural conditions for the application of the pattern (i.e. scope). Hence, scope is the sum of hits, which undergo the defined change, and exceptions, which do not undergo the defined change even though they meet the structural conditions for that change. Then, the calculated raw confidence scores are adjusted by using lower confidence limit statistics (Mikheev, 1997) in order to decrease the confidence scores of alternations that apply only to a few verb types. MGL has been used productively in many studies on (ir)regular morphophonological rules (Arabic: Ahyad & Becker, 2020; English: Albright & Hayes, 2003; Italian: Albright, 2003a; Korean: Albright & Kang, 2008; Russian: Kapatsinski, 2010, among others).

2.1.3 Unreliable rules as the major source of gaps

In order to explore the effect of the rule reliability scores calculated by MGL on lexical gaps in Spanish, Albright trained MGL separately for each of the three conjugation classes by providing in the input {infinitival, 1SG} pairs of all verbs in

the LEXESP corpus. MGL detected the morphophonological changes that can be used to derive 1SG forms from the infinitivals for each conjugation class and calculated their confidence scores. These confidence scores represent how likely the application of a morphophonological alternation is in a given environment, which Albright argues, is a major factor in determining whether a verb has a paradigm gap.

In order to test the effect of confidence scores obtained from MGL on speaker's confidence about the inflected forms, Albright builds a linear regression where he models speaker's confidence ratings as a function of the following independent variables: (i) token frequencies of verbs, (ii) confidence scores from MGL, and (iii) speaker's unfamiliarity with a verb. The results show that two of the predictors, confidence scores from MGL ($F = 6.7$, $p < .05$) and speaker's unfamiliarity with a verb ($F = 36.2$, $p < .0001$) have a statistically significant effect on defectivity.

Thus, there are two significant results of the study. The first one is that unfamiliar verbs are more likely to be defective (or perceived as defective) due to lower speaker confidence when inflecting unfamiliar verbs. The second is that the lower the reliability of a morphophonological rule is, the less certain speakers are about whether they should apply the rule to a verb that is in the scope of the rule. This leads to speakers to be uncertain about the "correctness" of the inflected form they produce and the observed gaps in Spanish.

In discussing the theoretical implications of the data, Albright states that the gaps in the 1SG cell of the present indicative paradigm of some verbs in Spanish show that some paradigm gaps are not arbitrary and lexically specific, unlike what is proposed by Halle (1973) and others who use diacritics to mark defective lexical items. Instead, they are due to uncertainty in the grammatical inference mechanism and they are an extreme end result of gradient uncertainty that speakers feel when they are deriving words that have not been stored in their mental lexicon on the fly. He notes that the observed gradience in uncertainty suggests that paradigm gaps are not an "all or nothing" phenomenon, unlike what is predicted by accounts that rely on

categorical productivity of rules (Gorman & Yang, 2019; Yang, 2016) or use mechanisms to filter out forms that have been generated by grammar but are categorically ungrammatical on other grounds (Fanselow & Féry, 2002; Orgun & Sprouse, 1999).

2.1.4 Shortcomings

Although Albright's account captures important generalizations about the causes of gaps in the present indicative paradigm in Spanish, it fails to account for related gaps in other paradigms. For instance, Boyé and Hofherr (2010) note that verbs such as *abolir* which have gaps in the present indicative paradigm have gaps also in their present subjunctive paradigm. Recall the present indicative paradigm of *abolir*, provided in Table (7).

Table 7. The Present Indicative Paradigm of *abolir* 'to abolish' (Albright, 2003b, p. 4)

'to abolish'	*abolir*
—	*abol-imos*
—	*abol-ís*
—	—

As discussed earlier, *abolir* is an anti-stress defective verb since it has gaps only in those cells where the root is stressed; other forms that do not have stress on their root (i.e. 1PL and 2PL) do have an acceptable form. Albright proposes that this is exactly what is predicted by his account given that morphophonological alternations occur only in those cells where the root is stressed and these alternations do not have high reliability. Hence, speakers are uncertain about the grammaticality of the forms in these cells. On the other hand, morphophonologial alternations are not observed in the unstressed roots in the paradigm, meaning that speakers would not be uncertain about whether a morphophonological alternation should be applied to such a form. Thus, this data is exactly what is predicted by Albright's account.

However, if gaps were to be found in those cells where a morphophonological alternation is *not* expected, then Albright's analysis would not suffice to account for

this data without further assumptions. Boyé and Cabredo Hofherr state that such data is actually observed in the present subjunctive paradigms of anti-stress verbs like *abolir*. The root is not stressed in the 1PL and 2PL forms in the present subjunctive paradigm. Hence, no morphophonological alternation is expected to occur in these cells. However, Boyé and Cabredo Hofherr claim that there is a gap in all the cells in the present subjunctive paradigm of *abolir*, including the 1PL and 2PL cells where the root is not normally stressed (p. 47).

Based on this data, Boyé and Cabredo Hofherr argue that speaker uncertainty about how to inflect a form in the face of irregular morphophonological alternations cannot explain why the 1PL and 2PL cells have a gap in the present subjunctive paradigm of verbs like *abolir* based on their observation that the whole present subjunctive paradigm of verbs like *abolir* is defective. Therefore, they posit that the gaps in the cells where there is speaker uncertainty due to morphophonological alternations have spread to the other cells where there is no synchronic motivation for "rule conflict" or uncertainty.

This analysis is not implausible since it is well known that speakers tend to go beyond the input by making over-generalizations that are sometimes erroneous (Marcus et al., 1992; Pinker, 1995; Yang, 2016). Hence, if linguistic knowledge of speakers encompasses paradigms, as has been proposed in Word-and-Paradigm models of morphology (Ackerman & Malouf, 2013; Blevins, 2016; Sims, 2015; Stump & Finkel, 2013; Zwicky, 1985), speakers may extend their knowledge about the gaps that are caused by uncertainty, which constitute the majority (4 out of 6), to the rest of the cells within the same paradigm that have no such motivation.

However, this analysis is not foolproof either: if the cells that are defective due to uncertainty have caused other cells to be defective in the present subjunctive paradigm, why are only some forms, namely those that exhibit morphophonological alternations, defective in the present indicative paradigm? If the forms in a paradigm "behave as a block", as Boyé and Hofherr (2010, p.48) suggest, then why do only some paradigms behave as a block in terms of defectivity? This analysis is not

complete without making explicit, first, how defectiveness has emerged in the origin cells, and, second, the necessary conditions that are required to generalize gaps from some cells to the others within a paradigm.

2.2 Gorman and Yang (2019)

Gorman and Yang note the challenges lexical gaps (i.e. lexemes that do not have acceptable inflected forms for no semantic reason) pose for current theories of word formation. First, wug tests illustrate that language is productive, that is, both children and adults can produce inflected word forms they have never heard before (Berko, 1958). However, in the case of gaps, speakers fail to produce grammatical inflected forms of some lexemes (e.g. the past tense of *forgo* or the past participle of *stride*). Second, most theories of word formation (e.g., Distributed Morphology and Optimality Theory) refer to a default form when there is no more specific rule or stored form when inflecting a lexeme. But, again, in the case of lexical gaps, this does not work. Therefore, these theories require additional mechanisms to rule out defective forms like **forgoed* or **forwent*.

Setting out to answer these questions, they discuss the pros and cons of earlier approaches to explain how grammar can handle lexical gaps. They mention two different approaches suggested by Halle (1973), which encompass most, if not all, accounts of lexical gaps proposed so far in the literature. Halle's first account is that defective forms are produced with the available word formation rules just like non-defective forms. What separates defectives from non-defectives in this account is that defective forms are marked with a feature such as [-lexical insertion] and they do not undergo lexical insertion; on the other hand, non-defectives are not marked with [-lexical insertion], hence, they are subject to lexical insertion. This way, defective forms become ungrammatical in actual use. Versions of this account have been put forward in some later research (Fanselow & Féry, 2002; Orgun & Sprouse, 1999; Pertsova, 2005).

There are several theories that are in line with Halle's first approach. One of them is *lexical conservatism* (Steriade, 1997), which suggests that speakers avoid producing (parts of) forms they haven't heard before. Lexical conservatism has been used to account for lexical gaps in Russian (Pertsova, 2005, 2016) and it is compatible with Halle's first approach since word forms that are not attested in a speaker's input might be marked with [-lexical insertion] in the grammar of this speaker, which would lead to the observed defectiviness of this form.

Another account that has been influential in lexical gap studies (Daland, Sims, & Pierrehumbert, 2007; Sims, 2015) and is in spirit compatible with Halle's first [-lexical insertion] approach relies on *negative evidence*. Negative evidence in linguistics is a kind of evidence for the ill-formedness of a form based on its absence in the input. Proponents of negative evidence accounts argue that speakers are not only sensitive to the presence of word forms in their input but they are also sensitive to the *absence* of word forms in their input. Thus, they suggest that, since lexical gaps are not attested or occur in relatively low frequencies in natural speech, speakers can detect this anomaly and mark these forms as defective (or [-lexical insertion]) (Sims, 2015).

However, Gorman and Yang note that lexical conservatism or negative evidence accounts are "difficult to reconcile with the unbounded creativity of word formation" (p. 2) given that both children and adults can easily produce and use forms they have never heard before as evidenced by wug-tests (Berko, 1958; Hayes & Londe, 2006). Therefore, they are not sympathetic with the line of analyses following Halle's first approach due to its implications conflicting with unbounded creativity of human language.

The second way that Halle suggests grammar can handle defectivity is that defective forms are not derived in the same way as non-defective word forms are. Instead, while non-defective word forms are derived by productive word formation rules, defective word forms are derived by non-productive word formation rules. In this account, only those word forms that are derived by non-productive word

formation rules are eligible to be marked with [-lexical insertion]. Hence, this account predicts that all defective forms are derived by non-productive rules; however, the opposite does not hold: not all word forms that are derived by non-productive rules are necessarily defective. Thus, it confines defectivity to forms derived by non-productive rules although it cannot predict exactly which forms will be defective.

Many studies have adopted versions of this proposal by linking defectivity to the productivity of rules (Albright, 2003b, 2009; Baronian, 2005), among which are also studies that have attempted to predict defectivity of individual word forms (Albright, 2003b; Hudson, 2000; Pertsova, 2016). However, Gorman and Yang state the aim of their study as finding out in which contexts defective forms *may* occur (i.e. when there are no productive rules to inflect a word) instead of predicting exactly which words are defective. To this end, they argue that lexical gaps can only be those forms that are produced by non-productive rules and, in order to determine the (non-)productivity of word formation rules and to detect where lexical gaps may be attested, they adopt Yang's (2005, 2016) Tolerance Principle.

2.2.1 Tolerance Principle

Tolerance Principle (TP) is a model of language processing that assumes computational efficiency — the third factor in the design of language (Chomsky, 2005). Since its formulation, it has been successfully applied to a number of phenomena ranging from language change (Atlamaz & Bağrıaçık, forthcoming; Kodner, 2023; Merkuur, Don, Hoekstra, & Versloot, 2019; Sneller, Fruehwald, & Yang, 2019) and defectivity (Björnsdóttir, 2023; Gorman & Yang, 2019; Yang, 2016) to language acquisition (Belth, Payne, Beser, Kodner, & Yang, 2021; Schuler, Yang, & Newport, 2021, March 30).

According to TP, a rule R is productive iff the number of exceptions (e) that do not follow R but are in R's domain are below the threshold (θ_N) calculated by dividing the number of items (N) in the domain of the rule by its natural logarithm

($\ln N$). Given the definitions above, the productivity of a rule R based on the Tolerance Principle is formulated as follows:

(1) *Tolerance Principle*
R is productive iff $e < \theta_N$ where $\theta_N \coloneqq \dfrac{N}{\ln N}$

To illustrate how TP works, imagine a made-up language, Burasi, where there are 10 nouns, each of which has one singular and one plural form that are different from each other. The noun inventory of Burasi is as follows:

Table 8. The Singular and Plural Forms of All 10 Nouns in Burasi

	SG	PL
'*sun*'	papas	sotar
'*mother*'	çimap	takan
'*house*'	hafas	tapak
'*human*'	hasat	hasati
'*soil*'	kipas	kipasi
'*water*'	tokas	tokasi
'*tree*'	tases	tasesi
'*father*'	pipak	pipaki
'*moon*'	kitar	kitari
'*cow*'	çotas	çotasi

When we look at Table 8, we can make the following generalization: except the first three nouns ('*sun*,'*mother*', and '*house*'), the plurals are formed by adding -i to the singulars.[9] Once we come up with this generalization, the question is whether it is productive based on the TP? To answer this question, we need N and e. First, the rule "Add -i to the singular form of a noun to form its plural." does not have a phonological or structural constraint other than that it applies only to nouns: all nouns are in the domain of this rule; hence, $N = 10$. However, 3 ('*sun*,'*mother*', and '*house*') of these 10 nouns do not follow this pattern (i.e., they have a suppletive form). Therefore, we list these 3 nouns as exceptions ($e = 3$).

Having assigned integers to the variables in the equation, we can now calculate the threshold in order to figure out the number of exceptions the rule "Add -i

[9]We might as well subtract -i from the plural to form the singulars. However, this generalization would have the same productivity. For this reason, I have decided to choose the typologically more natural generalization.

to the singular form of a noun to form its plural.' can *tolerate*. If 3 exceptions is tolerable, we will categorize the rule as productive; if not, the rule will be categorized as unproductive.[10]

Dividing 10 by its natural logarithm returns 4.34, meaning that the rule can tolerate 4 or less exceptions (i.e., irregulars) that are in its domain. Given that the plural rule in our made up language has only 3 exceptions, we can conclude that the rule of adding -i to singulars to make plurals is productive in this language. Thus, for instance, if novel nouns were introduced in their singular form in Burasi, we would expect native speakers of Burasi to form the plurals of these nouns by using the 'add -i" rule productively.

Finally, note that TP is sensitive to N, the number of items in the domain of a rule and $\ln N$, its natural logarithm. This nature of TP leads to an interesting implication: a rule can tolerate a higher proportion of exceptions (e) when the number of items in its domain (N) is smaller. This property is represented in Table (9).

Table 9. The Tolerance Principle Threshold for Various Values of N (Gorman & Yang, 2019, p. 173)

N	θ_N	%
10	4	40.0
20	7	35.0
50	13	26.0
100	22	22.0
200	38	19.0
500	80	16.0
1,000	145	14.5
5,000	587	11.7

Thus, TP predicts that, all else being equal, smaller vocabulary makes it easier to detect productive patterns. As Gorman and Yang note, children might be taking advantage of this property given their remarkable linguistic development with a rather small vocabulary in the early years of their life (Newport, 1990; see Yang, 2016, Chap. 7 for a detailed discussion)).

[10]In a realistic scenario, the pattern-detection mechanism that enables us to find these patterns would divide the hypothesis space based on linguistically relevant features (e.g., gender, the final segment etc.) to find other rules that might have a tolerable number of exceptions (Belth et al., 2021).

2.2.2 Defectiveness as the absence of a categorically productive rule

Gorman and Yang argue that defective lexical items are attested in those corners of grammar where there is no productive rule. To make their argument, they discuss defective lexical items in Spanish, Polish, and Russian as case studies. They illustrate that TP fails to find a productive rule for inflecting the defective lexical items in each of these cases. Based on this finding, they argue that, as an independently motivated model of language processing, TP makes correct predictions about the distribution of lexical gaps in these languages.

To demonstrate how their analysis is different from and why they argue that their account is superior to other productivity based accounts such as Albright's (2003b), let's compare their analysis of the lexical gaps in the present indicative verbal paradigms in Spanish to Albright's, which was extensively discussed in 2.1.

First, recall that therea are three main conjugation classes in Spanish (Table (3)) . In addition, remember that some verbs are irregular in that they don't follow the regular patterns illustrated in Table (3): irregular stems have alternations (i.e., diphthongization and raising) in their mid vowel (see Table (4)). Furthermore, as has been noted by Albright (2003b) and Maiden and O'Neill (2010), virtually all lexical gaps belong to the third conjugation class, where there are few verbs and mid-vowel alternations are abundant.

Based on these observations, Gorman and Yang first start with the question of why lexical gaps are restricted to the third class verbs? Based on the LEXESP database (Sebastián et al., 2000), they find out that there is a productive pattern in the first and second conjugation classes; most stems do not have an alternation in their mid-vowel. Namely, in the first class, there are 1,305 stems, out of which only 105 are diphthongizing. Given that the threshold that TP returns is 181 for the no-change pattern in the first class, 105 exceptions are tolerable; thus, the no-change pattern is productive. For stems in the second conjugation class, the number of no-change stems is 144 whereas 23 stems are diphthongizing. TP threshold for the second class is 32; hence, the no-change pattern is productive also in the second conjugation class.

When it comes to Class 3 stems; 13 of them are diphthongizing, 20 of them are lowering, and only 3 of them are no-change stems. Given these numbers, even the most dominant pattern, lowering, is not productive since the number of exceptions that a productive rule in this class can tolerate is 10, but the total number of exceptions is 16 even for the most robust one of these three patterns.

Based on these results, according to TP, the only conjugation class where there is no productive rule is Class 3. Thus, Gorman and Yang argue that TP predicts the prevalence of lexical gaps only in the third conjugation class successfully. Furthermore, they note that the results of Spanish acquisition studies (Clahsen, Aveledo, & Roca, 2002; Mayol, 2007) also support their claim that there is a productive no-change rule in Class 1 and 2 stems, but not in Class 3 stems, given that children overextend the no-change pattern to stems that have alternations (i.e., irregulars) in Class 1 and 2 verbs, but not in Class 3 verbs, since there is no regular irregular distinction among Class 3 verbs due to a lack of a productive, regular pattern.

Thus, Gorman and Yang argue that a major determining factor of defectivity is the lack of a productive rule. In this respect, their analysis is similar to Albright's (2003b), who also suggests that the reliability or confidence of a rule is a determining factor in the defectivity of a form. However, these two analyses diverge in two important aspects. First, Albright argues that defectivity is a gradient phenomenon whereas Gorman and Yang argues that it is a categorical phenomena (i.e., a form is either defective or not). Second, Albright argues that low log-frequency or speaker unfamiliarity with a verb also contributes to the defectivity. However, Gorman and Yang claim that frequency shouldn't have an impact on the defectivity of a form.

Given these divergences, Gorman and Yang sets out to compare the success of their model to Albright's MGL in explaining Spanish lexical gaps. To this end, first, they train MGL on pairs of non-defective verb forms from the third conjugation class in order to obtain the confidence scores of the most reliable rules that can be used in inflecting Class 3 verbs. Second, they calculate log frequencies of the lemmas in

Class 3 based on LEXESP database in order to test the effect of (log-)frequency on defectivity, Finaly, they plot MGL confidence scores, log-frequencies of the lemmas, and the defectivity of a form — as defective or non-defective based on previous research (Harris, 1969; Maiden & O'Neill, 2010) or dictionaries (Butt & Benjamin, 1988; M. Francis & Sastre, 1995; Real Academia Española, 1992).

Based on the plot, they conclude that MGL confidence scores and log-frequencies are not good predictors of defectivity since some non-defective forms have a lower MGL confidence score and lower log-frequency than defective forms. Therefore, they argue that Albright's model is incomplete to predict exactly which forms are defective. However, they note that their TP-based model correctly predicts where defective forms will be observed, which was the aim of their study, even though it cannot pinpoint individual defective forms either.

However, it is important to note a crucial difference between how Gorman and Yang operationalize defectiveness, on the one hand, and how Albright does so, on the other: the latter takes low confidence ratings provided by speakers about the forms they produced as a sign of defectivity, whereas the former takes as defective only those forms that have been categorized as defective in previous research (Harris, 1969; Maiden & O'Neill, 2010) or dictionaries (Butt, 1997; M. Francis & Sastre, 1995; Real Academia Española, 1992). Therefore, when Gorman and Yang argue that log-frequency and MGL confidence scores do not correctly predict defectivity, they mean that these independent variables do not accurately predict the defectivity of the items categorized as defective in the sources they have used. Hence, if defectivity is a speaker's uncertainty measured in an experimental setting about the correctness of a form, as Albright suggests, then there is still a good chance that log-frequency might play an important role in the defectivity of a form. Moreover, although Gorman and Yang use log-frequencies taken from a corpus in their plots, Albright uses self-reported ratings of participants about the familiarity of a form as a predictor in his model. Thus, if objective frequencies and subjective frequencies do not overlap, this

might explain why Gorman and Yang do not find an effect of frequency on defectivity whereas Albright does.

2.3 Sims (2015)

Based on a wide survey of inflectional defectiveness attested in different languages, Sims argues that different gaps might have different causes, ranging from due to a lack of a productive rule (Albright, 2003b; Baronian, 2005; Gorman & Yang, 2019) to lexical specification (Daland et al., 2007; Halle, 1973) and (implicative) structure of morphological paradigms (Boyé & Hofherr, 2010; Sims, 2015; Stump, 2010). She groups the accounts on the causes on inflectional defectiveness previously proposed into three groups: “gaps-as-anomalies", “gaps-as-epiphenomena", and “gaps-as-morphological-object".

2.3.1 Three kinds of accounts for paradigm gaps

Gaps-as-anomalies accounts argue that defective forms are lexically marked and filtered out before the spell-out. Halle’s (1973) first approach, where he suggests that defective forms are lexically marked with [-lexical insertion], is a canonical example of this account. Another example is Orgun and Sprouse’s (1999) optimality-theoretic (OT; Prince and Smolensky 1993) analysis of lexical gaps in Turkish and Tiene. Orgun and Sprouse report that monosyllabic loan words that end with a vowel (e.g., musical notes *do* and *re*) are not grammatical in Turkish when, for example, they are inflected for 1SG possessive agreement (e.g., **do-m* and **re-m*). Based on this and some other observations, they argue that if a Turkish word consists of more than one morpheme, it needs to be multi-syllabic. They account for this phenomenon by proposing an inviolable constraint on monosyllabic complex words in Turkish. They argue that , at the end of the derivation, this constraint applies to the candidate that has been selected as the most optimal candidate according to the principles of OT, and rules it out if it violates the constraint. Hence, Orgun and Sprouse’s account, too, employs a filtering mechanism applied to the output of the productive rules of

grammar, just like Halle's [-lexical insertion] account, and is categorized under gaps-as-anomalies.

Gaps-as-epiphenoma accounts posit that gaps arise from the usual workings of grammar and they do not have a different theoretical status (e.g. by undergoing a special filter) from non-defective forms. Examples of this account involve Albright (2003b) and Gorman and Yang (2019), which argue that defectivity falls out when the grammar cannot make a reliable or productive generalization on how to derive novel forms. Although both Albright and Gorman and Yang note that there might be a lexical marking component of defectivity, overall their accounts make predictions about where defective forms are likely to occur given the mechanisms of rule formation that they posit (MGL and TP, respectively). As noted in Sims (p. 9), Albright states that a significant implication of gaps-as-epiphenoma accounts is that a majority of gaps have a principled, rather than random, distribution, indicating that they are connected to each other somehow. Hence, positing that they are defective due to idiosyncratic anomalies misses an important generalization.

Finally, Sims labels those accounts which assign defectivity a morphological status (like suppletion or syncretism) as gaps-as-morphological-object accounts. For instance, in their analysis of defectivity in Spanish and French verbs, Boyé and Hofherr (2010) argue that defectivity is represented and, in turn, affected by paradigmatic organization of forms in the lexicon. They argue that, it is not only defectivity that follows the distribution of morphophonological alternations in Spanish gaps, as suggested by Albright. They argue that suppletion, a rather lexically idiosyncratic phenomenon (Aski, 1995; Hippisley, Chumakina, Corbett, & Brown, 2004), also tracks the distribution of alternating stems. Given the parallel between suppletion and defectivity, they argue that defectivity is a morphological object. Based on their observation that gaps in Spanish are found also in some cells where morphophonological alternation is not expected, they argue Albright's analysis cannot capture this data, and that defective forms need to be both lexically marked and in interaction with the organization of stem space.

2.3.2 Defectiveness-as-morphological-object

Sims also advocates that some gaps need to be at the very least reanalyzed as morphological objects. She argues that “defectiveness has been mistakenly equated with productivity" (p. 86) and that defectiveness is not due to non-productivity of a morphophonological or morphosyntactic pattern in most cases; instead, it is due to the shape of the inflectional paradigm. To make her case, she investigates different ways in which defectiveness interacts with other morphological phenomena like syncretism. She investigates inflectional defectiveness in the case paradigm of Martuthunira and the agreement paradigm of kinship terms in Mohawk. To provide an example, Mohawk has three active number values (singular, dual, plural) and person values (first, second, third). In addition, it marks four different gender values (neuter, masculine, feminine-zoic, and feminine-indefinite) within third person and, within first person, it marks two values of clusivity (inclusive, exclusive). Mohawk uses prefixes in the verbal paradigm to mark these values.

When forming kinship terms such as ‘his grandfather’, Mohawk uses verbal constructions literally corresponding to ‘he is grandfather to him’. Therefore, it uses these verbal prefixes to mark the morphologically active person, number, and gender values. However, interestingly, Mohawk speakers cannot grammatically form kinship terms defining an older male’s relationship to a younger indefinite female. That is, forming the equivalent of ‘her father’ or ‘her grandfather’ syntethically is not possible in Mohawk. Mithun (2010) argues that this gap is related to the development of gender marking in Mohawk and that the value combination [+feminine, -definite] have not yet spread to the whole inflectional system. Interestingly, although [+feminine, -definite] values are not yet marked in the lexemes of senior relatives, the outcome is not the same for all senior relatives: the lexemes for senior female relatives can be inflected by a syncretic form which actually realizes the value [+feminine-zoic] whereas lexemes referring to senior male relatives are defective (Sims, 2015, p. 98). Hence, Sims concludes that morphological productivity of some feature values might be restricted, but this does not always lead to defectivity. Based

on these observations, she speculates that a problematic paradigm cell might be filled in with a form from another cell (i.e., syncretism) when the two cells are semantically close. On the other hand, she argues that defectivity is observed in the problematic cell when there is no cell that is similar enough in meaning to the problematic cell. Yet, of course, this claim about under what conditions syncretism is chosen over defectivity needs further empirical or theoretical support.

2.3.2.1 Paradigm linkage theory: The interaction between syncretism and defectiveness

Regarding the relation between syncretism and defectiveness, Sims summarizes Stump's (2010) proposal that there might be three possible ways syncretism and defectiveness can interact. The first one is observed when two or more cells are defective, but a form from another cell in the paradigm is used in one of the defective cells. This is what he calls *syncretism overriding defectiveness*. Second, when there are two or more syncretic cells in a paradigm, one of them might be defective for a set of lexemes. This is what he calls *defectiveness overriding syncretism*. The third one is when defectiveness is observed in all of the cells that are normally syncretic. This is what he calls *syncretism determining a domain of defectiveness* (Stump, 2010, p. 183).

Stump argues that an instance for all of the three possible interactions is attested in Sanskrit (two of them in Vedic Sanskrit and one of them in Classical). For instance, *defectiveness overriding syncretism* is attested in Vedic Sanskrit, where the third person personal pronoun *ENA* is defective in most parts of the paradigm including the nominative cells. Interestingly, when the paradigm of *ENA* is compared to the paradigms of other pronouns, such as the relative pronoun *YA*, it is observed that six cells out of the all nine cells in the nominative are syncretic with (i.e., have the same form as) the corresponding cells in the accusative in the paradigm of pronominals where defectivity is not attested. However, *ENA* has only gaps in the nominative cells; all the accusatives are well-formed. Hence, defectiveness in the

nominative cells overrides syncretism between the nominatives and the accusatives in the paradigm of *ENA*, making this an instance of *defectiveness overriding syncretism*.

Stump notes that not all instances of defectiveness are reducible to independent phenomena (e.g., morphophonological productivity); some cases, as in the inflectional defectiveness in Vedic Sanskrit (for examples of the other categories and more details, see Stump and Sims, 2015, Chapter 4), need to be morphologically specified. Sims also agrees with Stump's stance, and, after reviewing other accounts (e.g., Orgun and Sprouse (1999)), argues that some gaps cannot be simply explained by constraints and referring to the inflectional system is a must in formal accounts of inflectional defectiveness. Particularly, following Stump's analysis of Sanskrit gaps, Sims argues that Icelandic imperative gaps and Russian genitive plural gaps, too, can be explained by using the tools of paradigm linkage theory (Stewart & Stump, 2007; Stump, 2001, 2002, 2006).

The theory of paradigm linkage employs two kinds of paradigms: content and form. A content paradigm is a set of pairs including a lexeme and an active morphosyntactic property set for that lexeme. On the other hand, a form paradigm is a set of pairs consisting of a root and an active morphosyntactic property set. Hence, while the content paradigm represents the syntactic uses of a lexeme, the form paradigm represents it inflectional realizations.

The realization of the cells in the content and form paradigms are defined by a paradigm function (PF). A paradigm function takes as argument a pairing of morphosyntactic properties and a lexeme L (i.e., PF($< L, \sigma >$)) or a pairing of morphosyntactic properties and a root R (PF($< R, \gamma >$)) R and returns its realization. In turn, the realization of the relevant content and form cells are connected by a rule of paradigm linkage as in (2).

(2) *Rule of Paradigm Linkage*
PF($< L, \sigma >$) = PF($< R, \gamma >$)

In the most straightforward case, which is represented by the default rule of paradigm linkage, there is a one-to-one correspondence between the realization of

content and form cells such that σ and γ are the same morphosyntactic property sets (i.e., $\sigma = \gamma$). However, there does not have to be a one-to-one correspondence between form and content cells. For instance, sometimes we observe that a lexeme has the same form in different morphosyntactic environments. This is called syncretism and, as stated above, is attested in the paradigm of the Vedic Sanskrit relative pronoun *YA* between some nominative forms and accusative forms.

Given this background on the paradigm linkage, how are defectiveness and syncretism represented in this theory? In order to account for defectiveness, Stump stipulates a definedness condition in the rule of paradigm linkage in order to represent defectiveness. He assumes that defectiveness is observed when the realization of a lexeme's content cell is not definable as (i.e., cannot be linked to) the realization of a form cell. On the other hand, syncretism is observed when the realization of multiple content cells are linked to the realization of a single form cell. The implication of these assumptions is that defectiveness is not a property of the cells, but of the rules linking the content and form cells. Sims argues that this is an intuitive analysis of defectivity given that defectivity is a failure of morphology to meet the syntactic needs rather than the defectivity of particular form or content cell. Thus, following Stump, Sims argues that the interactions between syncretism and defectiveness can be represented intuitively within a Word-and-Paradigm model such as the framework of Paradigm Function Morphology (Stewart & Stump, 2007).

2.3.2.2 The implicative structure of the inflectional system

As another case study, Sims analyzes defectivity in the genitive plural cell of the inflectional paradigm of some nouns in Modern Greek. Having searched two dictionaries, she notes that defectivity is attested in the genitive plural cell of 2,141 Modern Greek nouns. However, the gaps are not randomly distributed across the inflectional classes. In particular, she notes that GEN.PL gaps are attested mainly in three inflection classes represented by *kópelo* 'girl', zácharī 'sugar', and mísos 'hatred', which are provided in Table 10.

Table 10. Defective Inflection Classes in Modern Greek (Sims, 2015, p. 151)

SINGULAR			PLURAL		
NOM	GEN	ACC	NOM	GEN	ACC
kópela	kópelas	kópela	kópeles	-	kópeles
zácharī	zácharīs	zácharī	záchares	-	záchares
mísos	mísous	mísos	mísī	-	mísī

Sims observes that GEN.PL gaps seem to be related to stress placement, which is regulated by lexical, phonotactic, and inflectional factors in Modern Greek nouns. Namely, words might have a lexically specified stress; however, this can be overridden by inflectional or phonotactic stress. For instance, phonotactic well-formedness constraints in Modern Greek do not allow stress to be placed before the antepenultimate syllable. Therefore, when the antepenultimate syllable is stressed in some inflected form of a noun that has three syllables, if the syllable number increases in its another inflected form, the stress shifts to the right due to phonotactic restrictions. Hence, speakers of Modern Greek need to master the idiosyncratic stress patterns in the nominal inflection paradigm of some lexemes, which, Sims explains, is not trivial.

Sims notes that GEN.PL gaps are overrepresented in the subgroups of inflectional classes where stress placement of GEN.PL forms are variable and, thus, unpredictable. Further, she points out that lexemes that have less token frequency are more likely to have gaps in their GEN.PL form than the lexemes that have higher token frequency. Given these observations, she considers that genitive plural gaps in Modern Greek may be due to speaker uncertainty about the correct form of the genitive plural, which is in line with Albright's (2003b) analysis of Spanish lexical gaps. However, she notes that this cannot be the whole story since there are no gaps in some closely related subgroups of inflectional classes where stress placement is also variable. Thus, she concludes that, although unpredictability of stress seems to play a role in these gaps, it is not sufficient for a lexeme to be defective.

To be able to account for the data that cannot be explained by predictability accounts alone, Sims argues that considering the implicative structure of a paradigm is helpful. In addition to a form's predictability, she posits that its predictiveness of

other forms is also a crucial factor in determining its defectivity. That is, besides being predictable by, a form in a given cell needs to be significantly predictive of other forms in the same paradigm so as to be less prone to defectivity. She formulates paradigm cohesion in (3) as a way to integrate a form's predictability and predictiveness into the paradigm structure.

(3) "A paradigm exhibits cohesion to the extent that all cells form a single network of implicative relations such that either every cell in a paradigm significantly reduces the uncertainty associated with other cells, and/or other cells significantly reduce the uncertainty associated with it." (Sims, 2015, p. 163)

In order to test this hypothesis, she uses information theoretic tools and operationalizes paradigm cohesion as mutual information.

(4) Mutual information formula (Sims, 2015, p. 164)
$I(A;B) = H(A) - H(A|B)$

Mutual information measures the amount of reduced uncertainty (or entropy) regarding the form in a paradigm cell A or B when the form in the other cell is known. Hence, the equation in (4) is a measure of A's (or B's) predictability by and predictiveness of B (or A), which shows how informative they are of each other. The more informative cells are of each other in a paradigm, the more cohesive the paradigm will be. Thus, in order to calculate how cohesive a paradigm is, the average pairwise mutual information of its cells needs to be calculated.

Turning to genitive plural gaps in Modern Greek, in order to test the hypothesis that the predictiveness of a form contributes to its defectiveness, Sims calculates pairwise mutual information of the cells within defective and non-defective paradigms. As expected, she finds out that "genitive plural neither contributes to, nor is a beneficiary of, the predictive power of the paradigm"(p. 165) in the Greek nominal inflection paradigms overall. Moreover, based on the conditional probability distributions of the genitive plural cell given other cells, and vice versa, she highlights that defective subgroups and non-defective subgroups of inflectional classes differ from each other in terms of both predictability and predictiveness. Hence, this

measurement provides evidence that it is not only predictability but also predictiveness that contributes to the defectiveness of a cell.

2.3.2.3 The morpho-lexical specification of gaps

Thus, Sims argues that implicative structure of the paradigm can explain, to some extent, in which inflectional classes defectivity is attested. However, it is yet to be explained why there are no gaps in some classes similar to defective ones. Sims observes that the similar but non-defective class of Greek nouns differ from the defective class in terms of the pattern of syncretism in their paradigm: morphological subgroups where there is no defectiveness exhibit syncretism between genitive singular, genitive plural, and accusative plural. She notes that defectivity is not observed in the subgroups where genitive plural is syncretic with genitive singular and genitive plural. She argues that this pattern of syncretism is an indication of the genitive plural's active role (i.e., being predictable by and/or being predictive of at least the syncretic forms) in the implicative structure of these subgroups. Thus, the distribution of even the extremely similar defective and non-defective lexemes can be neatly explained by lack of paradigm cohesion and implicative structure of paradigms.

All in all, Sims argues that a paradigmatic theory of morphology can explain these gaps to a greater extent than the theories that rely on only predictability (Albright, 2003b; Gorman & Yang, 2019). However, before jumping to the conclusion that all gaps in the nominal inflection system of Greek can be explained by grammar indeterminacy, in addition to the information-theoretic analysis discussed above, she also conducts an elicitation and acceptability judgment experiment to test whether the genitive plural gaps in Modern Greek can be explained purely by grammar indeterminacy. The findings of her experiments suggest that there is a significant effect of defectiveness on speaker's judgments that cannot be simply reduced to uncertainty about the stress pattern of the defective word forms. Thus, she concludes that the claim that gaps must be reducible to independent grammatical

mechanisms and are epiphenomenal should be rejected. Drawing parallels between defectiveness and other morphological phenomena (e.g., syncretism), she posits that not all defective forms have a synchronic motivation to be defective: some gaps need to be morpho-lexically specified and learned as such.

2.4 Summary

Most of the literature on paradigm gaps have focused on the so-called idiosyncratic lexical gaps in Indo-European languages, as have been illustrated in this chapter. Therefore, naturally, this lead to the development of theories that can handle lexical gaps fairly well; however, it is questionable whether these theories can handle systematic, lexically unrestricted gaps as easily as lexical gaps that are mostly due to lexical irregularities within pardigms.

The first account that have been discussed is Albright's (2003) Minimal Generalization Learner. This account falls into the category of gaps-as-epiphenoma since it argues that gaps are an extreme end result of a failure to find robust rules to inflect forms that have not been stored in the lexicon. This learning algorithm, MGL, takes pairs of forms in the input and tries to find the most reliable rule to derive one from the other. Albright argues that all rules, including both the so-called regular and irregular (morphophonological) rules, are derived by this same mechanism. However, the only difference between them is that the rules to derive the irregular forms have low reliability or, even if they have high reliability, they are applicable to only a few forms due to being highly restricted to a specific domain. In the case of defectiveness, Albright argues that defective forms are an end result of a gradient scale of uncertainty stemming from rules with low confidence. Furthermore, he argues by providing experimental evidence that defectiveness is observed especially when two factors combine: a rule with low reliability and a lexeme with low frequency. He argues that if there is no reliable rule to inflect a rather infrequent lexeme, speakers feel uncertain about the correct inflected form and this is manifested as a gap in their

judgments. Hence, gaps are an extreme end result of a gradient range of uncertainty in this account.

The second account is Gorman and Yang's (2019) Tolerance Principle (Yang, 2016) account. This is also a gaps-as-epiphenoma account since it assumes that defectiveness can be predicted based on rule productivity. Gorman and Yang argue that there are two kinds of rules: productive and non-productive. The distinction between these rules is categorical such that if a rule can withstand the number exceptions in its domain/scope based on a threshold determined by TP, it is productive; otherwise, it is not productive. So, unlike in Albright's account, where productivity of rules are gradient (i.e., some rules are more productive and others are less), in TP-based accounts, a rule is either categorically productive or not. Based on the vast literature on language acquisition, following Yang (2016), Gorman and Yang argue that TP is an independently motivated principle that is needed to explain acquisition data, but it can also be succesfully applied to defectivity since it is a similar problem related to productivity. Namely, Gorman and Yang argue that gaps arise when there is no productive rule to inflect a form that is not stored as an exception in the lexicon. Hence, when a form is irregular (i.e., cannot be produced by a productive rule) and is not frequent enough to be stored in a speaker's lexicon, then this form might be defective. Although Gorman and Yang's model cannot predict which individual forms will be defective, their model is fairly successful in detecting the linguistic contexts where defective lexemes are likely.

Finally, Sims (2015) argues that individual cases of defectivity might have different sources. She argues that, while some defective forms have synchronic causes, some gaps require some sort of idiosycratic, morpho-lexical specification. Further, she argues that defectiveness is a morphological phenomenon just like syncretism, which is evidenced by how they interact with each other. Drawing on Stump (2010), she illustrates that, while sometimes defectiveness is overridden by syncretism, other times it overrides syncretism, and all these patterns can be represented by the toolbox of paradigm linkage theory. Furthermore, based on

Modern Greek data, she posits that a wide distribution of genitive plural gaps can be explained by the implicative structure of the lexicon. Namely, she argues that genitive plural cell is not integrated well into the inflectional system of Greek and it is disproportionately less predictable by and predictive of other cells in inflectional classes where the proportion of defective lexemes are significantly high. However, she notes that some of the gaps are not reducible to the normal functioning of the inflectional system and they need to be morpho-lexically marked as defective. Thus, Sims' main argument is that defectiveness should be representable as a morphological object when it is required and the most appropriate model to explain all these properties of defectiveness is word-and-paradigm morphology.

CHAPTER 3

THE DESIDERATIVE GAP: EMPIRICAL EVIDENCE

There are a few methods that can be used to provide empirical evidence for the defectivity of a form. One commonly used method is collecting acceptability judgments in a comprehension task (Bermel & Nikolaev, 2022). Since Chomsky (1965), acceptability judgments have proven to be useful in building theories of grammaticality in generative linguistics. The basic assumption behind this method is that high acceptability, or simply acceptability, of a form correlates with grammaticality whereas low acceptability, or unacceptability, of a form correlates with ungrammaticality. It is still a hot debate whether grammaticality in language is a categorical or a gradient phenomenon (see E. Francis (2021) for an overview). Researchers can decide on whether they would like to use a gradient or a categorical scale by choosing between Likert scale or magnitude estimation tasks on the one hand, and yes/no tasks on the other (see Schütze and Sprouse (2013) for details about various types of acceptability judgment tasks).

There is usually a difference between how different models of grammar approach grammaticality. For instance, generative and usage-based models differ drastically in terms of how they approach grammaticality. While most grammar models in the generative tradition, such as Distributed Morphology (Embick & Noyer, 2007; Halle & Marantz, 1993; Harley & Noyer, 1999) and Nanosyntax (Caha, De Clercq, & Vanden Wyngaerd, 2019; Starke, 2009), assume that grammaticality is categorical and a form is either grammatical or not, usage-based models, such as Word-and-Paradigm Morphology (Blevins, 2016) or Construction Grammar (Goldberg, 2013), assume that grammaticality is gradient and a form's grammaticality might be affected by factors such as similarity to existing forms or token frequency, which generative models treat as non-linguistic factors that should not have an impact on the grammaticality of a form even though it has an effect on its acceptability. Therefore, we should be careful and explicit about our assumptions regarding how acceptability correlates with grammaticality when designing an acceptability judgment experiment and interpreting its results.

Based on previous research on defectivity, which is discussed in Chapter 2 and which indicates that defectivity is a gradient effect, I will make the uncontroversial assumption that defective forms need not be completely unacceptable. The previous research suggests that forms that can possibly fill the defective cells have lower acceptability than what a grammatical form is expected to have; however, they are not as unacceptable as ungrammatical forms either. As Albright (2003) notes, "paradigm gaps represent one extreme in a spectrum of uncertainty" (p.11), and it is no surprise that speaker uncertainty is manifested in the lower acceptability scores defective forms get in acceptability judgment tasks. Hence, an acceptability judgment task is necessary in order to detect the defectivity of a word form and if there is a statistically significant difference between the acceptability of the forms in the arguably defective cell and the acceptability of the forms in the other cells such that the defective form has lower acceptability, I will take it as evidence for the defectivity of the form. Nevertheless, I will not rely solely on the results of the acceptability judgment experiment. I will also use an additional method, corpus search, to provide empirical evidence for the defectivity of the 3PL desiderative form under question.

Infrequent forms that are not defective might sometimes be judged to have low acceptability (Divjak, 2008), too, even though they do not have to be so as opposed to defective forms, which necessarily have low acceptability. Moreover, since defective forms are usually rare, we cannot be sure about whether they have low acceptability due to their infrequency or they are infrequent due to their being defective. For this reason, in order to make sure that a form is defective, we should also search for other sources for evidence. To this end, in addition to the acceptability judgment experiments, we can, for example, compare the acceptability of defective forms with non-defective forms that match in token frequency, or we can use other methods such as production experiments and searching corpora.

For the aforementioned reasons, I have used two methods to find evidence for the defectivity of 3PL desiderative verbs. Given that acceptability judgment tasks

have been proven to be effective to provide evidence for whether a word form is defective, I have collected acceptability judgments from Turkish speakers in a comprehension task where they were asked to rate the acceptability of -AsI desideratives including a 3PL agreeing desiderative verb. Moreover, in order to complement the results obtained via the acceptability judgment task, I have also searched corpora to detect if there are anomalies in the frequencies of the defective forms compared to other related forms given that this method has been shown to be useful in studies on defectivity (Sims, 2015).

In what follows, I will first present the results of the corpus search that I have conducted and argue that they provide evidence for the defectivity of 3PL desiderative forms. Then, I will go on to report the details of the acceptability judgment experiment. Finally, I will discuss the results of experiment, arguing that experimental results also suggest that 3PL desiderative forms are defective.

3.1 Evidence from corpora

We conducted a corpus search to determine if the frequency of 3PL desideratives in the desiderative agreement paradigm was anomalous compared to other forms[11]. However, corpus search is challenging for our specific purpose as automated morphological parsers tend to make errors in detecting the -AsI suffix due to the high frequency of the suffix -(s)I(n), which is used in compounds and genitive possessive constructions with a third singular or plural possessor. Hand-annotated corpora are too small for our purposes due to the low frequency of desideratives overall. Nonetheless, our goal is not to fully analyze the corpus frequencies of desideratives, but to provide evidence for the atypical behavior of 3PL desiderative forms. To accomplish this, I used an automatically annotated corpus cautiously by not only employing morphological tags but also making use of phonological contexts, collocations, or manual filtering when necessary.

[11]Parts of this section and the following section on the acceptability judgment experiment is based on our paper A Paradigm Gap in Turkish (İleri & Demirok, 2023) published in the Proceedings of the Workhop on Turkic and Languages in Contact with Turkic (TU+7).

The corpus that I used is TSCorpus v2[12], a morphologically annotated corpus that uses the BOUN Web Corpus[13] as its data source, which consists of 491,360,398 million word tokens and 4,950,407 word types. The desiderative marker -(y)AsI is tagged as “FeelLike" in TSCorpus. When we search for all instances of this marker, we see that 7606 tokens include a suffix tagged as “FeelLike". However, many of these tokens seem to have been misparsed. For instance, a token from the list is *göresini* from the phrase *gönlünüze göresini* ‘after your heart‘, which should actually be parsed as göre-sin-i rather than gör-esin-i. Thus, I needed to narrow down the search, which I have decided to do by specifying the context following the desiderative form.

As I have noted when introducing the desiderative clauses, desiderative clauses are taken as complement by only a few predicates that denote the presence or absence of the desire that is denoted by the desiderative clause. These predicates are the following: *gel-* ‘to come’, *var* ‘to exist’, *yok* ‘to not exist’, *kaç* ‘to run away’, *git* ‘to go away’, and *tut* ‘to hold’. Besides these predicates, desiderative clauses can be taken complement by only one other verb, a light verb, *ol-* ‘to be’, which is used when embedding a clause that has an existential predicate *var* or *yok* as the main predicate. For instance, take the desiderative construction in (2) as an example.

(1) *(Sen-in) kahve iç-esi-n var.*
(You-GEN) coffee drink-DESID-POSS.2SG exist
‘You want to drink coffee.’

In order to embed this desiderative clause, for instance, as the object of a factive predicate such as *bil-* ‘to know’ as in (2), the existential main predicate of the desiderative construction, var ‘exist’, is replaced with *ol-* ‘to be’ (Göksel & Kerslake, 2005, p. 115) since *var* cannot combine with a nominalizer/embedding suffix such as -DIK.

[12]https://tscorpus.com/corpora/ts-corpus-v2/ (Sezer, Sezer, & Mersin Ünivesitesi, 2013).
[13]sak2008turkish

(2) a. *(Sen-in) kahve iç-esi-n *var-dığ-ın-ı*
(You-GEN) coffee drink-DESID-POSS.2SG *exist-NOM-POSS.3SG-ACC
bil-iyor-um.
know-PROG-1SG

b. *(Sen-in) kahve iç-esi-n ol-duğ-un-u*
(You-GEN) coffee drink-DESID-POSS.2SG be-NOM-POSS.3SG-ACC
bil-iyor-um.
know-PROG-1SG
'I know that you want to drink coffee.'

Thus, *ol-* is another possible predicate that can take a desiderative clause as complement and, hence, that can occur right after a verb that bears the desiderative suffix. Given that desiderative constructions are rare overall and that they have a fairly rigid word order such that the desiderative verb is immediately followed by the main predicate, we can restrict the corpus search to only those tokens which are followed by one of these 7 predicates. Once we do this, we obtain the token frequency distribution of the forms in the desiderative paradigm given in Table (11).

Table 11. The Token Frequency Distribution of Desiderative Forms in TS Corpus

	SG	PL
1	1643 (%55.45)	34 (%1.15)
2	0 (%0.00)	0 (%0.00)
3	1284 (%43.34)	2 (%0.07)

Table (11) illustrates an interesting observation. First, we observe that nearly all instances in the TS corpus belong to either 1SG or 3SG forms in the desiderative paradigm. Second, the forms in the 3PL cell, which I argue to be defective, are virtually unattested with only 2 tokens in a 500 million-token corpus. Note that the existence of these two tokens is not counter evidence for the argument that 3PL forms are defective since previous research suggests that forms in the defective cells are not completely absent (Albright, 2003b; Sims, 2006, 2015). That is, a paradigm gap is not the absolute absence of a form in a given cell. Rather, it is the unexpectedly low frequency of a word form given the expectations based on the usage patterns in that language. The the question of what these expectations in Turkish are arises. I will return to answer this question in detail in the following paragraphs. However, first, there is another striking observation that requires an explanation about the frequency

distribution of forms in the desiderative paradigm: Why are second person forms completely absent in this 500 million-token corpus?

When we probe the corpus to understand the source of this surprising finding, we see that the second person desiderative forms are syncretic (i.e., have the same forms) with the second person optative forms in the verbal paradigm of Turkish. To illustrate, compare the optative paradigm of the verb *gel-* 'to come' in Table (12) with its desiderative agreement paradigm given in Table (13).

Table 12. The Optative Paradigm of *gel-* 'to come'

	SG	PL
1	gel-e-yim	gel-e-lim
2	gel-e-sin	gel-e-siniz
3	gel-sin	gel-sin-ler

Table 13. The Desiderative Paradigm of *gel-* 'to come'

	SG	PL
1	gel-e-sim	gel-e-simiz
2	gel-e-sin	gel-e-siniz
3	gel-esi	*gel-esi-leri / *gel-e-leri

When we look at the optative and desiderative paradigms of *gel-*, we observe that they have the same form in the second person cells. Moreover, we see that the desiderative suffix -AsI (tagged as FeelLike in TS Corpus) is attested in 7606 tokens overall in the TS Corpus as opposed to 431767 tokens that include the optative suffix -(y)A. Given that the parser encounters the optative suffix much more than the desiderative suffix in the input, it misanalyzes the second person desiderative that are sycretic with the second person optative forms in favor of the optative suffix. For this reason, it cannot detect the small number of second person desiderative forms automatically. Thus, we need to customize our search in order to detect how many tokens are actually second person desiderative forms in the corpus.

I narrowed down the search to find tokens that (i) include the optative suffix, (ii) end in either *-esin* or *-asın* for 2SG desideratives or that end in *-esiniz* or *-asınız* for 2PL desideratives, and (iii) are followed by one of the 7 predicates that can take the desiderative clauses as complements as discussed above. This search returned 72

hits for the 2SG forms, 68 of which are truly 2SG desiderative tokens; and 64 hits for the 2PL forms, all of which are truly instances of 2PL desiderative forms. Thus, the frequency distribution of the desiderative forms in TS Corpus needs to be updated as in (14):

Table 14. The Token Frequency Distribution of Desiderative Forms in TS Corpus (updated)

	SG	PL
1	1643 (%53.09)	34 (%1.10)
2	68 (%2.20)	64 (%2.07)
3	1284 (%41.49)	2 (%0.07)

The corrected frequency distribution of the forms in the desiderative paradigm indicates that the 1SG and 3SG forms still dominate the desiderative paradigm by making up about %95 of all the forms whereas 1PL, 2SG, and 2PL forms make up about %5 of the forms. When it comes to the arguably defective cell, the 3PL, we see that there are only 2 forms, which constitute only %0.07 of the desiderative forms in the corpus. However, we also see that the non-defective 1PL, 2SG, and 2PL forms also have relatively low frequency when compared to the 1SG and 3SG forms. For instance, 1PL constitutes only %1.10 of the desiderative forms in the corpus; however, they are not defective since speakers do not judge 1SG desiderative verbs as degraded or ill-formed . Then, is having only %0.07 relative frequency enough for a form to be categorized as defective? Likewise, is having only %1.10 relative frequency enough for a form to be categorized as non-defective? However small the difference might look, note that the forms in the 1PL cell are about 16 times more frequent than the forms in the 3PL cell. But, is this enough to claim that 3PL forms have unexpectedly low frequency whereas the frequency of the 1PL forms are not unexpected?

In order to answer this question, we need to figure out the expected frequencies of the forms in the desiderative paradigm by investigating the frequency distribution of forms in the paradigms of constructions that are morphosyntactically and semantically related to desideratives. In doing so, we can start by looking at the constructions formed with *iste-* 'to want', which carry a similar meaning to

desideratives. These constructions are also used to express a desire as can be seen in (3) and they are much more frequent with 985,999 tokens in the TS Corpus than desideratives, which have 3,095 tokens.

(3) *Ben kahve iç-mek iste-r-im.*
(I-GEN) coffee drink-INF want-AOR.1SG
'I want to drink coffee.'

Hence, if the instances where *iste-* bears a 1PL or 3PL agreement marker constitutes an extremely small proportion of the forms in its paradigm, too, we can say that the skewed frequency distribution of the forms in the desiderative paradigm is due to its meaning and, therefore, has nothing to do with the defectivity of forms infrequent forms. That is, if it were the case, it could be reasoned that the infrequent forms would be expected to be infrequent due to their semantics.

Searching for the frequencies of *-iste* with respect to the agreement markers it co-occurs with in TS Corpus, we obtain the distribution of forms in Table (15).

Table 15. The Token Frequency Distribution of *iste-* With Respect To Agreement Markers It Co-occurs With in TS Corpus

	SG	PL
1	190,174 (%19.29)	94,468 (%9.58)
2	17,094 (%1.73)	58,859 (%5.97)
3	495,885 (%50.29)	129,519 (%13.14)

We see that the relative frequencies of the forms in the cells other than the 3PL in the paradigm of *iste-* do not dramatically differ from the relative frequencies of the forms in the corresponding cells in the desiderative paradigm. Except the 3PL cell, the most dramatic change is observed in the relative frequency of the 1PL form across paradigms: *iste-*...-1PL is, relatively, about 8.7 times more frequent than X-DESID-1PL. On the other hand, *iste-*...-3PL is, relatively, about 187.7 times more frequent than X-DESID-3PL, which suggests that the 3PL desiderative form has a low frequency that cannot be explained solely by its meaning.

Similarly, we can also compare the relative frequencies of the constructions that are morphosyntactically similar to desideratives. Given that desiderative clauses

are a type of nominalized clause that exhibits possessive agreement with a genitive subject, we can compare the relative frequencies of nominalized verbs that bear a possessive agreement suffix with the relative frequencies of the desiderative verbs. However, searching the corpus for all kinds of nominalized verbs that bear a possessive agreement suffix does not return accurate results since the POSS.3SG suffix -(s)I(n) is used in a variety of constructions including non-verbal ones and it presents a difficulty to the parser in TS Corpusby returning all these word forms along with the nominalized verbs. Hence, I have restricted the search to verbs that are nominalized with the suffix -mA, which is a major nominalizer used frequenty in Turkish. The relative frequencies of verbs nominalized with -mA in TS Corpus is provided in Table (16).

Table 16. The Token Frequency Distribution of Verbs Nominalized With -mA in TS Corpus

	SG	PL
1	99,550 (%2.89)	92,755 (%2.70)
2	16,081 (%0.47)	68,429 (%1.99)
3	2,764,258 (%80.35)	399,384 (%11.61)

The search returned 3,440,457 tokens that have a possessive agreement marker followed by the nominalizer -mA in total. As can be seen, the majority of these forms belong to the 3SG cell. When we zoom in on the 3PL cell, which I argue to be defective in the desiderative paradigm, we see that there is a huge discrepancy between the relative frequencies of the 3PL forms of verbs derived with -mA and those derived with the desiderative suffix -AsI: compared to other forms within the paradigm, 3PL desiderative forms are about 165.9 times less frequent than -mA nominals. This distribution also suggests that other types of nominalized verbs, exemplified with -mA for convenience, frequently bear the 3PL possessive agreement suffix. Thus, the extremely low relative frequency of 3PL desideratives cannot be explained solely by morphosyntactic factors, meaning that the skewed frequency distribution is unexpected, surprising, or anomalous from a morphosyntactic point of view.

To summarize, corpus search shows that there is a few (namely, 2) tokens that belong to the arguably defective 3PL cell in the desiderative paradigm. However, this does not constitute counter evidence to the claim that this cell is defective since previous research suggests that forms in the defective cells are not completely absent anyway (Albright, 2003b; Gorman & Yang, 2019; Sims, 2006). That is, a paradigm gap is not the absolute absence of a form in a given cell. Rather, it is the unexpectedly low frequency of a word form given the expectations based on language internal factors such as morphosyntax and semantics. Therefore, I presented evidence from the corpus frequencies of semantically similar constructions formed with *-iste* 'to want' and morphosyntactically similar nominalized constructions formed with -mA that the relative frequency of 3PL desiderative word forms is indeed unexpectedly low given the relatively high frequency of 3PL agreeing forms in these similar constructions. Thus, I conclude that there is ample evidence for the defectivity of 3PL desiderative word forms in Turkish based on their usage frequencies.

3.2 Evidence from an acceptability judgment experiment

We conducted an acceptability judgment experiment to examine whether verbs with the desiderative suffix -AsI become ungrammatical in Turkish when they are inflected for third person plural agreement. Our hypothesis posits that these verbs are indeed ungrammatical, creating a gap in the agreement paradigm of desideratives within the third plural context. Additionally, we have a secondary goal, which is to determine if the frequency of a verbal lexeme in a third plural agreeing desiderative verb influences its grammaticality. While our native speaker consultants and our own intuitions do not predict a frequency effect on the acceptability of third plural agreeing desiderative verbs, previous studies on paradigm gaps suggest that low frequency lexemes reduce the acceptability of an inflected form more than high frequency lexemes (Albright, 2003b; Sims, 2006). Therefore, we also investigate the impact of lexeme frequency on the acceptability of desiderative verbs marked for third person plural agreement.

3.2.1 Participants

A total of 183 students from Boğaziçi University, aged between 18 and 32 years (mean = 21.4, standard deviation = 2.0), participated in the study and received extra course credit in return. Only the responses of individuals who were native speakers of Turkish were considered for the analysis. Consequently, non-native Turkish speakers were excluded, resulting in a final sample of 181 participants. The Boğaziçi University Ethics Committee for Master and PhD Theses in Social Sciences and Humanities (SOBETIK) has granted approval (number 47879, 13 January 2022), which you can find in Appendix A, for this study. The procedures adhered to the ethical principles outlined in the Helsinki Declaration regarding research involving human subjects.

3.2.2 Experimental Design

An acceptability judgment experiment was conducted using a 7-point Likert scale. Participants were presented with sentences in the center of the screen and were asked to rate their acceptability on the provided 7-point scale, where a rating of 1 indicated complete unnaturalness and a rating of 7 indicated complete naturalness. Based on our hypothesis, we expect that participants will rate grammatically correct constructions closer to 7, indicating naturalness, while ungrammatical constructions will receive lower ratings, closer to 1, indicating unnaturalness. The experimental sentences were divided into two groups using a Latin-square design, ensuring that each participant encountered each item only once and in one specific condition.

3.2.3 Materials

In the experiment, the main verb of the desiderative clauses is manipulated based on two factors: frequency and agreement, each with two levels. These factors, frequency (HIGH, LOW) and agreement (3PL, OTHER), are combined to create four conditions. To control the lexeme frequency of the desiderative verb, half of the experimental items were constructed using high frequency verbs, while the other half

utilized low frequency verbs. The high frequency verbs were selected from Y. Aksan, Aksan, Mersinli, and Demirhan (2016), which is a compilation based on a 50-million-word corpus. However, since Y. Aksan et al. (2016) only listed the most frequent verbs in Turkish, we referred to Göz (2020) for the low frequency verbs, although it is not as representative (1 million words) as the former.

We examined the frequencies of all candidate verbs in the Turkish National Corpus (TNC)[14] (M. Aksan, Koltuksuz, Sezer, Mersinli, et al., 2012) and categorized verbs with over 500 tokens per million as high frequency (mean = 2568.9), while verbs with less than 100 tokens per million were classified as low frequency (mean = 16.0). A total of 24 sentences were created, with 12 sentences using high frequency verbs and 12 sentences using low frequency verbs. Each sentence had two variations, forming a minimal pair: one with a 3PL desiderative form and the other with an OTHER form (1SG, 1PL, 2SG, 2PL, or 3SG) for the desiderative. Additionally, we controlled for sentence length, word type, main predicate, and word order across the items. All the desiderative verbs were mono-transitive with only one object. In total, 48 sentences (12 for each condition) were created as described in (4). You can see all the material used in the experiment in Appendix B.

(4) a. 3PL X FREQUENT
Bu akşam ödev-i yap-ası-ları var-mış.
This evening assignment-ACC do-DESID-POSS.3PL exist.EVID
'(I heard that) tonight they want to do assignment.'

b. OTHER X FREQUENT
Bu akşam ödev-i yap-ası-n var-mış.
This evening assignment-ACC do-DESID-POSS.2SG exist.EVID
'(I heard that) tonight you(sg) want to do assignment.'

c. 3PL X INFREQUENT
Mahkemede katil-le yüzleş-esi-leri var-mış.
In.court murderer-INST confront-DESID-POSS.3PL exist-EVID
'(I heard that) they want to confront the murderer in court.'

d. OTHER X INFREQUENT
Mahkemede katil-le yüzleş-esi-niz var-mış.
In.court murderer-INS confront-DESID-POSS.2PL exist-EVID
'(I heard that) you(pl) want to confront the murderer in court.'

[14] https://v3.tnc.org.tr/

3.2.4 Procedure

To ensure that participants did not encounter sentences that differed only in their desiderative agreement marker, we employed a Latin-square design to divide the experimental sentences into two distinct lists. Additionally, we incorporated 48 filler sentences into both lists, comprising 24 grammatical and 24 ungrammatical sentences. At the onset of the experiment, participants were randomly assigned to one of the two item lists as explained in the stimuli section. To familiarize participants with the rating process and encourage them to utilize the full range of options on the 7-point scale, we conducted a training session where they evaluated 9 sentences with varying levels of acceptability. This training session aimed to ensure that participants were comfortable and equipped to provide accurate judgments during the subsequent trial.

During the trial session, each participant was presented with a total of 72 sentences. This included 24 experimental items, with 6 sentences from each condition specified in (8), as well as 48 filler items. The entire experiment was conducted using the PCIbexFarm platform, as developed by Zehr and Schwarz (2022).

3.2.5 Results

All the data analyses were performed using the open-source statistical software R (R Core Team, 2021) and RStudio (RStudio Team, 2020). In Figure (1), we present a graphical representation of the distribution of responses based on the experimental conditions. The y-axis displays the number of observations for each response, while the x-axis represents the response options on the Likert scale ranging from 1 to 7, as utilized in the experiment. The upper panels illustrate the distribution of responses for items marked with the 3PL suffix (e.g., V-asɪ-larɪ). On the other hand, the lower panel represents the distribution of responses for items marked with an agreement suffix other than the 3PL.

It is evident from all the distributions that the responses are skewed towards the higher end of the scale, indicating that participants generally accept the experimental items regardless of the condition. However, upon comparing the plots in the upper panel with those in the lower panel, we observe that 7-responses are less frequent for items marked with 3PL than for items marked with another agreement suffix. Additionally, responses lower than 6 are more common for the 3PL items compared to the OTHER items. Furthermore, regarding the frequency effect on acceptability, we notice that the plots in the left panel and the ones in the right panel show minimal differences, suggesting that frequency does not significantly impact the acceptability of desiderative clauses. Hence, at first glance, the distribution of raw responses aligns with our main hypothesis that 3PL agreement decreases the acceptability of desiderative constructions. However, with regard to our secondary manipulation based on previous findings in the paradigm gap literature, the plots do not reveal a noticeable difference in the acceptability between desiderative verbs with high frequency lexemes and those with low frequency lexemes.

In addition to examining the raw responses displayed in Figure (1), we also calculated within-subject standardized responses using z-score transformation. This transformation involves subtracting the mean of each subject's responses from their individual responses and then dividing them by the standard deviation of their responses. The purpose of this transformation is to mitigate scale bias in Likert-scale responses collected from multiple participants (Schütze & Sprouse, 2013). However, it is worth noting that z-scored Likert-scale data can pose challenges in statistical testing (Bürkner & Vuorre, 2019; Liddell & Kruschke, 2018). Therefore, we only employed z-scored responses during the exploratory data analysis to identify any unexpected patterns before proceeding with the statistical tests.

Based on our hypothesis, we anticipated that only the 3PL agreement marker would lead to ungrammaticality in desiderative constructions, while other person-number agreement markers would not have the same effect. Therefore, in our study, we collapsed the items with desiderative verbs bearing agreement markers other than

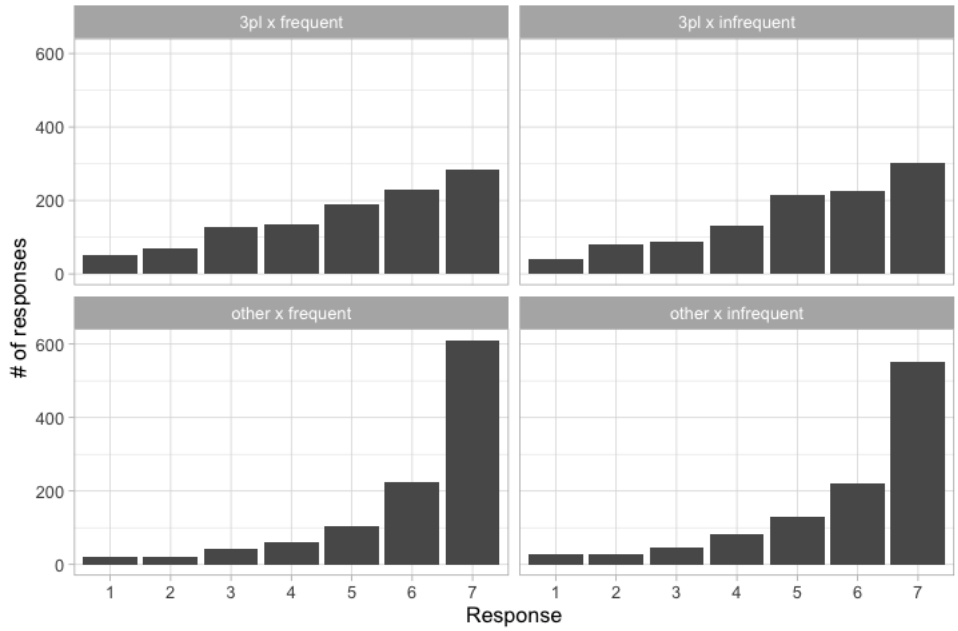


Figure 1. The distribution of Likert-scale responses, ranging from 1 to 7, is presented for each experimental condition, where a rating of 1 signifies "sounds unnatural" and a rating of 7 indicates "sounds natural"

the 3PL into the "OTHER" condition, as described in the Materials section. However, to ensure that the grammaticality of desiderative constructions was not influenced by the other agreement markers, we conducted further analysis before proceeding with statistical analysis. To examine this, we plotted the average within-subject z-scored response for each person-number agreement marker, as shown in Figure (2).

Figure (2) depicts the average acceptability of the items, measured in standard deviation units, based on the agreement marker in the desiderative suffix-bearing verb. A z-scored response below 0 indicates that the item is less acceptable than the average desiderative clause in the experiment. In a theoretical framework assuming binary grammaticality, responses below 0 can be interpreted as ungrammatical, while those above 0 can be considered grammatical. Surprisingly, as observed in Figure (3), both the 2PL and 3PL agreement markers fall below 0 and are equally unacceptable. This finding is unexpected since our prediction was that only the 3PL marker would be deemed ungrammatical.

Upon closer examination of the 2PL items through corpus search, we discovered that 2PL desiderative constructions are exclusively used with the Aorist

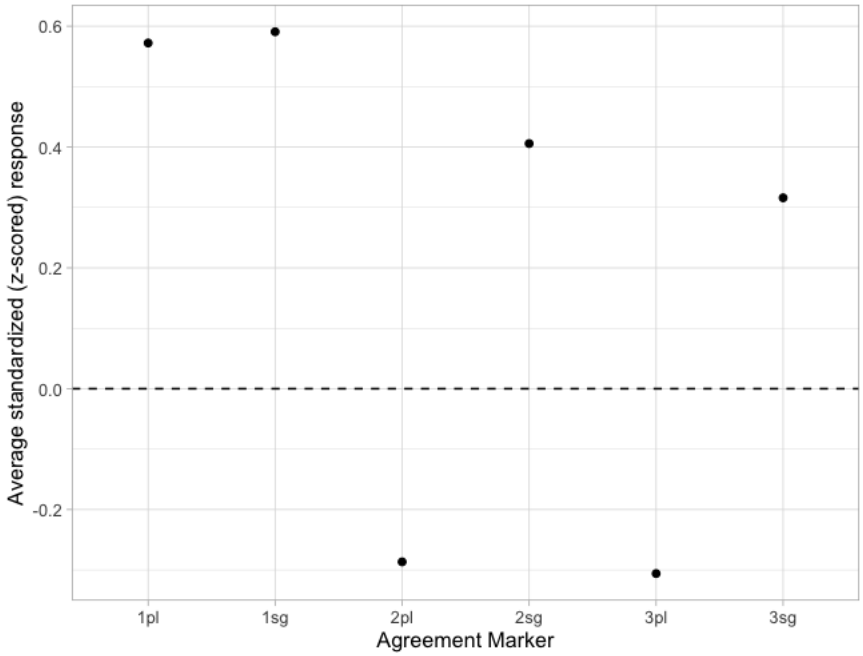


Figure 2. The averaged within-subject standardized responses for each agreement marker, focusing solely on the values of the experimental items and excluding the fillers. The y-axis values in the plot indicate the deviation in standard deviation units from the mean, which is represented by the value of 0. The mean serves as a reference point, reflecting the average acceptability of the items (desiderative clauses) in the experiment

suffix, which adds the meaning of genericity to the sentence (Göksel & Kerslake, 2005, p. 296), on the main predicate of the matrix clause. However, our experimental items solely consisted of an existential matrix predicate and a desiderative clause, and existential predicates cannot bear the Aorist suffix on their own. Consequently, our experimental items with 2PL-marked desiderative verbs sound unnatural. Despite the unexpected confound resulting in the unnaturalness of 2PL desideratives in our experiment, it is noteworthy that 2PL desideratives are used and accepted by speakers. To ensure the reliability of our results while testing our hypothesis, we believe it is justified to exclude the 2PL items from the analysis.

After removing the experimental sentences with 2PL and their corresponding minimally different sentences marked with 3PL, we were left with 19 pairs of sentences out of the total 24 pairs. To analyze the Likert-scale responses, we employed a maximally mixed ordinal Bayesian model (Bürkner & Vuorre, 2019) that incorporated both by-item and by-subject mixed effects and intercepts (R. H. Baayen,

2008). We treated the frequency effect as fixed by item, as frequency was considered a between-item factor in our modeling approach.

The findings indicate that items with the 3PL agreement marker in the desiderative condition are significantly lower, by approximately 0.91 standard deviations, on the latent acceptability scale compared to items in the OTHER condition. The 95% Credible Interval for this parameter ranges from -1.22 to -0.61, providing strong evidence in support of our hypothesis that the presence of the 3PL marker on the desiderative verb greatly decreases the acceptability of desiderative constructions. According to the model, there is no main effect of frequency on the acceptability of desiderative clauses (mean = 0.16, 95% CI = [-0.32, 0.65]); however, there is an interaction effect: weak evidence suggests that the impact of the 3PL agreement marker on acceptability is more pronounced when the desiderative verb has a high-frequency lexeme compared to a low-frequency lexeme (mean = -0.34, 95% CI = [-0.73, 0.05]).

Figure (3) displays the model's output, illustrating the probability of observing a specific response given an experimental sentence. Regardless of frequency, the likelihood of assigning a rating of 7 to desideratives significantly decreases when the desiderative verb carries a 3PL marker. However, the disparity in probabilities of assigning a rating of 7 between the 3PL condition and the OTHER condition is more pronounced when the verbal lexeme has a high frequency. This suggests that the 3PL agreement marker has a greater impact on reducing acceptability when the inflected desiderative form contains a high-frequency lexeme.

Lastly, it is worth noting that there is substantial variation between participants in both the intercept and the impact of 3PL on the acceptability of desideratives. The average standard deviation of the intercept across participants is 1.04, with a 95% Confidence Interval of [0.89, 1.21]. This indicates that the baseline acceptability of desideratives differs significantly among individuals. Similarly, the average standard deviation of the effect of 3PL is 0.85, with a 95% Confidence

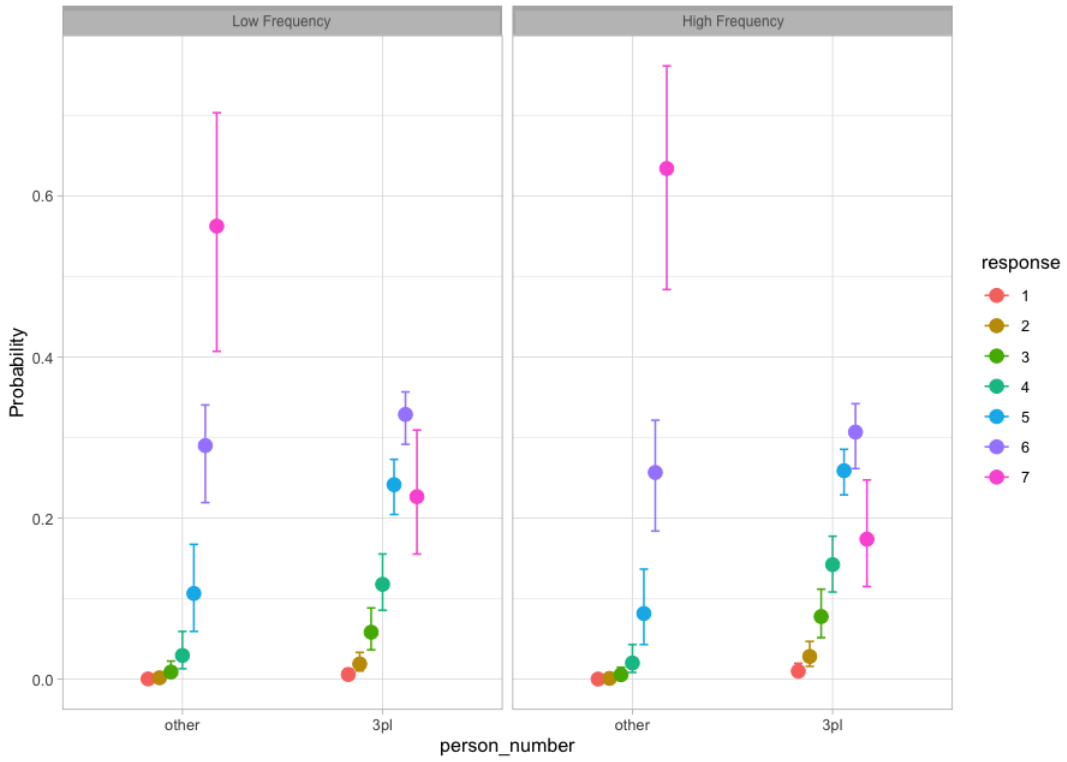


Figure 3. The probability of encountering a particular response on the Likert scale, ranging from 1 to 7, within each condition is depicted. The conditions, listed from left to right, include: Low-freq. X Other, Low-freq. X 3Pl, High-freq. X Other, and High-freq X Other. The whiskers on the plot indicate the 95% Confidence Intervals

Interval of [0.69, 1.03], suggesting that the extent to which the 3PL agreement marker reduces acceptability varies among participants.

3.3 Discussion

The experiment findings indicate that the acceptability of 3PL desideratives is not binary, but rather falls on a gradient scale from 1 to 7 on the Likert-scale. Native speakers' judgments of 3PL desideratives exhibit considerable variation. Despite this variation and the gradient nature of the judgments, there is strong evidence that, on average, 3PL agreement significantly decreases the acceptability of desiderative constructions at the population level. Apparently, this does not necessarily mean that 3PL desideratives are considered completely ungrammatical. Anyhow, it does show that the form is degraded as opposed to other forms within the same paradigm.

To delve into why participants rate the acceptability of 3PL desideratives lower, but not as low as completely ungrammatical sentences, I examined the ratings of filler items (recall that each participant assessed 24 grammatical and 24 ungrammatical fillers). Upon analyzing the ratings of these fillers, we observe that there was a greater tendency to rate ungrammatical sentences higher on the scale compared to the tendency to rate grammatical sentences lower as shown in Figure (4).

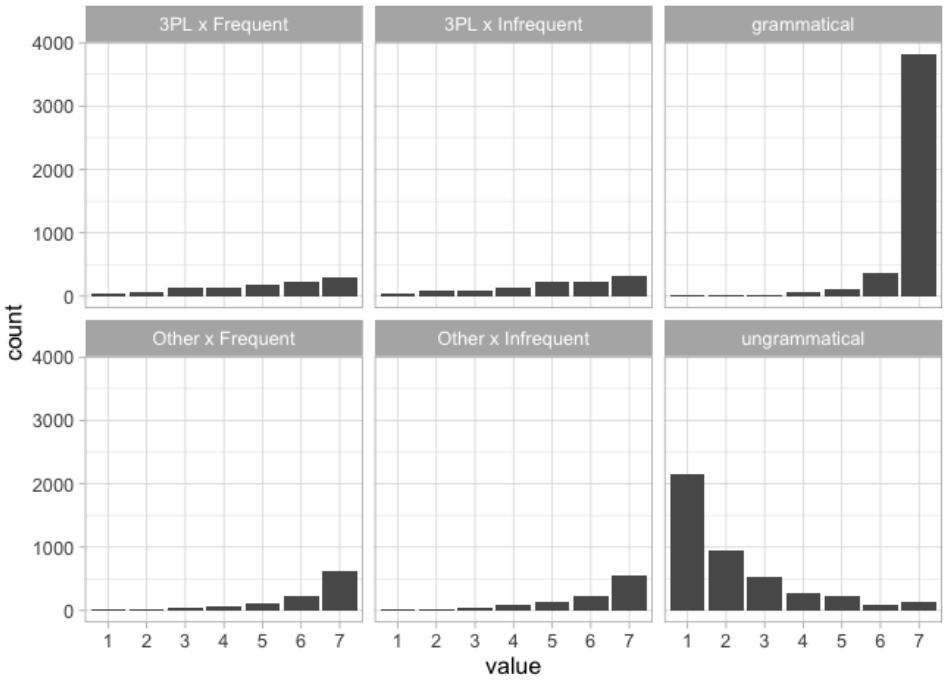


Figure 4. The distribution of responses encompasses all sentences used in the experiment, including two types of fillers: grammatical and ungrammatical sentences

Figure (4) demonstrates that participants exhibit uncertainty when evaluating desiderative clauses. Surprisingly, they tend to dislike even the desiderative clauses in the OTHER condition, which should be considered acceptable based on native speaker intuitions. This finding can be attributed to the influence of frequency. Previous studies investigating the relationship between acceptability scores and corpus frequency have consistently shown that more commonly encountered forms of a construction tend to receive higher ratings (Bermel & Knittl, 2012; Dabrowska, 2008; Divjak, 2008, 2017). Analysis of corpus data reveals that desiderative clauses are infrequent overall, primarily occurring in the 1SG and 3SG forms. As the OTHER condition includes infrequent variants (when compared to other

constructions) like 1PL, 2SG, and 2PL desiderative clauses, the lower acceptability ratings for desideratives can be plausibly explained by the influence of frequency. Consequently, desiderative constructions can be considered grammatical despite their relatively lower acceptability scores influenced by frequency. However, when combined with the 3PL agreement marker, a significant decline that cannot be solely attributed to the frequency effect is observed in their acceptability ratings. Therefore, we argue that significantly lower acceptability ratings that the 3PL desiderative forms received are attributed to their defectivity.

Another finding in the experiment was that the degree to which 3PL agreement has an impact on the acceptability of desiderative forms significantly differs from speaker to speaker. When combined with significantly low acceptability scores of the 3PL desideratives, the observation that there is a lot of between-speaker variation about the acceptability of the 3PL desiderative form provides substantial evidence for the defectivity of 3PL desideratives given that similar results for defective forms in other languages have been reported before. For instance, in one of the studies that are discussed at length in Chapter 2, (Albright, 2003b) reports that variation between speakers, which he calls between-speaker agreement rate, increases when a form is *more defective*. According to his argument, what a high degree of variation about a form actually indicates is a significant level of uncertainty regarding the correct form of a word. In turn, this state of uncertainty creates the ideal circumstances for defectivity in that cell. Hence, there is a high correlation between high variation (i.e. overabundance) and defectivity according to these studies.

However, correlation between two things does not necessarily mean causation, and, it certainly does not determine the causal direction if there is a causal relation between them. In Albright's account, it is overabundance that causes defectivity for he argues that there are multiple unreliable stochastic rules that compete in a given cell and an extreme end result of this is defectivity (i.e. when there is no acceptable word form in a given cell). However, this causal direction is argued to be in the opposite direction in some other studies. For example, in

analyzing past participle gaps in Finnish, Bermel and Nikolaev (2022) conceptualizes overabundance as a result of defectivity (p. 590). They propose that certain past participle forms of Finnish verbs are defective. They study how speakers compensate for defectivity by using various strategies to generate forms that can fill the defective cell and posit that overabundance is observed when multiple forms derived through different strategies (e.g. periphrastic or synonymous forms etc.) are available to fill the defective cell. Hence, the main assumption behind their study is that defectivity does not arise due to the availability of all these different forms; on the contrary, all these different forms exist to compensate for defectivity.

The arguments about this causal direction boils down to the authors' positions on the explanatory power of a clash between forms in accounting for paradigm gaps. As Sims (2015) argues, while some gaps are explicable in terms of a conflict between multiple forms in a cell, some cases of defectivity require lexical specification, which has been posited also by others before (Halle, 1973; Orgun & Sprouse, 1999). Thus, if we deal with a gap that requires lexical specification, it is not very plausible to hypothesize that defectivity arises due to overabundance; it is more plausible to posit that overabundance exists to compensate for defectivity. However, if the gap under question is for the most part explicable by multiple competing forms none of which are acceptable, then it would not be controversial to claim that overabundance causes defectivity since speakers are uncertain about how to fill the defective cell.

With this background on the relation between defectivity, speaker variation, and the existence of multiple forms to fill a defective cell, recall that there are two forms also in the 3PL cell of the desiderative paradigm in Turkish and speakers can produce a form to fill the defective cell when they are hard-pressed to do so. This is in line with the following statement made by Bermel and Nikolaev (2022) about the nature of paradigm gaps: "a 'gap' is not so much the absence of any possible form, as the absence of consensus in a speech community regarding the most appropriate forms to occupy the cell." (p. 586). Hence, the defectivity of 3PL desideratives is not the absence of a possible word form in the defective cell; rather, it is the

overabundance of forms that can fill the cell. However, this overabundance is attested not in the production of individual speakers, but it is attested on the population level: speakers are consistent in their productions (i.e. they produce either one form or the other; not both), but there is variation at the community level. This suggests that speakers have a high preference for one form over the other, but they are not sure about the correctness of their preferred form at least in part due to a lack of consensus among speakers about which form is correct.

Speakers can also produce novel forms (Berko, 1958), and there cannot possibly be consensus on the acceptability of these forms either since they are 'novel'. Then, how can a lack of consensus in the context of defective word forms be differentiated from a lack of consensus in the context of novel forms that have never been heard before? The answer to this question is hidden in the atypical relative frequency of use of defective forms. The non-existence of a novel lexeme is actually expected by speakers and they can inflect this lexeme for certain morphosyntactic features if they have a reliable rule or generalization at their disposal. Hence, they are aware that there can be no consensus on the acceptability of a novel word. However, this is not the case for the word forms in the defective cells. Speakers have ample evidence based on the unexpectedly low frequencies of defective forms in their input that these forms are not acceptable. So, in a sense, there is actually consensus among the speakers in a community that no form in this cell is acceptable. Thus, the atypical nature of the usage frequencies only in the case of forms in the defective cell but not in the case of the forms of novel lexemes is what helps speakers differentiate them. The evidence obtained from unexpectedly low frequency of use is called a negative evidence in some work on defectiveness (Daland, Sims, & Pierrehumbert, 2007; Sims, 2015).

Parallel to this discussion, one of the findings of the experiment was that 3PL agreement reduces acceptability more with low-frequency lexemes than with high-frequency lexemes. This finding is at odds with accounts such as Albright's (2003) and Yang's (2016). Recall that these accounts suggest that defectivity arises

from the absence of a productive rule to generate the form in the missing slot, arguing that defectivity results from low speaker confidence, which is observed particularly in the absence of a productive rule to inflect infrequent stems. Such accounts predict that low-frequency lexemes would exhibit more defectiveness compared to high-frequency lexemes when there is no rule to inflect them. However, our findings suggest the opposite: frequent lexemes are more defective when inflected for 3PL desiderative features. We propose that this finding is better explained by negative evidence accounts, such as the one proposed by Daland et al. (2007) and Sims (2015). According to these accounts, frequent lexemes are expected to appear more frequently in the defective slots than infrequent lexemes. Every time frequent lexemes occur in non-defective slots but not in defective slots, negative evidence accumulates for the defectiveness of those slots. On the other hand, infrequent lexemes are rarely found in both defective and non-defective slots, resulting in less negative evidence for their defectiveness when they do not occur in the defective slot. Therefore, negative evidence accounts predict that low-frequency lexemes would have higher acceptability than high-frequency lexemes in defective slots, which aligns with our findings.

3.4 Conclusion

The evidence obtained from corpus frequencies of desiderative word forms and a judgment experiment on the acceptability of desiderative word forms shows that the 3PL cell of the desiderative paradigm is defective. Corpus search indicates that 3PL desideratives have unexpectedly low relative frequency when compared to other forms in the paradigm and to the frequency distribution of the paradigms of other morphosyntactically or semantically parallel constructions. In addition to corpus frequencies, the experimental findings provide evidence for the defectivity of 3PL desideratives, too. The results of the experiment indicates that desiderative word forms that bear a 3PL agreement marker are rated significantly worse than desiderative word forms with other agreement markers. Furthermore, the findings

suggest that lexemes that have high-frequency are even more defective than low-frequency lexemes when used in the 3PL desiderative form. Combining this finding with the atypical frequency distributions in the corpus, I argue that in addition to competition accounts, negative evidence accounts are also needed to account for the 3PL gap in Turkish desideratives.

CHAPTER 4

ANALYSIS OF DESIDERATIVE GAPS

The unusual distribution of 3PL forms in the desiderative paradigm presented in Table (14) indicates that speakers tend to avoid using 3PL desideratives. This avoidance is facilitated by the fact that overt 3PL agreement is mandatory only when the 3PL pronoun is omitted, and desiderative constructions are not commonly used in Turkish overall. Consequently, speakers can easily refrain from using 3PL desideratives, further reducing their occurrence in the language input. Therefore, when speakers find themselves in a situation where they need to spontaneously produce a 3PL desiderative, it becomes a real-life wug-test in the face of uncertainty for most of them. Even if they manage to generate forms like X-A-lArI or X-AsI-lArI in such circumstances, the feeling of uncertainty regarding the acceptability of these forms is inevitable as the speaker judgments show.

In what follows, I will provide an analysis for why the 3PL desideratives are defective by considering the empirical evidence and the observations reported in the previous chapters, which are outlined as follows:

- There are two attested 3PL desiderative forms: X-AsI-lArI and X-A-lArI.
- An overwhelming majority of the speakers prefer X-AsI-lArI over X-A-lArI. However, most speakers are uncertain about the acceptability of even their preferred form.
- For speakers whose judgments exhibit no defectivity in 3PL desideratives, a majority judge X-AsI-lArI forms as grammatical whereas a few judge X-A-lArI forms as grammatical.
- Speakers agree on a single form in every cell other than the 3PL in the desiderative paradigm.
- Speaker judgments about the acceptability of 3PL desideratives are gradient with a high amount of between-speaker variation.

- About %95 of the forms in the desiderative paradigm belong to either 1SG or 3SG cell.
- 3PL desideratives are virtually absent in the input.
- There is an irregularity in the form of 3SG desideratives.

I will first posit a usage-based analogical account —which will be more in line with Albright's account than Gorman and Yang's or Sims' account for reasons that will be explained in the discussion— to explain the observations outlined above. Then, I will discuss how the data can be explained by using the tools of Distributed Morphology (Embick, 2010; Embick & Noyer, 2007; Halle & Marantz, 1993; Harley & Noyer, 1999). Finally, I will compare the two accounts and conclude.

4.1 An analogical analysis

It is not plausible to assume that speakers will have come across every single inflected form of a lexeme in a language, especially when this language has a rich inflectional system. For instance, there are about 30 inflected forms of a noun in Estonian (Ackerman, Blevins, & Malouf, 2009). Likewise, the inflectional system of Turkish is also considerably rich. According to Plank (1991), an average noun in Turkish has 84 inflected word forms (p. 1). Given these numbers, it is not plausible to assume that speakers of these languages will have heard every single inflected form of even the lexemes they actively use. However, these speakers can still use their language productively. The problem that speakers are required to produce or interpret forms they have never heard before to be able to use language productively is usually known as the Paradigm Cell Filling Problem (Ackerman et al., 2009), although it certainly is not a new observation and has been discussed in several studies (Albright, 2002; Yang, 2016) under the name of linguistic productivity in generative linguistics.

Paradigm Cell Filling Problem is not exclusive to speakers of languages with complex inflectional systems. For instance, speakers of English, which has a simpler inflectional system with fewer forms, face with this problem, too. This is made

explicit in studies of word production where participants are asked to provide a suitable inflected form of a nonce word. In these studies, participants are usually given a nonce word form in some morphosyntactic environment and are asked to provide a suitable form of the word they just heard in a different morphosyntactic environment. To exemplify, in the famous wug-test conducted on children by Berko (1958), the researcher shows the child a picture of a made-up animal that the child could not have ever seen before and tells the sentence "This is a wug." to the child. Then, the child is shown two pictures of the same animal and is told that "Now there are two of them. There are two ...", and is expected to complete the sentence with the proper word form. Berko, and many other studies since then (Nakipoğlu, Uzundağ, & Ketrez, 2023; Yang, 2016), have shown that most of the children, and adults, can fill in the blank with the appropriate word form (*wugs* in this particular case). Thus, there is good evidence that speakers are successful in solving the Paradigm Cell Filling Problem (henceforth PCFP) by extending their linguistic knowledge to forms beyond their input.

How do speakers solve PCFP? What kinds of knowledge and mechanisms are needed in solving this puzzle? First, speakers need to have some knowledge about at least one form in the paradigm so that they can reason about what the other forms might be.

Word formation has been usually analyzed as a trade-off between storage and computation. While there is no doubt that morphologically simplex words need to be stored in the mental lexicon, the storage of complex words is not that straightforward. Although there is consensus that some frequent complex words are stored and retrieved from lexicon as a whole without decomposition during comprehension or production (H. Baayen & Schreuder, 1999; Sims, 2015), the conditions that are necessary and sufficient for a complex word to be stored and accessed as a whole are still not clear. Therefore, if there is no behavioral evidence for a complex word to be stored as a chunk, a linguistic analysis that requires the minimum storage and maximum computation is favorable. This is because storing smaller parts of words

(i.e. morphemes) and computation (i.e. rules or analogy in inflection/derivation) is required anyway for novel word forms and the most economical account for the derivation of a word which has no behavioral evidence for being stored as a chunk is to posit that the stored related morphemes are combined according to the computational principles of word formation in that language. Thus, figuring out the minimum number of words and rules/patterns that need to be stored to account for all the forms in a paradigm has been a major research agenda in linguistics.

The (minimum number of) forms that need to be stored in the paradigm of a lexeme to be able to deduce all the other forms in a paradigm are called principal parts (Finkel & Stump, 2009) or base (Albright, 2002). Principal parts or bases rely on the assumption that there are implicative relations between the forms/cells of a paradigm. Implicative relations in paradigms have been extensively studied in recent theoretical and experimental studies in Word-and-Paradigm morphology (Ackerman & Malouf, 2013; Blevins, 2016; Finkel & Stump, 2009; Milin, Kuperman, Kostic, & Baayen, 2009; Parker, 2018; Sims, 2015). Word-and-Paradigm models of morphology assume that sub-word level units (morphemes) do not exist; the forms of a lexeme constitute a paradigm, which is a primary linguistic unit; and the forms in a paradigm have implicative relations between them.

Do bases or principal parts differ from paradigm to paradigm and from one language to another, or remain stable cross-linguistically? If they are dynamically selected, what factors affect the selection of bases in a paradigm? How are they selected? To answer these questions, I will summarize below Albright's (2002) influential account on how bases are identified in a paradigm.

4.1.1 Albright 2002

Based on leveling patterns in some morphological paradigms of Yiddish, Latin, and Lakhota, Albright argues that the process of base selection involves choosing a base from the existing surface forms. Crucially, there is a single base that remains consistent across all lexemes within each paradigm. In other words, each paradigm

contains a single cell (e.g. 3SG or 2PL) that serves as the base for all lexemes regardless of their identity. Moreover, he argues that the most important factor that determines which surface form will be selected as base is informativeness.

The informativeness of a potential base is evaluated according to its ability to be used as input to accurately generate other related forms in the paradigm — which is the main principle Minimal Generalization Learner is built on. Informativeness can be calculated in terms of entropy, which is 0 when there is %100 certainty. Hence, if there is only one form that can predict every other form in the paradigm with %100 accuracy, or, in other words, if the entropy of the forms in the paradigm is 0, then that form will be selected as the base according to the informativeness principle.

Then, how do gaps arise in some cells as in the 3PL cell of the -AsI desiderative paradigm in Turkish? Is it due to an inability to properly select a base that can predict all the other forms in the paradigm with %100 accuracy? I will argue that speakers cannot reliably select a base that can predict an accurate form in the 3PL cell of the desiderative paradigm. I will argue that both attested forms are possible given the analogical paths speakers might follow depending on the base they select.

Recall the paradigm of -AsI desideratives in Table (17) and the regular possessive paradigm as attested in frequent -mA nominalizations (see Chapter 3 for corpus counts) in Table (18). Both of the paradigms are illustrated with the verb *yap-* 'do' for the sake of exposition.

Table 17. The Desiderative Paradigm in Turkish

	SG	PL
1	yapasım	yapasımız
2	yapasın	yapasınız
3	yapası	*yapasıları / *yapaları

Table 18. The Regular Possessive Paradigm in Turkish (Exemplified with -mA)

	SG	PL
1	yapmam	yapmamız
2	yapman	yapmanız
3	yapması	yapmaları

As can be seen, beside the defective 3PL cell, the desiderative paradigm differs from the regular possessive paradigm in the 3SG cell: if the desiderative paradigm completely followed the regular possessive paradigm, the form in the 3SG cell would be **yapasısı* instead of *yapası*. This irregularity is due to a haplological operation that deletes one of the two adjacent identical suffixes in Turkish. Regardless, the surface form is irregular when the other forms in the desiderative paradigm and the regular paradigm are considered.

Now, given that one of the surface forms in a paradigm needs to be selected as the base to derive the the forms in other cells in the paradigm, one of the forms needs to be selected as base also in the desiderative paradigm. Assuming that the 3PL is virtually absent in their input, speakers can choose a base from among the other 5 forms. But, do speakers consider all the other 5 forms on equal grounds for base selection? According to previous studies on base selection in paradigms (Bybee, 1985; Bybee & Brewer, 1980; Mańczak, 1958; Tiersma, 1982) and Albright's (2002) discussion of Korean data (Chapter 5), where a less informative but highly frequent form is selected over the most informative but highly infrequent form, base selection is affected by other factors such as frequency in addition to informativeness. Therefore, not all forms are evaluated on equal grounds in terms of their informativeness.

Albright argues that informativeness is the determining factor in selecting a base in a paradigm only if the most informative form is readily available in the input. However, even if the perfect base exists in a paradigm such that every other form can be predicted from it with high accuracy, sometimes this form might not be available in the input due to low token frequency. Thus, base selection in the desiderative paradigm might be affected by token frequency, too, since, as you may recall, the distribution of token frequencies of the forms in the desiderative paradigm is extremely skewed. The token frequency distribution of desideratives is provided again in (19) for your convenience.

Table 19. The Token Frequency Distribution of Desiderative Forms in TS Corpus (updated)

	SG	PL
1	1643 (%53.09)	34 (%1.10)
2	68 (%2.20)	64 (%2.07)
3	1284 (%41.49)	2 (%0.07)

As you can see, %95 of the forms in the corpus belong to either 1SG or 3SG forms. Moreover, there are only 3,095 desiderative forms in a corpus comprised of ∼500 tokens. Combining the low frequency of desideratives overall and the dominance of 1SG and 3SG forms, the token counts of which do not differ much, I argue that only the 1SG and 3SG forms are accessible to be considered in the base selection process in the desiderative paradigm.

Thus, speakers need to make a decision about which form to choose as the base. I argue that the 1SG desiderative is favored by informativeness given that it does not have an irregular form and preserves all contrasts. However, in terms of frequency, there is not much of a difference between the two forms. Although 1SG seems to be a bit more frequent than 1SG in TS corpus, it is not definite that every speaker has been exposed to a distribution of forms as such. In other words, it may as well be that some speakers have been exposed to more 3SG desiderative forms than 1SG desiderative forms, for linguistic input is probabilistic and heavily depends on a speaker's environment. Therefore, there is no significantly favorable candidate in terms of token frequency.

It has been also argued by some studies that there are some other factors that affect base selection such as morphosyntactic unmarkedness (Bybee & Brewer, 1980; Tiersma, 1982) and presence or absence of affixes (Bybee, 1985; Mańczak, 1958). These studies suggest that base selection process is more complicated than simply comparing the informativeness of the base candidates. If we consider morphosyntactic unmarkedness, for example, as Bybee (1985, Chapter 3) argues, there is a cross-linguistic tendency to use 3SG form in a paradigm as the base. Likewise, in terms of word-length and the number of affixes in the word , again 3SG desideratives are more favorable to be selected as the base since they are shorter than

the 1PL desideratives with fewer affixes. Therefore, it is very likely for speakers to have difficulty choosing between 1SG and 3SG desideratives as base and this indecisiveness can lead to a gap in these speakers only in those cells where they have no positive evidence for the grammaticality of the form which is the 3PL cell since it is virtually absent in the input.

The indecisiveness can explain the hesitation speakers report in the judgment tasks. However, it does not answer why there is variation between two forms (X-AsI-lArI and X-A-lArI) in the 3PL cell. I argue that this variation results from the analogical process after base selection and that when speakers select 1SG as the base, the 4-part analogy results in X-AsI-lArI; when they select 3SG, the 4-part analogy results in X-A-lArI. To illustrate this mechanism, see the 4-part analogy (Albright, 2009) a speaker needs to build in order to derive the 3PL desiderative form of, for instance, *yap-* 'do', when they select the 1SG form in (1).

(1) yapma*m* : yapma*ları* :: yapası*m* : ? yapası*ları*

(1) shows that a speaker can rely on their knowledge of other forms in related paradigms for which they have more data (remember the corpus frequencies showing that -mA nominalizations are much more frequent than -AsI desideratives). They make an analogy by using the 1SG and 3PL forms of -mA nominalization on the one hand, and the 1SG form of the desiderative on the other. Then, the missing part in the equation, the 3PL desiderative, is simply calculated. As you can see, the 3PL desiderative form of *yap-* is found to be X-AsI-lArI with a simple 4-part analogical mechanism. Thus, I hypothesize that speakers who select 1SG as the base produce X-AsI-lArI for 3PL desideratives with this simple analogical mechanism, which is what Minimal Generalization Learner is built on.

Moving on to speakers who select 3SG as base, again we use the same mechanism by changing the 1SG forms with 3SG forms.

(2) yapmas*ı* : yapma*ları* :: yapas*ı* : ? yapa*ları*

(2) illustrates how speakers who choose 3SG form as the base in the desiderative paradigm can invariably produce X-A-lArI type 3PL desiderative forms.

Given 4-part analogy as an inductive learning mechanism and a base form from the paradigm, depending on the base they have selected, it is not difficult for speakers to come up with either X-A-lArI forms or X-AsI-lArI forms for 3PL desideratives. However, it is uneasy for speakers to select a base, for making a decision results in a completely different output and raises a feeling of uncertainty in the speakers.

4.1.2 Modeling three grammars

Going back to the judgments speakers provide, there are three major group of speakers:

1. Speakers who accept X-AsI-lArI
2. Speakers who accept X-A-lArI
3. Speakers who reject either, with a higher preference for one or the other

I argue that, first, the first group use the 1SG desiderative as the base and do not have uncertainty regarding base selection since they are confident in their judgments. Second, speakers who accept X-A-lArI use the 3SG desiderative as the base and do not have uncertainty regarding base selection. Third, speakers who reject either are divided into two subgroups; namely, those who prefer X-AsI-lArI and those who prefer X-A-lArI, but dislike even their preferred form. I hypothesize that the grammars of these speakers exhibit a gap due to uncertainty in base selection and their preference is affected by which base is favored based on the factors that affect base selection. One of these factors is token frequency, which is probabilistic and depends on the input, whereas others are theoretical assumptions such as morphosyntactic unmarkedness and informativeness. While informativeness and probably token frequency favor the 1SG, morphosyntactic unmarkedness and having a simpler form favor 3SG. Since the 1SG form is more informative and, hence, more

reliable as a base to predict other forms than the 3SG, according to Albright's account, we expect speakers to predominantly select the 1SG as the base in the desiderative paradigm. This prediction is borne out given that most speakers prefer X-AsI-lArI forms for 3PL desideratives, which suggests that informativeness is the most crucial factor in base selection.

The reason why the groups of speakers do not have uncertainty regarding base selection is most likely due to their input. That is, if these speakers do not have variable input regarding 3PL desideratives such that they have been exposed to the X-AsI-lArI forms or X-A-lArI forms dominantly when acquiring the language, it is only natural for these speakers two produce and accept forms parallel to those dominantly attested in their input. Hence, even though these speakers would also have a problem selecting a base if they did not hear 3PL forms, hearing 3PL forms must have reduced their uncertainty and lead them to choose the base/rule compatible with their input.

However, for the speakers with a gap, it is highly likely that they have been exposed to very few 3PL desiderative forms, which did not have a dominant pattern. As a result, this highly variable and restricted input would not have helped them in choosing between bases or forms. Hence, this process might have lead them to avoid 3PL forms by using periphrastic desiderative clauses formed with *iste-* 'to want' or simply use an overt third person plural genitive subject which does not require a 3PL desiderative form (as you may recall, 3SG agreeing forms are ore natural when there is an overt third person plural subject/possessor).

To conclude, the analogical analysis provided in this section is motivated by language use, namely, the statistical properties of the input, and can explain the set of varying speaker judgments about 3PL desideratives. It can explain why most speakers prefer X-AsI-lArI forms over X-A-lArI forms even though they judge even the form they prefer as ill-formed.

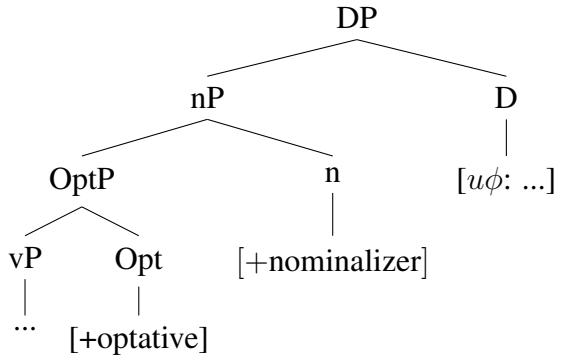
4.2 A Distributed Morphology analysis

Distributed Morphology (henceforth DM) is a formal, deterministic grammar model. It assumes a grammatical architecture in which the only generative component is syntax, where abstract syntactic features are manipulated via syntactic operations such as Merge and Movement. Unlike in the Lexicalist approaches, DM assumes that syntax does not manipulate any lexical item that is fed into syntax after being built in the Lexicon. This is a central tenet of DM and is called Late Insertion (Halle & Marantz, 1993).

4.2.1 The structure of -AsI desideratives

What is the structure of -AsI desideratives? First of all, -AsI desideratives are a type of nominalized clause that has a person/number possessive agreement marker on their main predicate. Therefore, the desiderative verb needs to be nominalized and agree with its genitive subject at some point. Second, they convey the meaning of a desire, which resembles the semantics of the optative morpheme that has the exponent -A in Turkish. As (Grosz, 2012) notes "Optative utterances express a wish, regret, hope or desire without an overt lexical item that means wish, regret, hope or desire"(p. 1). So, it is very likely that the -A part of the -AsI suffix is the optative suffix -A and the remaining -sI is the exponent of some kind of nominalizer (or possessive). Based on these form and meaning parallels between the optative and the desiderative, I propose the structure in (3) for -AsI desideratives.

(3) *The functional hierarchy of -AsI desideratives in Turkish:*



4.2.2 Modeling three grammars

Based on this structure, I will model the grammars of three groups of speakers (mentioned in the previous section and repeated below) that differ in their judgments for 3PL desiderative forms by proposing minimally differing vocabulary items and post-syntactic operations for each.

1. Speakers who accept X-AsI-lArI
2. Speakers who accept X-A-lArI
3. Speakers who reject either, with a higher preference for one

First, I propose the following vocabulary items for all speakers regardless of their group.

(4) a. [OPTATIVE] $\longleftrightarrow$ -A
b. [NOMINALIZER] $\longleftrightarrow$ -(s)I(n)
c. [1] $\longleftrightarrow$ -(I)m
d. [2] $\longleftrightarrow$ -(I)n
e. [1PL] $\longleftrightarrow$ -(I)mIz
f. [2PL] $\longleftrightarrow$ -(I)nIz
g. [PL] $\longleftrightarrow$ -lAr

The first group is people who produce and judge X-AsI-lArI forms for 3PL desideratives as acceptable. In addition to the vocabulary items in (4), I propose that the VI in (5) is also found in the mental lexicon of speakers in this group.

(5) [3PL] $\longleftrightarrow$ -lArI

Given the vocabulary items in (4) and (5), the first group of speakers can produce all the forms in the desiderative paradigm without a problem. In the case of 3PL desideratives, besides inserting the VIs for the verbal stem (v) that will depend on the specific lexical item, Opt, and n, they will insert the VI in (5) into D since the feature set 3PL will be under D, where agreement features reside. This way, this group of speakers will produce X-AsI-lArI forms grammatically with no other post-syntactic operations.

The second group, speakers who accept X-A-lArI, diverge from the first group in that, first, they do not have an extra vocabulary item to be used in desideratives other than those in (4). Hence, when they do vocabulary insertion by only using the VIs in (4), they end up with the following linearized morphosyntactic structure and form mappings:

(6) *After VI and Linearization:*

v * Opt * Nom * D

X -A -(s)I(n) -lAr

The linearized structure in (6) derives the form X-A-(s)I(n)-lAr as is. However, as I will argue in detail in the following chapter, there is a local dislocation rule (Embick & Noyer, 2007) that changes the order of suffixes -(s)I(n)*lAr into -lAr*(s)I(n) in Turkish. I formalize this operation in the next chapter and argue that it is sensitive only to the phonological form. Therefore, since the phonological form and the order of suffixes satisfy the conditions for this local dislocation rule, it will apply to (6) and turn it into the following form in (7), which is X-A-lArI as expected from this group.

(7) *After Local Dislocation:*

X -A -lAr -(s)I(n)

Finally, I argue that the third group of speakers, who are the ones that have a gap in the 3PL cell of the desiderative paradigm, actually share their lexical items with either the first, X-AsI-lArI group, or the second, X-A-lArI group. Then, why do these speakers have a gap but others do not?

The reason for this difference might an unresolvable competition between eligible vocabulary items during vocabulary insertion. If the competition is not resolved, we observe a gap; if vocabulary insertion is successful, we observe a fully acceptable 3PL desiderative. However, if we go down that path, we see that vocabulary insertion in Distributed Morphology is extremely deterministic and there is almost always a definitive winner based on the basic principles of vocabulary

insertion such as the Subset Principle (Halle & Marantz, 1993; Harley & Noyer, 1999).

The most obvious case where vocabulary items cannot win over one another would be when they are equally specific . To exemplify, assume that there are two vocabulary items that both spell-out the feature α. Also assume that neither of them is the default vocabulary item for this feature. That is, they are contextual allomorphs of the morpheme, α, and both of them need to satisfy their contextual requirements in order to be inserted. A hypothetical set of contextual allomorphs of α is provided in (8) and (9).

(8) $[\alpha] \longleftrightarrow$ C / _ [D]
(9) $[\alpha] \longleftrightarrow$ A / B _

As can be seen, (8) is specified for the environment following $[\alpha]$ whereas (9) is specified for the preceding environment. Following Bobaljik (2000) and assuming that vocabulary insertion proceeds root-outwards and features are rewritten by phonological exponents during vocabulary insertion, inward-sensitive allomorphy is expected to be sensitive to phonological features whereas outward-sensitive allomorphy is expected to be sensitive to morphosyntactic features. Therefore, for the context preceding (i.e., inside of) $[\alpha]$, I use an exponent (i.e., phonological form) whereas for the context following (i.e., outside of) $[\alpha]$, I employ a morphosyntactic feature.[15]

Proceeding with vocabulary insertion to insert an exponent into $[\alpha]$, in a configuration where both contextual requirements are met, that is, when the exponent B immediately precedes $[\alpha]$, and, at the same time, $[\alpha]$ immediately precedes the feature [D], how would the principles of vocabulary insertion decide which exponent would be inserted in the place of $[\alpha]$? Should we insert C or A? Since the Subset Principle, which states that the most specific vocabulary item wins the competition unless it does not have any junk features, does not make a statement about such

[15]Note that even though we use exponents or morphosyntactic features in both context, the point made in this thought experiment would not change as long as the contextual requirements are met for both contexts.

configurations, which are theoretically possible, vocabulary insertion would not be able to be concluded with certainty. Thus, theoretically, if such a configuration were attested when spelling out the structure of 3PL desideratives, but not other desideratives, then uncertainty would observed, which has been argued to lead to defectiveness in some cases (Albright, 2003b; Sims, 2015).

Although this situation seems theoretically possible, it has not been possible to implement this idea so as to lead to uncertainty (and defectiveness) for 3PL desideratives on the one hand, and not cause any problems in spelling out the structure of other desideratives on the other. Hence, for now, I leave the question of whether such configurations are possible or attested in human languages for future research, and take a different approach in explaining how defectivity would be represented in a model of grammar compatible with Distributed Morphology.

I suggest that the lexicon of speakers who exhibit a gap in the 3PL cell of -AsI desideratives does not differ from that of speakers with no gaps in terms of the inventory of vocabulary items. In other words, I propose that speakers who have a gap and who prefer X-AsI-lArI forms over X-AsI-lArI when hard-pressed have the same set of vocabulary items and post-snytactic operations —if any— that are needed in spelling out desiderative structures. Similarly, I suggest that X-A-lArI preferring speakers who exhibit a gap in 3PL also has the same set of vocabulary items and post-syntactic operations —if any— with the X-A-lArI speakers who do not report a gap.

What separates speakers with a gap from speakers without a gap, I propose, is the frequency distribution of the desiderative forms in their individual input. Namely, I posit that speakers who have a gap detect an anomaly in the frequency distribution of desiderative forms by noticing that 3PL desideratives are unusually infrequent in the input. In turn, this negative evidence leads speakers to avoid producing 3PL desiderative forms even though, in principle, their grammar can produce these forms without any difficulty. Thus, 3PL desideratives are not judged to be ill-formed due to grammar-internal reasons for this group of speakers; rather, it is ill-formed due to their general cognitive abilities enabling them to keep track of the frequency of forms

in their input (Daland, Sims, & Pierrehumbert, 2007; Hayes, Siptár, Zuraw, & Londe, 2009; Zuraw, 2000).

4.3 Discussion

I have provided two analyses for the defectiveness of 3PL desiderative forms in this chapter. The first analysis has been couched in a more usage-based, analogical framework, the tools of which have been helpful in explaining the variance and uncertainty in deriving 3PL forms based on the other forms available in the input. However, in the second, DM-analysis, we needed to refer to a non-linguistic cognitive ability in order to explain why some speakers exhibit a gap. Given that this cognitive ability can also be referred to in analogical based analysis, analogical account proves to be better suited to explain the behavioral data than the DM account. However, this does not mean that analogical analysis is complete, either.

First, remember the experimental results, where we observed that high-frequency defective forms are judged to be worse than the low-frequency defective forms. This finding is incompatible with Albright's (2003b) findings on Spanish gaps given that Albright has found just the opposite effect. In particular, Albright reports that low frequency lexemes cause more uncertainty in speakers when there is no reliable inflectional rule to inflect them. Thus, our experimental findings cannot be explained by a learning algorithm such as MGL without modifying it. Rather, our findings seem to be compatible with a negative evidence account. Namely, negative evidence accounts predict that the absence of a more frequent form will be more noticeable than the absence of a less frequent form given that we have higher expectations to hear higher frequency forms compared to lower frequency forms. Thus, this account fares well with the experimental results of our study. However, given that the analogical account can explain a set of crucial observations including why X-AsI-lArI forms are preferred by more speakers and how the only two attested forms can be produced, it performs pretty well on the desiderative gap data in Turkish.

Why have I preferred an Albrightian analogical account over Grman and Yang's TP-based account or Sims' gaps-as-morphologial-object account? Regarding the reasons for not pursuing a TP-based analysis, first, I think a TP account falls short of explaining the basic observation that all the other desiderative forms in the paradigm follow the template X-AsI-POS.AGR. That is, except 1SG and 3SG, most of the forms in the desiderative paradigm are very infrequent, meaning that speakers most likely produce them on the fly; however, they judge all the forms they produce except the defective 3PL to be acceptable. I believe this means that they have the productive rule X-AsI-POS.AGR for these cells. Then, how can they not have a productive rule for producing the 3PL form?

Of course it is possible that X-AsI-POS.AGR speakers reject the 3PL form they produce based on the productive rule X-AsI-POS.AGR due to other reasons (e.g., phonotactics). However, we observe that some speakers produce and accept X-A-POS.AGR forms for 3PL desideratives, which cannot be a productive rule since forms other than the 3rd person forms do not follow this template and 3rd person forms make up less than half of the word types in the data. For these reasons, especially the final point that I have made, I have decided that a TP-based model would not be a good fit for explaining the observations surrounding the desiderative paradigm in Turkish.

When it comes to Sims' account, the reason why I have decided not to pursue a similar approach is mainly due to my initial suspicion that the 3PL gap in Turkish desideratives would be explained due to a lack of a reliable/productive rule without referring to the properties of the inflectional system of Turkish overall. However, as it turns out, to account for the experimental results of our study, in addition to the analogical account, we ultimately need to posit that speakers are sensitive to negative evidence, which is what Daland et al. (2007) argues explains a gap in the verbal paradigm of Russian.

To summarize this study, Daland et al. (2007) show that negative evidence is sufficient for gaps to be transmitted from generation after generation. Namely, they

test whether the defectivity of 1SG non-past forms of some Russian verbs, which they argue do not have a synchronic cause, can be larned by speakers, the behavior of whom they model with a multi-agent Bayesian model. By using simulations, Daland et al. (2007) argue that lexical gaps like Russian 1SG non-past forms of some verbs, which have emerged due to unresolvable rule conflict at some point, but which no longer have a synchronic cause, are learnable from naturalistic input, meaning that speakers are sensitive to the frequency distribution of the forms in a paradigm.

Given these findings, as implied by Sims (2015) based on her comprehensive crosslinguistic survey of defectiveness, it is very likely that even gaps that are synchronically motivated are morpho-lexicalized gradually. Thus, it is not surprising that the experimental results point to an interaction between high frequency and defectiveness in the case of the 3PL gap in the desiderative paradigm: this gap has also been gradually morpho-lexicalized even though the initial cause of the gap, a conflict between two possible forms due to indeterminacy in base selection, is still very active.

CHAPTER 5

ANOTHER GAP: THE ASSOCIATIVE PLURAL PARADIGM

A different case of defectiveness is observed in the paradigm of associative plural constructions (henceforth APCs) in Turkish. Associative plural words are derived by combining an associative plural suffix with a stem that denotes a definite individual in Turkish. A group of possible stems comprises a kinship denoting noun followed by a possessive person/number agreement suffix. However, as illustrated in (1), the stem in an associative plural word can only bear a singular agreement marker: when there is a plural possessive agreement marker in the stem, as in (1b), the form is ungrammatical.[16]

(1) a. *anne-m-ler*
mother-POSS.1SG-APL
'my mother and her assoc.'

b. * *anne-miz-ler*
mother-POSS.1PL-APL
'our mother and her assoc.'

The contrast in (1) illustrates that the nominal root of an APC can be marked with a singular agreement marker; however, a plural agreement marker is not allowed in the same position. This raises the question of why plural agreement leads to ungrammaticality in APCs in Turkish. Is it the abstract features or the form of the plural agreement that is problematic? Attempting to answer this question, I argue that the data is best explained by a ban on two structurally adjacent plural features in Turkish. By first eliminating possible sources such as phonology and semantics, I demonstrate that in the derivation of an APC with a plural agreement marker (henceforth plural APC), such as in (1b), the plural agreement feature [+plural] and the associative plural feature [+plural] become adjacent prior to Vocabulary Insertion. I argue that this configuration violates a ban on two structurally adjacent [+plural] features and this is the source of ungrammaticality in plural APCs in Turkish.

In what follows, I will first introduce APCs formed with *-lAr* in Turkish (Section 2). In Section 3, I illustrate that there are some forms in the paradigm of APCs that are semantically/pragmatically expected, but ungrammatical. In Section 4,

[16]The same pattern is also attested in Hungarian (Lewis, to appear), which might reflect a tendency that is not language specific. However, more languages from diverse families need to be investigated in order to see if there is a typological tendency for plural APCs to be ungrammatical in especially languages with synthetically formed APCs.

I discuss the sources of defectiveness and argue that while the ungrammaticality in the 3SG APCs formed with *-lAr* is morphophonological, the gaps in the APCs with a plural agreement marker are morphosyntactically motivated. Finally, I discuss the implications of my analysis in Section 5 and Section 6 concludes.

5.1 Associative plural constructions in Turkish

Turkish patterns with many other languages in exhibiting two types of plurality: additive and associative. Although it realizes both types of plurality with the same form, *-lAr*, Turkish differentiates between the additive *-lAr* and associative *-lAr* syntactically and semantically (Görgülü, 2011) (for other languages see Cinque, 2018; Corbett, 2000; Dékány, 2021, a.o.). The contrast between the two types of plurals is illustrated in (2).

(2) a. *Additive Plural*
abla-lar-ım
sister-PL-POSS.1SG
'my sisters'

b. *Associative Plural*
abla-m-lar
sister-POSS.1SG-APL
'our sister and her associates'

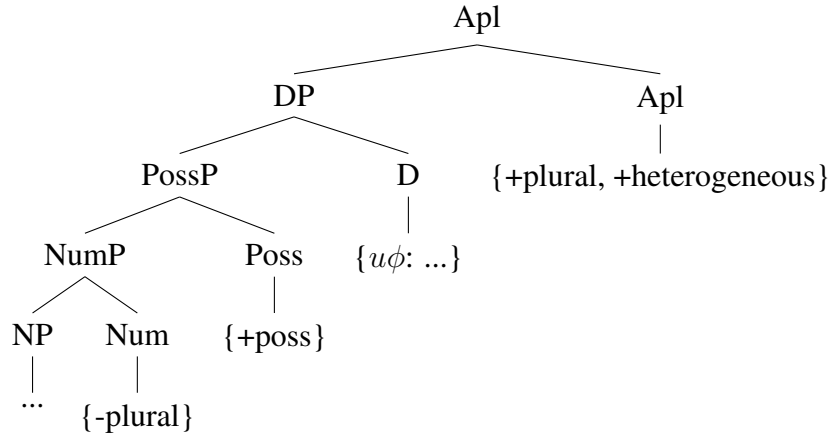
(2a) exemplifies that *-lAr* is interpreted as additive plural when preceding the possessive agreeement suffix. The additive plural is attached to a stem *X* and returns a set of individuals in which every individual has the property denoted by *X*. In this particular example, *ablalar* 'sisters' denotes a set of individuals where every individual is necessarily a sister. This additive plural interpretation of *-lAr* is possible only if it precedes the possessive agreement suffix in such constructions (Görgülü, 2011).

On the other hand, when *-lAr* follows the possessive agreement suffix, it is interpreted as associative plural (2b) —in fact, *-lAr* can be interpreted as associative plural only in this position. Hence, the associative plural combines with a referential, individual denoting stem *X* and returns a *plural individual* consisting of the focal referent 'X' and 'X's contextually defined associates'. To exemplify, in (2b), the focal referent is the definite noun *ablam* 'my sister'. The associative *-lAr* is attached to the stem *ablam*, and returns the plural individual 'my sister and her associates'. These

associates might be the focal referent's family or friends depending on the context. Thus, the plural individual formed by the associate plural phrase is characteristically heterogeneous. That is, except the focal referent, an individual part of the plural individual need not have the property of being a sister, unlike in the additive plural construction in (2a).

Hence, two major properties differentiate the associative plural from the additive: (i) the associative *-lAr* combines with a referential nominal and (ii) the associative *-lAr* follows the possessive agreement marker. Given that referentiality and genitive-possessive agreement are DP-level phenomena (Arslan-Kechriotis, 2009; Öztürk & Taylan, 2016), the associative plural head is merged above DP. Moreover, since the additive plural attaches to a predicate that denotes a property (set of individuals) and precedes the possessive marker, it needs to be merged below DP. Given these observations, I propose the structure in (3) for Turkish associative plurals, which complies with the functional hierarchy proposed in previous studies on associative plurals both in Turkish (Görgülü, 2011) and in other languages (Cinque, 2018; Dékány, 2021).

(3)



In (3), the additive plural resides under Num, which takes NP as complement, and is represented by the feature [+plural]. This is followed by the heads of PossP and DP, which host [+poss] and ϕ-agreement features, respectively. Finally, the associative plural head Apl, which comprises [+plural] and [+heterogeneous] features, is merged to the DP. [+plural] feature assumes the same function as in the

one under Num. It pluralizes its argument. [+heterogeneous] feature contributes the meaning that differentiates associatives from additives. It makes sure that the plural individual is heterogeneously formed in that it consists of a focal referent and this referent's associates. Furthermore, the proposal that the same feature, [+plural], is found both in the associative and additive plural also helps explain that they are realized by the same form in Turkish, as well as in many other languages (see also Dékány, 2021 for a similar proposal in Hungarian). Under the assumptions of a realizational theory of Morphology like Distributed Morphology (Embick & Noyer, 2007; Halle & Marantz, 1993), their syncretism can be simply explained by positing a single vocabulary item, as in (4), which would be inserted in both of the terminals Num and Apl in a structure like (3) by Subset Principle (Halle & Marantz, 1993; Harley & Noyer, 1999):

(4) [+plural] $\longleftrightarrow$ -lAr

5.2 The gaps

According to the proposed structure in (3), the possessive agreement morpheme under D head does not have a restriction. However, the paradigm in Table 1 illustrates that the associative plural *-lAr* cannot be followed by a 3SG, 1PL, 2PL or 3PL possessive agreement suffix: these forms are judged to be ungrammatical by native speakers of Turkish and this pattern is observed for all kinship terms that can be the root of the associative plural phrases formed with *-lAr*.

Table 20. The Paradigm of the Associative Plural Construction *abla*-POSS-LAR

	SG	PL
1	(benim) abla-m-lar	(bizim) *abla-mız-lar
2	(senin) abla-n-lar	(sizin) *abla-nız-lar
3	(onun) *abla-sı-lar	(onların) *abla-ları-lar

The shape of the paradigm in Table 20 raises the questions of "Why is the paradigm incomplete?" and "Why are ungrammatical forms ungrammatical?". To answer these questions, one needs to know if the ungrammatical forms are *expected*

by grammar in the first place. This is because a paradigm cannot be incomplete if the missing word forms are not expected to exist in the first place.

An expected form can be defined as one that is required by morphosyntax in order to express a semantically/pragmatically motivated utterance (Sims, 2015). Therefore, two requirements determine if a form is *expected*; one is morphosyntactic and the other is semantic/pragmatic. First, it is uncontroversial that all nouns that can be the root of associative plural constructions, such as *abla* 'sister', can be inflected in Turkish for all person/number features in possessive constructions elsewhere (Table 21). In fact, they are ungrammatical if they are not inflected for the appropriate person/number features when required.

Table 21. The Possessive Agreement Paradigm of *abla* 'sister'

	SG	PL
1	abla-m	abla-mız
2	abla-n	abla-nız
3	abla-sı	abla-ları

Hence, we expect the stems of associative plurals to be able to bear any possessive agreement marker when the necessary conditions are met. However, it is not the case. We see that even though the ungrammatical forms in Table (20) are morphosyntactically *expected* in Turkish due to possessive agreement, they are ungrammatical.

The second requirement is semantic/pragmatic. Are the meanings of the ungrammatical forms needed or motivated in the first place? There is no a priori reason for why the ungrammatical associative plural forms would not be needed. Assume the following context where an associative plural construction with the first person plural possessive suffix preceding the associative plural marker could be used: 'My brother and I are sharing an apartment. We are talking to a friend who invites us to a dinner party tonight. However, we cannot go to this dinner party since our sister and her friends are coming over to our apartment tonight for a dinner party that we are hosting.' In this context, I can say the sentence in (5) to explain the reason for why we cannot go to our friend's dinner party:

(5) *Bu akşam abla-mız ve arkadaş-lar-ı biz-e yemeğ-e*
This night sister-POSS.1PL and friend-PL-POSS.3SG we-DAT dinner-DAT
gel-iyor.
come-IMPF
'Tonight our sister and her friends are coming over to our place for dinner.'

In the context above, an APC is also well motivated to convey the meaning 'our sister and her associates'. However, I cannot use the sentence in (6) in this context because the synthetically formed associative plural form is ungrammatical when the first person plural possessive suffix precedes the associative plural suffix.

(6) * *Bu akşam abla-mız-lar biz-e yemeğ-e gel-iyor.*
This night sister-POSS.1PL-APL we-DAT dinner-DAT come-IMPF
'Tonight *our* sister and her associates are coming over to our place for dinner.'

See the contrast with sentence (7), which I can use in this context by leaving it implicit that it is not only *my* but *our* sister.

(7) *Bu akşam abla-m-lar biz-e yemeğ-e gel-iyor.*
This night sister-POSS.1SG-APL we-DAT dinner-DAT come-IMPF
'Tonight *my* sister and her associates are coming over to our place for dinner.'

Hence, ungrammatical APCs like **ablamızlar* are more informative – and thus better motivated – than the grammatical APCs like *ablamlar* in such contexts; yet, we still cannot use them licitly. That is, the components of grammar relating to the use (pragmatics) or meaning (semantics) of a form suggest that these ungrammatical forms should exist; however, they do not have a grammatical form contrary to expectations. This observation indicates that the ungrammatical associative plurals are semantically/pragmatically *expected*. Therefore, there is no a priori morphosyntactic or semantic/pragmatic reason for why some forms should not exist in the paradigm of APCs: they are all *expected* to exist. Nevertheless, some forms are ungrammatical, constituting a case of *defectiveness* (Sims, 2015) or *ineffability* (Pesetsky, 1997).

As discussed in the previous chapters, it has been argued that defectiveness may be caused by different components of grammar (Sims, 2015). Studies suggest

that while one form might be ungrammatical due to the phonological rules of a language (Orgun & Sprouse, 1999), another form might be ungrammatical due to its syntactic rules (Kastner & Zu, 2017). Therefore, it is not possible to know the source of defectiveness in a form without a careful analysis of its derivation. In the case of APCs, it might be that the ungrammatical forms are morphosyntactically ill-formed because of a rule in Turkish prohibiting the associative plural features and some agreement features to be in a certain configuration; or, it might be that the sequence of sounds created by certain exponents in ungrammatical associative plurals do not conform to the phonological well-formedness requirements in Turkish.

Since it is not possible to know the source of defectiveness in the ungrammatical associative plural forms without detailed investigation, in the next section, I analyze their derivation. I first consider the morphophonological component and show that morphophonology is responsible for the ungrammaticality of APCs with a third person singular possessive suffix. Following that, I move on to morphosyntax and argue that it is the structural adjacency of two identical [+plural] features that causes ungrammaticality in the illicit APCs which bear a plural agreement suffix.

5.3 Possible sources of defectiveness

I adopt the framework of Distributed Morphology (DM) for the analysis (Embick & Noyer, 2001; Halle & Marantz, 1993; Harley & Noyer, 1999; Nevins & Arregi, 2012). DM assumes that the derivation starts with Syntax, which builds the hierarchical structure by combining abstract features. Then, it sends the syntactic structure to Spell-Out (PF branch), where Morphology applies the necessary post-syntactic operations on the structure, linearizes it, and inserts vocabulary items into its terminal nodes. I use the term *morphosyntax* for the component that is sensitive to abstract features, and *morphophonology* for the component that is sensitive to the morphemes, words, and their forms.

5.3.1 Morphophonology

Recall the forms of the ungrammatical associative plurals:

(8) a. *X-si-ler*
X-POSS.3SG-APL

b. **X-miz-ler*
X-POSS.1PL-APL

c. **X-niz-ler*
X-POSS.2PL-APL

d. **X-leri-ler*
X-POSS.3PL-APL

Is it the phonological form of the associative plural morpheme, i.e. *-lAr*, that causes ungrammaticality when preceded by the 3SG, 1PL, 2PL, or 3PL possessive agreement morpheme? The most straightforward evidence for the role of morphophonology in the distribution of APCs comes from the dialectal variant of the associative plural marker, *-gil*. In addition to *-lAr*, some speakers of Turkish also use the suffix *-gil* to express the meaning of associative plurality. Even though there is some difference between these exponents with regards to formality and distribution, they can be used interchangeably in many cases as in (9).

(9) a. *(Ben-im) baba-m-lar geldi.*
(I-GEN) father-POSS.1SG-APL came

b. *(Ben-im) baba-m-gil geldi.*
(I-GEN) father-POSS.1SG-APL came
'My father and his associates came.'

Given the parallel between the word-internal positions and meanings of *-gil* and *-lar*, it can be inferred that they share the morphosyntactic and semantic features of associative plurality despite the fact that they are phonologically different. Therefore, if a difference is observed in the shape of their paradigms, this must be due to the difference in their forms; not due to the morphosyntactic or semantic features of associative plurality. When we compare the paradigms of *-lAr* Table (22) and *-gil* Table (23), we see that they differ only in the grammaticality of the 3SG form out of six possible forms.

In both paradigms, 1SG and 2SG forms are grammatical whereas 1PL, 2PL, and 3PL forms are ungrammatical. That is, the paradigms of *-gil* and *-lAr* diverge only in the grammaticality of the 3SG form. Associative plural word forms where the

Table 22. The Paradigm of the Associative *-lAr*.

	SG	PL
1	*X*-m-lar	**X*-mız-lar
2	*X*-n-lar	**X*-nız-lar
3	**X*-sı-lar	**X*-ları-lar

Table 23. The Paradigm of the Associative *-gil*.

	SG	PL
1	*X*-m-gil	**X*-mız-gil
2	*X*-n-gil	**X*-nız-gil
3	*X*-sı-gil	**X*-ları-gil

root is followed by the so-called third person singular possessive agreement marker *-sI* are ungrammatical when followed by *-lAr* Table (22); however, they are grammatical when followed by *-gil* Table (23). Therefore, we can infer that the reason for the ungrammaticality of APCs where *-lAr* follows *-sI* must be due to the form of the affix sequence **-sI+lAr*. Thus, I hypothesize that the suffix order **-(s)I+lAr* is ill-formed in Turkish.

A major piece of evidence that the suffix order **-(s)I+lAr* is ungrammatical in Turkish comes from speakers who use the form in (10b) to express the intended meaning of (10a).

(10) a. * *abi-si-ler*
brother-POSS.3SG-APL
Intended:'her brother and his associates'

b. *abi-ler-i*
brother-APL-POSS.3SG
'her brother and his associates'

Based on the morphosyntactic structure of APCs and other forms in the paradigm, the associative plural marker is expected to follow the possessive agreement marker. Accordingly, the expected order in 3SG APCs is **-(s)I+lAr*; however, this form is ungrammatical. Interestingly, some Turkish speakers use forms such as in (10b), where the suffix order is *-lAr+(s)I*, for 3SG APCs instead.[17] Based

[17]Some might counter that *-lAr* can be the exponent of the additive plural in these words since it precedes the possessive marker. However, note that (10b) is interpreted as an APC: the plural individual denoted by *abileri* may include only one brother and his friends, instead of multiple

on this data (and others which will be provided as we proceed), I argue that there is a repair mechanism that changes the illicit suffix order *-*(s)I+lAr* into the well-formed suffix order -*lAr+(s)I* in Turkish.[18] In particular, I argue that it is this rule that changes the expected order *-*(s)I+lAr* into -*lAr+(s)I* when deriving words like *abileri* in 10b.

Before illustrating how this repair mechanism works and how it can be formulated, the morphemes and their exponents in APCs like in (15) need to be discussed. First, following Kunduracı (2013, 2015) and Öztürk and Taylan (2016), I assume that third person singular possessive marker is null in Turkish. There is both typological and language-internal evidence for this argument. First, third person singular agreement is mostly null in the verbal domain in Turkish (Göksel & Kerslake, 2005) and if an agreement marker is null in the verbal paradigm in a language, it tends to be null in the nominal paradigm, too (Siewierska, 2010). Therefore, as pointed out in Kunduracı (2013, 2015) and Öztürk and Taylan (2016), the third person singular possessive agreement marker is expected to have a null exponent in Turkish. The second piece of evidence comes from the distribution of -*(s)I* in a variety of possessive phrases in Turkish, which is extensively discussed in the aforementioned research. Based on these data, it has been argue that -*(s)I* in the third person singular agreeing nominals, which is traditionally known as the compound marker, is actually the exponent of the possessive marker whereas 3SG agreement morpheme has no overt exponent, as illustrated in (11).

(11) *Abi-si-∅* *gel-di-∅.*
Brother-POSS-3SG come-PST-3SG
'His/Her brother came.'

Besides -*(s)I* being the exponent of the possessive marker, there is ample evidence that -*lAr* is the exponent of the plural feature in Turkish: recall that both the additive plural and the associative plural are realized as -*lAr*. Given these

brothers, which is the only meaning that can be derived by the additive plural. Therefore, -*lAr* has to be the associative plural marker in (10b).

[18]The initial consonant of the suffix -*(s)I* is deleted when it is attached to a stem that ends in a consonant. Therefore, when the order of -*(s)I* and -*lAr* changes, -*lAr+(s)I* takes the surface form -*lArI* given that -*lAr* ends in a consonant.

observations, I argue that the so-called 3PL possessive suffix *-lArI* is in fact decomposed into *-lAr* and *-(s)I*, and that *-(s)I* is expected to precede *-lAr* based on the syntactic structure of possessive phrases. In what follows, I will demonstrate how this analysis explains why the grammatical form of 3SG APCs is like *abileri* 'her brother and his associates', provided in 10b, rather than **abisiler*, provided in (10a).

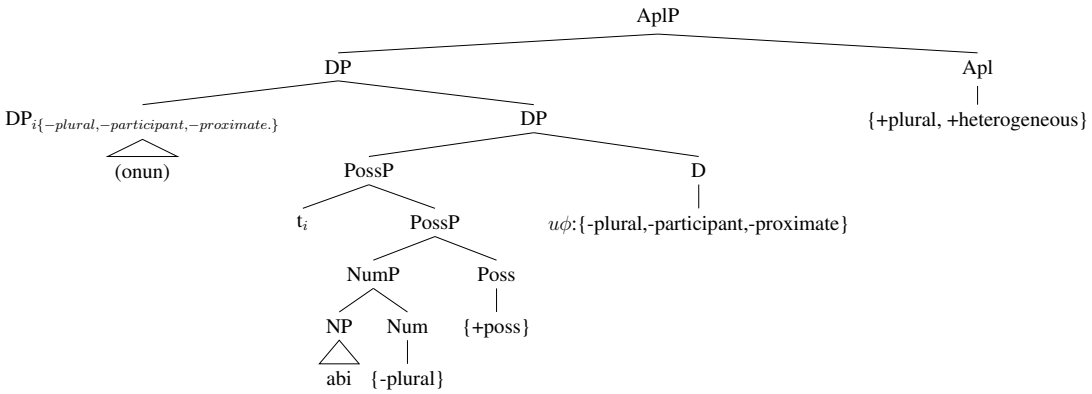
Let us start with the vocabulary items that are needed for deriving 3SG APCs. To spell-out the structure of a 3SG APC, we need vocabulary items (VIs) for the following morphemes in addition to the root: singular (the possessee noun phrase is singular), possessive, 3SG agreement, and associative plural. I assume that singular is [-plural], and since singular is unmarked in Turkish, I assume that the exponent of [-plural] is null. In addition, given the foregoing discussion, I posit that the exponent of the possessive marker, which consists of the feature [+poss], is *-(s)I*. Following Nevins (2007), among others, I assume that the third person is the absence of two features, consisting of the feature set {-participant, -proximate}. Furthermore, for simplicity, I assume that there is no specific VI exclusively for either third person or third person singular: when there is third person singular agreement, i.e., the feature set {-participant, -proximate, -plural}, the VI for [-plural] is inserted to spell out this feature set by Subset Principle. Given that both singular and 3SG morphemes are realized by a null exponent, and they share the feature [-plural], this seems to be the most economical solution. Finally, as argued before, I assume that [+plural] is exponed by *-lAr*, which also realizes the associative plural by Subset Principle due to the absence of a vocabulary item for [+heterogeneous]. Hence, I propose the VIs in 12 that are used in APC that have a third person singular possessor in Turkish.[19]

(12) *The list of VIs that are used in* 3SG *APCs*
{-plural} $\longleftrightarrow \emptyset$
{+plural} $\longleftrightarrow$ -lAr
{+poss} $\longleftrightarrow$ -sI

[19]In this analysis, when the possessor is first or second person, we need to assume that the possessive marker has a null allomorph in the environment of first and second person features, given that it is phonologically absent when followed by a first or second person possessive agreement suffix. However, for the sake of exposition, I will gloss the possessive agreement markers of first and second persons as if they also spell-out POSS as a portmanteau throughout the paper.

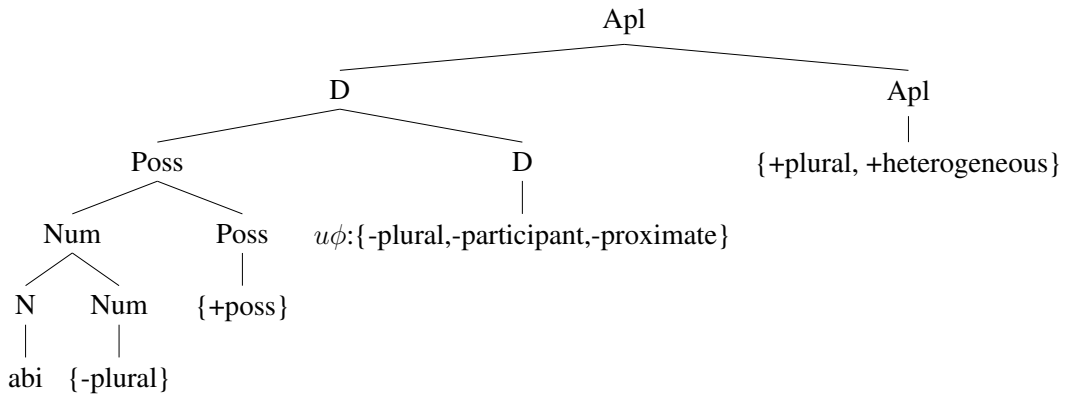
With these vocabulary items, I return back to the 3SG APC *abileri* and posit that it has the structure in (13) before Vocabulary Insertion.

(13) The structure of *(onun) abileri* 'her brother and his associates'



(13) is the final structure of *(onun) abileri* 'her brother and his associates' before morphological words are formed. A morphological word in DM is the highest terminal node that is not dominated by another terminal node and it is formed by head-movement. A morpheme, on the other hand, is the feature set under a simplex terminal node that does not dominate another terminal node (Embick & Noyer, 2001). By this definition, a morphologically complex word is a complex terminal consisting of multiple terminals, each of which realizes a morpheme. Therefore, given that *abileri* is a complex word that consists of multiple morphemes, I posit that it is formed by the movement of all the heads —except those dominated by the DPi in the specifier position since it is a separate morphological word— into the highest head, Apl. This gives us the structure in (14) for the complex head Apl, which represents the morphological word *abileri*.

(14) The structure of the morphological word *abileri* 'her brother and his associates'



In this structure, N is spelled-out by *abi* 'brother'.[20] Num hosts [-plural] and is inserted a null exponent based on the VIs in (12). Poss hosts [+poss] and it is inserted *-(s)I* given the VI for [+poss]. D hosts third person singular agreement features {-plural, -participant, -proximate}, but it does not have a complete match in the set of VIs. Therefore, the exponent of [-plural], which is null, is inserted into the terminal node D by Subset Principle since [-plural] is a subset of the feature set {-plural, -participant, -proximate} under D and there is no more specific VI that can be inserted for this feature set. Finally, Apl hosts the feature set {+plural, +heterogenenous} and, again, there is no exact match for it in the list of VIs. Therefore, by Subset Principle, *-lAr*, the exponent of {+plural} is inserted into Apl for the feature set {+plural, +heterogenenous}. Thus, vocabulary insertion gives us the ungrammatical morphological word **abisiler*, which is provided in (15a) with the glosses updated based on the foregoing discussion, for 'her brother and his associates'. However, if we apply the proposed repair to turn the illicit suffix order *-(s)I+lAr* into *-lAr+(s)I*, we derive the grammatical string *abileri* in (15b).

(15) a. * *abi-si-∅-ler*
brother-POSS-3SG-APL
Intended:'her brother and his associates'

[20]In DM, a root needs to merge with a categorizing head that categorizes it as noun, adjective, etc. Hence, in (14), there minimally needs to be a categorizing head N between the root and Num in the functional hierarchy. However, I represent the root as N for simplicity since it does not bear immediate relevance for the current discussion.

b. *abi-ler-i*
brother-APL-POSS(.3SG)
'her brother and his associates'

Thus, I argue that 3SG APCs that follow the template *X+(s)I+lAr* – which is the expected order of morphemes given the morpho-syntactic hierarchy – are ungrammatical due to the morphophonological ill-formedness of the suffix order **-(s)I+lAr*. I propose that the illicit suffix order **-(s)I+lAr* is repaired by turning the order into *-lAr+(s)I*. That is, the linear order in 3SG APCs, which seemingly violates the generalization that linear order of affixes *mirror* the syntactic structure (Baker, 1985; Embick, 2010; Halle & Marantz, 1993), is changed by a repair mechanism that turns the morphophonologically illicit order **-(s)I+lAr* into the morphophonologically licit order *-lAr+(s)I*.

The argument that **-(s)I+lAr* is ill-formed and it is repaired as *-lAr+(s)I* is not ad hoc in order to account for 3SG APCs in Turkish. There is also independent evidence for the morphophonological ill-formedness of **-(s)I+lAr*. The suffix sequence **-(s)I+lAr* is possible, and *expected*, in some other constructions; nevertheless, it is not grammatical in these constructions either as long as the suffix order is not changed. For instance, the third person plural agreement marker *-lAr* may be found on the nominal predicate of a sentence if the subject is third person plural, as shown in (16). I mark this verbal agreement *-lAr* as COP.PL to differentiate it from the additive plural or possessive plural agreement marker *-lAr*.[21]

(16) * *Bu adam-lar öğretmen-(di)-ler.*
This man-PL teacher-(PST)-COP.PL
'These men are (were) teachers.'

COP.PL *-lAr* normally follows the possessive agreement marker, if there is any, on a nominal predicate, as shown in (17a). However, (17b) illustrates that when the possessive agreement marker is *-(s)I*, it cannot be followed by *-lAr*; it can only be spelled out as in (17c).

[21]However, they do not need to be differentiated: apparently, they share the feature [+plural] and they can be realized by the same vocabulary item. Nevertheless, I will not go into the details of the verbal agreement morphemes and use the given glossing for the purposes of data-illustration.

(17) a. *Bu adam-lar biz-im abi-miz-ler.*
This man-PL we-GEN brother-POSS.1PL-COP.PL
'These men are our brothers.'

b. * *Bu adam-lar on-un abi-si-ler.*
This man-PL s/he-GEN brother-POSS.3SG-COP.PL
Intended: 'These men are his/her brothers.'

c. *Bu adam-lar on-un abi-ler-i.*
This man-PL s/he-GEN brother-COP.PL-POSS.3SG
'These men are his/her brothers.'

Thus, the restriction that *-(s)I+lAr* is not a grammatical sequence of exponents in Turkish is motivated independently of the ungrammatical 3SG APCs that end in **-(s)I+lAr*. However, note that this restriction cannot apply to every word form that ends in *(s)I+lAr*: the phonological sequence is not ungrammatical as long as *(s)I* is a part of the root, as illustrated in (18).

(18) *yüksek ısı-lar*
high temperature-PL
'high temperatures'

Therefore, Turkish does not prohibit the roots that end in *(s)I* and are followed by *-lAr*; it prohibits the words in which the suffix *-(s)I* is followed by the suffix *-lAr*. Since the prohibition applies when two suffixes are linearly adjacent, as shown in (18), it cannot be achieved with a purely phonological rule. Furthermore, given the foregoing discussion on the repaired 3SG APC, we also need to have a mechanism that ensures that the banned **-(s)I+lAr* sequence is repaired as *-lAr+(s)I*, so that the intended meaning can still be expressed. Given these observations, I propose that this repair mechanism can be formulated as a morphophonological *local dislocation* rule (Embick & Noyer, 2007), which is provided in (19). This rule applies after linearization and changes the order between the linearly adjacent morphemes *-(s)I* and *-lAr* iff *-(s)I* linearly precedes *-lAr*.

(19) *Local Dislocation Rule*
*-(s)I * -lAr* $\longrightarrow$ *-lAr * -(s)I*

With the rule in (19), we account for the observations that APCs in which the associative plural marker *-lAr* immediately follows the possessive marker *-sI* are

ungrammatical and that this illicit sequence can be repaired by changing the order of these morphemes. In addition, this rule is not restricted to associative plurals and it explains why we do not find the morpheme sequence *(s)I-lAr* elsewhere in Turkish.

A systematic pattern emerges in APCs after we account for the only singular ungrammatical form: forms with singular agreement markers are grammatical whereas forms with plural agreement markers are ugrammatical. This systematicity does not relate to phonology since what is shared by the plural agreement markers is not their forms: there is no common string of sounds shared by *-mIz*, *-nIz*, and *-lArI*. Instead, what they have in common is the set of abstract features of plural agreement. More specifically, APCs where a plural agreement morpheme is followed by an associative plural morpheme are ungrammatical regardless of their form. Therefore, I hypothesize that the ungrammaticality of these forms is due to the set of abstract feature(s) of the plural agreement morpheme and its position in the morphosyntactic structure. In the next section, I argue that the reason for their ungrammaticality is a morphosyntactic ban on two structurally adjacent [+plural] features in Turkish.

5.3.2 Morphosyntax

The associative plural morpheme can only combine with a subset of nominal stems that denote an individual in Turkish. The nominal stem provides the denotation of the focal referent in APC. Referential nominals can be either proper nouns, as in (20a), or kinship terms that are marked with a possessive suffix which reflects the person/number features of the possessor, as in (20b).[22]

(20) a. *Merve-ler*
Merve-APL
'Merve and her associates'

b. *[ben-im anne-m]-ler*
[I-GEN mother-POSS.1SG]-APL
'my mother and her associates'

[22]Note that although some non-relational kinship terms do not agree with their possessor, they can still be a base for the associative plural marker. However, this is not problematic for the claimed referentiality of the bases of associative plurals since the referents of these kinship terms are contextually defined, as suggested by Öztürk and Taylan (2016).

As can be seen in (20b), the associative plural morpheme actually attaches to a complex nominal which is a possessive phrase with a genitive marked possessor. On the other hand, the additive plural morpheme attaches to a simple noun phrase, exemplified with *anne* 'mother' in (21), which does not have a referential meaning.

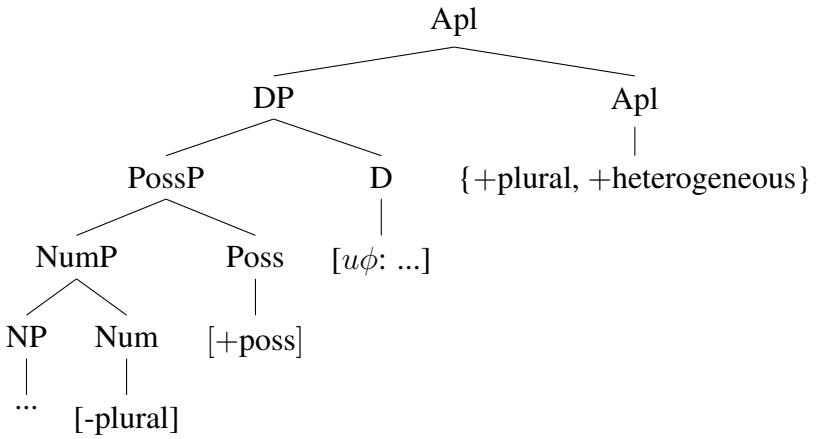
(21) *anne-ler*
mother-PL
'mothers'

Thus, referentiality and genitive case assignment are distinguishing properties that differentiate phrases that can combine with the associative plural from phrases that can combine with the additive plural. Since both of these properties are argued to be DP-level phenomena in Turkish (Arslan-Kechriotis, 2006, 2009; Bošković & Şener, 2014; Öztürk & Taylan, 2016), we expect that the associative plural is merged above DP whereas the additive plural is merged below DP.

In previous studies on the structure of DP, the additive plural is argued to occupy Num head below PossP whereas the associative plural is merged over PossP or DP (Cinque, 2018; Dékány, 2021; Görgülü, 2011). Following these studies, I suggest that the associative plural is merged with DP in Turkish. Furthermore, I adopt the DP structure proposed by Öztürk and Taylan (2016), which is posited based on the properties of genitive-possessive phrases in Turkish.

Hence, the functional hierarchy that emerges for APCs in Turkish is as follows: NP is combined with Num, which hosts the additive number feature. If the highest projection is a DP, the number feature on Num can be specified as either singular or plural. However, if the highest projection is the associative plural phrase, Num can be specified only as [-plural] since the associative plural selects a DP denoting a singular referent. After NP, Poss is merged, which is followed by D. Finally, Apl is merged to the whole DP. The proposed hierarchy can be seen in (22).

(22) *The functional hierarchy of associative plural phrases in Turkish:*



By following Öztürk and Taylan (2016), I assume that if there is a nominal argument of the NP, it is introduced in Spec, PossP. If the introduced argument has a referentiality or specificity feature, then it moves to Spec, DP to check these features. Eventually, this movement results in the valuation of the uninterpretable ϕ-features of D with the ϕ-features of the moved DP. In addition, as Dékány (2021) notes (p. 234), there must be two meaning components for associative plurality given that two separate morphemes are used to mark associative plurality in Yu'pik (Corbett & Mithun, 1996). One of the meaning components is plurality and the other is associativity. Therefore, following Dékány (2021), I assume that Apl host the features [+heterogenous] and [+plural], which express the characterizing meaning components of associatives: (i) forming plurals and (ii) forming a heterogeneous set comprising of a focal referent and his/her/their associatives.

Having provided the functional hierarchy and the features under the terminal nodes, we can return to the question of why APCs with a plural agreement suffix are ungrammatical regardless of the form of the suffix. There are two differences between plural agreeing forms and singular agreeing forms: the former has a plural possessor and the agreement feature [+plural] under D whereas the latter has a singular possessor an the singular agreement feature [-plural]. By providing data from APCs that have a plural possessor but no agreement marker, I argue that it is the agreement feature [+plural] that causes ungrammaticality in APCs in Turkish.

Öztürk and Taylan (2016) argue that some kinship terms in Turkish have two variants; one is relational and the other is non-relational. They argue that relational kinship terms agree in person and number with their possessor whereas the non-relational ones do not. For instance, *baba* in (23a) is the relational root and *peder* in (23b) is the non-relational root for the kinship term 'father'.

(23) a. *ben-im baba-m*
I-GEN father-POSS.1SG
'my father'

b. *ben-im peder-(*im)*
I-GEN father-(*POSS.1SG)
'my father'

Returning to APCs, we observe that APCs with a non-relational kinship term as the stem, which does not agree with its possessor (Öztürk & Taylan, 2016), provide evidence that the plural possessor does not cause ungrammaticality alone in the absence of an agreement suffix on the root. (24) illustrates that both *baba* and *peder* can occur as the roots of APCs that have a singular possessor.

(24) a. *ben-im baba-m-lar*
I-GEN father-POSS.1SG-APL
'my father and his associates'

b. *ben-im peder-ler*
I-GEN father-APL
'my father and his associates'

However, (25) shows that *baba* cannot grammatically form an APC with a plural possessor while *peder* can. Therefore, the plural possessor alone cannot be the source of ungrammaticality in illicit APCs like in (25a): a plural agreement marker is required for the form to be ungrammatical.

(25) a. * *biz-im baba-mız-lar*
we-GEN father-POSS.1PL-APL
Intended: 'our father and his associates'

b. *biz-im peder-ler*
we-GEN father-APL
'our father and his associates'

Thus, we can infer that the linear and/or the structural position of the plural agreement morpheme in APCs must be the source of ungrammaticality. To understand exactly how this works, we should investigate how ungrammatical APCs are derived.

Recall that words are formed via head movement in DM (Embick & Noyer, 2007; Harley & Noyer, 1999) and that Apl is the complex head that represents the associative plural word. When the morphological word that bears the associative plural suffix is formed, I propose that it has the morphosyntactic structure in 26 based on the functional hierarchy in 22.[23] I also assume that this configuration is found at a stage before linearization at PF. Thus, it has information only about abstract morphosyntactic features under terminals and their hierarchical structure.[24]

(26)

$[_{Apl}[_{D}[_{Poss}[_{Num}$	NP	Num]	Poss]	D]	Apl]
	...	-plural	+poss	*+plural*	*+plural*
				±participant	+heterogeneous
				±proximate	

(26) is the structure of the terminal node that represents an associative plural word with a plural agreeing stem. The only morphosyntactic difference between such words, which are ungrammatical, and associative plural words that have a singular agreeing stem, which are grammatical, is that there is [+plural] under D in the ungrammatical ones whereas there is [-plural] in the grammatical ones. Therefore, the ungrammaticality must be due to [+plural] under D.

I argue that the ungrammaticality of these associative plural words is due to the morphosyntactic adjacency of two [+plural] features in the structure. In the structure of 26, two adjacent heads, D and Apl, host a [+plural] feature each. The [+plural] under D is a result of plural agreement and the [+plural] under Apl is the plurality feature of the associative plural morpheme. I suggest that this configuration is not licensed due to a ban which prohibits the co-occurrence of two adjacent [+plural] features under a syntactic terminal, i.e. a morphological word, in Turkish. This rule can be formulated as such:

(27)

*$[_{Y}$	$[_{X}$ ...	X]	Y]
		+plural	+plural

[23]The possessor in Spec, DP is not represented since it forms a separate morphological word and its only significance is to trigger plural agreement on the Apl head.

[24]I make this assumption in order not to take sides on the debate about where Agree takes place. Some researchers claim that agreement happens at syntax proper (Preminger, 2014), and others claim that agreement is sensitive to PF-level phenomena and hence should take place when the syntactic structure is sent to PF (Bobaljik, 2012). Therefore, I assume that 26 is found at a stage in PF where all agreement operations must have been completed, whether it be in syntax proper or at PF.

The ban on the adjacency of two [+plural] features in (27) explains why grammatical word forms in which an associative plural marker follows a singular agreement marker, such as *ablamlar* 'my sister and her associates', become ungrammatical when the agreement marker is plural, such as in **ablamızlar* 'our sister and her associates'. Following the terminology of Nevins (2012), I argue that this ban on the structural adjacency of two [+plural] features operates on morphological words (M-words) such that it refers to (a subset) of features under terminal nodes and it is phonologically insensitive.

This restriction cannot be solely due to the plural agreement morpheme since plural agreement morphemes are attested in many words in Turkish. For instance, forms like in (28) are grammatical, where a possessive plural agreement marker is immediately followed by the verbal (copular) plural agreement marker *-lAr*.

(28) *Onlar siz-in abi-niz-ler.*
They you(pl)-GEN brother-POSS.3SG-COP.PL
'They are your(pl) brothers.'

The sentence in (28) may sound odd without a context since third person plural agreement in Turkish is usually dropped when there is an overt subject in the sentence (Göksel and Kerslake, 2005, p.118). However, it is perfectly licit when uttered, for example, as a follow-up sentence by the director in the following context (which can happen in a soap opera): "The director of an orphanage points at two men through her office window, who are waiting in the courtyard, and asks the two little children in the room if they see the men. Children answer the question by nodding."

The grammaticality of the form in (28) is unexpected if we look at only the surface form. However, (29) shows that there is, at the very least, an intervening Tense/Aspect/Mood node, which is realized by the evidential *-mIş* in this example, between the possessive plural agreement morpheme and the verbal plural agreement morpheme in the structure of nominal predicates such as in (28) (Kelepir, 2001).

(29) *Onlar siz-in abi-niz-miş-ler.*
They you(pl)-GEN brother-POSS.2PL-EVID-PL
'Presumably, they are your(pl) brothers.'

Thus, forms like *abinizler* 'They are your(pl) brothers.' in (28), where a verbal (copular) third person plural agreement suffix immediately follows a possessive plural agreement suffix, are grammatical. Furthermore, (29) illustrates that plural morphemes are not structurally adjacent in examples like in (28): there needs to be Tense/Aspect/Mood nodes, though sometimes null, that structurally intervene between the plural morphemes in the structure of such words. Hence, these forms provide evidence that a ban on the structural adjacency of two plural morphemes make the correct predictions by allowing forms like *abinizler* 'They are your(pl) brothers.'. On the other hand, a rule that prohibits the phonological adjacency of two plural suffixes makes incorrect predictions by disallowing forms like *abinizler* 'They are your(pl) brothers.', which are actually grammatical.

Another data point that can potentially falsify the analysis that structural adjacency of two plural features is banned comes from pluralized noun phrases that have a plural possessor. The additive plural *-lAr*, which also has [+plural], is immediately followed by a plural possessive agreement suffix in words like *annelerimiz* 'our mothers' in (30). If the additive plural morpheme and the possessive plural agreement morpheme are structurally adjacent in these words, then they pose a challenge for our generalization.

(30) *(biz-im) anne-ler-imiz*
(we-GEN) mother-PL-POSS.1PL
'our mothers'

However, I argue that [+plural] features are not adjacent in the morphosyntactic structure of (30); hence, the form is not expected to be ungrammatical. Recall (22), where I proposed that the additive plural morpheme [+plural] occupies Num and the person/number agreement morpheme occupies D. I also proposed that, in the functional hierarchy, there is an intervening Poss between Num and D. Since Poss breaks the structural adjacency of Num and D in possessive phrases, there is no issue of adjacency between [+plural] features under Num and D in these phrases.

Positing a functional head below DP, such as Poss, in possessive phrases is not needed only for the sake of the current analysis. It is independently motivated by studies on possessive constructions in Turkish (i.e. genitive-possessive phrases and possessive compounds). For instance, Öztürk and Taylan, 2016 argue that the NP argument of the head NP in possessive constructions is introduced by a functional head, which they call *n*, bearing a [+poss] feature. Regarding its position, they note that "POSS belongs to an inner domain and, as a terminal element, is observed only after the markers which belong to this domain lower than the DP, such as other noun deriving suffixes and the plural marker" (p.104). That is, in the functional hierarchy, Poss is above NumP, which hosts the additive plural and below DP, which hosts the plural agreement. Therefore, it breaks the adjacency between the features under their heads, and avoids ungrammaticality in examples like 30, proving not to be problematic for the proposed analysis.

Finally, the famous case of **-lAr-lAr* haplology in plural noun phrases that have a third person plural agreement marker in Turkish poses a challenge for the presented analysis. Plural noun phrases that agree with a third person plural possessor in Turkish are expected to have two plural suffixes: one for the additive plural and one for the plural agreement, as illustrated in 31a. But instead, they have only one plural suffix, as shown in 31b. Besides Turkish, this pattern is also attested in other Turkic languages such as Sakha (Kirby & Sevgi, 2023; Vinokurova, 2005), Yakut, and Bashkir (Johanson, 2021), among others.

(31) a. *(onlar-ın) *abi-ler-ler-i*
(they-GEN) brother-PL-3PL-POSS
'their brothers'
b. *(onlar-ın) abi-ler-i*
(they-GEN) brother-PL.3PL-POSS
'their brothers'

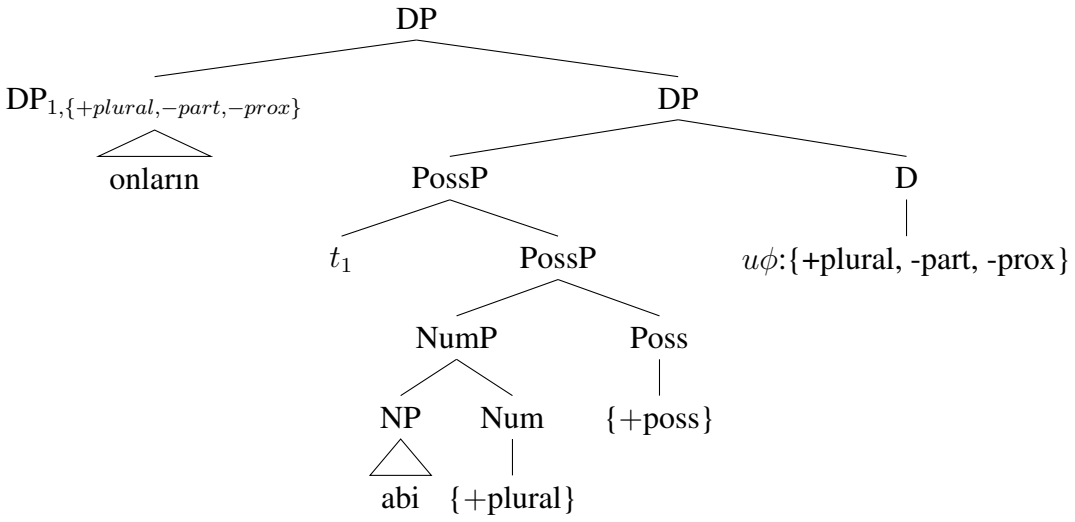
The surface form in (31a) suggests that it might be ungrammatical due to the adjacency of two plural morphemes in its structure. If that is the case, the rules and vocabulary items posited so far fall short of explaining how 'their brothers' can be

spelled-out grammatically with the form in (31b). Recall that the APCs that are prohibited by the ban on two structurally adjacent [+plural] features cannot be spelled-out grammatically: their ungrammaticality cannot be repaired. Therefore, if the form in (31a) is ungrammatical due to the same ban, we expect that it should not be repaired, in contrast with what is observed in (31b).

At any rate, although it may be counter-intuitive at first sight, I argue that the structure of the form in (31a) does not contain two adjacent [+plural] features and is not ungrammatical due to the ban on the structural adjacency of two [+plural] features. In particular, I argue that the mechanism that repairs (31a) as (31b) is a morphophonological rule that deletes one of the *-lAr*s after Vocabulary Insertion and the data does not constitute a problem for the current analysis. In what follows, I will demonstrate how the form in (31b) is derived with the tools proposed in this paper in order to illustrate that, coupled with the local dislocation rule applied to **-(s)I+lAr*, the posited morphophonological rule that deletes one of the *-lAr*s makes the correct predictions.

First, again, based on the functional hierarchy in (22), I assume the following structure for plural noun phrases that have a third person plural agreement marker. Second, the VIs provided in (12) are restated in (33) since they will be needed in the derivation.

(32)



(33) *VIs (for spelling out 'their brothers')*
{-plural} $\longleftrightarrow \emptyset$
{+plural} $\longleftrightarrow$ -lAr
{+poss} $\longleftrightarrow$ -sI

Given the discussion so far, I assume that in (32), the pronominal possessor was generated in Spec, PossP, from where it moved to Spec, DP for checking its referentiality/specificity features (Arslan-Kechriotis, 2006; Öztürk & Taylan, 2016). Then, in that position, it was assigned Genitive case and its ϕ-features were copied onto the D-probe by *Agree* (Chomsky, 2000). I also assume that the structure in (32) is the final structure before word formation via head movement (Bobaljik, 2012; Embick & Noyer, 2007). When all the heads in (32), excluding those under the possessor in Spec, DP, are moved to D head for word formation, and linearized according to the functional hierarchy (Embick, 2010), we obtain the linearized structure in (34).

(34) *Linearization:*

N	*	Num	*	Poss	*	D
...		{+plural}		{+poss}		{+plural, +part, +prox}

The ban on multiple adjacent [+plural] features should be applied at this stage at the latest since it is the last stage before Vocabulary Insertion. Hence, if there are any adjacent [+plural] features, the structure should be banned at this stage. However, (34) does not have adjacent [+plural] features since the only two [+plural] features in the structure are separated by Poss. Therefore, the structure cannot be ruled out at this stage of derivation.

Proceeding to Vocabulary Insertion, first the lexical root *abi* 'brother' is inserted into N in (34).[25] Then, the second VI in (33) is inserted into Num to expone it with *-lAr*. In turn, Poss is exponed by *-(s)I* with the third vocabulary item. Finally, the second VI in (33) is inserted into D by Subset Principle, given that {+plural} is a subset of {+plural, +part, +prox} and that there is no more specific VI than {+plural}

[25]The internal structure of NP should include a root and a nominalizer at a minimum given the assumptions of DM. However, I simplify it as N since it does not have an impact on the discussion in this paper.

in the list which can be inserted into D. Hence, we obtain the order of exponents in (35) as a result of Vocabulary Insertion.

(35) *Vocabulary Insertion:*
abi * *-lAr* * *-(s)I* * *-lAr*

After vocabulary insertion, operations that are sensitive to the linear structure and the forms of morphemes are applied, if any. Recall the local dislocation rule provided in (19), restated here as (36).

(36) *Local Dislocation Rule in Turkish*
-(s)I * *-lAr* $\longrightarrow$ *-lAr* * *-(s)I*

The configuration in (35) is in the domain of this rule. There are two morphemes, *-(s)I* and *-lAr*, such that (i) *-(s)I* and *-lAr* are linearly adjacent and (ii) *-(s)I* precedes *-lAr*. Thus, the local dislocation rule should be applied, deriving the following linear order in (37).

(37) *abi* * *-lAr* * *-lAr* * *-(s)I*

Finally, relevant phonological rules (e.g. vowel harmony) are applied to the form in (37) and the final form in (31a) is obtained: **abilerleri*. Note that this form is unexpectedly ungrammatical given the current analysis: the ban that we posited on adjacent plural features operates at an earlier stage before vocabulary insertion. Since there is no adjacency between plural features at that level, it cannot rule out this form. However, we seem to miss an important generalization: both ungrammatical APCs and plural noun phrases bearing the 3PL possessive agreement morpheme include two adjacent plural markers. Then, given this similarity, it is desirable to have one common constraint, or violation, that can explain the ungrammaticality of both.

Nevertheless, I argue that the ungrammaticalities in these two forms cannot be collapsed into a single constraint. There is substantial difference between the ill-formedness of plural noun phrases that have the third person plural agreement marker (**N-lAr-lAr-I*) and APCs that have a plural agreement marker (e.g. **abimizler*). Therefore, I suggest that the ban on the structural adjacency of two

[+plural] features need not account for the ungrammaticality of plural noun phrases that have the third person plural agreement marker: these forms are ungrammatical due to a constraint which prohibits phonologically (form-wise) and morphologically (feature-wise) identical morphemes in Turkish.

The first difference is that, as extensively argued in this section, APCs that have a plural agreement morpheme are ungrammatical solely due to the abstract features of plural morphemes, i.e. the ungrammaticality is not sensitive to their forms and the structure is ruled out before vocabulary insertion. However, the adjacency of plural markers in **N-lAr-lAr-I* forms is obtained after the application of the *Local Dislocation Rule* in (36), which happens after vocabulary insertion. Hence, there is no structural adjacency between plural features before vocabulary insertion. That is, if the ungrammaticality of **N-lAr-lAr-I* forms is due to adjacent *-lAr* suffixes, it cannot exclusively refer to their abstract features as they have already been inserted their exponents.

The second difference is the availability of a repair strategy for **N-lAr-lAr-I* forms. As illustrated in (31b), **abilerleri* can be repaired as *abileri*, i.e. if speakers want to convey the meaning 'their brothers', they can use *abileri*. However, there is no repair strategy for ungrammatical associative plurals like **abimizler*: speakers cannot use a different but parallel word form to convey the meaning 'my brother and his associates', which is the intended meaning of **abimizler*. So, the source of ungrammaticality in **abilerleri* can be repaired whereas the source of ungrammaticality in **abimizler*, which is the structural adjacency of two [+plural] features, cannot. Therefore, the ill-formedness of these two forms are due to different violations: one is resolvable, but the other is not.

The observations that **N-lAr-lAr-I* can be repaired as *N-lAr-I* and that it does not have two adjacent [+plural] features before vocabulary insertion show that the ungrammaticality of **N-lAr-lAr-I* cannot be due to the ban on two structurally adjacent [+plural] features proposed in (27). Therefore, we need to posit two things: (i) a constraint which will mark **N-lAr-lAr-I* as ungrammatical by referring to the

phonological identity of its components, and (ii) a repair mechanism to turn **N-lAr-lAr-I* into *N-lAr-I* and avoid the violation of the constraint in (i).

Considering (i) and (ii), I argue that the expected **-lAr+lAr* order is ungrammatical and it is repaired as *-lAr* when each *-lAr* constitutes a morpheme on its own. Thus, I formulate the morphophonological dissimilation operation in (38), which states that if there are two linearly adjacent morphemes, X and Y, such that both morphemes are spelled out by *-lAr*, delete one *-lAr*.

(38)

X	*	Y		
-lAr	*	*-lAr*	⟶	*-lAr*

As Kirby and Sevgi (2023) also notes, the ban on **-lAr+lAr* clusters cannot purely be phonological: when one of them is a part of the stem, the form is grammatical. Hence, the rule should prohibit only consequent suffixes, each of which has the exponent *-lAr*.

(39) *polar-lar*
fleece-PL
'things made of fleece'

Hence, the deletion of *-lAr* in **-lAr-lAr* is a phenomenon of morphophonological dissimilation similar to the deletion of *-s* in **-s-'s* clusters in English —which, in turn, is similar to why 3SG desideratives lack an additional *-sI* as suggested in Footnote 5. When the plural marker *-s* is followed by the possessive marker *-'s*, **-s-'s* is turned into *-s* in English. As Nevins (2012) argues by providing the data in (40), each *s* sound should constitute a morpheme on its own for this rule to apply.

(40) a. the cats' feet are dirty (kæts, *kætsɪz)
b. the pigs' hooves are clean (pɪgz, *pɪgzɪz)
c. the oxen's hooves are dirty
d. Katz's deli (Nevins, 2012, p.105)

The rule in (38) would delete one of the *-lAr*s in *-lAr-lAr* affix sequence regardless of the identity of the morphemes, meaning that the morphemes need not be

[+plural]. However, given that *-lAr-lAr* affix sequence can occur in Turkish only when a plural noun phrase agrees with a third person plural possessor, there is no way to test if the individual morphemes that are realized by *-lAr* are required to be [+plural] morphemes. For this reason, I posit the most general rule by stating that regardless of the featural decomposition of morphemes, if two morphemes are linearly adjacent and each of them have the exponent *-lAr*, the rule in (38) applies.

5.3.3 Interim Summary

To summarize this section, I started by arguing that the ungrammatical forms, i.e. gaps, in the paradigm of associative plural constructions (APCs) are semantically and pragmatically motivated. I posited that the ungrammaticality in 3SG APCs that are formed with the plural marker *-lAr* is due to a morphophonological constraint on the **-(s)I-lAr* suffix order in Turkish. Based on speaker judgments and data from other word forms where the expected order is **-(s)I-lAr* but the surface order is *-lAr-(s)I*, I suggested that the illicit order **-(s)I-lAr* is repaired as *-lAr-(s)I* with a local dislocation rule in Turkish.

Having explained the gap in the 3SG cell, I turned to the systematic gap in APCs with a plural agreement marker. I argued that this gap is a result of a ban on two structurally adjacent [+plural] features in Turkish. By discussing some potentially problematic data, I demonstrated that the analysis makes correct predictions in all cases. Finally, I discussed a well-known instance of haplology in plural noun phrases with third person plural agreement in Turkish (and most other Turkic languages). I argued that this, too, is not problematic for my analysis since the adjacency of plural suffixes is fed by the local dislocation rule that repair **-(s)I-lAr* as *-lAr-(s)I*, showing that it applies after vocabulary insertion at the linear structure (Embick, 2010). Moreover, I argued that **-lAr-lAr* is coalesced into *-lAr* with a morphophonological haplology rule similar to *-s*-deletion in **-s-'s* affix order in English.

5.4 Discussion

I offered three distinct operations in explaining a variety of data observed in possessive constructions in Turkish. The first one is a ban on the structural adjacency of two [+plural] features. I argued that this ban operates at the level of abstract features, for which I used the term morphosyntax. Hence, this constraint is insensitive to the phonological identity of the terminal nodes/morphemes. I provided evidence for this argument by showing that, in addition to the standard associative plural suffix *-lAr*, its form-wise distinct dialectal variant *-gil* is also ungrammatical in the environment of a plural agreement marker. Moreover, I illustrated that associative plural word forms are ungrammatical when there is *any* plural agreement marker in the word. Because the plural agreement markers *-mIz* (1PL), *-nIz* (2PL), and *-lAr* (3PL) are form-wise distinct, I argued that the ban applies at the level of abstract features.

This argument hinges on the architectural assumptions of DM. DM assumes that derivation proceeds step-by-step fashion following a certain order. First the structure is built by morphosyntactic features. At this stage, there is no phonological form. Then, the set of features under terminal nodes is matched with their exponents, which are stored in the Lexicon. This stage of the derivation is called Vocabulary Insertion. Given these assumptions, there is no phonological form in the derived structure before Vocabulary Insertion, which is a distinguishing property of DM and is called *Late Insertion* (Embick & Noyer, 2007; Halle & Marantz, 1993; Harley & Noyer, 1999). Therefore, I argue that the ban on two adjacent [+plural] features operates before Vocabulary Insertion and it is a morphosyntactic ban, since it is not sensitive to the phonological form of the morphemes in associative plural constructions.

Note that the ban on the structural adjacency of two [+plural] features does not rule out structures where the intervening node between the nodes that bear [+plural] is phonologically null. Recall the example in (28), *abinizler* 'they are your(pl) brothers', where *-nIz* is the exponent of 2PL features under D (possessive

agreement) and *-lAr* is the exponent of 3PL features under T (verbal agreement) . I argued that there is an Aspect/Mood node intervening between D and T in this structure, given the existence of forms such as *abinizmişler* 'they are your(pl) brothers' in (29), where the evidential marker *-mIş* is the surface exponent of the intervening Aspect/Mood node (Kelepir, 2001). Thus, there needs to be no node, though null, between two [+plural] features for the ban to label the structure as ungrammatical.

The second operation I posited is a local dislocation rule which turns the order of exponents *-(s)I-lAr* into *lAr-(s)I*. I posited this rule based on a variety of data from different constructions. First, I discussed that associative plural constructions with a third person singular possessor, which have the form (ROOT-*(s)I-lAr*), are ungrammatical. However, some speakers report that they accept the form (ROOT-*lAr-(s)I*) to express the intended meaning of ROOT-*(s)I-lAr* forms. This order is unexpected since the associative plural, which is realized by *-lAr*, is syntactically higher than Poss, which is exponed by *-(s)I*. To a large extent, the order of affixes is assumed to be determined by syntactic hierarchy (Baker, 1985; Bobaljik, 2012; Halle & Marantz, 1993; Harley, 2015). If there is a discrepancy between affix order and syntactic hierarchy, which is the case for *-lAr-(s)I*, it is usually alluded to post-syntactic operations such as local dislocation (Embick, 2010; Embick and Noyer, 2001, 2007; cf. Koopman, 2017). Hence, there seems to be a post-syntactic operation that causes this syntactically unexpected order.

Second, I illustrated that associative plural constructions formed with the dialectal variant *-gil* (X-*(s)I-gil*) are grammatical. Since *-lAr* and *-gil* are form-wise distinct but they are both feature-wise associative plural morphemes, I hypothesized that the ungrammaticality of X-*(s)I-lAr* associative plural constructions is morphophonological. I hypothesized that it is the affix sequence *-(s)I-lAr* that is morphophonologically ill-formed and I argued that it can be repaired by a post-syntactic operation such as a local dislocation rule which changes the order of exponents *-(s)I-lAr* into *-lArI*. Furthermore, I argued that the affixes *-(s)I* and *-lAr*

need not be structurally adjacent based on data from other constructions where the verbal (copular) plural agreement marker *-lAr* follows the possessive marker *-(s)I*. Thus, the rule requires the exponents of morphemes *-(s)I* and *-lAr* only to be linearly adjacent, with no consideration for their structural position, which is in line with previous work on local dislocation operations in DM. For instance, Embick and Noyer (2007) argue that local dislocation is applied after linearization, and it "operates only in terms of linear adjacency, not hierarchical structure" (p.23). Thus, the rule that turns *-(s)I-lAr* into *-lArI* can be defined as a local dislocation operation in DM.[26]

Finally, the third operation that I posited is a haplological rule that deletes one of the *-lAr*s in the suffix sequence *-lAr-lAr*, which occurs when the third person plural marker *-lAr* is concatenated with a pluralized nominal. I argued that this rule is fed by the local dislocation rule, which creates the environment needed for its application. I also suggested that this haplological repair mechanism operates at the same level with the local dislocation rule, given that it is fed by the latter and that it considers the linear adjacency of morphemes that have identical forms.

However, an important question arises regarding the scope of the haplological rule that deletes *-lAr* in *-lAr-lAr*: is it a general rule that deletes one of *any* two morphemes that have identical forms? To put it differently, in addition to having identical forms, do morphemes need to be identical, too, in order for one to be deleted? Before answering this question, one needs to answer "What does it mean for two morphemes to be identical?" Theoretically, a morpheme, what is also called a *subword*, is a terminal node that consists of a set of features within a complex syntactic terminal (a *word* in DM) (Embick & Noyer, 2001). In addition to other principles applied at Vocabulary Insertion (e.g. *Subset Principle*), the set of abstract feature(s) that makes up the terminal determine which vocabulary item will be

[26]Morphemes that have null exponence might be deleted from the linear structure, according to Embick (2010), and this is called *Pruning*. However, if there is no such mechanism, then *-(s)I* and *-lAr* would not be linearly adjacent, given that there are syntactic nodes that have null exponents between them. Therefore, this analysis is compatible with the accounts assuming that null exponents are transparent for operations that occur after linearization, e.g., local dislocation.

inserted into that terminal. Then, if two terminal nodes consist of the same set of feature(s), these two terminal nodes can be stated to be identical morphemes.

Identical morphemes may be inserted different vocabulary items, though, if they have allomorphs that are determined by their morphosyntactic or morphophonological environment. For instance, if we assume that passive markers in Turkish are the same morpheme (Murphy, 2014; Özkaragöz, 1986), i.e. they have identical features, then the constructions that include two consecutive passive markers actually include two identical passive morphemes (cf. Legate, Akkuş, Milena, and Ringe, 2020). However, as illustrated in (41), even though they are identical morphemes, they have different forms depending on their environment.

(41) *Harpte vur-ul-un-ur.*
War-LOC shoot-PASS-PASS-AOR
'One is shot (by one) in the war.' (Özkaragöz, 1986, p.77)

Therefore, two morphemes may be identical despite having different forms. On the other hand, two morphemes may be distinct even though they have the same form. For instance, Turkish has a nominalizer suffix *-mA* and a negation suffix *-mA*, as exemplified in (42).

(42) *yap-ma-ma*
do-NEG-NOM
'not doing'

(42) illustrates that two distinct morphemes that are realized by the same exponent, the negation morpheme *-mA* and the nominalizer morpheme *-mA*, can be linearly adjacent in Turkish. This data provide evidence that Turkish does not have an haplological operation that deletes two linearly adjacent morphemes that are distinct morphemes but have identical forms. That is, to answer the raised question, a haplological rule that deletes one of *any* two morphemes that have identical forms makes incorrect predictions for Turkish.

Furthermore, some argue that a null allomorph is inserted into one of the [+plural] features in the environment of the other [+plural] *-lAr* (Kirby & Sevgi,

2023). However, this analysis would not work in our case since two [+plural] features are not adjacent before vocabulary insertion: they become adjacent after vocabulary insertion. That is, when vocabulary items are inserted, the order of affixes is *-lAr-(s)I-lAr*, given that the first *-lAr* is inserted under Num, *-(s)I* is inserted under Poss, and the final *-lAr* is inserted under D. Then, *-(s)I-lAr* sequence undergoes local dislocation rule to derive the affix order *-lAr-lAr-(s)I*. Only at this point, where vocabulary items have already been inserted, the plural markers become adjacent. Since the vocabulary insertion has already happened at this stage, a null morpheme cannot be inserted into one of the plural morphemes. Hence, because **-(s)I-lAr* local dislocation rule is well-motivated to explain a range of observations in Turkish, the analysis that **-lAr-lAr* haplology is resolved by deleting one of the *-lAr*s is superior to an analysis that utilizes contextual/suppletive allomorphy.

Another possible explanation for the mechanism behind **-lAr-lAr* haplology is that there is a rule in Turkish that deletes one of the morphemes if both the morphemes and their exponents are identical. Such an operation, of course, would require an architecture where the abstract features are visible even after vocabulary insertion. This is in fact what is posited by Harizanov and Gribanova (2013) to explain the distribution of the allomorphs of definiteness marker in Bulgarian: if the rewriting of features is rejected when a feature set is matched with a phonological form, its features are maintained. Yet, such an explanation needs to be further motivated given that the context of a vocabulary item is predominantly defined either by using abstract features or by using the phonological form of a morpheme, but not both (see Gouskova and Bobaljik, 2020 for a detailed review). Hence, I suggest that **-lAr-lAr* haplology is due to an operation that is distinct from vocabulary insertion that deletes one of the *-lAr* suffixes after they are inserted.

Similarly, as you may recall, we do not observe *X-AsI(*-sI)* forms for 3SG desideratives. Instead, the grammatical form is *X-AsI*, which makes them kind of irregular. I suggested in Footnote 5 that this might be the result of a morpho-phonological haplological operation that deletes one *-sI* from **-sI-sI*

sequence[27], just like what is posited for *-*s*-*'s* haplology in English or *-*lAr*-*lAr* haplology in Turkish. Thus, this operation may not be restricted to only -*sI* or -*lAr* and may be applied to a number of cases where identical affixes are expected to be adjacent in Turkish. This may be interesting to explore in future work.

5.5 Summary

This chapter presents an analysis of an interesting *gap* in the paradigm of associative plural constructions is Turkish. I argued that a plural agreement marker and an associative plural marker cannot grammatically combine due to a ban on two adjacent plural features in Turkish. I provided evidence that this ban operates at the level of abstract features before vocabulary insertion. In addition to the systematic ungrammaticality of associative plurals with plural agreement markers, I discussed that a mismatch is observed between the affix order in associative plural constructions that have a third person singular possessor. I explained this data with a local dislocation rule, which accounts for the unexpected affix order in a wide range of word forms in Turkish. Finally, I argued that the impoverished phonological form of plural nominals that agree with a third person plural possessor stems from a haplological operation that repairs the structure by deleting one of the two identical exponents from the linear order of affixes.

[27] To the best of my knowledge, the deletion of -*sI* in 3SG desiderative forms has not been discussed in the literature before. However, the deletion of the possessive marker -*sI* in the environment of another -*s*I in embedded possessive constructions Kunduracı (2013) or in the environment of possessive agreement markers Kornfilt (1986) and Tat and Kornfilt (2018) have been discussed in previous work. The deletion of the possessive suffix -sI in these enviroments is well-known and has been famously dubbed as *Stuttering Prohibition* by Kornfilt. However, my analysis differs from these analyses in that I argue that the deletion operation is sensitive to both phonological and morphological features whereas in other studies it is analyzed as a purely morphological operation.

CHAPTER 6

CONCLUSION

6.1 Conclusion

The primary focus of this thesis is to report a gap (i.e., lack of an acceptable word form) in the third plural cell of the possessive agreement paradigm of -AsI desideratives in Turkish. To this end, first, I introduced desiderative constructions formed with -AsI and showed that it is syntactically required that a verb bearing the desiderative -AsI suffix agree with its genitive subject given the inflectional rules of Turkish. However, I argued that this syntactic requirement is not met in the case of 3PL agreement: no desiderative verb has an acceptable form that satisfies the requirements of 3PL agreement at the form level, meaning that, by definition (Sims, 2015), the 3PL cell of the possessive agreement paradigm of -AsI desideratives is systematically defective for all lexemes that have an acceptable form in all the other cells in the desiderative paradigm.

Moving on to literature on paradigm gaps, I have reviewed influential accounts offered for gaps in various langauges (Albright, 2003b; Gorman & Yang, 2019; Sims, 2015). First, Albright argues that defective forms are an end result of a gradient scale of uncertainty stemming from rules with low confidence. Furthermore, he argues that low-frequency lexemes are more likely to be defective than high frequency lexemes when there is no reliable rule to inflect them. Second, while Gorman and Yang agree with Albright in that gaps arise when there is no productive rule to inflect a form that is not frequent enough to be stored as an exception in the lexicon, they argue that productivity is caategorical. Namely, they argue that if a rule cannot withstand the number exceptions in its domain based on a threshold determined by the Tolerance Principle (Yang, 2005, 2016), it is not productive and this is where most gaps are attested. Third, Sims argues that not all gaps can be explained with rule-productivity. She posits that while some defective forms have synchronic causes, some gaps require idiosycratic or morpho-lexical specification.

Having reviewed influential accounts of gaps, I turn to provide empirical evidence from corpus frequencies and an acceptability judgment experiment for the

defectiveness of 3PL desiderative forms. Corpus search showed that there is only 2 tokens that belong to the arguably defective 3PL cell in the desiderative paradigm. However, a paradigm gap is not the absolute absence of a form in a given cell; rather, it is the unexpectedly low frequency of a word form given the expectations based on language internal factors such as morphosyntax and semantics (Sims, 2015). Therefore, I presented evidence from the corpus frequencies of semantically similar constructions formed with -iste 'to want' and morphosyntactically similar nominalized constructions formed with -mA that the relative frequency of 3PL desiderative word forms is indeed unexpectedly low given the relatively high frequency of 3PL agreeing forms in these similar constructions. Thus, there is ample evidence for the defectivity of 3PL desiderative word forms in Turkish based on usage frequencies.

I conducted an acceptability judgment experiment ($N = 181$) to test whether 3PL desiderative word forms are defective and whether token frequency has a role in its defectivity. The results of the experiment indicate that desiderative word forms bearing a 3PL agreement marker are rated significantly worse than desiderative word forms with other agreement markers. Furthermore, the findings suggest that lexemes that have high-frequency are even more defective than low-frequency lexemes when used in the 3PL desiderative form. Combining this finding with the atypical frequency distributions in the corpus, I argued that in addition to competition accounts (e.g. Albright, 2002; Gorman and Yang, 2019), negative evidence accounts (e.g., Sims, 2015) are also needed to account for the 3PL gap in Turkish desideratives.

After providing evidence for the defective behavior of 3PL desiderative forms, I sketched two different analyses attempting to explain why 3PL desiderative forms are defective. In the first, usage based analogical analysis, I argued that there is a competition between two forms within the desiderative paradigm, namely the 1SG and 3SG, to be the base for producing the 3PL desiderative form, which is virtually absent in the input, but that speakers cannot choose either of the bases reliably. I showed that this is an expected result if we assume that, first, inflected forms are built

on another inflected form (i.e., base) within the same paradigm, and second, bases are selected considering multiple criteria such as morphosyntactic markedness (Bybee, 1985) and similarity, type (Yang, 2016) and token frequency (Bybee, 1985) and informativeness (Albright, 2002), and third, there may be multiple bases in a paradigm (contra Albright, 2002). I argued that while 1SG is superior to 3SG in terms of some criteria, it is inferior than 3SG in terms of other criteria. Given that there is no definitive winner and that selecting a different base leads to a different form due to the irregularity in the form of 3SG desideratives, speakers feel uncertain about the correct form of the 3PL, which results in a gap.

In the second analysis, I offered an analysis in the framework of Distributed Morphology (Halle & Marantz, 1993). I proposed that what separates speakers who produce X-AsI-lArI forms from those who produce X-A-lArI forms is minimally differing vocabulary items and post-syntactic operations in their grammar. I argued that this variation can be represented neatly in a framework like DM. However, I discussed that representing the gap is not straigthforward in within an architecture like DM given the deterministic nature of the vocabulary insertion algorithm. Therefore, I suggested that speakers who report a gap differ from speakers who do no report a gap only in that while the former has been exposed to negative evidence, the latter has been exposed to a sufficient amound of non-variant 3PL desiderative forms. I argued that this difference in their linguistic experience lead only the first group to conclude that 3PL desideratives are defective. Comparing these analyses, I argued that the usage-based analogical account is better suited to explain the desiderative gap than the DM account.

Following the discussion of the desiderative gap, I turned to another interesting set of gaps in the paradigm of associative plural constructions is Turkish. In order to explain the gaps in associative plurals with a plural possessive agreemeent marker, I argued that a plural agreement marker and an associative plural marker cannot grammatically combine due to a ban on two adjacent plural features in Turkish. I provided evidence that this ban operates at the level of abstract features

before vocabulary insertion. Then, I turned to a discrepancy in the suffix ordering in associative plural constructions that have a third person singular possessor. I explained this data with a local dislocation rule which turned out to be extremely useful in accounting for unexpected suffix orders in a wide range of word forms in Turkish. Finally, I argued that the impoverished phonological form of plural nominals that agree with a third person plural possessor is caused a haplological operation that repairs the structure by deleting one of the two identical exponents from the linear order of affixes.

The different kinds of gaps that have been discussed throughout this thesis suggest that defectiveness may be caused by a variety of factors such as indeterminacy of grammar in selecting between multiple forms, as in the case of 3PL desideratives, or illicit configurations that are categorically ruled out by grammar, as in the case of associative plurals. Therefore, in order to understand the source of defectiveness in a form, all possible roots, ranging from historical causes to synchronic ones, should be considered, and, if possible, the derivation of the defective form should be analyzed rigorously.

A major implication of this study is that our linguistic models should be compatible with both categorical and stochastic generalizations; however, we need to be careful in disentangling domain specific processes from domain general processes. For instance, tracking statistics is considered to be a domain general ability. Hence, if speakers' acceptability judgments are affected by the distributional properties of the input as implied by negative evidence studies, then we need to be careful in deciding whether a form is (un)grammatical because of its grammatical properties or it is (un)grammatical due to its distributional properties. Therefore, understanding how domain general and domain specific mechanisms interact to make up what we call *language* is crucial for developing rigorous models of language.

To conclude, I hope that this study on defectiveness in Turkish sparks an interest in this field, especially in closely related Turkic languages. Some potentially promising follow up studies that can complement the findings of this thesis include,

but are not limited to, (i) conducting follow-up experiments to test the robustness of the interaction effect between frequency and defectiveness and to test the hypothesis that 3PL desiderative forms are built on 1SG desideratives for some speakers and 3SG desideratives for others, (ii) investigating the related morphological paradigms of closely related Turkic languages to see if similar patterns of defectiveness exist, and (iii) exploring the implicative structure of the possessive paradigm as a whole.

APPENDIX A

ETHICS COMMITTEE APPROVAL

Evrak Tarih ve Sayısı: 13.01.2022-47879

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER YÜKSEK LİSANS VE DOKTORA TEZLERİ ETİK İNCELEME KOMİSYONU
TOPLANTI KARAR TUTANAĞI

Toplantı Sayısı	:	27
Toplantı Tarihi	:	13.01.2022
Toplantı Saati	:	10:00
Toplantı Yeri	:	Zoom Sanal Toplantı
Bulunanlar	:	Prof. Dr. Ebru Kaya, Prof. Dr. Fatma Nevra Seggie, Dr. Öğr. Üyesi Yasemin Sohtorik İlkmen
Bulunmayanlar	:	

Muhammed İleri
Dilbilim

Sayın Araştırmacı,
"Türkçede Paradigma Boşluğu" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2022/03 sayılı başvuru komisyonumuz tarafından 13 Ocak 2022 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya çevrimiçi olarak katılımı ve oybirliği ile alınmıştır. COVID-19 önlemleri kapsamında kurul üyelerinden ıslak imza alınamadığı için bu onay mektubu üye ve raportör olarak Fatma Nevra Seggie tarafından bütün üyeler adına e-imzalanmıştır.

Saygılarımızla, bilgilerinizi rica ederiz.

Prof. Dr. Fatma Nevra SEGGIE
ÜYE

e-imzalıdır
Prof. Dr.Fatma Nevra SEGGIE
Raportör

SOBETİK 27 13.01.2022

Bu belge 5070 sayılı Elektronik İmza Kanununun 5. Maddesi gereğince güvenli elektronik imza ile imzalanmıştır.

APPENDIX B

Experiment items

B.1 Experimental items

B.1.1 High frequency, Defective (3pl)

1. Partide tatlı yiyesileri varmış.
2. Bu sabah müşteriyi arayasıları yokmuş.
3. Bu yaşta sokakta kalasıları yokmuş.
4. Yazın sınava giresileri yokmuş.
5. Hastanede merdivenden çıkasıları varmış.
6. Haftaya bisiklet alasıları varmış.

B.1.2 Low frequency, Defective (3pl)

1. Bugün ufaklığı şımartasıları varmış.
2. Yarın sabah halı silkeleyesileri varmış.
3. Pazarda satıcıyı oyalayasıları yokmuş.
4. Dün akşam ayakkabı boyatasıları yokmuş.
5. Yarışmada ödülü bölüşesileri yokmuş.
6. Yayında kaydı dinletesileri varmış.

B.1.3 High frequency, Non-defective

1. Yarın akşam antremana başlayasım yok.
2. Ekranda gerçeği söyleyesiniz yokmuş.
3. Yarın akşam zanlıyı göresiniz varmış.
4. Müsabakada taraftara bakasın yokmuş.

5. Hafta sonu barınağa gidesimiz var.

6. Bu akşam ödevi yapasın varmış.

B.1.4 Low frequency, Non-defective

1. Krizde vatandaşı kazıklayası varmış.

2. Programda seyirciyi coşturasımız vardı.

3. Mahkemede katille yüzleşesiniz varmış.

4. Okulda hocayla dertleşesim yok.

5. Görüşmede arabulucuyla uzlaşasın yokmuş.

6. Gece kule gözetleyesi yokmuş.

B.2 Filler items

B.2.1 Grammatical

1. Bana makarna pişireceğine söz vermiştin.

2. Yarın mahkemeye çıkarılacakmışsınız.

3. Yarın akşam ailecek film izleyeceğiz.

4. Anneni özlediğini bilmiyordum.

5. Genellikle yemekten sonra mutfağı toplarım.

6. Nişanlısıyla tanışmayı siz de çok istiyormuşsunuz.

7. Şiir okuyuşuna hayran kaldım.

8. Suçsuz olduğunuzu kanıtlamaya çalışıyorduk.

9. Motorlar olay yerinden hızla uzaklaştı.

10. Evin duvarlarını tablolarla süsleyin.

11. Metroya binmekten çok yoruldular.

12. Yönetmenler oyuncuları birbirine benzetmişlerdi.

13. Bu projeyi hayata geçirdiğimizi duymuşsunuz.

14. Sırtınızı devlete dayamışsınız.

15. Yılbaşı için tavuğu haşlamana şaşırdık.

16. Dün akşam evde fasulye ayıkladım.

17. Ders çalışmam herkesi hayrete düşürdü.

18. Kedinin kumunu temizlerken yere dökmüşsün.

19. Sen her zaman başarılı oldun.

20. Senin onu sevdiğini anlamışlar.

21. Bu cinayetin failini bulmuşlar.

22. Her hafta en az bir kitap bitirirdik.

23. Benim için bu kadar çabalaması beni sevdiğini gösteriyor.

24. Bu arabanın yakıtı çok ekonomik.

B.2.2 Ungrammatical

1. Kutuyu satması çok zahmetli olmakta değil.

2. Sinema etkinliğine sıkıcılaştırmamızda ısrarcısınız.

3. Benle arkadaşlarım hafta sonu takıldım.

4. Perşembe pazarındaki elmaları çürüdük.

5. Dün gece herkesle selam verdiğimi tespitliyormuşsunuz.

6. Şu deveyi omuzlayabileceğini düşünmüştüktü.

7. Sabahleyin yeri düşmüşsün galiba.
8. Koltuklar tepelerinde oturduğunu ezberledik.
9. Biz sizinle geceleri mekanlarda çıldırıyorsunuz.
10. Senden hoşlandığımız duyulduk.
11. Kediler koşarak çöpe saklandık.
12. Yazınki tatil planım bozuyorlar.
13. Yarın en parlak dimağlar göç etmeyi kararlaştırmışlar.
14. Dersaneye yazıldığımıza kimseye bahsetme.
15. Yarın aylaklık yüzünden kalemler aradım.
16. Yarın bütün onurunu ayaklar altında ezmekteyim.
17. Ceplerimizden fırladığını kıskanıyor ve heyecanlandırdım.
18. Yarın işi bırakacağından mutsuzlarmıştı.
19. Bu akşam memleketten sel basmış.
20. Kendimi büyük sanıyormuşsun.
21. Seyir halindeyken şarkı dinlemişsindi.
22. Akşamki rüzgar korkunç şekilde binayı esti.
23. Seneye bir köye inzivaya çekilmişsin.
24. Çorbacı yerleri siliyorlar.

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