Parasitic Gaps in Derivational Grammar

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Abstract

This master thesis will explore the properties, behaviour and theoretical implications of the syntactic phenomenon called “parasitic gaps”. The main aim of this thesis is to develop a theory of parasitic gaps that enables an explanation in terms of derivational grammar, i.e. the grammaticality of parasitic gap sentences will depend on the possibility of deriving them.

In the first part of the thesis (chapter 2 and 3), I will review the knowledge about parasitic gaps that has been collected over the last thirty years.

The second part of the thesis (chapter 4, 5 and 6) will develop and explore a new account of parasitic gaps which is fully derivational and provides an explanation for the properties of parasitic gaps. The new account will be in line with the principles of the minimalist framework (Chomsky 1995, 2000, 2001). The main idea of this account will be that lexical items can be duplicated in the numeration, that these duplicates will independently enter the derivation and that the two duplicates have to come together again in the course of the derivation. By integrating these ideas into the island model of Müller (2010), I will derive the puzzling property of parasitic gaps that the parasitic gap and its antecedent can be separated by one barrier but not by more than one barrier. Additionally, the new system is able to derive several other properties of parasitic gaps. The new theory will then be compared to the operator-based account of Nissenbaum (2000) showing that his theory is inferior to mine in several aspects.

The final part of this thesis (chapter 7) is devoted to the question if parasitic gaps are a phenomenon that is only interesting for English (and other languages) or if they exist in German as well.
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Chapter 1

Introduction

In the beginning of the 80’s, a new syntactic phenomenon attracted the interest of linguists. This new phenomenon was called “Parasitic Gaps”. Parasitic gaps are gaps that are not licensed by its own antecedent but rather use the antecedent of an independently existing gap. In that sense, these gaps are parasitic. The best method to distinguish a parasitic from a real gap is to test if the gap in question can occur independently.

In the sentence in (1), two gaps occur which both refer to the same antecedent, that is, who. Since each gap usually has its own antecedent, one of the two gaps has to be parasitic.

(1) Who would you like to meet — without first getting to know —?

The test in (2) reveals that the parasitic gap is the one in the without-clause.

(2) a. Who would you like to meet — without first getting to know his mom?

b. *Who would you like to meet his mom without first getting to know —?

Throughout this thesis, I will mark parasitic gaps with the notion $pg$ while real gaps, or licensing gaps, are marked by $t$.

Constructions with parasitic gaps are subject to discussion for at least
the last five decades and attracted increasing interest of theoretical grammar especially in the last three decades. The phenomenon was probably first noted by Ross (1967:191ff.) even though the name “parasitic gap” was not assigned at this time.

The name “parasitic gap” comes from Engdahl (1983) (and independently from Taraldsen (1981)) who provided the first major study of these constructions.

Parasitic gaps have always presented a challenge to grammatic theories of any kind and the question has always been how such constructions like in (1) can be possible at all.

This question is particularly interesting from the point of view of derivational grammars which assume that sentences are constructed step by step and that syntactic constraints which rule out ungrammatical sentences are the outcome of rules and constraints about derivation.

The question of this thesis is, therefore, how parasitic gaps can be captured in a derivational grammar. More precisely, the questions are (i) what is a parasitic gaps in terms of derivational syntax, (ii) how can the dependence between the parasitic gap and the licensing gap be established and (iii) how can a theory explaining what parasitic gaps are and in which way they are dependent on the licensing gap account for the various properties of parasitic gaps. All these question should be answered in the course of this thesis. The theory that I will develop is carried out in the minimalist framework, as suggested by Chomsky (1995) and subsequent works.

The thesis is structured as follows. Chapter 2 provides the empirical description of parasitic gaps. I will provide an overview of the distribution of parasitic gaps using examples from different languages and summarize the main properties of parasitic gaps that have been noted since the topic was raised by Taraldsen (1981) and Engdahl (1983).

In chapter 3 I will summarize the most important theories of parasitic gaps that have been developed throughout the last thirty years. The main parameter
that distinguishes these theories will be the question if parasitic gaps are traces
in the sense that they are created by movement of some category or if they are
in fact empty categories that don’t move. The overview of chapter 3 will contain
theories of Chomsky (1982); Cinque (1990); Kayne (1983); Chomsky (1986);
Nissenbaum (2000) and Nunes (2001). Even though each of these theories
has various variants, it is beyond the scope of this thesis to explain every
one in detail. Hence, theories like the ones of Longobardi (1985); Frampton
(1990); Munn (1992); Manzini (1994); Postal (1998); Ouhalla (2001) cannot be
considered here. The references of these theories are, however, given below.

After having summarized the existing knowledge about parasitic gaps, I
will go through a new analysis of parasitic gaps in detail. The analysis that I
suggest for parasitic gaps is different from the ones above in that it involves
syntactic mechanisms that haven’t been proposed before. In a nutshell, I
propose that parasitic gaps are the result of a defective numeration, i.e., a
numeration that has not enough items to guarantee a successful derivation. To
avoid a new calculation of the numeration, material that is already present in
the numeration is duplicated. The price of duplication is, however, that the
duplicated material has to come together again with the original one during the
course of the derivation. This process will be called Fusion because it strongly
resembles the morphological operation Fusion (Halle and Marantz (1993)). That
means, the properties of parasitic gaps fall out from the conditions when two
elements can fuse.

Chapter 5 will, then, look back at the properties of parasitic gaps and com-
pare the new theory’s descriptive adequacy with the perhaps most challenging
theory of Nissenbaum (2000) which is a minimalist version of Chomsky’s (1986)
theory. The result will mainly be that although the two theories work with
totally different syntactic means, they make comparable predictions for the
properties of parasitic gaps.

After revisiting the properties of parasitic gaps, chapter 6 shows that the
new theory developed in chapter 4 is empirically superior to the theory of
Finally, the last chapter is devoted to the question if parasitic gaps are not only part of the grammar of English and other languages but also relevant for German. The result of the discussion will be that although parasitic gap constructions and coordination constructions in German have a lot in common, an analysis of them as coordination constructions is highly problematic and therefore questionable.

Chapter 8 summarizes and concludes the discussion.
Chapter 2

Properties of Parasitic Gaps

The distribution of parasitic gaps is manifold on the one hand but restricted by several constraints on the other hand. This problematic distribution forces most theories to concentrate only on some properties.

In this section, I will provide a discussion of all the properties of parasitic gaps that are known to me.

2.1 Distribution

2.1.1 The Contexts

Parasitic gaps occur in constituents that are typical islands for movement. In English, parasitic gaps can be found in adverbial, relative and complement clauses. Furthermore, they can occur inside DPs. Examples of all these contexts are given in (1) to (5).

(1) *Untensed adverbial clause*
   Which article did John file \( t \) without reading \( pg \)?  
   *Engdahl (1983:5)*

(2) *Tensed adverbial clause*
   Which colleague did John slander \( t \) because he despised \( pg \)?
   *Engdahl (1983:11)*
CHAPTER 2. PROPERTIES OF PARASITIC GAPS

(3) Complement clause
Who did you tell \( t \) that we were going to vote for \( pg \)?

Engdahl (1983:11)

(4) Relative clause
He is a man that everyone who gives presents to \( pg \) likes \( t \).

Chomsky (1986:58)

(5) Determiner phrase
Who did you give a picture of \( pg \) to \( t \)?

Culicover (2001:33)

According to Engdahl (1983), the acceptability of parasitic gaps differs between the various contexts they can appear in. She arranges the contexts in the following accessibility hierarchy. The hierarchy implies that when a parasitic gap can occur in a context that is low on the hierarchy it must also be able to occur in all contexts that are higher on the hierarchy.

(6) Accessibility hierarchy for occurrences of parasitic gaps (Engdahl (1983:9))

\[
\begin{align*}
\text{manner adverbs} & \quad \lor \\
\text{temporal adverbs} & \quad \lor \\
\text{purpose clauses} & \quad \lor \\
\text{that clauses} & \\
\text{than clauses} & \\
\text{when clauses} & \\
\text{because clauses} & \\
\text{cond. if clauses} & \\
\text{relative clauses} & \\
\text{indirect questions} & \quad \lor \\
\end{align*}
\]

\begin{align*}
\text{untensed domains} & \\
\text{tensed domains} &
\end{align*}

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2.1. DISTRIBUTION

In languages other than English, the contexts for parasitic gaps are much more restricted. In German, for example, parasitic gaps can only occur in untensed adverbial clauses that are introduced by the conjunctions *um, ohne* or *anstatt*.

(7) a. Wen hat er ohne zu kennen t geküsst?
   Who has he without to know kissed
   “Who did he kiss without knowing?”

b. *Wen hat er bevor er kennengelernt hat t geküsst?*
   Who has he before he get.to.know has kissed?
   “Who did he kiss before he got to know?”

c. *ein Mann den [DP jeder der] t mag
da a man who everyone who knows likes
   “a man who everyone who knows likes”

As far as I know, the cross-linguistic distribution respects the accessibility hierarchy in (6).

2.1.2 Type of Movement

The next parameter of the distribution of parasitic gaps is the type of movement that can license parasitic gaps.

Parasitic gaps are licensed by types of movement that used to be characterized as Ā-movement (Chomsky (1986)). These movements can be unbounded like wh-movement, relativization or topicalization or bounded like scrambling, heavy NP shift (HNPS) or clitic movement. Examples of each movement type are given in the following sentences.

(8) Wh-movement
   Which article did John file t without reading *pg*?  \[Engdahl (1983:5)\]

(9) Relativization
   He is a man that everyone who gives presents to *pg* likes *t*.
   \[Chomsky (1986:58)\]
CHAPTER 2. PROPERTIES OF PARASITIC GAPS

(10) **Topicalization**
The paper, we filed \( t \) before we could read \( pg \).

*Alexopolulou and Kolliakou* (2002:205)

(11) **Heavy NP shift**
John offended \( t \) by not recognizing \( pg \) immediately his favourite uncle from Cleveland.

*Engdahl* (1983:12)

(12) **Object raising**
These papers were hard for us to file \( t \) without reading \( pg \).

*Engdahl* (1983:12)

(13) **Scrambling**
Peter hat den Mann [ohne \( pg \) zu kennen] \( t \) gegrüßt.
Peter has the man without to know greeted
“Peter has greeted the man without knowing him.”

(14) **Clitic movement**
Lo archivaron \( t \) sin leer \( pg \).
it they-filed without to-read
“They filed it without reading (it).”

*Campos* (1991:118)

2.1.3 **Grammatical Function of the Parasitic Gap**

Finally, parasitic gaps can take over various functions in the clause. In most cases they are the direct object of the verb. This is the case for most examples above. But parasitic gaps can also occur in subject position like the following example shows.

(15) **Finite Subject P-Gap**
Which people did you invite \( t \) to the party without thinking \( pg \) would actually come?

*Levine et al.* (2001:186)
2.2. CONSTRAINTS OF THE DISTRIBUTION OF PARASITIC GAPS

It has been claimed that only NPs\textsuperscript{1} can be antecedents for parasitic gaps (see below). However, Engdahl (1983) notes that Swedish allows for non-NP parasitic gaps. Furthermore, Levine et al. (2001) give examples showing that also English has non-NP parasitic gaps. The sentence in (16-a) shows that parasitic gaps can be non-verbal predicates, too.

(16) Non-NP parasitic gaps

a. I wonder just how nasty you can pretend to be without actually becoming pg.

b. [That Robin is a spy] would naturally be difficult to refute without (someone) having conjectured pg.

But even though parasitic gaps can be non-NPs (complement clauses, predicate adjectives), it seems that they cannot be modifiers.

(17) *How long does John drink t before lecturing pg? Postal (1994:64)

After having discussed the three parameters of the distribution of parasitic gaps, the next part of this chapter will deal with the constraints that parasitic gaps are subject to.

2.2 Constraints of the Distribution of Parasitic Gaps

The wide distribution of parasitic gaps is additionally complicated by a big amount of constraints. The properties of parasitic gaps that result from these

\textsuperscript{1}The question if nominal categories are DPs or NPs is an orthogonal question to this thesis and cannot be discussed here. Because of the ongoing discussion which structure of nominal categories is right (see e.g. Georgi and Müller (2010)), I will refer to them sometimes as DP and sometimes as NP. The assumption of this thesis is, however, that structurally, nominal categories are headed by determiners, i.e., they are DPs.
constraints have sometimes even been used to define what is a parasitic gap and what is not a parasitic gap (e.g. Fanselow (2001)). In what follows, I will list all constraints about parasitic gaps that are known to me. Most constraints, however, are quite controversial and not accepted universally. So perhaps, they shouldn’t been used to define the term parasitic gap.

2.2.1 Overt Movement

The first constraint about parasitic gaps is well known: Parasitic gaps must be licensed in narrow syntax by categories that are already antecedent for another gap, i.e. they must be licensed at S-Structure. (cf. Culicover (2001:5), Engdahl (1983)).

(18) a. *I forget who filed which articles, without reading pg?

b. *Who told whom that we were going to vote for pg?

The sentences in (18) are ungrammatical because the movement of the wh-operator happens at LF and not in narrow syntax or, in terms of GB theory (Chomsky (1986)), at S-Structure. The antecedent of the parasitic gap in (18-a) is which article. However, which article has not been moved to Spec,CP of the embedded sentence and, thus, the sentence is ungrammatical. The reason for the ungrammaticality of (18-b) is obviously the same as in (18-a).

One exception to this constraint should be mentioned: In some languages, for example in Spanish, parasitic gaps can be licensed by in situ elements (Campos (1991)).

(19) ¿Tú archivaste cuál artículo sin leer pg?

you filed which article without to.read

“Which article did you file without reading?” (Campos (1991:120)
2.2. CONSTRAINTS OF THE DISTRIBUTION OF PARASITIC GAPS

Campos (1991) claims that in Spanish, wh-movement is not necessary to form questions. If this is true, one could assume that cuál artículo has actually moved but it is spelled out in situ.

An important observation comes from Nissenbaum (2000) who argues that this licensing constraint for parasitic gaps is only partially correct. Sentences like (20) show that in situ elements can license parasitic gaps also in English.

(20)  
\begin{align*}
\text{a. } & \text{[Which senator]}_1 \text{ did you persuade } t_1 \text{ to borrow } [\text{which car}]_2 \text{ [after getting [an opponent of } p_1] \text{ to put a bomb in } p_2] ? \\
\text{b. } & \text{*[Which senator]}_1 \text{ did you persuade } t_1 \text{ to borrow } [\text{which car}]_2 \text{ [after putting a bomb in } p_2]? 
\end{align*}

(21)  
\begin{align*}
\text{a. } & \text{[Which kid]}_1 \text{ did you give } [\text{which candy bar}]_2 \text{ to } t_1 \text{ [without first telling [a parent of } p_1] \text{ about the ingredients in } p_2] ? \\
\text{b. } & \text{*[Which kid]}_1 \text{ did you give } [\text{which candy bar}]_2 \text{ to } t_1 \text{ [without looking at the ingredients in } p_2]? 
\end{align*}

These examples show that if there are two wh-operators there have to be two parasitic gaps they license. The corresponding examples in (20-b) and (21-b) are bad because there is only one parasitic gap. These data will be extensively discussed in section 5.1.

2.2.2 Anti-c-command

The second constraint is, again, quite widely accepted. Parasitic gaps must not be c-commanded by the true gap. The consequence of this constraint is that the true gap can, in most cases, not be in subject position like (22) shows.

(22)  
\begin{align*}
\text{a. } & \text{*Which articles } t \text{ got filed by John without him reading } p_2? \\
\text{b. } & \text{*Who } t \text{ sent a picture of } p_2? 
\end{align*}
And again, there seems to be an obvious exception to this constraint. In English, parasitic gaps can occur in complement sentences of ditransitive verbs.

(23) Who did you tell that we were going to vote for pg?

### 2.2.3 Island Sensitivity

The next constraint (also known as subjacency effects) has been first noticed by Kayne (1983). Although parasitic gaps occur in constituents that are islands for movement, the island with the parasitic gap must not be embedded in another island. Hence, (24-a) is grammatical while (24-b) is not.

(24) a. the article [which we filed t [without reading pg]]

   > Culicover (2001:27)

   b. *the article [which we filed t [without meeting the person [who wrote pg]]]

   > Culicover (2001:27)

But as usual, there is an exception to this constraint. Lee (1988, 1998) notes that Korean parasitic gaps have nearly the same behaviour like their English counterparts but that Korean doesn’t exhibit this effect.

(25) a. *the man who I decided to interview t [without calling you [before I spoke to pg]]

   > Lee (1998:350)

   b. ney-ka pg mal-ul kelepoki ceney ne-eykey cenwhahaci anhko t I-NOM speak to before you-DAT telephone not intebyuw hakiro kyelcenghan salam to interview decide man

   > Lee (1998:350)

### 2.2.4 Æ-Movement

Furthermore, the antecedent of a parasitic gap has to be in an Æ-position, i.e., A-movement like passive or raising doesn’t license a parasitic gap (cf. Engdahl (1983:13)).
2.2. CONSTRAINTS OF THE DISTRIBUTION OF PARASITIC GAPS

(26) a. *John was killed \( t \) by a tree falling on \( pg \).
    b. *Mary tried \( t \) to leave without John’s hearing \( pg \)\(^2\).
    c. *Mary seemed \( t \) to disapprove of John’s talking to \( pg \).

As far as I know, there is no exception to this constraint.

2.2.5 Referential Nominals

Parasitic gaps are claimed to be only licensed by referential nominals (Cinque (1990); Frampton (1990); Emonds (1985); Aoun and Clark (1985); Koster (1987); Postal (1993, 1994, 2001)).

The following English examples from Postal (1993:736) show that non-NPs cannot license parasitic gaps.

(27) a. *Sick though Frank was \( t \), without looking \( pg \), he didn’t visit a physician.
    b. *How \( 2 \) did Deborah cook the pork \( t_2 \) after cooking the chicken \( pg_2 \)?

Furthermore, Cinque (1990) gives the following Italian examples that should prove that parasitic gaps do not only have to be nominals but also referential.

(28) a. *Quanti chili pesa \( t \) [senza credere di pesare \( pg \)]? how.many kilos he.weighs without to.believe in to.weigh

\(^2\)The structure in (26-b) is a case of control. Basically, there are two theories which account for this phenomenon. One of these theories involve an empty category that is inserted in the subject position of the embedded clause and bound by the matrix subject (Chomsky (1981)) and one theory assumes that the subject of the embedded clause moves into the position of the matrix subject (cf. Boeckx et al. (2009)).

(i) a. Mary\(_1\) tried [PRO\(_1\) to leave].
    b. Mary tried [Mary to leave].

Only if control is movement, control structures are relevant for the discussion.
“How many kilos does he weigh without believing he weighs?”

b. *Quante settimane ha passato t a Berlino [senza aver how many weeks he has spent in Berlin without have voluto passare pg a Londra]? wished to spend in London
“How many weeks did he spend in Berlin without wanting to spend in London?”

c. *Che posso fare t stasera per cena [senza esser in obbligo di what I can do tonight for dinner without be in debt to mangiare pg]? eat
“What can I do tonight for dinner without having to eat?”

In all examples in (28), the antecedents of the parasitic gaps are non-referential. In (28-a) it is an amount, in (28-b) it is a duration and in (28-c) the antecedent is the non-referential che.

Nevertheless, it has also been argued that the constraint that parasitic gaps have to be referential nominals maybe doesn’t exist.

First of all, it seems to be the case that some languages allow non-referential NP parasitic gaps [Engdahl (2001); Chao and Sells (1983)].

(29) I met every/each/no influential professor that John sent his book to t in order to impress pg.

However, such sentences don’t present a challenge for the claim that parasitic gaps have to be referential because Chao and Sells’s (1983) understanding of referentiality differs from the one of Cinque’s (1990).³

Furthermore, there seems to exist data that obviously involve parasitic gaps licensed by a non-NP antecedent. The following data are from Engdahl (1983).

³Thanks to Gereon Müller for pointing that out to me.
2.2. CONSTRAINTS OF THE DISTRIBUTION OF PARASITIC GAPS

(30) a. \([\text{PP } \text{Till himlen}] \text{ är det inte säkert att } [\text{NP alla } [\text{Sr } \text{ som}]
   \text{ To heaven it is not certain that everyone who länge} [\text{PP } pg/det]] \text{ kommer } [\text{PP } t].
   \text{ longs } \ldots \text{ there get}
   \text{ “It is not certain that everyone who longs to (go to) heaven gets to go there.”}
   \text{ Engdahl (1983:17)}

b. \([\text{AP } \text{Fattig}] \text{ vill } [\text{NP ingen } [\text{Sr } \text{ som någonsin varit } [\text{AP } pg/det]] \text{ bli } [\text{AP } t] \text{ igen}.
   \text{ Poor } \text{ wants no-one } \text{ who ever } \text{ been } \ldots \text{ it become } \text{ again}
   \text{ “No one who ever has been poor wants to become poor again.”}
   \text{ Engdahl (1983:17)}

The claim that parasitic gaps have to be referential nominals is closely tied to the claim that they involve resumption. Since resumptive pronouns can only be bound by referential nominals, various scholars have argued that parasitic gaps are actually empty resumptive pronouns (see below). Now, \text{Engdahl (1983)} claims that the possibility of non-NP antecedents is given in Swedish because Swedish has more pro-forms than English. This would explain why in Swedish PPs and APs can be antecedents of parasitic gaps.

But there are some data that can’t be captured with this explanation. \text{Levine et al. (2001:185)} provide English sentences that show that also English allows for non-nominal antecedents.

(31) a. How harshly do you think we can treat them \( t \) without in turn being treated \( pg \) ourselves?

b. That’s the kind of table on which it would be wrong to put expensive silverware \( t \) without also putting \( pg \) a fancy centerpiece.

c. I wonder just how nasty you can pretend to be \( t \) without actually becoming \( pg \).

d. [That Robin is a spy] would naturally be difficult to refute \( t \) without (someone) having conjectured \( pg \).
2.2.6 Antipronominal Contexts

One very interesting constraint of parasitic gaps brought up by Cinque (1990) (see also Postal (1993, 1994, 2001)) is that they are blocked in antipronominal contexts. The distribution of parasitic gaps seems to show the same behaviour as weak definite pronouns, i.e., all contexts that doesn’t allow weak pronouns also prohibit the occurrence of parasitic gaps. Postal (2001:225) shows this property, amongst others, with the following examples.

(32)  
(a) It was *her/HER that the drug helped. 
(b) *Which child did everyone who believed it was pg that the drug had helped see t the hospital?

(33)  
(a) Mirabelle dyed her sheets purple/*it. 
(b) *the color that everyone who dyed their sheets pg praised t.

Postal (1993), nevertheless, points out that the distribution of definite pronouns and parasitic gaps is not identical.

(34)  
(a) *Frank attends Yale, but Sandra does not attend it. 
(b) Which college did she apply to t without really wanting to attend pg? Postal (1993:745)

He suggests that there is a distinction between surface and nonsurface antipronominal constraints. Parasitic gaps are, however, only subject to non-surface constraints.

The whole situation is further complicated by the data in (35) (cf. Postal (2001:227)).

(35)  
(a) Which child did everyone who saw pg believe that the drug had helped t? 
(b) *Which child did everyone who saw pg believe it was t that the drug had helped t?
2.2. CONSTRAINTS OF THE DISTRIBUTION OF PARASITIC GAPS

c. Which child did everyone who saw Gail believe it was \( t \) that the drug had helped \( t \)?

Sentence (35-b) shows that it is not only the parasitic gap that is incompatible with antipronominal contexts. The licensing gap \( t \) in (35-b) is in a cleft position which is an antipronominal context.

Postal (2001:227), therefore, formulates the following constraint in (36).

(36) No parasitic gap, even in an otherwise licit parasitic gap position, is licit if its licensing gap is one of a large class of antipronominal contexts.

2.2.7 No Reflexives or Reciprocals

There are three more constraints about parasitic gaps that I want to mention here. The first one is about possible antecedents of parasitic gaps. Postal (2001:224f.) notes that reflexives or reciprocals can never be antecedents for parasitic gaps.

(37) a. *Himself\(_1\), Mike\(_1\) praised \( t \) after describing \( pg_1 \) to Mary.
    b. *It was herself\(_1\) that\(_1\) studying \( pg_1 \) led Sonia\(_1\) to appreciate \( t_1 \).
    c. *Himself\(_1\), I talked to John\(_1\) about \( t_1 \) after describing him\(_1\) to \( pg_1 \).

(38) a. Each other\(_1\), they\(_1\) (never) praised \( t_1 \).
    b. *Each other\(_1\), they\(_1\) (never) praised \( t_1 \) after describing \( pg_1 \).
    c. *It was each other\(_1\) that\(_1\) their\(_1\) getting to know \( pg_1 \) led them\(_1\) to respect \( t_1 \).

However, one counterexample seems to exist in German. In German, reflexive pronouns are able to scramble and are, so, in principle able to be an antecedent of a parasitic gap. This, in fact, seems to be true (see also Fanselow (2001)).
CHAPTER 2. PROPERTIES OF PARASITIC GAPS

(39) a. Lisa sagt Markus, dass er sich [anstatt pg mit so einem Mist zu beschäftigen] t lieber um die Haustiere kümmern sollte. “Lisa tells Markus that he should better care about the pets instead of dealing with such rubbish.”

b. Lisa findet es eklig, dass Markus sich [ohne pg vorher zu waschen] t rasiert hat. “Lisa finds it disgusting that Markus has shaved himself without washing before.”

The sentence in (39-a) involves two verbs that are inherently reflexive (‘sich beschäftigen’ (to deal) and ‘sich kümmern’ (to care)) while the examples in (39-b) have two verbs that are not inherently reflexive (‘waschen (to wash) and ‘rasieren (to shave)).

2.2.8 Antipassivizability

The next constraint is a more intricate problem. Parasitic gaps are incompatible with object positions of verbs that are antipassivizable (Postal (1993, 2001)).

(40) a. Their relations involved abuse.

b. *Abuse was involved by their relations.

c. [What kind of abuse] did their relations involve t? do not involve pg?

d. [What kind of abuse] did his constantly discussing pg suggest that their relations involved t? do not involve pg?

e. *[What kind of abuse] did your discovering that their relations involved pg lead him to discuss t? do not involve pg?

f. *[What kind of abuse] did their relations lead to condemnation of t without involving pg? Postal (2001:224)
2.2. CONSTRAINTS OF THE DISTRIBUTION OF PARASITIC GAPS

Postal (1993) lists up a big set of examples that confirm his observation. The contexts that disallow parasitic gaps can be categorized along the following categories: lexical exceptions, verbs with inversion structures, unaccusatives, verbs that are already passivized, unmarked infinitives, subject control verbs, verbs that allow expletive subjects and from-PPs, i.e., pseudo-passivization. The examples that Postal (1993) gives for these contexts are listed in (41).

(41) a. catch/contract/get/have some disease \(\text{lexical exception}\)
b. bother someone with something \(\text{lexical exception}\)
c. spoke/belong to someone \(\text{inversion structure}\)
d. appeal to someone (ask someone for something) \(\text{inversion structure}\)

e. sleep/die under something \(\text{unaccusative}\)
f. appear to someone \(\text{inversion structure}\)
g. was given something \(\text{multiple passivization}\)
h. feel something move \(\text{unmarked infinitives}\)
i. swear to someone \(\text{allows subject control}\)
j. it amuses someone to do something \(\text{expletive subject}\)
k. steal from someone \(\text{object of from}\)
l. owe something to someone \(\text{lexical exception}\)

However, the diversity of the examples in (41) indicate that the antipassivizability constraint on parasitic gaps is likely to be a bunch of constraints.

2.2.9 Multiple Wh-Questions

The next constraint that I want to mention here was observed by Kim and Lyle (1996). They realized that parasitic gaps cannot occur in multiple wh-questions.

(42) a. Which parcel did you give \(t\) to Susan without opening \(pg\)?
b. *Which parcel did you give \(t\) to whom without opening \(pg\)?
CHAPTER 2. PROPERTIES OF PARASITIC GAPS

The difference between (42-a) and (42-b) is unexpected and puzzling at first sight. The constraint will be further discussed in section 5.9.

2.2.10 Reconstruction

Finally, parasitic gaps are claimed to show asymmetrical reconstruction. The fact is shown in (43).

(43) a. [Which books about himself₁]₂ did John₁ file t₂ before Mary read \( p_{g₂} \)?

b. *[Which books about herself₁]₂ did John file t₂ before Mary₁ read \( p_{g₂} \)?

Kearney (1983)

The sentences illustrate that the antecedent which books about himself/herself can only reconstruct into the position of the true gap. Hence, the sentence in (43-b) is ungrammatical because herself can neither be bound by John, due to a \( \varphi \)-feature mismatch, nor by Mary, due to asymmetrical reconstruction.

The constraints I have listed in this section are the most important ones about parasitic gaps. The next chapter will provide an overview about the most important accounts to parasitic gaps that have been developed during the last thirty years and about how they can capture the properties of parasitic gaps discussed above.
Chapter 3

Existing Theories about Parasitic Gaps

During the last three decades, various ideas about parasitic gaps have been developed. These ideas basically differ in their answer to the question if parasitic gaps are real gaps in the sense that they are the result of movement or if parasitic gaps are covert categories that are identified with the antecedent of the true gap (Lee (1998)).

In this section, I will shortly review the most important theories.

3.1 Non-Movement Theories

The main claim of non-movement theories is that what seems to be a parasitic gap is, in fact, some covert category (e) that is bound by the antecedent of the true gap. (Chomsky (1982); Kayne (1983); Engdahl (1985); Cinque (1990); Frampton (1990))
The exact nature of the covert category that is bound by the antecedent is, however, disputable. Some theories (e.g. Chomsky (1982); Engdahl (1985); Cinque (1990)) assume that parasitic gaps are empty pronouns that are bound by an operator. In other theories, the covert category is simply a gap and is, then, subject to the same constraints as the licensing gap (Kayne (1983); Frampton (1990)).

The first part of this section will, therefore, deal with what I call pronoun theories\(^1\) while the second part will introduce the theory of Connectedness developed by Kayne (1983).

3.1.1 Pronoun Theories

There are two quite convincing arguments that assertors of pronoun theories always mention. The first one is that parasitic gaps have to be nominals.\(^2\)

\[(2)\]

a. *Sick, though Frank was \(t\), without looking \(pg\), he didn’t visit a physician.

b. *How \(2\) did Deborah cook the pork \(t_2\) after cooking the chicken \(pg_2\)?

---

1. Note that there are theories about pronominalization that involve movement of pronouns to its binder (See e.g. Postal (1998); Ouhalla (2001)).
2. For the discussion of this argument see sections 2.2.5 and 5.5
3.1. NON-MOVEMENT THEORIES

This behaviour seems to coincide with the property of resumptive pronouns to refer only to nominals.

The second argument for parasitic gaps to be pronouns are the antipronominal contexts in which they are forbidden.

(3)  
  a. There are spiders/*them in the soup.  
  b. What kind of spiders, are there $t_1$ in the soup?  
  c. *It was such spiders$_2$ that everyone who said there were $pg_2$ in the soup refused to eat $t_2$.  
  d. *What kind of spiders$_3$ did he praise $t_3$ before learning there were $pg_3$ in the soup?  

Postal (1993:744)

(4)  
  a. Blake painted his house green/*it.  
  b. What color$_1$ did Blake paint his house $t_1$?  
  c. *It was that color$_2$ that everyone who painted their house $pg_2$ wanted to paint their car $t_2$.  
  d. *What color$_3$ did they criticize $t_3$ after painting their house $pg_3$?

Postal (1993:744)

If parasitic gaps are simply pronouns, this behaviour follows naturally. In all other theories this property of parasitic gaps seems to play a minor role and is, in most cases, not even mentioned.

Another argument for a pronoun analysis of parasitic gaps is that in some languages, a resumptive pronoun is used instead of a parasitic gap. This is true, for example, for Moroccan Arabic (Ouhalla (2001)). The English sentences in (5) correspond to the Arabic sentences in (6).

(5)  
  a. Which article did he criticize before reading?  
  b. This is the article he criticized before reading.

Ouhalla (2001:148)
(6)  
  a. Shmen maqal ntaqd qblma yqra h?
      “Which article did he criticize before reading?”
  b. Hada huwwa l-maqal li ntaqd qblma yqra h?
      “This is the article he criticized before reading?”

Hornstein (1995) adds an additional semantic argument for the pronoun analysis of parasitic gaps. The difference between the sentences in (7) is that the first sentence allows pair-list and individual reading while in the sentence in (7-b), only individual reading is possible. Hornstein (1995), refining the idea of Chiercha (1991), proposes that individual reading is due to a hidden bindable pronoun in the wh-phrase.

(7)  
  a. What did everyone review t?  
      pl-reading or i-reading
  b. What did everyone review t before I read pg?  
      i-reading

If the parasitic gap is indeed nothing else but a pronoun, this would explain the unambiguous reading of (7-b).

Finally, pronoun theories are able to account for reconstruction (Culicover (2001)). The parasitic gap, which is a pronoun, is simply bound by the wh-phrase and not affected by the reflexive pronoun just like its overt counterpart in (8).

(8)  
[Which books about himself$_1$]$_2$ did John$_1$ file t$_2$ before Mary read them$_2$?  

Culicover (2001) notes, however, that asymmetric reconstruction is also known for ATB configurations. Interestingly, Nissenbaum (2000:30ff.) talks about the same data. He, however, acts on the assumption that the sentence in (9-a) is

---

3The original sentences given by Nissenbaum (2000) are in (i). But the difference is only in the chosen vocabulary.
3.1. NON-MOVEMENT THEORIES

ungrammatical.

(9) a. */\*[Which books about himself] did John file and Mary read
   →
   b. *[Which books about herself] did John file and Mary read

The different grammaticality judgement leads Nissenbaum (2000) to the result
that parasitic gap constructions, in contrast to ATB constructions, cannot be
derived by the same mechanism.

On the other hand, Culicover (2001) assumes that parasitic gaps and ATB
gaps behave alike. However, he provides no discussion of the problem but refers
to Munn (2001).

There is, however, one serious problem for all pronoun theories not involving
movement, namely island sensitivity or subjacency (Kayne (1983); Chomsky (1986); Nissenbaum (2000)). If parasitic gaps can be explained simply by
binding of an empty pronoun, it shouldn’t matter how many barriers exist
between the antecedent and the parasitic gap. Hence, the two sentences in (10)
should be equal contrary to fact.

(10) a. ?a person [who [close friends of pg] admire t]
   b. *a person [who you admire t [because [close friends of pg] become
      famous]]

   Kayne (1983:228)

Though subjacency is a problem for pronoun theories, it is not a problem for
non-movement theories in general. In the next section, I will summarize Kayne’s
(1983) theory of connectedness which is able to account for the difference in
(10).

(i) a. *Which pictures of himself did John sell and Mary buy?
   b. *Which pictures of himself did Mary sell and John buy?

For further discussion of the reconstruction behaviour of parasitic gaps, see also section
5.10
CHAPTER 3. EXISTING THEORIES ABOUT PARASITIC GAPS

3.1.2 Connectedness

A quite different non-movement approach to parasitic gaps comes from Kayne (1983). He claims that parasitic gaps that occur in sentences are simply gaps just like the licensing gap. These gaps must then be connected with the antecedent. In this sense, the whole theory can be considered to be representational and not derivational.

Kayne (1983) proposes that a gap and its antecedent are only connected if they are both in the same g-projection. G-projection is defined as in (11) (cf. Kayne (1983:225)).

\begin{equation}
Y \text{ is a } g\text{-projection of } X \text{ iff}
\begin{align*}
a. & \quad Y \text{ is a projection of } X \text{ (in the usual sense of } X\text{-theory) or of a } \\
& \quad \text{g-projection of } X \text{ or } \\
b. & \quad X \text{ is a structural governor and } Y \text{ immediately dominates } W \text{ and } \\
& \quad Z, \text{ where } Z \text{ is a maximal projection of a } g\text{-projection of } X, \text{ and } W \text{ and } Z \text{ are in a canonical government configuration.}
\end{align*}
\end{equation}

\begin{equation}
W \text{ and } Z \text{ (} Z \text{ a maximal projection, and } W \text{ and } Z \text{ immediately dominated by some } Y) \text{ are in a canonical government configuration iff}
\begin{align*}
a. & \quad V \text{ governs NP to its right in the grammar of the language in question and } W \text{ precedes } Z \text{ or } \\
b. & \quad V \text{ governs NP to its left in the grammar of the language in question and } Z \text{ precedes } W.
\end{align*}
\end{equation}

Now, Kayne (1983) defines a set $G_\beta$ that contains all g-projections of some category $\beta$.

\begin{equation}
G\text{-projection set } G_\beta \text{ (Kayne (1983:229))}
\begin{align*}
a. & \quad \forall \pi, \pi = a \text{ g-projection of } \gamma \rightarrow \pi \in G_\beta; \text{ where } \gamma \text{ is a governor of } \beta \\
b. & \quad \beta \in G_\beta
\end{align*}
\end{equation}
3.1. NON-MOVEMENT THEORIES

and

c. $\delta$ dominates $\beta$ and $\delta$ does not dominate $\gamma \rightarrow \delta \in G_\beta$

As parasitic gaps are in most cases objects, let’s assume that $\beta$ is an object and $\gamma$ is a verb. The definition in (13), then, simply says that the g-projection set of an object contains the object itself, all categories inside the object and all g-projections of the verb.

With these definitions in mind, [Kayne (1983)] redefines the Empty Category Principle which finally excludes certain ungrammatical parasitic gap constructions.

(14) Empty Category Principle ([Kayne (1983) 229])

Let $\beta_1, \ldots, \beta_j, \beta_{j+1}, \ldots, \beta_n$ be a maximal set of empty categories in a tree $T$ such that $\exists$ a c-commanding $\alpha$, $\forall j, \beta_j$ is locally bound by $\alpha$. Then

a. $\bigcup_{1 \leq j \leq n} G_{\beta_j}$ must constitute a subtree of $T$

and

b. there must exist a $\rho$ such that $\rho \in \bigcup_{1 \leq j \leq n} G_{\beta_j}$ and $\rho$ dominates $\alpha$.

In terms of parasitic gap constructions, the new definition [Kayne (1983)] proposes says three things: First, there has to be an antecedent of the true and the parasitic gap. Second, the g-projection sets of the true and the parasitic gap constructions must form a subtree. Third, a category which is in the g-projection set of the true as well as of the parasitic gap must dominate the antecedent.

Now, let’s have a look at the two sentences in (15). The sentence in (15-b) is ungrammatical because there are two barriers between the gap and the antecedent.

(15) a. ?a person [who [close friends of pg] admire t]

b. *a person [who you admire t [because [close friends of pg] become famous]] [Kayne (1983) 228]
The difference between the sentences in (15), which have been a problem for pronoun theories, can now be accounted for.\footnote{Three notes to the structures shown in (16): First, the labeling of the tree nodes is not important. Second, the numbers in brackets mark the corresponding g-projection sets. Nodes with the same number are members of the same set. Third, although the gaps have different names here (e for the parasitic gap, t for the true gap), both gaps are equal in status, i.e., there is no difference between parasitic and true gaps. Both gaps are equally subject to the ECP in (14).}
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b. CP(2)

who C'(2)

C S(2)

you VP(2)

VP(2) CP

admire t(2) because C'

C S

DP(1) VP

close NP(1) become famous

friends PP

of e(1)

Now, as the structure in (16-b) shows, the reason for the ungrammaticality in (15-b) is due to the violation of condition (14-a), i.e., the g-projection sets of the gaps don’t constitute a subtree.

In sum, the theory of Connectedness (Kayne (1983)) is able to derive subjacency effects of parasitic gap constructions. To do so, Kayne (1983) defines g-projection and g-projection sets and modifies the Empty Category Principle in a way that it makes use of g-projection sets. However, the drawback of the theory in respect to the aim of this thesis is the fact that it is purely representational.
CHAPTER 3. EXISTING THEORIES ABOUT PARASITIC GAPS

3.2 Movement Theories

Now, I will review another type of parasitic gap theories, namely movement theories.

Theories that consider parasitic gaps to be real gaps which result from movement can be further categorized into two types: One type of theory assumes null operators which are merged in the position of the parasitic gap and move then to the highest possible position inside the island in which the parasitic gap occurs. These operators will, then, be identified with the antecedent of the true gap. (See e.g. Kiss (1985); Chomsky (1986); Frampton (1990); Nissenbaum (2000); Lee (1998)) In this sense, Nissenbaum (2000) calls such theories Non-Shared Antecedent theories. These theories will be dealt with in the first part of this section.

The other type of theory dispenses with operators that are antecedents of parasitic gaps, but develops the idea that parasitic gap constructions can be derived along the lines of constructions involving ATB movement. (Grosu (1980); Huybregts and Van Riemsdijk (1985); Williams (1990); Munn (1992, 1994, 2001); Nunes (1995, 2001)) However, since the accounts of ATB-movement are manifold themselves, I will restrict the discussion in the second part of this section to Sideward Movement.

3.2.1 Operator Theories

The crucial idea of all operator theories is shown in (17). A null operator in argument position moves to a higher position in the embedded category, i.e., it doesn’t move out of the island, and leaves a trace — the parasitic gap. This operator is, then, identified with the antecedent of the true gap (Stowell (1985)).
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How identification proceeds exactly, differs from theory to theory. Chomsky (1986), for example, uses the mechanism of Chain Composition in (19). A chain consists of a head and a set of traces in which each element (except the tail) locally binds its successor. The chains that exist in the structure in (17) are given in (18).

(18) a. \( C_1 = (\alpha, t_\alpha) \)
b. \( C_2 = (\text{Op}, t_{\text{Op}}) \)

(19) Chain Composition

\[
\text{If } C = (\alpha_1, \ldots, \alpha_n) \text{ is the chain of the real gap, and } C' = (\beta_1, \ldots, \beta_n) \text{ is the chain of the parasitic gap, then the composed chain is } \\
(C, C') = (\alpha_1, \ldots, \alpha_n, \beta_1, \ldots, \beta_n)
\]

Chain composition causes the identification of the operator and the antecedent \( \alpha \). Since the head of the composed chain \((C_1, C_2)\) is \( \alpha \), the status of Op is changed. Now, it is no longer a head itself but bound by \( \alpha \) just like \( t_\alpha \) and \( t_{\text{Op}} \).

(20) \((C_1, C_2) = (\alpha, t_\alpha, \text{Op}, t_{\text{Op}})\)

Furthermore, Chomsky (1986) proposes 0-subjacency as a licensing condition for composed chains. 0-subjacency says that there must not be a bounding
CHAPTER 3. EXISTING THEORIES ABOUT PARASITIC GAPS

node between two elements. Bounding nodes are maximal projections that are either non-theta-marked itself or immediately dominate a non-theta-marked maximal projection. In that sense, VP is, amongst others, a bounding node. Chomsky (1986) proposes that 0-subjacency must hold between \( \alpha_n \) and \( \beta_1 \).

Additionally, 1-subjacency must hold between two members of a chain that are in a successor relation. Only if two chains obey 0-subjacency, they can compose under the principle in (19).

With these assumptions, subjacency effects like in (21) (repeated from section 2.2.3) can be derived.\(^6\)

\[(21)\]

\begin{itemize}
  \item a. the article which we \([\text{VP filed t \[\text{PP Op without \[\text{VP reading t}_{Op}\]}}]\]
  \item b. *the article which we \([\text{VP filed t \[\text{PP Op without \[\text{VP meeting the person \[\text{CP who \[\text{VP wrote t}_{Op}\]}}]\]}}]\]
\end{itemize}

Both sentences in (21) fulfill 0-subjacency because there is no barrier between \( t \) and Op. The reason why (21-b) is bad is simply that 1-subjacency between Op and \( pg \) is not given since there are at least two bounding nodes between them.

In addition, 0-subjacency is able to explain the anti-c-command condition on parasitic gaps. The sentences are given in (22) (repeated from section 2.2.2) with the corresponding structures.

\[(22)\]

\begin{itemize}
  \item a. *Which articles \( t \) got \([\text{VP filed by John \[\text{CP Op without him \[\text{VP reading t}_{Op}\]}}]\)?
  \item b. *Who \( t \) \([\text{DP Op a picture of t}_{Op}\)]?\)
\end{itemize}

In both sentences in (22), the bounding node VP is between \( t \) and Op, thereby violating 0-subjacency.

However, the great disadvantage of Chomsky’s (1986) theory seems to be that Chain Composition as well as 0-subjacency are stipulated rules that cannot be used for anything else but parasitic gap constructions.

\(^6\)The constituency is in line with the one suggested by Chomsky (1986:64).
3.2. MOVEMENT THEORIES

Although the theory of Chomsky (1986) seems stipulative at first sight, the idea that parasitic gaps are the result of operator movement was further developed by other scholars. Nissenbaum (2000), for example, reinvents the operator theory in a minimalist framework. Because of its up-to-dateness and simplicity, it is the most challenging rival for the theory developed in the next chapter.

The difference to Chomsky (1986) is that the identification of the null operator and the antecedent happens at LF via predicate abstraction and predicate modification (Heim and Kratzer (1998)).

Just like in the analysis of Chomsky (1986), Nissenbaum (2000) assumes an operator in the adjunct clause which moves to a higher position. This is exemplified in the structure in (24) (cf. Nissenbaum (2000:43)). The sentence to be derived is given in (23) (cf. Nissenbaum (2000:46)).

(23) John put \( t_i \) on the table [without reading \( pg \) [a recent article about global warming]].

(24) \[
\begin{array}{c}
\text{vP} \\
\text{vP} \\
\text{vP} \\
\text{t}_{John} \text{ put } t_i \text{ on the table} \\
\text{DP}_i \\
\text{CP} \\
\text{a recent article} \\
\text{about global warming} \\
\text{without PRO reading}
\end{array}
\]

The two semantic rules that finally enable the operator identification are given in (25) and (26).
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Let $\alpha$ be a branching node with daughters $\beta$ and $\gamma$, where $\beta$ dominates only a numerical index $i$. Then, for any variable assignment $a$, $[\alpha]^a = \lambda x \in D . [\gamma]^a/x^i$

(26) *Predicate Modification* (Heim and Kratzer (1998:95))

If $\alpha$ is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any assignment $a$, if $[\beta]^a$ and $[\gamma]^a$ are both functions of type $<e,t>$, then $[\alpha]^a = \lambda x \in D . [\beta]^a(x) = [\gamma]^a(x) = 1$

As the empty operator is an element that only dominates a numerical index, operator movement results in predicate abstraction, changing the type of the embedded clause from $t$ to $<e,t>$. Now, the sentence in (23) exemplifies a parasitic gap that is licensed by heavy-NP-shift. Nissenbaum (2000) argues that HNPS is the result of movement that has the full $vP$ as its landing site. He, furthermore, proposes that any movement relation results in predicate abstraction. This has the consequence that also the $vP$ is changed from $t$ to $<e,t>$. Now, if $vP$ and and the adjunct clause are merged, this results in predicate modification since both categories have the type $<e,t>$. Semantically, this means that the meaning of the mother node is the logical conjunction of the meaning of the $vP$ and the meaning of the adjunct, and has the type $<e,t>$ as well.

The last step is now simple functional application. The DP *a recent article about global warming* has the type $e$ and the modified $vP$ the type $<e,t>$. The resulting type is, therefore, $t$.

To ensure that $vP$ is really a $<e,t>$ type, movement must precede Merge of the adjunct. To enable countercyclic Merge, Nissenbaum (2000) uses the tucking-in mechanism of Richards (1997). That is, first the DP moves to a position above the clausal $vP$ and then, the adjunct tucks-in under the DP. The exact sequence of Move and Merge will be relevant in sections 5.1 and 5.9.
3.2. MOVEMENT THEORIES

The behaviour of operator theories towards parasitic gaps will be subject of chapter 5 and 6 where it will be compared with a new analysis of parasitic gaps developed in chapter 4. But before finally turning to my own analysis of parasitic gaps, I will summarize another approach to parasitic gaps which is closer to my own one in that the antecedent of the licensing gap is also the antecedent of the parasitic gap.

3.2.2 Sideward Movement

The main idea of sideward movement (Nunes (1995, 2001); Hornstein and Nunes (2002)) is to allow movement of a phrase $\alpha$ inside a complex category $\beta$ to another complex category $\gamma$ without the two having a dominating node in common and without the problem of $\beta$ having already required an island status. This process is illustrated in (27).

\[
\begin{array}{c}
\gamma \\
\downarrow \alpha \\uparrow t \alpha \\
X \hspace{1cm} \hspace{1cm} \hspace{1cm} \hspace{1cm} \hspace{1cm} Y
\end{array}
\]

Now, Nunes (1995, 2001) assumes the copy theory of movement (Chomsky (1995)). In this understanding of movement, movement consists of the two operations Copy and Merge. The copies that occur in a syntactic object build a chain under c-command and are then subject to deletion on the two interface levels PF and LF. Only certain deletions (as induced by (28)) result in syntactic objects that can be linearized according to (29).

\[
\text{(28) \hspace{1cm} Chain Reduction (Nunes (2001:308))}
\]

Delete the minimal number of constituents of a nontrivial chain CH that suffices for CH to be mapped into a linear order in accordance with the LCA.

7If I speak of operator theories in the next chapters, I will always refer to the account of Nissenbaum (2000).
CHAPTER 3. EXISTING THEORIES ABOUT PARASITIC GAPS

(29) *Linear Correspondence Axiom* (LCA) (Kayne (1994:33))
Let X, Y be nonterminals and x, y terminals such that X dominates x and Y dominates y. Then, if X asymmetrically c-commands Y, x precedes y.

Now, the derivation of a sentence with a parasitic gap like in (30) can be derived as follows: First, there are two distinct syntactic objects. One of these constitute the adverbial clause before it becomes an adjunct, the other one is the starting point of the matrix clause.

(30) Which paper did you file without reading?

(31) a. $K = [\text{CP } [\text{TP } \text{PRO}_j [\text{T'} T [\text{vP } t_j [\text{v} v [\text{VP reading [which paper]]}]]]]]]$

b. $L = \text{file}$

In the next step, *which paper* is copied and merged with *file*. This copy is then moved to Spec,CP of the matrix clause. The final configuration is given in (32).

(32) $[\text{CP } [\text{which paper}] \text{ did} + Q [\text{TP you [vP file [which paper]]}] [\text{PP without PRO reading [which paper]]]]$]

Now, the only possibility for linearization to be successful is to delete both occurrences of *which paper* in their object positions. If none of the copies or only one copy is deleted, asymmetry is violated and the final syntactic configuration cannot be linearized.

Nunes (1995, 2001) uses the same mechanism to explain ATB-movement. A sentence like (33) has, therefore, (nearly) the same derivation as the sentence in (30).\(^8\)

(33) Which paper did John file and Mary read?

\(^8\)Relevant for the discussion is only the sideward movement of *which paper*. Nevertheless, also *did* sideward-moves from the second conjunct to the first conjunct.
3.2. MOVEMENT THEORIES

(34) a. \( K = [\text{TP \ did \ [\text{VP \ Mary \ v \ [\text{VP \ read \ [ which \ paper]]}]]}] \)
    b. \( L = \text{file} \)

(35) \([\text{CP \ [ which \ paper]} \ \text{did} + \text{Q} \ [\text{andP \ [\text{TP \ John \ did} \ \text{file \ [ which \ paper]}]}] \ [\text{and} \ [\text{TP \ Mary \ did \ read \ [ which \ paper]]}] \]

This analysis of parasitic gaps is, according to Nunes (1995, 2001) (cf. Nunes (2001:325)), able to derive four important properties of parasitic gaps, which are the ones in (36).

(36) a. Parasitic gaps show subjacency effects.
    b. Parasitic gaps are licensed at S-Structure.
    c. Parasitic gaps must not be c-commanded by the licensing gap.
    d. Parasitic gaps cannot be licensed by A-movement.

The first property in (36-a), illustrated in (37), is explained by the derivation in (38).

(37) *Which book did you borrow t [after leaving the bookstore [without finding pg]]?  

\[ \text{Nunes (2001:327)} \]

(38) a. \( K = [\text{CP \ PRO \ [\text{VP \ [\text{VP \ leaving \ the \ bookstore} \ [\text{PP \ without \ PRO \ finding \ [ which \ book]]}]}}] \)
    b. \( L = \text{borrow} \)

At the point, where sideward movement could apply, the PP without finding which book has already become an adjunct. Therefore, which book is no longer accessible and cannot be merged with borrow.

The next property in (36-b) is again easily explained as shown in (39).

(39) a. *Who filed which report without reading?
    b. [who [[filed [which report]] [without PRO reading [which report]]]]
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Here, the two occurrences of *which report* cannot form a chain because of the lack of c-command. Therefore, the two occurrences of *which report* are trivial chains and none of them can be deleted.

The next property in (36-c) is more difficult to explain. To illustrate the anti-c-command condition of parasitic gaps, the structure for the sentence in (40-a) is given in (40-b)\(^9\).

\begin{equation}
\text{(40) a. } \multicolumn{2}{c}{\text{*I wonder which man called you before you met.}} \\
\text{b. } vP \\
I \quad v' \\
\text{wonder} \quad \text{CP} \\
\text{which man}_4 \quad \text{TP} \\
\text{which man}_3 \quad T' \\
T \quad vP \\
vP \quad \text{PP} \\
\text{which man}_2 \quad \text{before you met} \\
v \quad \text{called you} \\
\text{which man}_1
\end{equation}

For the derivation to be successful, it is necessary that *which man*\textsubscript{3} and *which man*\textsubscript{1} can form a chain. This, however, is impossible because there are “nonlocal Case-checking and Case-bearing elements” (Nunes (2001:333)) between the two copies, i.e. in this case the subject in the adjunct clause.

\(^9\)Indices indicate the sequence of copy steps.
3.2. MOVEMENT THEORIES

The same explanation is used by Nunes (2001) to derive the property in (36-d). In the sentence in (41), my intervenes between the two occurrences of the book in the adjunct and the subject position of the matrix clause.

(41) a. *The book was filed without my reading first. [Nunes (2001:335)]
    b. \([TP [the book] was [vP [vP filed [the book]] [PP without my reading [the book] first]]] \]

Although, the theory of Nunes (1995, 2001) can explain some of the most important properties of parasitic gaps, it fails to explain others. First of all, the theory cannot per se account for the fact that parasitic gaps are restricted to nominals. Nunes (2001), however, notes that this restriction is not specific for parasitic gap constructions but rather for operator-variable constructions in general (Nunes (2001:fn. 32)).

Furthermore, just like any theory of parasitic gaps that dispenses with the idea of parasitic gaps being pronominals, antipronominal contexts remain unexplained.

As mentioned above, reconstruction effects can differ between parasitic gap and ATB constructions. The data are repeated in (42).

(42) a. Which books about himself did John file before Mary read \(pg\)?
    b. *Which books about herself did John file before Mary read \(pg\)?

These data show that reconstruction into the parasitic gap is impossible. Obviously, this is a problem for Nunes’s account since he assumes that in case of (42), it is the full DP which books about himself/herself that is sideward-moved. However, as mentioned by Nunes (2001 fn. 35), Munn (1994) shows that the apparent reconstruction asymmetry in (42) is due to other factors. Evidence that reconstruction is not asymmetrical is given by (43). Here, reconstruction into the licensing gap is impossible.

43
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(43) a. *Which picture of herself did every boy who saw pg say Mary liked t?  
b. Which picture of himself did every boy who saw pg say Mary liked t?

So, it is unclear if reconstruction is an argument against sideward movement.

Finally, the question remains whether an account that treats parasitic gap and ATB constructions alike is warrantable. Despite the fact that ATB and parasitic gap constructions differ in many aspects (see especially Engdahl (1983); Postal (1993)), they share a lot of properties as well (Munn (1992, 1994, 2001)).

The arguments against the equal treatment of both constructions are mainly the following ones: First, ATB movement affects constituents of the same type that are coordinated while the parasitic and the licensing gap occur in categories that are different in their syntactic and semantic type. Next, as Postal (1993) has shown, the syntactic properties of parasitic gap and ATB constructions differ in several aspects: constituent restrictions (parasitic gaps can only be NPs while ATB gaps can correspond to several types), finite subject restrictions (parasitic gaps cannot occur in the position of a finite clause subject\textsuperscript{10}), passivizability restrictions (parasitic gaps cannot occur in positions that are inherently unpassivizable), antipronominal contexts, predicate nominal restrictions (parasitic gaps cannot be predicate nominals) and infinitival complement positions (parasitic gaps cannot occur in the position of postverbal NPs of verbs like e.g. believe).

Although this huge amount of arguments against an ATB account of parasitic gaps exists, several scholars like (Williams (1978); Grosu (1980); Sag (1983); Cowper (1985); Huybregts and Van Riemsdijk (1985); Williams (1990); Munn (1992, 1994, 2001); Nunes (1995, 2001)) have argued for an analysis that covers both ATB and parasitic gap constructions. Munn (2001), for example,

\textsuperscript{10}For a different view, see Levine et al. (2001)
3.2. MOVEMENT THEORIES

observes the following properties: First, both constructions show island effects. Next, he argues that both constructions show anti-c-command restrictions. Further similarities of the two constructions can be found in respect to weak crossover and the occurrence of resumptive pronouns.

Now, after having reviewed and discussed some important theories about parasitic gaps, it is time for a new account of parasitic gaps. In the next chapter, I will present a detailed derivation of a parasitic gap sentence exemplifying what I will call the Duplication Theory of parasitic gaps.

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11Possible counterexamples like in (i) are ruled out because they involve, according to Munn (2001), VP coordination rather than vP or TP coordination.

(i) a. Who read the paper and filed it?
   b. Who t [andP [vP read the paper] and [vP filed it]]?
Chapter 4

Analysis

In this section, I want to develop a new analysis of parasitic gaps that don’t involve operators and LF but that works exclusively in narrow syntax. The main idea is that parasitic gaps result from two operations: a duplication operation in the numeration and a fusion operation in the derivation.

The two operations together with the whole derivation will be exemplified by the sentence in (1).

(1) Which article did you file t [without reading pg]?

4.1 The Duplication Operation

I assume that the element that is inserted in the position of the parasitic gap is identical to the element that is inserted in the position of the true gap. This is due to a duplication operation that is made in the numeration.

Suppose the numeration of the sentence in (1) is the following one given in (2).

\begin{enumerate}
\item For simplicity, I assume that referential indexing is tied to the categorial feature D since only DPs can have referential indices. Therefore, all D items of the numeration possess an index (here $i$ or $j$).
\item The two markings $\bullet\bullet$ and $\ast\ast$ are to be understood in the sense of Müller [2010], i.e., $\bullet\bullet$ is the structure-building property of features triggering Merge while $\ast\ast$ is the probe property
\end{enumerate}
CHAPTER 4. ANALYSIS

(2) \( N = \{ \text{which[D, wh, } \bullet\text{N}, \text{ acc, } \varphi, *\text{acc}*^3, \ldots, \text{phon}^4, \text{ sem} \}, \text{ article[N, acc, ...], C[C, } \bullet\text{wh}, \bullet\text{T}, \ldots], \text{ you[D, } \varphi, \text{ nom, ...], T[T, } \text{ EPP, } \bullet\text{v}, *\varphi*, *\text{nom*}, \ldots], \text{ v[v, } \bullet\text{V}, \bullet\text{D}, *\varphi*, *\text{acc*}, \ldots], \text{ file[V, } \bullet\text{D}, \ldots], \text{ without[...], C[C, } \bullet\text{T}, \ldots], \text{ T[T, } \text{ EPP, } \bullet\text{v}, \ldots], \text{ PRO[D, ...], v[v, } \bullet\text{V}, \bullet\text{D}, *\varphi*, *\text{acc*}, \ldots], \text{ read[V, } \bullet\text{D}, \ldots] \}\)

This derivation is obviously supposed to crash since there are not enough D elements to fill all argument positions of the verbs. Assuming that PRO can only be inserted in subject position (and the pronoun you will be inserted in subject position) either file or read is missing an object.

The two possibilities are now to cancel the whole thing and calculate a new numeration or to let a repair mechanism apply to this numeration.

Here, I want to suggest that there is indeed such a repair mechanism, namely Duplication. Duplication can be applied to lexical items in case that the derivation based on its numeration is supposed to crash. The preliminary definition of Duplication is given in (3).

(3) **Duplication** \((N = [L, \ldots])\)

a. There are structure-building and probe features \([\bullet F_1 \bullet, \ldots [\bullet F_i \bullet, [\ast F_j \ast], \ldots [\ast F_n \ast] \) in the numeration \(N\) that don’t have matching features \([F_1], \ldots [F_n]\). 

b. There is a lexical item \(L\) in \(N\) that has such features \([F_1, \ldots, F_n]\). 

c. An item \(L’\) with the features \([F_1, \ldots, F_n]\) of \(L\) is added to \(N\). 

3Like other D heads, which plays a double role when it comes to case. On the one hand, it must be able to check the case feature of \(v\), and on the other hand, it has a case feature which must be checked by its complement noun. This double role will be neglected during the derivation here but becomes important again in section 6.2.1.

4The features phon and sem are to be understood as feature sets. “phon” encompasses all phonological features and “sem” all semantic features.
4.1. THE DUPLICATION OPERATION

d. All duplicated features on L are marked by $\rhd\lhd$.

This definition needs some clarification. The first condition in (3-a) describes exactly the situation of the numeration above. One of the verbs — let’s say *read* — has a structure-building feature $\bullet\text{D}\bullet$ that doesn’t have a matching feature [D]. (Altogether, the two verbs have four features $\bullet\text{D}\bullet$ but there are only three matching features [D].) Furthermore, $\ast\varphi\ast$ needs a matching feature [\varphi] and $\ast\text{acc}\ast$ a matching feature [\text{acc}].

The second condition in (3-b) says that for Duplication to be able to apply, the features [D], $\varphi$ and [acc] must be already present in the numeration. (This condition together with the condition in (3-a) makes sense because it eliminates the possibility of useless duplications.) The consequence for our numeration above is that only elements with the features [D], $\varphi$ and [acc] can be duplicated. In our example above, this can only be *which*.

Now, the next two conditions regulate the operation. The numeration is expanded by another item that has the features [D$_i$, $\varphi$, acc].

Finally, the duplicated features of *which* are marked by $\rhd\lhd$. The task of $\rhd\lhd$ will be clarified in the following subsections. The nature of $\rhd\lhd$, however, is that it is a property of features in the same sense as $\bullet\bullet$, which is the structure-building property, and $\ast\ast$, which is the probe property.\(^5\) I will refer to the new property $\rhd\lhd$ as the *fusion property* of features. Two things about the fusion property should be mentioned: First, the fusion property doesn’t change the way the features interact with matching features that have the properties $\bullet\bullet$ or $\ast\ast$. That is, a feature [\rhd\lhd] can cause the deletion of a feature $\bullet\text{D}\bullet$ just as fine as [D]. Second, features with the property $\rhd\lhd$ must be deleted just like features with the properties $\bullet\bullet$ or $\ast\ast$.

Now, after having clarified the meaning of Duplication, *which* is duplicated. The numeration after Duplication is given in (4).

\(^5\)See also [Lahme (2009)] who assumes that feature properties can be inserted on features via specific rules.
CHAPTER 4. ANALYSIS

Now, that the failure of the derivation is averted, both which and its duplicate ∅ can enter the derivation, during which they are independent from each other, i.e., they can freely enter into Agree and Merge operations.

4.2 The Derivation

Before I start going through the derivation of the sentence in (1), I should clarify which assumptions I make about derivations in general.

At first, I assume a phase-based model which has been suggested by [Chomsky (2000, 2001), i.e., non-defective vP and CP (and additionally DP (see Svenonius (2004))) are phases.

Furthermore, I adopt the model suggested by Müller (2010) to derive (CED-based) island effects. In a nutshell, the crucial idea is that CED effects can be derived from the PIC in (5).

(5) Phase Impenetrability Condition (Chomsky (2001), Müller (2010:36))

The domain of a head X of a phase XP is not accessible to operations outside XP; only X and its edge are accessible to such operations.

(6) Condition on Extraction Domain

a. Movement must not cross a barrier.

b. An XP is a barrier iff its is not a complement.

The assumptions Müller (2010) makes to derive CED effects are Last Resort, the assumption that all features on phase heads are ordered (whereby structure-building and probe features appear on separate lists), the assumption that

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6 The CED is due to Huang (1982). The version in (6) is taken from Müller (2010:36).
4.2. THE DERIVATION

all phrases are phases\(^7\) and a modified version of the edge feature condition saying that edge features (proposed by Chomsky (2000, 2001)), which guarantee successive-cyclic movement (and thereby the accessibility of elements), can only be inserted on heads that still have features which trigger syntactic operations.

(7) **Last Resort** (Müller (2010:40))

a. Every syntactic operation must discharge either \([\bullet F \bullet]\) or \([F^\star]\).

b. Only features on the top of a feature list are accessible.

(8) **Edge Feature Condition** (Müller (2010:42))

An edge feature \([\bullet X \bullet]\) can be assigned to the head \(\gamma\) of a phase only if (a) and (b) hold:

a. \(\gamma\) has not yet discharged all its structure-building or probe features.

b. \([\bullet X \bullet]\) ends up on top of \(\gamma\)'s list of structure-building features.

In principle, edge features can trigger the movement of any (accessible) element. However, derivations will only be successful if the “right” elements are moved to the edge of a phase in order to be accessible. To restrict the power of edge features, a constraint like **Phase Balance**, suggested by Müller and Heck (2000), can be adopted.

(9) **Phase Balance** (Müller and Heck (2000:221))

Phases must be balanced: If \(P\) is a phase candidate, then for every feature \(F\) in the numeration there must be a distinct potentially available checker for \(F\).

(10) **Potential Availability** (Müller and Heck (2000:222))

Syntactic material is potentially available for material outside a phase \(P\) if it is

a. part of the numeration or

---

\(^7\)This is an assumption which I will not adopt in my system. Nevertheless, the system works just as well if only vP, CP and DP are phases.
Phase Balance, therefore, regulates which elements must be moved to the edge of a phase.

Now, let’s turn to a sample derivation of the sentence in (1).

The first step of the derivation is to merge read and ∅. Afterwards, v is merged, ∅ is moved to the phase edge (in line with Phase Balance) and the subject is merged. The single steps are shown in (11) and the tree in (12).\(^8\)

\[(11)\]
\[
\begin{align*}
a. & \text{Merge of read and } \emptyset \\
& [\text{VP read} (\bullet D \emptyset) \emptyset_i] \\
b. & \text{Merge of } v \text{ and VP} \\
& [v v (\bullet V \emptyset \succ \bullet D \emptyset, \ast \phi \ast \succ \ast \text{acc} \ast) [\text{VP read} (\bullet D \emptyset) \emptyset_i]] \\
c. & \text{Agree and case checking between } v \text{ and } \emptyset \\
& [v (\ast \phi \ast \succ \ast \text{acc} \ast, \bullet D \emptyset) [\text{VP read} (\bullet D \emptyset) \emptyset_i]] \\
d. & \text{Insertion of an edge feature} \\
& [v (\bullet X \emptyset \succ \bullet D \emptyset) [\text{VP read} (\bullet D \emptyset) \emptyset_i]] \\
e. & \text{Movement of } \emptyset \text{ and deletion of the edge feature} \\
& [\emptyset \emptyset_i [v (\bullet X \emptyset \succ \bullet D \emptyset) [\text{VP read} \emptyset_i]]] \\
f. & \text{Merge of } \text{PRO} \\
& [\text{VP} \text{ PRO} [v \emptyset_i [v (\bullet D \emptyset) [\text{VP read} \emptyset_i]]]]
\]

\(^8\)In order to increase the readability of the bracket structures, features of elements are written inside round brackets rather than squared ones. Furthermore, only relevant features will occur inside brackets.
4.2. THE DERIVATION

The next part of the derivation consists of constructing the embedded CP. At first, T is merged. Then, PRO is EPP-moved to Spec,TP and C is merged. Finally, ∅ is moved to Spec,CP and *without* is merged.  

\[
\begin{array}{c}
\text{(12)} \\
\begin{array}{c}
P \underbrace{\text{PRO}}_{v}
\end{array}
\begin{array}{c}
\emptyset
\end{array}
\begin{array}{c}
v
\end{array}
\begin{array}{c}
\text{VP}
\end{array}
\begin{array}{c}
\text{read} \, \emptyset
\end{array}
\end{array}
\]

The next part of the derivation consists of constructing the embedded CP. At first, T is merged. Then, PRO is EPP-moved to Spec,TP and C is merged. Finally, ∅ is moved to Spec,CP and *without* is merged.  

\[
\begin{array}{c}
\text{(13)} \\
\begin{array}{c}
\text{a. Merge of } T \text{ and } vP
\end{array}
\begin{array}{c}
\text{[}_T' \text{ } T(\bullet \bullet \succ EPP) \text{[}_vP \text{ PRO [}_v' \emptyset_i [}_v' v \text{ [VP read } \emptyset_T ]]]]}
\end{array}
\begin{array}{c}
\text{b. EPP-movement of } PRO
\end{array}
\begin{array}{c}
\text{[}_T' \text{ PRO } [}_T' \text{ } T(EPP) \text{[}_vP \text{ PRO [}_v' \emptyset_i [}_v' v \text{ [VP read } \emptyset_T ]]]]}
\end{array}
\begin{array}{c}
\text{c. Merge of } C \text{ and } TP
\end{array}
\begin{array}{c}
\text{[}_C' \text{ } C(\bullet \bullet \succ \bullet \text{Op}) \text{[}_T' \text{ PRO } [}_T' \text{ } T(EPP) \text{[}_vP \text{ PRO [}_v' \emptyset_i [}_v' v \text{ [VP read } \emptyset_T ]]]]}
\end{array}
\begin{array}{c}
\text{d. Insertion of an edge feature}
\end{array}
\begin{array}{c}
\text{[}_C' \text{ } C(\bullet \bullet \succ \bullet \text{Op}) \text{[}_T' \text{ PRO } [}_T' \text{ } T(EPP) \text{[}_vP \text{ PRO [}_v' \emptyset_i [}_v' v \text{ [VP read } \emptyset_T ]]]]}
\end{array}
\begin{array}{c}
\text{e. Movement of } \emptyset \text{ and deletion of the edge feature}
\end{array}
\begin{array}{c}
\text{[}_C' \emptyset_i [}_C' \text{ } C(\bullet \bullet \succ \bullet \text{Op}) \text{[}_T' \text{ PRO } [}_T' \text{ } T(EPP) \text{[}_vP \text{ PRO [}_v' \emptyset_T [}_v' v \text{ [VP read } \emptyset_T ]]]]}
\end{array}
\end{array}
\]

\[9\text{Standardly, elements like *without*, *after* or *before* are assumed to be prepositions which take CPs as there complements (e.g. Nunes (2001)). In such structures one can often find additional empty temporal, logical or negation operators which stand in Spec,CP (see e.g. Munn (2001)). For simplicity, I will stick to the structure where the alleged prepositions stand in Spec,CP.}\]
CHAPTER 4. ANALYSIS

f. Merge of the operator and $C'$

\[
[CP \text{ without } [C' \emptyset, [C' C(\bullet Op \bullet)] T_P \text{ PRO } [T' T(EPP) \text{ } [v_P \text{ PRO } [v' \emptyset, v \text{ [VP read } \emptyset]]]]]]
\]

(14)

\[\begin{array}{c}
\text{CP} \\
\text{without} \\
\emptyset \\
C' \\
\emptyset \\
C \\
\text{TP} \\
\text{PRO} \\
T' \\
T \\
v_P \\
\text{PRO} \\
v' \\
\emptyset \\
v' \\
v \\
\text{VP} \\
\text{read } \emptyset
\end{array}\]

Now, the original *which* enters the derivation. It is first merged with *article* and then merged in the complement position of *file*. Then, after $v$ has merged and Agree has taken place, an edge feature is inserted on $v$ that allows for *which* to move to Spec, $vP$. I assume that adjunct clauses are merged in Spec, $vP$. (See Nissenbaum (2000) for discussion and convincing evidence.) The adjunction of the adverbial clause is clearly a syntactic operation and, hence, it must discharge a feature. In the following derivation, I assume therefore, that this feature is simply $[\bullet C \bullet]$ which is optionally present on $v$. This has the effect that adjunction is reduced to Merge.

The steps of the derivation are shown in (15).
4.2. THE DERIVATION

(15) a. Merge of which article and file
   \[ [\text{VP file which}_i(\text{D}_i \prec \chi \prec \text{acc} \prec \phi \prec) \text{ article}] \]

b. Merge of \(v\) and VP
   \[ [v \binom{\text{v}'}{\text{D}'} > \text{C}_i \cdot} {\ast} \prec \prec \text{acc} \prec \phi \prec) \text{ article}] \]

c. \(\phi\) and case checking between \(v\) and which
   \[ [v \binom{\text{v}'}{\phi} > \text{acc} \prec \text{D} \prec \text{C} \cdot} {\ast} \prec \prec \text{acc} \prec \phi \prec) \text{ article}] \]

d. Insertion of an edge feature
   \[ [v \binom{\text{v}'}{X} > \text{D} \prec \text{C} \cdot} {\ast} \prec \prec \text{acc} \prec \phi \prec) \text{ article}] \]

e. Movement of which and deletion of the edge feature
   \[ [v \binom{\text{which}_i}{\phi} > \text{acc} \prec \phi \prec) \text{ article}] [v \binom{\text{v}'}{\phi} > \text{D} \prec \text{C} \cdot} {\ast} \prec \prec \text{acc} \prec \phi \prec) \text{ article}] \]

(16)

\[
\begin{array}{c}
\text{DP} \\
\text{which} \ \text{NP} \ \text{v} \\
\text{article} \\
\text{file} \\
\text{DP} \\
\text{which} \ \text{article}
\end{array}
\]

At this point, the derivation has almost reached the point where the fusion features of which can be deleted. Nevertheless, some preparations still have to be done.

Till now, we have reached a point in the derivation where which and its duplicate have entered the derivation. As I sketched in section 4.1, the two instances of which have to come together again since one instance of which has features marked by \(\chi\) which have to be discharged to circumvent a crash of
Now, the problem which arise by the configuration in (15-e) is that these features are only present on *which* and not on *v*. If the derivation would proceed now, the final two structure-building features of *v* would be deleted. Thus, after merging the CP, no edge feature could be inserted on *v* anymore and subsequently no element could be moved out of the CP. But, as we will see in a short while, movement of $\emptyset$ out of the CP is necessary.

This problem, however, can be avoided by a slight modification of feature percolation. The standard view of feature percolation is that only features present on the head daughter can percolate to the mother node. However, if one allows features to percolate also from non-head daughters, the fusion features of *which* can percolate to a projection of *v*.$^{10,11}$

Now, because features are organized in lists, it is necessary to percolate not only bare features but rather feature lists. Müllер (2010) explicitly claims that phase heads can have more than one feature list. (He assumes that structure-building and probe features are distributed on different lists.) So, the only addition that I want to add to Müllér’s framework is that feature lists cannot only percolate from head daughters but also from non-head daughters. The mechanism is schematized in (17).

---

$^{10}$This understanding of feature percolation is probably best known from representational frameworks like GPSG (Gazdar et al. (1985)) or HPSG (Pollard/Sag94). There, feature percolation is guaranteed by the Nonlocal Feature Principle.

$^{11}$Feature percolation from specifier positions have been independently suggested for analyzing Pied-Piping, for example by Horvath (1997), Ortiz de Urbina (1993) or Yoon (2001).
The tree in (17) simply says that the set of feature lists of specifiers project just the same way as the set of feature lists of the head.

The effect of this modification of feature (list) percolation is that it is indeed the $[\triangleright D_i \triangleleft]$ feature, the $[\triangleright \text{acc} \triangleleft]$ feature and the $[\triangleright \varphi \triangleleft]$ feature of which that keeps the $v$-head active and allows the insertion of an edge feature.

Two things should be mentioned before we go on with the derivation. First of all, I assume that features can only percolate if it has an effect on outcome. That is, only features that have to be checked can percolate. Thus, percolation of features or feature lists is justified because it prevents a crash of the derivation. Second, percolated features are only present on the mother node. That means, if the fusion features of which percolate to $v'$ they are no longer present on which.

Now, we can continue with the derivation. The point where we stopped above is illustrated by the tree in (18).
The first step now is the feature percolation of \([\triangleright D_i \triangleleft]\), \([\triangleright \text{acc} \triangleleft]\) and \([\triangleright \varphi \triangleleft]\) from \textit{which} to a projection of \(v\). Afterwards, the subject and the adverbial clause are merged. Although the structure-building features that were originally present on \(v\) are deleted, the fusion features of \textit{which} still reside on \(v\) (or rather a projection of \(v\)). So now, an edge feature can be inserted on \(v\) and the parasitic counterpart of \textit{which} can be moved out of the adjunct clause.

\begin{align*}
(18) & \quad \begin{array}{c}
\text{which} \\
\text{NP}
\end{array} \quad \begin{array}{c}
v' \\
\text{v'}
\end{array} \quad \begin{array}{c}
\text{VP} \\
\text{file}
\end{array} \quad \begin{array}{c}
\text{DP} \\
\text{article}
\end{array}
\end{align*}

(19) a. \textit{Feature list percolation}
\[
[\nu \text{ which}_i (\triangleright D_i \triangleleft \triangleright \text{acc} \triangleright \triangleright \varphi \triangleleft) \text{ article } [\nu' v (\bullet D \bullet \triangleright \bullet C \bullet, \triangleright D_i \triangleleft > \triangleright \text{acc} \triangleright > \triangleright \varphi \triangleleft) ] [\text{VP file which}_i (\triangleright D_i \triangleleft > \triangleright \text{acc} \triangleright > \triangleright \varphi \triangleleft)]]]
\]
b. \textit{Merge of the subject and the adverbial clause}
\[
[\nu' [\nu' \text{ you } [\nu' \text{ which}_i \text{ article } [\nu' v (\bullet D \bullet \triangleright \bullet C \bullet, \triangleright D_i \triangleleft > \triangleright \text{acc} \triangleright > \triangleright \varphi \triangleleft) ] [\text{VP file which}_i (\triangleright D_i \triangleleft > \triangleright \text{acc} \triangleright > \triangleright \varphi \triangleleft) \text{ article}]]]]] \quad [\text{CP without } [C' \emptyset_i [C' C(\bullet O \bullet) \text{ TP PRO } [T' T [\nu' PRO } [\nu' \emptyset_T [\nu' v [\text{VP read } \emptyset_T ]]]]]]]]]]
\]
c. \textit{Insertion of an edge feature}
\[
[\nu' [\nu' \text{ you } [\nu' \text{ which}_i \text{ article } [\nu' v (\bullet X \bullet \triangleright \triangleright D_i \triangleleft > \triangleright \text{acc} \triangleright > \triangleright \varphi \triangleleft) ] [\text{VP file which}_i (\triangleright D_i \triangleleft > \triangleright \text{acc} \triangleright > \triangleright \varphi \triangleleft) \text{ article}]]]]] \quad [\text{CP without } [C' \emptyset_i [C' C(\bullet O \bullet) \text{ TP PRO } [T' T(EPP) [\nu' PRO } [\nu' \emptyset_T [\nu' v [\text{VP read } \emptyset_T ]]]]]]]]]]
\]
d. \textit{Movement of }\emptyset\text{ and deletion of the edge feature}
4.2. THE DERIVATION

\[
[vP \emptyset [\nu [\nu' which\textsubscript{i} article [\nu v(X \rightarrow \triangleright D, \triangleright acc \triangleright \triangleright \varphi \triangleright) [vP file which(D, \triangleright acc \triangleright \triangleright \varphi \triangleright) article]]] [CP without [\nu' C(\bullet Op \bullet) [TP PRO [T EPP] vP PRO [\nu' [\nu v [vP read \emptyset \emptyset \emptyset]]]]]]
\]

(20)

After all these steps, both which and its duplicate are located in Spec,vP. At this point, the fusion operation can take place.
4.3 The Fusion Operation

The idea of the fusion operation is to unify two nodes in a tree. Fusion plays a big role in Distributed Morphology \cite{Halle:1993}. The morphological operation Fusion is part of the morphological component and is applied at the PF interface after the syntactic computation is finished.

The idea of the fusion operation I use is essentially the same one as Fusion suggested by \cite{Halle:1993}. According to them, Fusion can apply under sisterhood and is schematized in (21). The only difference that I want to suggest is that Fusion, just like any other syntactic operation, has to result in feature checking, i.e., be triggered by a feature with a certain property, which I suggest to be exactly $\gg \ll$.

\begin{equation}
(21) \quad \text{Fusion} \quad \xymatrix{ X \ar[rr] & & XY \ar[ll] \ar[dr] & \left\uparrow \begin{array}{c} x(F) \ar@{-}[r] & Y(\gg F \ll) \ar@{-}|{y,z}[rr] & & y \ar@{-}[r] & z \end{array} \right. } \\
\end{equation}

After Fusion is applied to $v'$ and $\emptyset$, the structure given in (20) looks like in (22). Note that all three fusion features of $v'$ can be deleted in one step since the structural configurations are given for all features.\footnote{Multiple feature checking also occurs in ϕ agreement contexts since ϕ features are actually three single features. Hence, I assume that also Fusion can check more than one feature at the same time.}

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At this point, the derivation proceeds as usual. After C is merged, the fused DP *which article* moves to Spec,CP. The final structure is shown in (23).
4.4 Interim Summary

In this chapter so far, I have introduced a new derivational method to derive parasitic gap constructions which differs from all previous accounts in that it assumes two new syntactic operations: Duplication and Fusion. While Fusion is well known from the morphological component, Duplication has never been suggested before. The main idea of Duplication is that features in the numeration can be duplicated only if it is necessary to ensure a successful derivation. Duplicated features are, then, marked by the feature property
4.5. QUESTIONS

▷◁ on the original lexical item. These features are then later able to keep
the phase head in which specifier the island is merged active in the sense of
Müller (2010) because they are percolated to this phase head. As long as phase
heads are active, i.e., possess features that trigger syntactic operations, edge
features [•X•] can be inserted which allow movement of any constituents to
the phase edge. This enables the duplicate which has been merged inside an
island to move out of it. Now, Fusion can apply under sisterhood, whereby the
duplicated features [▷F₁◁, . . . ▷Fₙ◁] are deleted and the duplicate is fused
with a projection of the phase head. After that, the derivation can proceed as
usual.

4.5 Questions

In the last part of this chapter, I want to address some important questions
that arise from my analysis of parasitic gaps.

1. The first question that is of importance is about the referential identity
of the licensing and the parasitic gap.\(^\text{13}\) Thus, in a sentence like (24), the
picture that Peter liked is exactly the one that he had seen before. The
picture he had seen before cannot be different from the one he liked.

(24) [Which picture]i did Peter like tᵢ after he has seen pgᵢ?

In the derivation above, referential identity was enabled by the assumption
that referential indices are tied to the categorial feature D. So if which
is duplicated in the numeration, the duplicate must necessarily have the
same index. Thus, referential identity is guaranteed.

Another possibility to guarantee referential identity would be to assume
an index feature [i] which is independent from the categorial feature

\(^{13}\)Thanks to Gereon Müller for asking this question and suggesting a solution.
and an index feature \([*i*]\) on the verb that must be checked by \([i]\). Then, the index feature \([i]\) must be duplicated as well in order to ensure a successful derivation. However, the difference between the two possibilities is reduced to the question if the index is tied to categorial features and is so orthogonal to the topic of this thesis. In the former case, the original element in the numeration would have a fusion feature \([\geq D_i < \langle]\), while in the latter case, it would have two fusion features \([\geq D < \vdash]\) and \([\geq i < \vdash]\). In either case, referential identity is guaranteed.

2. The next question is closely connected to the discussion above. Can fusion features like \([\geq D < \vdash]\), \([\geq \varphi < \vdash]\), etc. be checked by a category different than the duplicate?\(^{14}\) The answer to this question is clearly, no. Due to the referential index, the fusion feature \([\geq D_i < \langle]\) of the original element can only be checked by a matching feature \([D_i]\). So, the duplication of the index does not only guarantee referential identity but also that categories can only be fused with its duplicates.

3. Next, I want to discuss the question, why the duplicate has to move out of its island in order to undergo Fusion with \(v'\).\(^{15}\) The configuration in question is sketched in (25).

\(^{14}\) Thanks to Doreen Georgi for bringing this issue up.

\(^{15}\) Again, thanks to Doreen Georgi for asking this question.
Since both elements that have to undergo Fusion are moved to specifier positions, their features should be percolated to the respective mother nodes. If this is true for any feature, the categorial feature of $\emptyset_i$ should be percolated to CP and the fusion feature of $wh_i$ to $v'$. Then, a configuration would be given in which Fusion could take place. Thus, no movement of $\emptyset_i$ out of the CP is needed. However, this would mean that $v'$ and CP are the categories to be fused which is obviously not the case.

This scenario is, however, prevented by the function of feature percolation discussed above. Feature percolation was introduced above as a mechanism that prevents the crash of a derivation by copying unchecked features from specifiers to projections of their heads. Hence, it is reasonable to assume that not all features percolate but only features which cannot be checked otherwise. This assumption in turn means that simple categorial features like $[D]$ cannot percolate with the consequence that $\emptyset_i$ in (25) must move out of the adjunct in order to enable fusion.

4. The next question that I want to answer is of particular interest: what happens if the original element having fusion features and the duplicate having the matching features are merged in the position of their respective counterpart, that means in the example in (26), $what$ is merged with $read$
and $\emptyset$ is merged with *file*.

(26) What did you file *t* without reading *pg*?

The derivation of the sentence in (26) would be like in (27). First, *what*, having a fusion feature $[\text{\textgreater} D\text{\textless}]$ is merged inside the adjunct clause and moved to the edge of the clause. The duplicate $\emptyset$ would be merged in the matrix clause and move to Spec, $vP$. From its specifier position the fusion features of *what* can percolate to CP. Since the adjunct clause is in a specifier position, the fusion features can further percolate to $v'$. Now, an edge feature can be inserted on $v'$ and $\emptyset$ can move to a higher specifier position (assuming that such local movement is possible). In this position fusion can take place.

(27)

\[
\begin{array}{c}
\text{vP} \\
\text{\textbullet}(D) \\
\text{v'(\text{\textgreater}D\text{\textless})} \\
\text{\textbullet} \\
\text{\textbullet} \\
\end{array}
\]

However, even though the fusion operation will be successful, the derivation will crash at a later step. The structure-building feature $[\textbullet wh\textbullet]$ of the matrix C cannot be deleted because *what* is not accessible for C due to its position in the adjunct.
4.5. QUESTIONS

(28) \[\begin{array}{c}
\text{C}' \\
\text{C(\text{\bullet wh \bullet})} \\
\text{TP} \\
\text{you} \\
\text{T'} \\
\text{T} \\
\text{vP} \\
\text{v'} \\
\text{CP} \\
\text{\ldots} \\
\text{what(wh)} \\
\text{\ldots}
\end{array}\]

Hence, the only possibility for a successful derivation is to merge the original D element in the matrix clause and the duplicate in the adjunct clause.\(^\text{16}\)

5. The last question has a very short answer, but is nevertheless important. The question concerns the optionality of parasitic gaps.

(29) a. What did you file \textit{t} without reading \textit{pg}?

b. What did you file \textit{t} without reading \textit{it}?

In my theory, the difference between the the sentences in (29) arise from different numerations. In case of (29-a) the numeration is defective, and Duplication has to apply and in case of (29-b) a pronoun is already part of the numeration.

This chapter have provided a new theory about parasitic gaps that assumes that parasitic gaps are duplicates of lexical items in the numeration. After \footnote{\textsuperscript{16}Later, we will see that fusion features of the CP cannot percolate from its specifier position in the \textit{vP} because feature percolation is only possible from specifiers that are created by movement. Then, the derivation will crash already at the point where the adjunct is merged and the \textit{vP} phase is completed.}
having given a detailed analysis of the sentence “Which article did you file without reading?” I have addressed some important questions that results from my assumptions.

The next two chapters of this thesis will discuss evidence for the new theory comparing it with Nissenbaum’s (2000) operator theory.
Chapter 5

Properties of Parasitic Gaps
Revisited

In this chapter, I will, again, review the properties of parasitic gaps and compare my analysis to an analysis that uses null operators.

5.1 Overt Movement

The first property of parasitic gaps that I mentioned in section 2.2 was the fact that parasitic gaps must have a licensing gap, i.e. a category which is created by movement in narrow syntax. The data exemplifying this fact are repeated in (1).

(1)  a. *I forget who filed which articles without reading pg?

     Engdahl (1983:14)

     b. *Who told whom that we were going to vote for pg?

Operator theories of parasitic gaps could say that the sentences in (1) are ungrammatical because no movement to Spec,vP takes place and so no predicate abstraction of the vP. But wh-operators are supposed to move at LF too, so that this explanation fails.
The explanation Nissenbaum (2000) suggests for the ungrammaticality of the data in (1) is, therefore, much more complex. He suggests that nothing precludes parasitic gaps to be licensed by LF-movement. Data that show this fact are given in (2) (repeated from section 2.2.1).

(2)  a. *[Which senator]_1 did you persuade t₁ to borrow [which car]₂ [after getting [an opponent of pg₁] to put a bomb in pg₂]?  
   b. *Which senator]_1 did you persuade t₁ to borrow [which car]₂ [after putting a bomb in pg₂]?

(3)  a. *[Which kid]_1 did you give [which candy bar]₂ to t₁ [without first telling [a parent of pg₁] about the ingredients in pg₂]?  
   b. *Which kid]_1 did you give [which candy bar]₂ to t₁ [without looking at the ingredients in pg₂]?

Nissenbaum (2000) argues that movement of any kind results in tucking in (see Richards (1997)). Nissenbaum (2000) summarizes tucking-in by the following condition in (4).

(4)  **Tucking-in Condition** (Nissenbaum (2000:101))  
Movement does not extend the tree if an alternative exists (it must tuck in below the outermost segment whenever possible).

So, if wh-phrases are moved to an intermediate position in Spec, vP in order to license parasitic gaps in an adjunct, they must move to a position above the adjunct. This is only possible if movement is realized before the adjunct is merged in Spec, vP. Now, covert movement must necessarily follow overt movement, that is, in sentences like (1) movement of the lower wh-phrase must tuck in below the adjunct. Then, the configuration in which parasitic gaps can be licensed is not given and such sentences must be ungrammatical.
5.1. OVERT MOVEMENT

Now, the grammatical sentences like in (2-a) and (3-a) can be explained as follows: First, the higher wh-operator moves overtly to Spec,vP. Then, the adjunct containing two parasitic gaps is merged just below the operator. Next, the second wh-phrase is moved to Spec,vP. Nissenbaum (2000) suggests that it is not clear into which position the second wh-phrase is tucked in. It could be located right under the first wh-operator yielding the correct structure or under the adjunct where it couldn’t license the second parasitic gap. That means that parasitic gaps in multiple questions are only possible if each wh-operator licenses one parasitic gap.

Now, turning to my theory using duplication and fusion as two primitive operations, the data in (1) can be explained just as well. This time, the
ungrammatical unicity is not an outcome of the semantics, but of the syntax. In (1-a) *which* is the lexical item that is duplicated in the numeration. The derivation is quite similar to the derivation I went through in chapter 4. The only problem now is that the original *which* having a fusion feature \[\text{[\textgreater D\textless]}\] cannot move to Spec,\(vP\) because of the subject *who*.

The consequence of all this is that the duplicated *which* cannot be moved out of the adjunct because this is only possible if there is at least one unchecked feature left on \(vP\) that enables the insertion of an edge feature. And this feature can only be the \[\text{[\textgreater D\textless]}\] feature of the original *which*.

(7)

\[
\begin{array}{c}
\text{vP} \\
\text{v'} \\
\text{wh}_1 \quad \text{v'} \\
\text{CP} \\
\emptyset_2(\text{D}) \ldots \\
\text{v} \quad \text{VP} \\
\text{V} \quad \text{wh}_2(\text{[\textgreater D\textless]})
\end{array}
\]

The sentences in (2-a) and (3-a) however, seem to be more problematic for me if I assume that the presence of a wh-operator in specifier position of a phase blocks the movement of another wh-element. If this is, however, not the case, my new theory is perfectly able to derive the differences in grammaticality:

In both sentences, Duplication has to apply twice in the numeration. To ensure a successful numeration, both wh-operators have to move to Spec,\(vP\) and both \[\text{[\textgreater D\textless]}\] features are percolated to (a projection of) \(v\). Now, both duplicated

1 The blocking of the movement of *which* to Spec,\(vP\) could be due to the feature [wh] which is present on both the subject and the object.

2 Of course, *which* also has features [\textgreater \varphi\textless] and [\textgreater acc\textless] that could keep the phase active. This is ignored here because nothing hinges on that.
5.1. **OVERT MOVEMENT**

elements can be moved out of the adjunct and Fusion can apply twice.³

(8) $vP$

However, if both objects can move to Spec,$vP$, the ungrammaticality of (2-b) and (3-b) can hardly be explained. This time, only one wh-phrase is duplicated and hence Fusion takes place only once. It is indeed not clear to me what blocks Fusion here.

Nevertheless, leaving the intricate data brought up by Nissenbaum (2000) beside, the two theories make equal predictions for the licensing of parasitic gaps in this aspect.

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³This derivation is based on the assumption that Fusion can apply at LF as well.
CHAPTER 5. PROPERTIES OF PARASITIC GAPS REVISITED

5.2 Anti-c-command

The next constraint in section 2.2 was the anti-c-command condition first discussed by Chomsky (1982). The constraint says that the true gap may not c-command the parasitic gap.

(9)  
   a. *Which articles t got filed by John without him reading pg?
   b. *Who t sent a picture of pg?

In operator theories, this fact has the following explanation: There cannot be movement inside the vP because the subject, that serves as the antecedent this time, is already in Spec,vP. The operator theory has to assume, therefore, that movement from a specifier position to a higher specifier position of a phase head is impossible (maybe because it doesn’t change the accessibility status of the element in question). Consequently, the vP sticks to the type t and no predicate modification can take place.

Now, Culicover (2001), citing Haegeman (1984), notes the following difference between the two sentences in (10).

(10)  
   a. a note which [unless we send back pg] t will ruin our relationship
   b. *a note which t will ruin our relationship [unless we send back pg]

The sentence in (10-a) is grammatical while the sentence in (10-b) is ungrammatical. If the anti-c-command condition of parasitic gaps is right, the sentences in (10) must have different structures. Thus, (10-a) would be good because the adjunct clause is in a structurally higher position than in (10-b) with the consequence that the trace c-commands the adjunct in (10-b) but not in (10-a).

These sentences don’t argue against an operator theory but rather fit into this account. Compare the derivation in (11) (derivation for (10-a)) with the derivation in (12) (derivation for (10-b)).

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4 See also Chomsky (1986); Longobardi (1985)
5.2. ANTI-C-COMMAND

(11)  a.  
\[ \begin{array}{c}
\text{vP} \\
\text{v}' \\
\text{CP}
\end{array} \]
which will ruin our relationship  
Op unless we send back \( t_{Op} \)

b.  
\[ \begin{array}{c}
\text{TP} \\
\text{which} \\
\text{T}' \\
\text{T} \\
\text{vP} \\
\text{vP} \\
\text{CP}
\end{array} \]
t will ruin our relationship  
Op unless we send back \( t_{Op} \)

c.  
\[ \begin{array}{c}
\text{TP} \\
\text{which} \\
\text{T}' \\
\text{Adjunct} \\
\text{Op unless we send back } t_{Op} \\
\text{T} \\
\text{vP} \\
\text{vP} \\
\text{t}_{\text{Adjunct}}
\end{array} \]
t will ruin our relationship
The derivation in (11) yields a structure that allows the licensing of a parasitic gap because the adjunct and the subject are in exactly the same configuration like in the examples before. This time, predicate abstraction and modification...
5.2. ANTI-C-COMMAND

takes place in the TP rather than in the vP. In (12), on the other hand, the adjunct clause remains the sister of vP and so, no predicate modification in the TP can take place. In that sense, the constraint of parasitic gaps is no longer an anti-c-command constraint, since the trace in (12-c) doesn’t c-comand the adjunct, but rather a constraint about type compatibility.

To overcome this dilemma, the definition of feature percolation must be slightly changed.

(13)  Feature List Percolation (Revised)

\[
\begin{align*}
&\text{XP}(S_{\beta} \cup S_{X'}) \\
&\beta (S_{\beta} = \{F_1, \ldots, F_i\}) \\
&X'(S_{X'} = \{F_j, \ldots, F_n\}) \\
&X(S_X = \{\gamma \succ F_j, \ldots, F_n\}) \\
&\alpha (S_\alpha = \{\ldots\}) \\
&\ldots t_{\beta} \ldots
\end{align*}
\]

The difference to the version in section 4.2 is that, now, features can only be percolated from specifiers that are created by movement.\(^5\)

Now, the data in (9) can be explained. Because the subject is a specifier of \(v\) that is created by Merge rather than Move, fusion features cannot percolate to \(v'\).

This also explains why the sentence in (10-b) is ungrammatical. At the point when the adjunct is merged, no fusion feature is present on \(v\) and so, the duplicated category cannot be moved out of the adjunct. However, if the subject is moved to CP, the fusion feature can percolate to C because this

\(^5\)This understanding of feature percolation is at odds with the view of Yoon (2001) who explicitly states that features can percolate from any specifier position, i.e., also from base-generated ones.
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time, it has been moved to a specifier position. Hence, an edge feature can be inserted on C. Now, if the adjunct clause remains in its position in the vP it is not accessible for C. That’s why, the adjunct must move up to Spec,TP. Then, the duplicate can be moved out of the adjunct and Fusion can take place. Hence, (10-a) is supposed to be grammatical while (10-b) should be bad.

In sum, the anti-c-command condition cannot distinguish between the two theories. Both theories are able to derive the empirical situation correctly, although the duplication theory needs a modified understanding of feature percolation.

5.3 Island Sensitivity

Next, parasitic gaps are subject to subjacency effects as is shown in the examples in (14).

(14) a. This is the man [Op John interviewed t [before meeting pg]]
   b. *This is the man [Op John interviewed t [before expecting you to
      leave [without meeting pg]]] \(\text{Chomsky (1986:55)}\)

This property is clearly a big argument for all movement theories because subjacency violations occur only in movement contexts. Hence, if parasitic gaps were actually (resumptive) pronouns that are bound by the antecedent of the true gap, the number of barriers between binder and bindee should not matter.\(^6\)

Operator theories assume that an empty operator would be inserted in the complement position of meet in (14-b) and then be moved to Spec,CP of the without-clause. Now, the without-clause being type <e,t> would modify the vP of leave in the before-clause where no movement has taken place, i. e., which is

\(\text{Postal (1994, 1998); Ouhalla (2001), however, assume that pronouns are inserted in the position of parasitic gap and, then, moved to a higher position in the adjunct just like operators.}\)

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5.4. $\bar{A}$-MOVEMENT

type t. Predicate modification is, therefore, impossible and the sentence can have no meaning.\footnote{Alternatively, the operator theories can use a syntactic explanation for subjacency effects.}

In my theory, the ungrammaticality of (14-b) simply follows from Müller’s system to derive CED-based island effects. More precisely, the duplicate of $Op$ would be merged with $meet$ but cannot be moved to a position outside of the $without$-clause. The structure is given in (15).

(15)

\[
\begin{aligned}
&vP \\
&\quad v' \\
&\quad \quad PRO \\
&\quad \quad v' \\
&\quad \quad \quad \emptyset_{Op} \text{ without meeting} \\
&\quad \quad v \\
&\quad \quad VP \\
&\quad \quad \quad \text{leave}
\end{aligned}
\]

The $without$-clause is merged in the $vP$ when all structure-building and probe features are already deleted. And because no fusion features are present on $v'$, since the original item $Op$ is later merged in the matrix clause, no edge feature can be inserted on $v'$ and thus, no extraction of $\emptyset_{Op}$ out of the $without$-clause can take place. The sentence in (14-b) should, therefore, be impossible.

That means both theories can account for the island sensitivity of parasitic gaps.

5.4 $\bar{A}$-Movement

The next property of parasitic gaps concerns the position of the antecedent. Only categories in $\bar{A}$-positions can license parasitic gaps. The sentences in (16)
are, therefore, ungrammatical.

(16)  
   a. *John was killed by a tree falling on *\(pg\).

   b. *Mary tried to leave without John’s hearing.

   c. *Mary seemed to disapprove of John’s talking to *\(pg\).

The landing site in all three examples in (16) is Spec,TP. Furthermore, in all three cases, \(v\) doesn’t subcategorize a subject.

Defenders of the operator theory have to assume that no movement to Spec, vP takes place in the examples in (16). In the case of raising, no problem occurs since the raised DP is the subject of the embedded clause and so, the raising problem can be subsumed under the anti-c-command condition.

Passive, on the other hand, could pose a problem for this theory since movement from VP to Spec,TP requires a stop-over at Spec, vP. Chomsky (2000), however, has suggested that the underlying structure of passive doesn’t involve a vP, but a bare VP. This would mean that there is no phase head in between and the complement of the verb is directly accessible for T.

Interestingly, examples like (17) (cf. Legate (2003)) show that passive constructions must involve a vP phase, where the wh-operator can stop over in order to license a parasitic gap.

(17)  
   a. ?Which house did John buy before we could demolish *\(pg\)?

   b. ?Which house was John sold before we could demolish *\(pg\)?

   c. ?Which story did John show the editor without anyone verifying *\(pg\)?

   d. ?Which story was the editor shown without anyone verifying *\(pg\)?

Legate (2003:511)

The sentences in (17-b) and (17-d) involve passive movement of the goal as well as wh-movement of the theme. But if the wh-operator can license the parasitic gap in all cases, all structures must be equal accept as for passive
5.4.  Ā-MOVEMENT

movement, i.e., they must have a vP phase. The structure of (17-b) is given in (18).

But then, operator theories have difficulties in explaining the contrast between (17-b) and (19). Nothing should prevent passivized wh-operators to license parasitic gaps if they intermediately stop at a phase edge. Hence the structures of (19) must be like in (20).

(19)  *Which house was sold t [before we could demolish pg]?
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If passive structures, however, involve a phase just like active structures, operator theories cannot explain the ungrammaticality of neither (19) nor (16-a).

My theory, however, makes some interesting predictions with respect to this phenomenon. The answer to the difference between (19) and (17-b) must be due to the feature structure. First, in the numeration, a wh-operator like which has the following feature specification.

(21) \[ which \{D, N, \varphi, \text{case}, \ast \text{case}, \ast, \text{wh}, \ldots \} \]

Now, if Duplication applies, the feature specification changes to the one in (22).

(22) a. \[ which \{D, N, \varphi, \text{case}, \ast \text{case}, \ast, \text{wh}, \ldots \} \]

b. \[ \emptyset \{D, \varphi, \text{case} \} \]

The original which and its duplicate can now enter the derivation. The structure-building and the probe features of which are deleted during the derivation.

Now, if Fusion applies to which and \(\emptyset\), the remaining feature specification is given in (23).

(23) \[ which \{\text{wh}, \ldots \} \]

So, the categorial feature of which is no longer present. But assuming that the EPP property of T can only be satisfied by categorial features, which in (19) cannot delete the EPP feature of T. In (17-b) it is John that checks the EPP feature and which, still having the [wh] feature, checks [\(\bullet \text{wh} \bullet\)] on C.

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8Thanks to Marc Richards for native speaker judgements and helpful discussion of (17-b) and (19).
5.5. REFERENTIAL NOMINALS

Hence, (17-b) is correctly predicted to be grammatical while (19) must be ungrammatical.

In sum, the property that parasitic gaps cannot be licensed by passive is mysterious under operator theories but is naturally explained under the duplication theory.

5.5 Referential Nominals

The third property that I listed relates to the sentences in (24) (repeated from section 2.2.5).

(24)  
   a. *Sick, though Frank was ti, without looking pg, he didn’t visit a physician.
   b. *How2 did Deborah cook the pork t2 after cooking the chicken pg2?

Cinque (1990) has claimed that parasitic gaps have to be referential nominals. Thus, the sentences in (24) must be ungrammatical. This property, if true, poses a serious problem for both theories since it cannot be derived without additional assumptions about operators or the type of lexical items that can be duplicated.9

However, as I have already mentioned, this constraint on parasitic gaps is not uncontroversial. Some of the data, that argue the converse are repeated in (25).

(25)  
   a. How harshly do you think we can treat them t without in turn being treated pg ourselves?

\footnote{Nunes (2001) suggests that the compatibility only with NPs is not restricted to parasitic gaps:}

“The fact that the restrictions in (i) [Parasitic Gaps can only be licensed by (nonreferential) NPs] are also found in constructions involving wh-phrases in situ suggests that they should be viewed as general conditions on operator-variable constructions, rather than specific properties of parasitic gap constructions […]” (Nunes 2001:325,fn. 32)
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b. That’s the kind of table on which it would be wrong to put expensive silverware without also putting a fancy centerpiece.

c. I wonder just how nasty you can pretend to be without actually becoming.

d. [That Robin is a spy] would naturally be difficult to refute without (someone) having conjectured pg.

Levine et al. (2001:185)

So, the status of this constraint is not quite clear to me and the constraint we are faced with here is perhaps much more complex than a simple categorial one. If Levine et al. (2001) are right and parasitic gaps can be licensed by any category, the constraint about referentiality is harmless for both theories.

5.6 Antipronominal Contexts

Next, antipronominal contexts, as observed by Cinque (1990) and Postal (1993), are not compatible with parasitic gaps. Some of the sentences that exemplify this incompatibility are repeated in (26).

(26) a. It was *her/HER that the drug helped.

b. *Which child did everyone who believed it was pg that the drug had helped see t the hospital?

(27) a. Mirabelle dyed her sheets purple/*it.

b. *the color that everyone who dyed their sheets praised t.

This property is really puzzling if parasitic gaps are not empty pronouns. Obviously, operator theories can hardly handle this fact. But theories that

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10See Levine et al. (2001) for details. They bring up the idea that the putative ungrammaticality of non-nominal parasitic gaps is due to the working memory. They cite Kluender (1998) who has shown that referential fillers remain longer in the working memory than non-referential fillers.
5.6. ANTIPRONOMINAL CONTEXTS

simply identify parasitic gaps with empty pronouns get a problem with data which show that also the licensing gap may not occur in an antipronominal context.

(28) *Which child did everyone who saw pg believe it was \( t \) that the drug had helped \( t \)?

A clear solution to this problem has, however, not been found yet. Postal, who recognized this problem, also tries to find a solution. In fact, he even offers two solutions.

Postal (1998) distinguishes two types of extractions in English: *A-extraction* and *B-extraction*. B-extractions (topicalization, clefting and nonrestrictive relative extraction) are incompatible with antipronominal contexts. Postal, therefore, concludes that B-extraction always involves the insertion of a resumptive pronoun. However, there remains the question why the sentence in (29) is ungrammatical.

(29) *[How many spies] did the committee include \( t \) before the secret police eliminated pg?*

Here, wh-extraction from an antipronominal context (*include someone/*\( t \)) took place which is actually an A-extraction. Postal (1998), therefore, suggests that every extraction that licenses a parasitic gap is a B-extraction.

Postal (2001), however, rejects this idea, since there is no further evidence for this stipulation and, furthermore, it doesn’t suffice to explain subtle differences between antipronominal contexts. There are antipronominal contexts which are compatible with licensing but not with parasitic gaps.

(30) a. *What situation did no one [who minded pg] discuss \( t \)?*

b. *What situation did no one [who discussed pg] mind \( t \)?*
Therefore, Postal (2001) dispenses with his old theory and suggests that the complex behaviour of parasitic gap constructions towards antipronominal contexts can be better explained in Metagraph Grammar. (See Postal (2001) for details.)

The exact nature of antipronominal contexts is, however, still unclear. Postal (2001) remarks that verbs like mind s-select features that contradict the features of pronouns. That means in general, some of the antipronominal contexts can be explained on semantic grounds.

Levine et al. (2001:193f.) discuss this aspect of parasitic gaps extensively. Their conclusion is that the evidence showing that parasitic gaps (and licensing gaps) are incompatible with antipronominal contexts is not conclusive. They quote grammatical examples for different antipronominal contexts in which parasitic gaps can occur.

(31) **Second dative object**
   a. *I sent Robin it for his birthday.
   b. I found a really nice card that I decided to keep *t for myself [instead of sending Robin pg for his birthday].

(32) **Color context**
   a. *We painted the walls it.
   b. Mint green is a color that you might paint your ceiling *t [without necessarily wanting to paint the surrounding walls pg].

(33) **Predicate nominals**
   a. *Robin wants to be a doctor but I don’t think he’ll ever become it.
   b. Anybody can become a bureaucrat, but a doctor, one could spend one’s whole life studying to be *t [without ever becoming pg].

(34) **Specialized spatial/locative contexts**
   a. *He talked a lot about the Greek Army but had never entered it.
5.7. NO REFLEXIVES OR RECIPROCALS

b. The Greek Army is one national service that I would certainly want to assess carefully before entering.

To me, these data seem to be convincing to prove that the incompatibility of parasitic gaps with antipronominal contexts is much more complex than Postal claims it to be. What factors play a role for this exactly is still obscure and hence, this property can be no real counterevidence for both the operator and the duplication theory.

5.7 No Reflexives or Reciprocals

The next property of parasitic gaps is, again, very mysterious: parasitic gaps cannot be licensed by categories that are subject to binding principle A, i.e. reflexives and reciprocals. The relevant data are repeated in (35).

(35) a. *Himself₁, Mike₁ praised t after PRO₁ describing pg₁ to Mary.
   b. *It was herself₁ that₁ PRO₁ studying pg₁ led Sonia₁ to appreciate t₁.
   c. *Himself₁, I talked to John₁ about t₁ after describing him₁ to pg₁.

(36) a. Each other₁, they₁ (never) praised t₁.
   b. *Each other₁, they₁ (never) praised t₁ after PRO₁ describing pg₁.
   c. *It was each other₁ that₁ their₁ getting to know pg₁ led them₁ to respect t₁.

This property is clearly problematic for operator theories of parasitic gaps and is, probably therefore, not noted in these analysis.¹¹

Let’s discuss the possibilities of the duplication theory. The ungrammaticality of the sentences in (35) and (36) cannot be accounted for in my theory. Let’s have a look at the sentence in (35-a). Here, it is the reflexive himself that

¹¹In fact, the only source of information for these data is, to my knowledge, Postal (2001).
is duplicated. If binding is an instance of Agree, as Fischer (2004) (see also Fischer (2006)) has proposed, himself has a feature specification as in (37).

(37)  \textit{himself}[D, \varphi, *\text{case*}, \text{top}, \beta, \ldots]

The binding feature \(\beta\) will be the goal for a feature \([*\beta*]\) located on the binder of \textit{himself}. Now, let’s assume that only \textit{John} has a feature \([*\beta*]\). Then, the duplicate of \textit{himself} would not have a binding feature and couldn’t be bound. So far, so good. Nevertheless, whether the binding feature is copied or not shouldn’t determine the success of the derivation.

Even worse, Fischer (2004) assumes that elements that possess a feature \([\beta]\) can also have a feature \([*\beta*]\). If this is the case, PRO has a feature \([*\beta*]\) and the binding feature of \textit{himself} is duplicated as well.

That means, the fact that reflexives and reciprocals cannot be antecedents for parasitic gaps is still unexplained.

But in the face of all theories having problems with these data, it is not a drawback neither of the duplication nor of the operator theory.

5.8 Antipassivizability

The next property of parasitic gaps is that they are not compatible with antipassivization contexts. The example from section 2.2.8 is repeated in (38).

(38)  a. Their relations involved abuse.
    b. *Abuse was involved by their relations.
    c. [What kind of abuse] did their relations involve \(t\)?
    d. [What kind of abuse] did his constantly discussing \(pg\) suggest that their relations involved \(t\)?
    e. *[What kind of abuse] did your discovering that their relations involved \(pg\) lead him to discuss \(t\)?
    f. *[What kind of abuse] did their relations lead to condemnation of \(t\)
5.9. MULTIPLE WH-QUESTIONS

However, as it is not clear what factors lead to the impossibility of parasitic gaps to occur in these contexts, I cannot provide an answer to this problem nor — I think — can any other theory about parasitic gaps.

5.9 Multiple Wh-Questions

The next property of section 2.2 was the observation of Kim and Lyle (1996) that parasitic gaps may not occur in multiple questions.

(39) a. Which parcel_{1} did you give t_{1} to Susan without opening pg_{1}?
    b. *Which parcel_{1} did you give t_{1} to whom without opening pg_{1}?

A similar set of data has already been discussed in section 5.1. Nissenbaum (2000) has provided the sentence in (40-b) which corroborate this observation.

(40) a. ?[Which kid]_{1} did you give [which candy bar]_{2} to t_{1} [without first
telling [a parent of pg_{1}] about the ingredients in pg_{2}]?
    b. *[Which kid]_{1} did you give [which candy bar]_{2} to t_{1} [without looking
at the ingredients in pg_{2}]?

The only difference between (39-b) and (40-b) is that in (39-b), the parasitic gap corresponds to the overtly moved wh-operator while in (40-b), the parasitic gap belongs to the non-moved operator.

So, the ungrammatical sentence in (39-b) should be derived, according to Nissenbaum (2000), as in (41).

(41) a. [vP which parcel_{1} [vP t_{1} give to whom]]
    b. [vP which parcel_{1} [CP Op without opening t_{Op}] [vP t_{1} give to whom]]
    c. [vP which parcel_{1} whom_{2} [CP Op without opening t_{Op}] [vP t_{1} give to t_{2}]]
CHAPTER 5. PROPERTIES OF PARASITIC GAPS REVISITED

However, Nissenbaum (2000) doesn’t exclude the possibility of whom being merged below the adjunct.

(42) \([vP \text{ which parcel}_1 [CP \text{ Op without opening } t_{Op}] \text{ whom}_2 [VP \ t_1 \text{ give to } t_2]]\]

This possibility is necessary to derive sentences like (43) where the lower object is overtly moved to Spec,vP.

(43) ?[Which kid]_1 \text{ did you give [which candy bar]}_2 \text{ to } t_1 \ [\text{ in order to impress } pg_1] ?

Therefore, Nissenbaum (2000) cannot account for (39-b).

And just like in section 5.1, I cannot provide an answer to this problem. The duplication theory predicts all sentences involving overt wh-operator movement to enable parasitic gaps. Hence, (39-b) and (43) should be both grammatical.

5.10 Reconstruction

Finally, the last property of parasitic gaps is asymmetrical reconstruction. The data are repeated below.

(44) a. [Which books about himself]_1 \text{ did John}_1 \text{ file } t_2 \text{ before Mary read } pg_2 ?

b. *[Which books about herself]_1 \text{ did John}_1 \text{ file } t_2 \text{ before Mary}_1 \text{ read } pg_2 ?

Kearney (1983)

This property is predicted by both theories. First, if parasitic gaps are operators, they refer to the whole DP which books about himself rather than to himself.

In my theory, this behaviour is expected because, the only item that is
5.10. RECONSTRUCTION

duplicated is *which. Thus, only the duplicate of *which is merged in the adjunct clause. Furthermore, because of Fusion the duplicate cannot be reconstructed into the adjunct clause. Therefore, the two theories are again equal in this respect.

One thing should be mentioned, though. Munn (1994) noticed that what appears to be simply the impossibility of reconstruction into an island, is indeed much more complicated.

(45)  
  a. *Which picture of herself did every boy who saw pg say Mary liked t?  
  b. Which picture of himself did every boy who saw pg say Mary liked t?

Munn (1994) claims that reconstruction depends on the relative position of the gap. That is, if the parasitic gap follows the licensing gap (cf. (44)), the antecedent will be reconstructed into the licensing gap. If, however, the parasitic gap precedes the licensing gap (cf. (45)), the antecedent will be reconstructed into the parasitic gap.

If this is true, both theories fail to explain the ungrammaticality of (45-a).

Summarizing this chapter, we have seen that the new theory of parasitic gaps doesn’t have any big disadvantage over operator theories of parasitic gaps. In most aspects considered so far, both theories make the same predictions about the properties of parasitic gaps, that is either they can both derive the behaviour or they both can’t. An interesting difference between the two theories regards passive structures. While the operator theory is unable to explain why simple passivized categories cannot license parasitic gaps, I have shown that because of duplication and fusion, passivized categories lose their categorial features before they can check EPP on T. Hence, passive movement cannot license parasitic gaps.
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The next chapter will provide further empirical evidence why the new theory is superior to theories that assume empty operators.
Chapter 6

More Empiricial Evidence

The aim of this chapter is to show that operator theories are not adequate to describe the behaviour of parasitic gaps. The evidence for this will be threefold: First of all, I will show that the parasitic and the licensing gap have to be identical in certain features which is expected under the duplication theory but unexpected under the operator theory. Secondly, I will show that operator theories are semantically inadequate for all contexts where parasitic gaps can occur except for adjuncts. Finally, I will discuss the behaviour of duplicated items before and after Fusion.

6.1 Identity Restrictions for the Duplicate

The first type of evidence is well known and goes back to Kiss (1985). She has shown that the parasitic and the licensing gap have to have the same case feature.\footnote{In fact, case identity means morphological case identity. Franks (1993) shows that in Russian, case identity can be violated if the morphological form of the antecedent is syncretic and encompasses the different cases of the parasitic and the licensing gap.}

(i) a. mal’čik, *kotoromu/*kotorogo Maša davala den’gi t do togo, boy who.DAT/GEN Masha.NOM gave money t.DAT until kak (ona) stala izbegat’ pg (she) started to-avoid pg.GEN
CHAPTER 6. MORE EMPIRICAL EVIDENCE

This fact is shown in (1) and (2) for Hungarian (Kiss (1985)) and German (Kathol (2001)).

(1) a. [FP Milyen iratok tettél el t [CP mielőtt elolvastál-volna pg]]
    what papers.ACC you.put away before you.had.read
    “What papers did you put away before you had read?”

   b. *[FP Milyen iratok vesztek el t [CP mielőtt elolvastál-volna pg]]
    what papers got.lost away before you.had.read
    “What papers did you put away before you had read?”

   c. [FP Milyen iratokat gondoltál [CP mielőtt elolvastál-volna pg]]
    what papers.ACC you.thought before you.had.read
    [CP hogy nem szeretnél [CP ha elvesznének t]]
    that not you.would.like if got.lost
    “What papers did you think before reading that you would not like
    if were lost?”

(2) a. *Hans hat seiner Tochter [ohne pg davon zu]
    Hans has his daughter.DAT without thereof to
    informieren] DM 100 überwiesen.
    inform DM 100 wired
    “Hans wired his daughter 100 DM without telling her of it.”

   b. *Hans hat seine Tochter [ohne pg Geld zu geben]
    Hans has his daughter.ACC without money to give
    unterstützen können.
    support could
    “Hans was able to help his daughter without sending her money.”

The Hungarian data in (1) show that sentences with parasitic gaps are only

“the boy who Masha gave money to until she started to avoid him”

b. devuška, kotoroj Ivan daval den’gi t do togo, kak
    girl who.DAT/GEN Ivan.NOM gave money until t.DAT (he) started
    to-avoid pg.GEN
    “the girl who Ivan gave money to until he started to avoid her”

An answer to this problem is to assume that case features are already decomposed in the
numeration and that the case marker in (i-b) is underspecified. If decomposition of case
features is legitimate, case identity is not violated.

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6.1. **IDENTITY RESTRICTIONS FOR THE DUPLICATE**

acceptable if both the parasitic and the licensing gap have the same case. This is true for (1-a) where both have accusative case. In (1-b), on the other hand, the licensing gap is nominative while the parasitic gap is accusative. Finally, in (1-c) the situation is similar to (1-b) but with the difference that the licensing gap’s case is changed from nominative to accusative case during the derivation. (This case change is optional in Hungarian.)

The German sentences in (2) confirm the claim that both gaps have to have the same case. In (2-a) the antecedent of both gaps has dative case which is incompatible with the verb *informieren* which governs accusative case. In (2-b), the antecedent is, now, accusative which is the case of the real gap this time but not of the parasitic gap.

Kiss assumes that sentences with parasitic gaps involve only one antecedent which is the head of two chains. (This could be the case if one assumes the chain composition mechanism of [Chomsky 1986] or the theory of [Frampton 1990].) She suggests the condition in (3) which she claims to be a natural consequence of the case properties of ŠA-chains given in (4).

(3) In a parasitic gap construction, the Case of both the real gap and the parasitic gap must be properly transmitted to the phonologically realized operator.

(4) **Case marking in ŠA-chains**

a. A transitive V case-marks its noun phrase object or the noun phrase occupying the specifier of its sentential object, whether the target noun phrase is empty or lexically filled. (Case marking is optional, unless forced by the Case Filter.)

b. In an ŠA-chain, Case is inherited successive cyclically.

c. If an element of an ŠA-chain is both Case marked by a Case assigner and inherits a Case, the more marked one of the two Cases is realized.
So, minimalist operator theories have to assume Chain Composition or similar mechanisms and the assumptions about case marking in chains to derive the case identity property of parasitic gaps. However, such mechanism haven’t been proposed by Nissenbaum (2000) who argues that parasitic gaps are exclusively licensed at LF.²

Turning to the Duplication theory of parasitic gaps, the case identity requirement is a natural outcome of my theory.

Since case features are already present in the numeration and duplication is copying of features, the duplicate must have the same case feature as the original lexical item.³,⁴

Beside case, such features are definiteness and animacy. Definiteness is a feature that is morphologically overt in Hungarian. The following data is due to Kiss (1985).

²In fact, case marking should not matter at all according to Nissenbaum (2000) since case marking is a property of narrow syntax and not of LF. Thanks to Philipp Weisser for strengthening this position.

³Somewhat more complicated is the theory if case features are the outcome of feature valuation. The only way out here is to assume that the case feature of the antecedent is percolated together with the fusion features. Thus, Fusion must be revised.

(i) **Fusion (Revised Version)**

\[
\begin{array}{c}
X \\
\downarrow \\
x \\
(F, \\
α_1, \ldots, α_i)
\end{array} \Rightarrow \begin{array}{c}
xY \\
\downarrow \\
(α_1, \ldots, α_n)
\end{array} \begin{array}{c}
y \\
\downarrow \\
z
\end{array}
\]

Now, Fusion is restricted by the condition that the goal of Fusion must be identical in a subset of features to the node bearing the Fusion feature.

⁴The duplication theory, however, predicts to be impossible since the two case features differ at the point where the two elements are merged. Thus, a theory assuming feature valuation would be perhaps more suitable.
6.1. **IDENTITY RESTRICTIONS FOR THE DUPLICATE**

(5) *[FP Kiket szeretnél [CP ha eljnnék t [PP Who.pl.acc[−DEF] you.would.like if came anékül [CP hogy megphívod pg]]]]

“Whom would you like if came without having invited?”

In (5), *meghívod agrees with a definite object while the antecedent *kiket is indefinite. If definiteness is a feature already present in the numeration, it is excepted under my theory that both instances of *kiket should have the feature [+DEF]. Hence, the agreement marking in (5) can never come off.

Another feature that should presumably matter is animacy. Compare the German sentences in (6).

(6) a. Was hat er ohne zu kennen gemocht?
   what has he without to know liked
   “What did he like without knowing?”

b. *Was hat er ohne zu mögen geheiratet?
   what has he without to like married
   “What did he marry without liking?”

c. *Was hat er ohne zu heiraten gemocht?
   what has he without to marry liked
   “What did he like without marrying?”

The sentences in (6) should illustrate that the two gap positions must agree in animacy. The two verbs in (6-a), *kennen (‘to know’) and *mögen (‘to like’), both select animate as well as inanimate complements. Thus, the sentence in (6-a) is grammatical with the inanimate wh-phrase *was. In contrast to that, the verb *heiraten (to marry) only selects animate (and human) objects.\(^5\) Now, while (6-b) is predicted in both the operator and the duplication theory, (6-c) definitely is a problem for operator theories. The reason is the following one:

In (6-b) and (6-c), defenders of the operator theory would assume an empty

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\(^5\)Actually, it is possible to combine an inanimate object with marry but this is unambiguously understood as insult to the bridge or the groom. This reading is not favoured here.
operator in the object position of the *ohne*-adjunct while the object of the matrix verb is the antecedent *was*. Since *was* is inanimate, it is incompatible with *heiraten* and so (6-b) is definitely impossible. But in (6-c), *was* is merged with *mögen* and the empty operator with *heiraten*. Now this should be possible because empty operators are not supposed to be specified for animacy. Evidence for this comes from English *that*-relative clauses like in (7).

(7) a. the man [Op₁ that I don’t like \( t₁ \)]
   b. the book [Op₁ that I don’t like \( t₁ \)]

The general view of *that*-relative clauses is that they involve an empty operator which is the null equivalent of *which* and *who*. But, as the examples in (7) show, the operator is compatible with both animate and inanimate noun phrases. So, it is the operator theory’s task to prove the existence of two types of empty operators — animate and inanimate ones.

The data in (6) is, however, a natural consequence of the duplication operation in section 4.1. Let’s assume, animacy is a feature which is part of the lexicon. Then, this feature is already present in the numeration (just like case). Hence, the item that is duplicated and the duplicate must have the same animacy feature. So, the verbs must be comparable in respect to their s-selection properties to which animacy clearly belongs.

In sum, this section has shown that identity restrictions on parasitic and licensing gaps distinguish both theories. Operator theories cannot derive the effects without additional assumptions while duplication easily explains the desired effects as long as all features are already present in the numeration.

### 6.2 Parasitic Gaps in Other Constructions

In this section, I will discuss the adequacy of the operator theory of Nissenbaum (2000) in respect to parasitic gaps that occur in relative clauses, subjects and
6.2. PARASITIC GAPS IN OTHER CONSTRUCTIONS

complement clauses comparing my account using Duplication and Fusion with
the operator account of Nissenbaum (2000). According to Engdahl’s (1983)
accessibility hierarchy for parasitic gaps (see section 2.1.1), these are domains
that make sentences with parasitic gaps less acceptable in general, that is they
are low on the hierarchy. Nevertheless, even if the sentences under consideration
are at best marginal, they provide another testing ground for both theories.

6.2.1 Relative clauses

The first construction that I want to consider in this section are relative clauses.
Examples of parasitic gaps in relative clauses in various languages are given in
(8).

(8) *English*

This is a man that people [CP who meet pg] really like t.

Parker (1999:17)

(9) *Dutch*

Dit is het artikel waar ik pg over zei dat Harry een reactie t op
this is the article where I about said that H. a reaction to
moest schrijven.
should write
“This is the article about which I said that Harry should write a reaction
to.”

Bennis and Hoekstra (1985:75)

(10) *Swedish*

a. Räkna upp de filmer som [NP alla [S som sett pg]]
List of those films that everyone who has seen
tyckte bra om t
liked a lot.
“list of thos films that everyone who has seen liked a lot”

*Cited by Parker (1999)*
b. Kalle är en kille som [NP ingen [S som träffat pg]] kan tåla t. 
Kalle is a guy who no one who (has) met can stand.

“Kalle is a guy who no one who has met can stand.”

Engdahl (1983:17)

Before turning to my theory, I want to derive the sentence in (8) by means of operators.

The structure of (8) is given in (11).

Now, this derivation will definitely yield a semantic crash because of type mismatches inside the DP. The movement of the relative pronoun who and the null operator Op causes predicate abstraction twice. The relative clause will, therefore, have the type <e,<e,t>> while the noun phrase has the type <e,t>. That means neither predicate modification nor functional application can be used to determine the type of the modified NP. Thus, the sentence can have no
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Assume now, that the operator Op can move further up to Spec,DP, so that predicate abstraction takes place in the DP. Then, the DP would have the type \(<e,e>\) which is incompatible with the \(v'\) being of type \(<e,t>\). So, even if a type mismatch inside the NP could be prevented, a type mismatch between the subject and \(v'\) occurs.

The operator theory is, therefore, not able to derive sentences where a parasitic gap occurs inside a relative clause.

Now, the derivation of the structure in (8) by means of duplication and fusion must look like in (12).

(12)

```
(12)
```

```
vP
    \(\emptyset\)
    \(v'(\Rightarrow D\rangle\)
      DP
    v'(\Rightarrow D\rangle)
      Op(\Rightarrow D\rangle)
    v'
      really like \(t_{Op}\)
    D(\bullet N\bullet, \bullet X\bullet \succ nom\rangle)
    NP
      NP
      CP
        people
        who
        CP
          \(t_0\)
          \(C'\)
          \(t_{who} \meet t_0\)
```

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First, the duplicated element $\emptyset$ is moved to Spec,CP. Remember from chapter 4 that D heads have a feature [\textit{\texttt{*case*}}] which must be checked by an NP having a matching feature [case]. Now, because D has a case feature that is unchecked at the point when the NP is merged, an edge feature can be inserted that enables the movement of $\emptyset$ to Spec,DP. Now, the duplicate is accessible for $v$ since it has a feature [$>D<_e$] percolated from the moved operator Op. So, an edge feature can be inserted, $\emptyset$ can be moved out of the DP and Fusion can take place. The derivation is supposed to be successful.

In sum, parasitic gaps inside relative clauses pose a real problem for operator theories that license parasitic gaps at LF because the derivation is supposed to cause type mismatches. A theory that dispenses with operators doesn’t have a problem with this type of parasitic gap constructions. Especially, my theory that uses duplicates which fuse during the derivation can derive such structures elegantly.

### 6.2.2 Subjects

Another construction where parasitic gaps may occur are subjects. An example is given in (13).


The predictions for these constructions are the same as for relative clauses. \textit{Nissenbaum} (2000) would assume that an operator is inserted in the position of the parasitic gap who is moved to Spec,DP. This causes predicate abstraction and the DP would be of type $<e,e>$. This type would, however, be incompatible with the verbal projection $v'$ which is of type $<e,t>$. Again, if parasitic gaps are the result of Duplication and Fusion, the possibility of parasitic gaps inside DPs is not surprising. The duplicated who moves to Spec,DP where it is accessible for $v$ which has a fusion feature [$>D<_e$] percolated from the original who. Now, when the duplicate has been extracted
6.2. **PARASITIC GAPS IN OTHER CONSTRUCTIONS**

out of the DP, it can fuse with $\nu'$. The derivation is, therefore, successful.

### 6.2.3 Complement Clauses

The next category that allows parasitic gaps are complement sentences like the ones in (14).

\begin{equation}
\begin{align*}
(14) & \quad a. \quad \text{Who did you warn } t \text{ that the police would arrest } pg? \\
& \hspace{1cm} \text{Culicover (2001:43)} \\
& \quad b. \quad \text{Which man did you persuade } t \text{ that Bill would visit } pg? \\
& \hspace{1cm} \text{Munn (2001:392, fn. 11)} \\
& \quad c. \quad \text{Who did you tell } t \text{ that we were going to vote for } pg? \\
& \hspace{1cm} \text{Engdahl (1983:11)} \\
& \quad d. \quad \text{This is the man who I told } t \text{ that my brother would visit } pg? \\
& \hspace{1cm} \text{Bennis and Hoekstra (1985:61)}
\end{align*}
\end{equation}

The acceptibility of these examples is, however, controversial. While most authors judge them as grammatical (Chomsky (1986); Parker (1999); Culicover (2001); Safir (1987); Engdahl (1983)), some find them rather unacceptable (Munn (2001); Bennis and Hoekstra (1985); Manzini (1994)).

Now, the exact structure of the sentences in (14) is a matter of discussion. On the one hand, there is evidence showing that the position of the licensing gap c-commands the sentential complement of the matrix verb, but on the other hand, this would violate the anti-c-command condition of parasitic gaps. Therefore, Safir (1987) has argued for a structure where the complement clause is in a higher position.

Kiss (1985) has argued that if the object c-commands the sentential complement, the sentence in (15-a) is correctly predicted to be ungrammatical due to Binding Condition C while the sentence in (15-b) is grammatical under coindexing of the quantifier and the pronoun.
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(15) a. *The police warned him that they would arrest John.
    b. The police warned everybody that they would arrest him.

Safir (1987), who acknowledges the facts illustrated in (15), nevertheless argues that the anti-c-command condition is true also for sentential complements. He suggests that the sentential complement can be extraposed to a higher position where it is not c-commanded by the direct object. One of the arguments he provides for this movement is suggested by the data in (16).

(16) a. I called John an enemy of himself.
    b. Who did you call an enemy of John?
    c. *Who did you call an enemy of pg?

The sentence in (16-a) suggests a c-command relation between the complex DP an enemy of himself and John since himself is bound by John. (16-b) shows that movement from the position of John is possible. Now, (16-c) shows that a parasitic gap in the DP causes ungrammaticality since the licensing gap, due to the impossibility of extraposition of the DP, inevitably c-commands the parasitic gap. Safir (1987) concludes, therefore, that the sentential complements in (15) can extrapose and so escape c-command while the non-sentential complement in (16) cannot do so.

Furthermore, Safir (1987) construes sentences that show that the sentential complements of persuade, tell, warn, etc. and adjunct clauses behave alike.

(17) a. I don’t know who Mary will [VP trust t], but I know who John will [VP ].
    b. I don’t [VP know who Mary will [VP trust t ]][CP without meeting pg], but John does [VP [VP ][CP ]].
    c. ??I don’t know who Mary will [VP trust t ][CP without meeting pg], but I know who John will [VP ].

(18) a. I don’t know who John [VP persuaded t ][CP (that) we should trust
6.2. PARASITIC GAPS IN OTHER CONSTRUCTIONS

Bill], but I know who Mary did [VP].

b. I don’t [VP know who John [VP persuaded t][CP that we should visit pg]], but Mary does [VP [VP ][CP ]].

c. ?*I don’t know who John [VP persuaded t][CP that we should visit pg], but I know who Mary did [VP ].

The sentences in (17-b,c) and (18-b,c) show that in both situations it is possible to delete the matrix VP containing the embedded VP and the CP but sentences where only the embedded VP is deleted are ungrammatical. This can only be explained by the CP not being part of the embedded VP in both cases, i.e. if the CP in (18-c) would be part of the VP headed by persuade it should be possible to delete the VP just like in (18-b). If it is not, then, the sentential complement must be in a position higher than the complement of persuade.

So let’s investigate the two possible positions for the sentential complement of the verb persuade starting with the complement position. The structure of (14-b) is given in (19).

(19)

```
vP
   /\   
  v'  v'
 /\    /\  
DP  you v'  v'  
    \   /\   /\  
      \ / v  v  v
        /   /   /  
      t  VP V'  CP
       /  /   /    /  
      persuade that Bill would visit pg
```
CHAPTER 6. MORE EMPIRICIAL EVIDENCE

Now, assuming an operator in the position of the parasitic gap would result in a type mismatch since the complement would have type \(<e,t>\) but \textit{persuade} expects an argument of type \(t\).

The derivation of the structure in (19) by means of Duplication and Fusion is, however, supposed to be successful. First of all the duplicate is merged in the position of the parasitic gap and then moved to Spec,CP via Spec,vP. Then, \textit{which man} moves to Spec,vP of the matrix clause and percolates its fusion features to \(v\). Now, the duplicate of \textit{which} can be extracted and Fusion can take place.

\[(20)\]

a. \textit{Embedded CP}
\[
[CP \emptyset_i \text{ that Bill would } [vP \emptyset_i \text{ visit } \emptyset_i]]
\]

b. \textit{Construction of the VP}
\[
[VP \text{ which(} \text{D}_i \langle \triangleright \text{acc} \langle \triangleright \text{ϕ} \langle \text{)} \text{ man } [vP \text{ persuade CP } \emptyset_i \text{ that Bill would } [vP \emptyset_i \text{ visit } \emptyset_i]]]
\]

c. \textit{Movement to Spec,vP and Feature Percolation}
\[
[vP [v' \text{ which man } v(\text{D}_i \langle \triangleright \text{acc} \langle \triangleright \text{ϕ} \langle \text{)} \text{ man } [vP \text{ persuade CP } \emptyset_i \text{ that Bill would } [vP \emptyset_i \text{ visit } \emptyset_i]]]]]
\]

d. \textit{Extraction of } \emptyset \text{ out of the CP}
\[
[vP [v' \text{ which man } v(\text{D}_i \langle \triangleright \text{acc} \langle \triangleright \text{ϕ} \langle \text{)} \text{ man } [vP \text{ persuade CP } \emptyset_i \text{ that Bill would } [vP \emptyset_i \text{ visit } \emptyset_i]]]]]
\]

e. \textit{Fusion}
\[
[vP [v' \text{ which man } v [VP \text{ which(} \text{D}_i \langle \triangleright \text{acc} \langle \triangleright \text{ϕ} \langle \text{)} \text{ man } [vP \text{ persuade CP } \emptyset_i \text{ that Bill would } [vP \emptyset_i \text{ visit } \emptyset_i]]]]]
\]

Now, turning to the second possibility, if sentential complements and adjunct clauses behave similar in certain respects, the landing site of the extraposition is presumably the position of the adjunct clause, i.e. Spec,vP. The structure
6.3. **THE DUPLICATES BEFORE AND AFTER FUSION**

involving extraposition is given in (21).

(21)

```
vP
  |__ DP
  |   v'
  |     which man
  |         v'
  |           v'
  |             v'
  |               v
  |                 t
  |                   V'
  |                     persuade
  |                       t_{CP}
 CP
```

Of course, this configuration is exactly like the one for adjuncts. Hence, both theories should equally account for this construction. The only problem for operator theories is that the complement clause is now semantically an adjunct clause but perhaps this can be justified.

In sum, parasitic gaps in complement sentences, although only marginally acceptable for some speakers, are expected under both theories.

### 6.3 The Duplicates Before and After Fusion

This section deals with the question if there is further evidence for Fusion in that the syntactic, morphological or semantic behaviour is in some way affected by the presence or absence of fusion features.

The presence of the fusion property on features of some category \( \alpha \) is not supposed to change the way of interaction of \( \alpha \) in Merge or Agree relations.
That is, as I mentioned in the chapter 4, a feature \([\bullet F \bullet]\) can be satisfied by a feature \([F]\) or \([\triangleright F \triangleleft]\) in the same way. Hence, we would expect that categorial and Agree properties of elements with fusion features to be the same as of elements without such features.

Nevertheless, it may be possible that there are languages that make a difference between \([F]\) and \([\triangleright F \triangleleft]\). One set of data that could show differences are reflexes of successive-cyclic movement (Kayne and Pollock 1978; McCloskey 1979; Clements 1984; Collins 1994; Chung 1998; Lahne 2009).


The hypothesis that my theory makes is, therefore, the one in (22).

(22) There are languages in which the syntactic behaviour of some category \(\alpha\) depends on whether it has fusion features or not.

In other words, there should be languages where (i) certain grammatical properties don’t show up until Fusion has taken place or (ii) certain grammatical properties don’t show up after Fusion has applied.

For the latter case (ii), we have seen an example in section 5.4. Before Fusion takes place, elements with fusion features still have categorial properties. Categorial properties are important to satisfy the EPP property of verbal heads, e.g. T. We have seen that Fusion causes the deletion of categorial properties. Hence, elements without categorial features are incapable of satisfying EPP after Fusion. This feature deletion explains why passive movement never licenses parasitic gaps.

For the former case (i), I have not found any examples yet and I will leave this issue for further research.
Chapter 7

Parasitic Gaps in German

The final chapter of this thesis deals with an issue that is orthogonal to the discussion above but, nevertheless, interesting to pursue. However, for reasons of space, I will not provide a full discussion of this topic but rather list up some arguments that have been made by other scholars. The question is if parasitic gaps also exist in German. The arguments against parasitic gaps in German are not at all conclusive for me and I will end this chapter with the question if an alternative, involving coordination, is really adequate for the constructions in question.

The question if parasitic gaps exist in Standard German is one that has been discussed extensively for decades \cite{felix1985, fanselow2001, kathol2001}. The constructions in question are the ones in (1) to (3).

(1) a. Wen hat er [anstatt \textit{PRO} \textit{pg} freundlich zu behandeln] \textit{t} annoyed
gelärgert?
“Who did he annoy instead of treating friendly?”

\footnote{I won’t discuss parasitic gaps in Bavarian German here. For further information about these constructions, which is structurally closer to its English counterpart, see especially \cite{felix1985, lutz2004}.}
The first set of examples illustrate apparent parasitic gaps in German that are licensed by wh-movement. To me it seems, that in cases where a pronoun occurs in the parasitic gap position the sentences get slightly worse. Furthermore, note that extraposition doesn’t affect grammaticality in the examples in [1].
The set of data in (2) shows, that the same construction is possible if the antecedent is scrambled and not wh-moved. However, to me it seems, that the insertion of a pronoun is better in these cases, especially if the *anstatt*-clause is extraposed. Finally, the sentences in (3) give examples for other adjuncts in German that allow parasitic gaps. While *ohne*-clauses are good contexts for parasitic gaps, *um*-clauses are highly marginal (*Kathol* [2001] even finds them ungrammatical).

At all, the contexts for parasitic gaps in German are highly restricted. While English allows parasitic gaps to occur in a big variety of domains, they can only be found in tenseless adjuncts in German.

So, tensed adjuncts, relative clauses, subjects and complement clauses don’t allow parasitic gaps.

(4) **Tensed adjunct**

*Wen hat Peter [nachdem er *pg* geschubst hat] *t* getreten?

who has Peter after he *jostled* has kicked

“Who did Peter kick after he jostled?”

(5) **Relative clause**


(i) a. ?Welches Buch hat Annica [bevor jemand *pg* lesen konnte] *t* zur Bibliothek zurückgebracht?

which book has Annica before somebody else could read could to library brought back

“Which book did Annica bring back before somebody else could read?”

b. ?Dies ist die Art, die du [bevor du *pg* verstehen wirst] *t* studieren musst.

this is the kind of topic which you before you understand will study must

“This is the kind of topic which you have to study before you must understand?”

c. ?Welches Mädchen hat er [weil er *pg* hasste] *t* ignoriert.

which girl has he because he hated ignored

“Which girl did he ignore because he hated?”

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*Wen hat der Mann [der eigentlich kannte *pg]* geleugnet t zu kennen?
who has the man who actually knew denied to know

“Who did the man that actually knew denied to know?”

(6)  
Subject

*Wem haben [Freunde von *pg] t geholfen?
who has friends of helped

“Who did friends of help?”

(7)  
Complement Clause

*Wen hat er gewarnt t dass *pg* schlagen würde?
who has he warned that he would beat would

“Who did he warn that he would beat *pg*?”

The first difference between German and English is, therefore, the distribution of parasitic gaps, which is much more restricted in German. However, a restricted distribution is not necessarily an argument against parasitic gaps since in languages like Spanish, parasitic gaps can also only occur in tenseless adjuncts (e.g. Mayo (1994)).

Another argument against the existence of parasitic gaps in German is the nature of the antecedent. Obviously, German allows not only for non-nominal but also for non-referential antecedents (Fanselow (2001)).

(8) dass er sich anstatt (sich) um Maria zu kümmern mit Büchern
that he REFL instead REFL of Maria to care with books
beschäftigte
occupied
“that he occupied himself with books instead of caring for Maria”

Fanselow (2001:412)

(9) dass er mit Maria anstatt in die Oper zu gehen Rambo II
that he with Maria instead of in the opera to go Rambo II
angeschaut hat
watched has
“that he watched Rambo II with Maria instead of going to the opera with her”

Assmann and Heck (2009:7)
Now, we have seen that languages like Swedish also allow non-NP antecedents for parasitic gaps. Levine et al. (2001) have argued that even in English non-NP and non-referential antecedents are allowed. The only thing that is special for German is that reflexive pronouns can be the antecedent for a parasitic gap (cf. (8)). In English, this is not possible.

(10)  

a. *Himself₁, Mike₁ praised t after describing pg₁ to Mary.

b. *Each other₁, they₁ (never) praised t₁ after describing pg₁.

Fanselow (2001), who argues against parasitic gaps in German, raises the issue that in German more than one parasitic gap can occur in the adjunct clause.

(11) dass er dem Kind₁ das Buch₂ anstatt pg₁ pg₂ zu leihen verkaufte

“that he sold the book to the child, instead of lending it to him”

However, this is clearly not an argument against parasitic gaps in German since in English multiple gaps are possible as well. The data are repeated in (12). (13) shows German multiple gap constructions (cf. Assmann and Heck (2009:9))

(12)  

a. ?[Which senator]₁ did you persuade t₁ to borrow [which car]₂ [after getting [an opponent of pg₁] to put a bomb in pg₂]?

b. *[Which senator]₁ did you persuade t₁ to borrow [which car]₂ [after putting a bomb in pg₂]?

(13)  

a. wenn man der Maria₁ das Buch₂ anstatt pg₁ pg₂ zu schenken]

“If one borrows Maria the book instead of giving it to her”
b. wenn man der Maria1 [anstatt \( pg_1 \) zu helfen] das Buch
   if one the Maria instead.of to help the book
   wegnimmt
   take.away
   “if one takes away the book from Maria instead of helping her”

c. *wenn man der Maria1 das Buch [anstatt \( pg_1 \) zu helfen]
   if one the Maria the book instead.of to help
   wegnimmt
   take.away
   “if one takes away the book from Maria instead of helping her”

It is rather the case that the German data in (13) resemble the English data in (12). If two categories move, they must license two parasitic gaps (cf. (12-a) and (13-a)), if only one category moves, only one parasitic gap is allowed (cf. (13-b)). Therefore, (13-c) must be ungrammatical just like (12-b) since two categories move but there is only one parasitic gap.

Thus, the sentence in (11) is rather an argument for parasitic gaps in German.\(^3\)

\[\text{Kathol (2001)}\] deals with multiple gap constructions as well and observes a difference between English and German. In English, replacement of one gap with a pronoun leads to ungrammaticality while in German, pronouns can be freely exchanged with parasitic gaps.

(i) a. Which book\(_1\) do you wonder who\(_2\) [Bill told \( t_2 \) that Mary bought \( t_1 \)] [before Sam persuaded \( pg_2 \) that Mary wanted \( pg_1 \)].

b. *Which book\(_1\) do you wonder who\(_2\) [Bill told \( t_2 \) that Mary bought \( t_1 \)] [before Sam persuaded \( pg_2 \) that Mary wanted it].

c. *Which book\(_1\) do you wonder who\(_2\) [Bill told \( t_2 \) that Mary bought \( t_1 \)] [before Sam persuaded him that Mary wanted \( pg_1 \)].

(ii) a. Den Käfer\(_1\) hat ihr\(_2\) Karl [anstatt \( pg_2 \) \( pg_1 \) zu schenken] teuer
   the VW-beetle has her Karl instead.of to give expensively
   verkauft.
   sold
   “Karl sold her the VW beetle to her for much money instead of giving it to her
   for free.”

b. Den Käfer\(_1\) hat ihr\(_2\) Karl [anstatt ihr \( pg_1 \) zu schenken] teuer
   the VW-beetle has her Karl instead.of to give expensively
On the other hand, Kathol (2001) tries to show that what seems to be a parasitic gap construction is rather an instance of a gap left by left node raising. To do so he shows various similarities between parasitic gap and coordination constructions.

The first property that the two constructions have in common concerns verb movement in German. Both coordination and parasitic gap constructions are ungrammatical if the verb appears in C.

(14) **Left Node Raising**

a. *Hans sah Maria [erst t lange an] und [dann t leidenschaftlich geküsst hat] Hans looked Maria first long at and then passionately kissed has
   “First, Hans looked at Maria long and then kissed her passionately”

b. *Hans sah Maria [erst t lange an] und [küsste dann t] Hans looked Maria first long at and kissed then leidenschaftlich passionately
   “First, Hans looked at Maria long and then kissed her passionately”

(15) **Parasitic Gap**

a. ??Hans küsste Maria [ohne pg anzusehen] Hans kissed Maria without to.look.at
   “Hans kissed Maria without looking at her.”

b. *Hans sah Maria [ohne pg zu küssen] lange an. Hans look Maria without to kiss long at
   “Hans look at Maria without kissing her.”

This property is indeed puzzling and I can’t offer a solution for that now.

verkauft.
sold
“Karl sold her the VW beetle to her for much money instead of giving it to her for free.”

Although the sentence in (ii-b) is grammatical, I find the sentence in (ii-a) without a pronoun a little better.
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The next property [Kathol (2001)] brings up is case identity. This property was already discussed in section [6.1]. Now, case identity is not only a problem for parasitic gap constructions but also for coordination constructions as shown in (16).

(16) *Hans möchte seine/seiner Tochter [Geld t geben] und [auch t moralisch unterstützen]
Hans would like his.ACC/his.dat daughter money give and [also morally support]
“Hans would like to give his daughter money and also to support her morally.”

Nevertheless, case identity is a property of parasitic gaps, that is found in other languages, too, e.g. in Hungarian. (See section [6.1] for details.) So it might be a property of multiple gap constructions in general.

Finally, [Kathol (2001)] says that if parasitic gaps exist in German, it is puzzling that the adjunct clause cannot be extraposed. This property is shown by the example in (17).

(17) *Hans hat Maria geküsst [ohne pg anzusehen].
Hans has Maria kissed without to.look.at
“Hans kissed Maria without looking at her.”

Although I find the example in (17) just as bad as Kathol, I am not convinced that extraposition is the only factor that rules out (17). Consider the sentence in (18), repeated from [1-c]

(18) Wen hat er t geärgert [anstatt PRO pg freundlich zu behandeln]? who has he annoyed instead.of friendly to treat
“Who did he annoy instead of treating friendly?”

If the alleged parasitic gap is licensed by wh-movement rather than scrambling and if it occurs in an anstatt-clause instead of an ohne-clause, the example is much better.
Now, let’s assume that all these arguments against parasitic gaps were right. The consequence must be that what seems to be adjunction is in fact coordination. This result has been achieved for example by Fanselow (2001). Fanselow (2001) assumes that elements like \textit{anstatt} are actually conjunctions. However, the question that comes up right then is which constituents are actually coordinated. Presumably, a sentence like (19-b) would have the structure in (20-b).

(19) a. Er hat Maria [\(t\) geküsst] und [\(t\) geohrfeigt].
   He has Maria kissed and slapped.
   “He slapped Maria and kissed her.”

b. Er hat Maria anstatt [\(t\) zu küssen] [\(t\) geohrfeigt].
   He has Maria instead.of to kiss slapped
   “He slapped Maria instead of kissing her.”

(20) a. 

```
  vP
 /   \
 vP  undP
 |   |
 t geküsst  und  vP
 |       |
 t geohrfeigt
```

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This structure, however, raises two questions. First, if *anstatt* is indeed a conjunction, why is the position different from other conjunctions like *und*? Second, how can two categories of different syntactic and semantic type be coordinated at all?

An argument that Kathol (2001) brings up against coordination is that alleged parasitic gap constructions show control properties, that is the adjuncts that allow parasitic gaps always contain a PRO that must be controlled by the subject of the matrix clause.

(21) a. *dass dieses Buch$_i$ [ohne PRO$_i$ pg$_i$ zu lesen] dem Jungen t$_i$ that this book without to read the boy gegeben wurde given was (intended reading): “that this book was given to the boy without its reading itself” Müller (1993:191)$^4$

b. *dass dieses Buch$_i$ [ohne PRO$_i$ es zu lesen] dem Jungen t$_i$ that this book without it to read the boy gegeben wurde given was

Kathol (2001:331)

c. *dass der Titel$_i$ dieses Buch$_j$ [ohne PRO$_i$ pg$_j$ zu lesen] in die that the title this book without to read into the Bestsellerliste katapultierte bestseller.charts tossed
All three examples in (21) are bad because the PRO of the embedded clause cannot be controlled by the matrix subject. In (21-a,b), the only possible controller is a passivized subject which is known to be incapable of being a controller (cf. [Legate (2003:511)]. In (21-c), the subject is inanimate and therefore unable to control the PRO which must have an animate controller because of the context ‘to read’.

[Kathol (2001)] admits that this control property of alleged parasitic gaps doesn’t emerge from an analysis involving for example left node raising.

Another property that tells parasitic gaps apart from coordination constructions is its behaviour towards long-distance dependencies (cf. [Kathol (2001:331f.)]). While in the sentence in (22-a) involving coordination, a long-distance dependency is possible, (22-b) is ungrammatical. Therefore, such constructions shouldn’t involve coordination.

(22) a. [Mit dem] hat Hans vermutet [dass wir lange t₁ verhandelt with whom has Hans conjectured that we long negotiated hatten] und [deshalb sofort t₁ einen Vertrag had and therefore immediately a treaty abgeschlossen]?

   “Who did Hans think that we had been negotiating with and therefore sign a treaty with immediately?’’

b. *[Mit dem] hat Hans [ohne zu vermuten [dass wir lange pg₁ with whom has Hans without to conjecture that we long verhandelt hatten]] einen Vertrag t₁ abgeschlossen?

   “Who did Hans sign a treaty with without thinking that we had been negotiating with him?’’

\footnote{Although the sentence is from [Müller (1993)], the conclusion that the ungrammaticality is due to failed control stems from [Kathol (2001)]. Müller (1993) argues that (21) involves passive movement which is known to be unable to license parasitic gaps (cf. [Kathol (2001:317)].}
In sum, the discussion above has supplied various arguments for and against parasitic gaps in German. To me, it is still inconclusive to say that alleged parasitic gap constructions in German are in fact coordination constructions, like e.g. Fanselow (2001) would say. An alternative, that Kathol (2001) proposed, is that such constructions involve “non-coordinate” left node raising. The conclusion is definitely not wrong but perhaps an account for parasitic gaps can also cover left node raising, so that there would be no difference between the two operations at all. As I have discussed in section 3.2, there already exist various proposals that treat parasitic gaps and ATB movement alike. Maybe these theories can also account for left node raising. However, I will answer the question if parasitic gaps exist in German with yes because (i) the behaviour of parasitic gap and coordination constructions differ in several aspects and (ii) convincing alternative accounts for these constructions doesn’t exist.
Chapter 8

Conclusion

The topic of this thesis was the development of a derivational syntactic theory which can explain the complex phenomenon that parasitic gaps represent.

Starting with an empirical description of the problem, I have shown the peculiar and sometimes intricate behaviour of parasitic gaps which gives reason to the question if parasitic gaps are a natural consequence of the principles of universal grammar or if they indeed need special mechanisms. The main results of this chapter are repeated in (1) and (2).

(1)  

Distribution

a. Domains:
   (i) untensed and tensed adverbial clauses
   (ii) complement clauses
   (iii) relative clauses
   (iv) subjects

b. Types of movement:
   (i) wh-movement
   (ii) relativization
   (iii) topicalization
   (iv) HPNS
   (v) object raising
CHAPTER 8. CONCLUSION

(vi) scrambling
(vii) clitic movement

c. Grammatical functions of the parasitic gaps
   (i) subjects
   (ii) objects
   (iii) predicates

(2) Constraints about parasitic gaps (PGs)
   a. PGs must be licensed by overt movement.
   b. PGs must not be c-commanded by the true gap.
   c. PGs are sensitive to islands (i.e., they show subjacency effects).
   d. PGs cannot be licensed by A-movement.
   e. The antecedents of PGs must be referential nominals.
   f. PGs are prohibited in antipronominal contexts.
   g. PGs cannot be licensed by reflexives and reciprocals.
   h. PGs are incompatible with verbs that are inherently unpassivizable.
   i. PGs cannot occur in multiple wh-questions.
   j. Antecedents of PGs cannot reconstruct into the position of PGs.

The subsequent chapter dealt with theories of parasitic gaps that try to explain especially the constraints in (2). I have introduced the idea that parasitic gaps are actually empty pronominals or proforms that are bound by the antecedent of the true gap. Defenders of pronoun theories are for example Chomsky (1982); Engdahl (1985, 2001); Cinque (1990); Postal (1993, 1994). The main arguments for these theories are first, that parasitic gaps seem to be restricted by the category of the antecedent, i.e. parasitic gaps can only be licensed by referential nominals and second, parasitic gaps seem to be incompatible with antipronominal contexts. However, as I have argued in chapter 5 these constraints are perhaps not so strong and counterexamples are easy to be find (Levine et al. (2001)). Two important failures of this
account are, however, that it fails to explain the constraints in (2-c) and (2-d). If parasitic gaps were pronouns, they shouldn’t be sensitive to the type of movement relation between the true gap and the antecedent. But more important, pronoun theories fail to explain, why parasitic gaps show island effects which are actually a sign of movement.

This island sensitivity of parasitic gaps have, then, been the reason for Kayne (1983) to develop a new idea of explaining parasitic gaps. He develops the theory of connectedness which assumes that parasitic gaps are really gaps in the same sense as gaps that are created by movement. Hence, parasitic gaps are subject to the same constraints as true gaps. By defining the terms of g-projection and g-projection sets and by modifying the definition of the empty category principle, Kayne (1983) develops representational constraints about parasitic gaps and thereby explains the island sensitivity of parasitic gaps. Nevertheless, even though his account is able to explain many properties of parasitic gaps, the system is not derivational and contradict the aim of this thesis.

The second part of chapter 3 dealt with derivational theories of parasitic gaps, which are able to explain the movement properties. The type of theory, I summarized first, proposes that parasitic gaps are the result of operator movement. Because parasitic gaps can be separated from their antecedents by one island but not by more than one island, these theories assume that an empty operator moves to the highest possible position inside the island. If they are stopped by further barriers in between, the derivation crashes. However, null operators have to be identified with some overt category in order to be licensed (Stowell (1985)). One way to achieve this is to apply Chomsky’s mechanism of Chain Composition where the licensing and the parasitic chain are composed in one chain so that the head of the licensing chain becomes the head of the parasitic chain, too. Frampton (1990) modifies Chomsky’s (1986) theory in that the parasitic gap is the result of a deletion of process. The antecedent of
the parasitic gap is inserted twice in the position of the true and the parasitic gap. The true gap results from movement while the parasitic gap from deletion, thereby becoming a trace that is in a chain with the moved antecedent.\footnote{This theory was not explained in section 3.2 because of reasons of space.}

But the perhaps most important modification of the operator theory was done by Nissenbaum (2000). He argued that parasitic gaps are exclusively licensed on LF and that the null operators are licensed by the same semantic principles as for example relative operators, i.e. predicate abstraction and predicate modification (Heim and Kratzer (1998)). Because the theory appears quite promising with respect to explaining parasitic gap constraints and respects principles of the minimalist framework, the predictions and behaviour of this theory are further examined in the subsequent chapters.

Finally, the last part of chapter 3 summarized one account that treats parasitic gap and coordination constructions alike, namely sideward movement (Nunes (1995, 2001)).

Chapter 4 was devoted to the development of a totally new account on parasitic gaps. I have argued that parasitic gaps result from a defective numeration. A numeration is defective when it contains structure-building or probe features which must be checked but don’t have matching features that could check them. I proposed a repair mechanism that I called Duplication which copies matching features that are present in the numeration and adds these features to the numeration again. The original features are marked by the fusion property $\triangleright<\cdot$, that requires the fusion of the original and the duplicated feature. Fusion should be understood in the sense of morphological Fusion (Halle and Marantz (1993)), i.e., it can only apply under sisterhood. The two operations are repeated in (3) and (4).

\begin{equation}
\text{Duplication (}\mathcal{N} = [L, \ldots])
\end{equation}

\begin{enumerate}
\item There are structure-building and probe features $[\bullet F_1 \bullet, \ldots [\bullet F_i \bullet], \ldots [\bullet F_j \bullet]$,
[\*F_j\*], \ldots [\*F_n\*] in the numeration N that don’t have matching features [F_1], \ldots [F_n].

b. There is a lexical item L in N that has such features [F_1, \ldots, F_n].

c. An item L’ with the features [F_1, \ldots, F_n] of L is added to N.

d. All duplicated features are marked by \( \triangleright \triangleright \) on L.

\textbf{(4)} \hspace{1cm} \textit{Fusion}

\[X \Rightarrow xY\]

\[x(F) \hspace{1cm} y \hspace{1cm} z\]

\[y \hspace{1cm} z\]

In order to derive the “selective” island-sensitivity (\textsc{Nunes} (2001:325)), I integrated Duplication and Fusion into the system of \textsc{Müller} (2010) who assumes that the fact that categories are barriers for movement if they are last-merged in a phase (cf. \textsc{Huang} (1982)) can be explained by assuming that only active phase heads allow the extraction of categories out of constituents. Phase heads are active if they still possess features that need to be checked. Now, if the duplicated item is merged inside the category that is usually a barrier and the original item is merged in the matrix clause, both items have to come together in a configuration where Fusion can take place. To enable the fusion features and its matching features to be in a sisterhood configurations, I proposed the following mechanism of feature percolation, that allows the percolation of features not only from the head daughter but also from specifiers that are created by movement. Because features are organized in ordered lists in Müllner’s system, percolation not only involves bare features but rather feature lists.

\textbf{(5)} \hspace{1cm} \textit{Feature List Percolation}
That means, the duplicated item is not directly fused with the original item but with the projection of a phase head whose specifier the original item is. The derivation which I provided in chapter 4 is repeated schematically in (6).

In the next two chapters, I have shown that the new theory is able to explain the behaviour of parasitic gaps. Chapter 5 compared the operator theory of Nissenbaum (2000) with the theory developed in chapter 4 by revisiting the constraints about parasitic gaps that I have introduced in section 2.2. The result of the discussion was that both theories don’t differ dramatically in their predictions, so that the duplication theory is not inferior to the operator theory.
The most important properties of parasitic gaps, which are the ones in (2-a) to (2-j) can be explained by both theories under certain assumptions, which are in my view all justified while the properties in (2-e) to (2-i) are puzzling for both theories.

In chapter 6 I have discussed further empirical evidence that showed the inadequacy of operator theories in certain domains. I considered identity requirements of the two gaps, type mismatches in contexts other than adjunct clauses and evidence for the existence of the Fusion operation, i.e. evidence suggesting that items behave differently before and after Fusion.

Finally, in chapter 7 I have investigated the existence of parasitic gaps in German. This problem has been discussed throughout years and there are mainly two movements: one side argues that parasitic gaps in German are real and give reason to the assumption that scrambling can license parasitic gaps (Felix (1985); Bennis and Hoekstra (1985); Assmann and Heck (2009)) and the other side tries to prove that what seems to be parasitic gap constructions are in fact coordination constructions (e.g. Huybregts and Van Riemsdijk (1985); Fanselow (2001); Kathol (2001)). I have discussed the arguments against parasitic gaps in German and the possibility of coordination. The discussion ended with the conclusion that even though coordination and parasitic gap constructions have a lot in common, analyses that treat both constructions alike are highly problematic for empirical and theoretical reasons.

In conclusion, I can say that the aim I formulated in chapter 1 is achieved. The first of the three questions was what a parasitic gap actually is. The answer to this question is that parasitic gaps are duplications of the elements that act as antecedents. The next question was how the dependence between the parasitic and the licensing gap is established. I suggested that the two gaps are dependent because they have to undergo Fusion. The last question was how a theory answering the first two questions can account for the properties
CHAPTER 8. CONCLUSION

of parasitic gaps. By using the system of Müller (2010), I was able to derive the island sensitivity of parasitic gaps. The fact that parasitic gaps can only be licensed by overt movement and the anti-c-command constraint follow from the feature list percolation mechanism. The fact that parasitic gaps cannot be licensed by A-movement follows from Fusion and the deletion of categorial features. Finally, identity properties and asymmetrical reconstruction follow from Duplication.

Although, this thesis has answered a lot of questions, it has raised some new ones. The most important question is perhaps, if Duplication and Fusion can be used for other multiple gap constructions, like for example ATB constructions, too. I haven’t discussed this possibility here but leave it to further research.

Another question which I could not answer now is if there is evidence that elements which have been duplicated and not fused yet behave different from elements that haven’t been duplicated. Hopefully, future research can provide an answer to this question.

Finally, I can say that the new theory developed in this thesis provides a new and adventurous perception of parasitic gaps and seems to be promising not only in empirical but also in theoretical terms.
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Erklärungen

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Leipzig, den 27.04.2010

Hiermit versichere ich, dass ich die Arbeit in allen Teilen selbstständig verfasst und keine anderen als die angegebenen Hilfsmittel benutzt habe.

Leipzig, den 27.04.2010