

Argument Realization:

Grammatical Function and Case Assignment

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To my parents

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Abstract

In this dissertation we propose a new mapping theory within the OT-LFG framework to account for the fact that in Catalan and other Romance languages, the direct argument of intransitive verbs (whether unaccusative or unergative), as well as the internal argument of transitive verbs in passive constructions, alternates between subject and object, but is consistently in the nominative case and agrees with the main predicate of the clause. The proposed analysis diverges from standard versions of mapping theories in LFG, as it discards the generally assumed $[\pm r]/[\pm o]$ feature decomposition system and the Subject Condition as an inviolable principle, allowing an external argument to map onto an object and permitting a clause to lack a subject. In our new mapping theory, case assignment plays a major role. The theory is a simple one, consisting of a principle mapping a core argument onto a direct grammatical function (DGF), in addition to a small set of case assignment principles, argument-to-grammatical function (GF) mapping rules, and constraints restricting GF assignment on the basis of case features and definiteness of the arguments, as well as morphosyntactic operations such as passivization, causativization, and reflexivization. The subject-object alternation is constrained by definiteness: the argument is a subject if it is definite and is an object if it is indefinite. The claim that verbs agree with a nominative function (either subject or object) is explained by applying a theory of agreement proposed independently of the facts of Catalan, namely, by assuming a set of agreement features (AGR) of the clause that are identified with the AGR of a GF, and not necessarily the subject, by general constraints. One of the implications of our theory is that argument-to-GF realization takes place in the syntax, instead of in the lexicon. The assumption of standard LFG mapping theories that the mapping of arguments to GFs happens in the lexicon implies that languages with expletives should also stipulate the expletive in the lexical entry of the predicate that co-occurs with the expletive. We thus propose a theory for English expletives according to which predicates do not lexically specify whether they take an expletive or what expletive they take, but the distribution of expletives follows from general principles and from the lexical entries of the expletives, thereby opening up new lines of relevant typological research.

Resum

En aquesta tesi, proposem una nova teoria de mapeig dins el marc teòric OT-LFG per explicar el fet que en català i altres llengües romàniques, tant l'argument directe dels verbs intransitius (siguin inacusatius o inergatius), com l'argument intern dels verbs transitius en construccions passives alternen entre subjecte i objecte, però tenen invariablement cas nominatiu i concorden amb el predicat principal de l'oració. L'anàlisi proposada difereix de les versions estàndards de les teories de mapeig en LFG pel fet de descartar el sistema de descomposició de trets $[\pm r]/[\pm o]$ i la Condició de Subjecte com a principi inviolable. Com a conseqüència, és possible que un argument extern correspongui a un objecte i que una oració no tingui subjecte. En la teoria de mapeig proposada, l'assignació de cas té un paper important. La nostra teoria és simple: l'idea principal és que un argument nuclear es mapeja a una funció gramatical directa (FGD) i es complementa amb uns principis d'assignació de cas, unes regles de mapeig d'arguments a funcions gramaticals (FG) i restriccions que condicionen l'assignació de FG d'acord amb el cas assignat i la definitud dels arguments, a més d'operacions morfosintàctiques, com la passivització, la causativització i la reflexivització. L'alternança entre subjecte i objecte és restringida per la definitud de l'argument: és un subjecte si és definit i és un objecte si és indefinit. El fet que els verbs concordin amb una funció nominativa (sigui subjecte o objecte) s'explica aplicant una teoria de concordança proposada independentment dels fets del català, és a dir, assumint un conjunt de trets de concordança de l'oració (AGR) que s'identifica amb el d'una funció gramatical –que no és necessàriament el subjecte– segons restriccions generals. Una de les implicacions de la nostra teoria és que el mapeig d'arguments a FG té lloc en la sintaxi, en comptes del lexicó. La suposició de les teories estàndards de mapeig en LFG que la realització d'arguments com a FG té lloc en el lexicó implica que les llengües amb expletius han d'especificar la funció expletiva a l'entrada lèxica del predicat que coocorre amb aquesta funció expletiva. Per aquest motiu, proposem una teoria d'expletius per a l'anglès segons la qual no cal que els predicats estableixin lèxicament si demanen una funció expletiva ni quina funció demanen, sinó que es pot derivar la distribució dels expletius de principis generals i de les entrades lèxiques dels expletius. D'aquesta manera, s'obren noves línies d'investigació rellevants per a altres llengües.

Resumen

En esta tesis, proponemos una nueva teoría de mapeo dentro del marco teórico OT-LFG para explicar el hecho de que en catalán y otras lenguas romances, tanto el argumento directo de los verbos intransitivos (sean inacusativos o inergativos) como el argumento interno de los verbos transitivos en construcciones pasivas alternan entre sujeto y objeto, pero tienen invariablemente caso nominativo y concuerdan con el predicado principal de la oración. El análisis propuesto difiere de las versiones estándares de las teorías de mapeo en LFG en el hecho de descartar el sistema de descomposición de rasgos $[\pm r]/[\pm o]$ y la Condición de Sujeto como un principio inviolable. Como consecuencia, es posible que un argumento externo corresponda a un objeto y que una oración carezca de sujeto. En la teoría de mapeo propuesta, la asignación de caso juega un papel importante. Nuestra teoría es simple: la idea principal es que un argumento nuclear se mapea a una función gramatical directa (FGD), y se complementa con unos principios de asignación de caso, unas reglas de mapeo de argumentos a funciones gramaticales (FG) y restricciones que condicionan la asignación de FG de acuerdo con el caso asignado y la definitud de los argumentos, así como operaciones morfosintácticas, como la pasivización, la causativización y la reflexivización. La alternancia entre sujeto y objeto se ve restringida por la definitud del argumento: es un sujeto si es definido y es un objeto si es indefinido. El hecho de que los verbos concuerden con una función nominativa (sea sujeto u objeto) se explica aplicando una teoría de concordancia propuesta independientemente de los hechos del catalán, es decir, asumiendo un conjunto de rasgos de concordancia de la oración (AGR) que se identifica con el de una función gramatical –que no es necesariamente el sujeto– según restricciones generales. Una de las implicaciones de nuestra teoría es que el mapeo de argumentos a FG ocurre en la sintaxis, en lugar de en el léxico. La suposición de las teorías estándares de mapeo en LFG de que el mapeo de argumentos a FG tiene lugar en el léxico implica que las lenguas con expletivos deben especificar la función expletiva en la entrada léxica del predicado que coocurre con dicha función en una oración. Por este motivo, proponemos una teoría de expletivos para el inglés según la cual no es necesario que los predicados establezcan léxicamente si toman una función expletiva ni qué función toman, sino que se puede derivar la distribución de los expletivos de principios generales y de las entradas léxicas de los expletivos. De este modo, se abren nuevas líneas de investigación relevantes para otras lenguas.

摘要

本文提出，加泰语及其他一些罗曼语语言中一元谓词的唯一论元（无论是非宾格动词还是非作格动词）及被动结构中二元谓词的内论元可实现为主语或宾语，但该论元恒定获得主格，并与小句主谓词的人称和数目相一致。为解释该现象，我们在优选论-词汇功能语法理论框架下提出了新的映射理论。与传统词汇功能语法的映射理论不同，本文提出的映射理论不再采用 $[\pm r]/[\pm o]$ 特征分解系统，也不再假设小句必须包含且仅包含一个主语。由此，外论元可映射至宾语，且小句允许主语缺失。在该映射理论中，格的分配起到了关键作用。其核心思想为，谓词的核心论元（**core argument**）映射至某一直接语法功能（**direct grammatical function, DGF**）。该映射理论包含了三条格分配准则，两条论元映射规则，数条规范语法功能实现的制约条件，及包括被动、致使、自复在内的一系列形态-句法层面的操作。主语与宾语之间的切换由相关论元的有定性来决定：若相关论元有定，则其实现为主语；若相关论元无定，则其实现为宾语。我们也对谓词与其主格论元（不管其实现为主语还是宾语）保持人称和数目相一致的现象进行了解释：小句谓词的人称和数目特征构成特征一致组，用 **AGR** 表示；小句谓词是否与某个语法功能共享特征一致组取决于该语法功能是否为主格。由此，小句谓词并非一定与主语保持一致。此外，根据本理论，论元至语法功能的映射发生于句法层面，而非传统词汇映射理论所认为的词汇层面。若论元与功能之间的映射发生于词汇层面，则对于包含虚功能词的语言来说，包含虚功能的小句的主谓词必须在其词汇中规定相关虚功能的语法信息。为避免在词汇中作出过多规定，我们为英语虚功能词创立新的理论。在该理论中，小句的虚功能不必在其谓词词汇中作出规定，而是取决于一般性准则以及虚功能词本身的词汇信息。本文提出的映射理论与关于虚功能词的理论为相关跨语言研究提供了新的研究思路。

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Chapter 1

Introduction

This dissertation stems from our curiosity about *en*-cliticization in intransitive constructions in Romance languages. The phenomenon has often been assumed to be restricted to unaccusative verbs (as in Belletti and Rizzi 1981, Rizzi 1982, and Burzio 1986, etc.), a subclass of intransitive verbs typically with non-agentive arguments. However, facts from Catalan indicate that even though this phenomenon is much more common with unaccusatives, it is not restricted to this subclass, but occurs with unergatives as well:¹

- (1) a. En vindran tres massa tard.
en.cl come.fut.3p.pl three too late
 ‘Three of them will come too late.’

(Unaccusative, Cortés and Gavarró 1997:53)

- b. En ploraran sis quan sàpiguen la veritat.
en.cl cry.fut.3p.pl six when know.sbjv.3p.pl the.f.sg truth.f.sg
 ‘Six of them will cry when they find out the truth.’

(Unergative, Cortés and Gavarró 1997:41)

En-cliticization has attracted much attention in the linguistic literature. One group of analyses can be classified as the lexical-syntactic approaches. For example, Torrego (1989) argues that apparent unergative constructions in which the sole argument can be cliticized by *en* are not real unergatives, but rather unaccusatives “shifted” from unergatives. She further claims that the key factor licensing the unergative-unaccusative shift is the presence of a preverbal overt locative subject. Cortés and Gavarró (1997), citing Fabra (1912) and Gràcia (1989), show that a locative element is not obligatory, or

¹ Here we are describing the facts of speakers who accept *en* cliticization with unergatives as well as with unaccusatives, like Cortés and Gavarró (1997) for Catalan. For similar evidence from other Romance languages, see for example Hulk (1989) or Mackenzie (2006) for French, and Saccon (1995) for Italian, among others.

necessarily preverbal when it occurs. They in turn propose a purely structural account of *en*-cliticization, assuming that it occurs when the argument (whether internal or external) appears VP-internally and enters into a specifier-head relation with the verb stem. It is within the structurally least prominent VP specifier position where possible *en*-cliticization happens. The other group of analyses are the discourse-functional approaches: Levin and Rappaport Hovav (1995) suggest that unergative verbs with *en*-cliticization are found in locative inversion constructions in which the verb “describes a characteristic activity or process of the entity it is predicated of” (Levin and Rappaport Hovav 1995:276), similar to the *presentational focus* notion proposed by Bresnan and Kanerva (1989). Mackenzie (2006) argues that it is unlikely that the postverbal argument of unergative verbs showing apparent unaccusative properties such as *en*-cliticization is syntactically conditioned. He thus also suggests that the explanation should resort to information structure and presentational capability of the relevant verb. Mendikoetxea (2006) stands in between, claiming that inversion constructions are basically unaccusative, and that unergative verbs appearing in inversion constructions (including locative inversions) “become” syntactically unaccusative, but that the syntactic approach is compatible with a pragmatic approach that such constructions usually express existence and appearance meanings.

We are sympathetic to the discourse approach in rejecting *en*-cliticization as an unaccusative test, therefore we will also reject the assumption of the lexical-syntactic approach that an unergative verb “becomes” an unaccusative (or an external argument “shifts” to an internal one). However, this does not mean that a syntactic approach should be repudiated at all. Instead of assuming the external-internal argument shift, we can also assume that the sole argument of intransitive verbs is invariably external or internal, but alternates between subject and object. If so, then the *en* clitic should be analyzed as providing information about the object instead of being an unaccusative test. This means that when the sole argument of intransitive verbs is pronominalized by *en*, it is the object of the intransitive clause, and in such cases the element that the intransitive verb agrees with is its object. Our assumptions find support in the work of Alsina and Vigo (2014) and Vigo (2016) about copular constructions with inverse agreement, in which it is assumed that a verb agrees with its complement, or object. Therefore, one of the principal tasks to be addressed in this dissertation is to give a detailed description of the behavior of the sole argument of intransitive verbs in terms of the grammatical function it bears.

Another problem arises from verb agreement in intransitive constructions, mentioned in the last paragraph. Many previous approaches assume that the clitic *en* is a manifestation of partitive case assignment. For example, according to Belletti (1987), the sole argument in an example like (1a) receives (inherent) partitive case² and agrees with the verb. Similarly, Rigau (1991) claims that NPs and DPs with nonspecific reading in intransitive constructions are assigned partitive case and the intransitive verb agrees with the partitive element. Cortés and Gavarró (1997) and Mackenzie (2006) also argue that clitic *en* is associated with partitive case in intransitive constructions and that it only pronominalizes indefinite constituents. Such assumptions conflict with Alsina and Vigo (2014), according to which a GF must be nominative in order to agree with the verb. For us, this implies that the sole argument of intransitive verbs should bear nominative case

² Actually, partitive case assignment is restricted to unaccusative verbs and to the postverbal complement (object) position according to Belletti (1987). For postverbal elements in unergative verbs and in unaccusatives in which the element is definite, the author suggests that the element does not occupy the complement position (i.e., it is argued to be an adjunct), thus it will not be assigned partitive case.

so that verbal agreement can take place. Therefore the clitic *en* should correspond to a *nominative* object in intransitive constructions. In this dissertation, we would consider the assumption of partitive case in Catalan and Spanish (and maybe in other Romance languages as well) to have not been independently motivated, and we would invariably assume nominative case for the single argument in intransitive constructions,³ rather than additionally assume a partitive case depending on whether the argument is definite or not. As a consequence, verb agreement in intransitive clauses is nothing but agreement between the intransitive verb and its nominative argument. From here arises another task of the dissertation, namely, to give an account for case assignment in intransitive constructions and in other constructions in general in Romance languages, like Catalan and Spanish.

This dissertation is organized as follows.

The relevant facts are presented in Chapter 2. We will first analyze argument realization in intransitive clauses in Catalan to show how the behavior of the single direct argument⁴ of intransitive verbs (the *intransitive argument*, for short) is split between subject and object. We will then confirm our claim by analyzing the behavior of the internal argument of transitive verbs in passive constructions, considering that passivization is commonly taken to be a detransitivization process which makes a transitive verb appear similar to an unaccusative one. With the linguistic facts to be listed, we demonstrate that the internal argument of a passivized transitive verb in Catalan does not always behave like a subject: it behaves in some ways like an object as well. Some consequences of the subject-object alternation are that an external argument may be realized as an object, a predicate may agree with its object, and a clause may lack a subject. All these facts and implications in this chapter pose a series of correlated questions, such as argument realization, case assignment, and verbal agreement, etc., all of which require reasonable theoretical accounts.

In Chapter 3 we introduce the theoretical framework within which the dissertation is developed: Lexical-Functional Grammar (LFG), a parallel, constraint-based non-derivational linguistic model in which the word and the lexicon play a major role. We first give a brief introduction to three of the basic structures assumed in LFG (namely, constituent structure/c-structure, functional structure/f-structure, and argument structure/a-structure), as well as the well-formedness conditions licensing these structures and their correspondences. We then present Optimality Theory (OT), followed by an introduction to the implementation of OT in current LFG syntax. The combination of OT with LFG will enable us to give a plausible explanation to the subject-object alternation puzzle to be brought up in Chapter 2 and facilitate the development of our theory of expletives in Chapter 5. After presenting the general theoretical framework, we review current mapping theories and discuss the problems they face. In addition, we will discuss case assignment issues in LFG. We observe that current mapping theories fall short of a complete picture of explanation to the subject-object alternation problem. We also observe that case assignment has not been playing an active role in the argument-to-function mapping process, and claim that such incorporation can avoid the problems that current mapping theories may face.

³ And accusative case for the internal arguments in active transitive constructions, as we will see.

⁴ By *direct argument* we refer to an argument whose default expression is as a direct grammatical function with an unmarked case feature (nominative or accusative).

The argument realization theory needed to account for these issues is proposed in Chapter 4, where case assignment plays a crucial role in constraining the mapping of arguments to grammatical functions. The present mapping theory assumes a level of argument structure and three sets of principles licensing argument realization, i.e., case assignment principles, argument-to-GF linking rules, and constraints on case features. The subject-object alternation puzzle is accounted for within the OT-LFG framework, mainly by assuming a constraint concerning the definiteness of the relevant argument that interacts with other constraints to yield grammatical constructions. The agreement facts –including the agreement in constructions involving a raising verb like *semblar* ‘seem’– are also explained, applying the theory of agreement proposed by Alsina and Vigo (2014, 2017). As for the illustration of our mapping theory, we test it with four types of predicates in Catalan in their simple active form (i.e., intransitives, transitives, ditransitives, and *like*-type verbs) and discuss the effect of morphosyntactic operations on the mapping process, including passivization, impersonalization, and causativization. For each morphosyntactic operation, we first review their previous LFG approaches, then give our own account to them according to the proposed mapping theory, and test if our theory works with the above-mentioned four types of predicates. Passivization is accounted for by assuming two passive morphemes that suppress the highest argument of the predicate that the passive morpheme attaches to; impersonalization is explained by assuming a reflexive impersonal *se*; and causativization is explained by assuming the causative construction to be monoclausal, with a causative verb and an infinitive base verb forming a complex predicate. Our assumption –following Alsina (1996) and Butt (1995)– that causative constructions only have one PRED value in the f-structure of the main clause requires us to renew our mapping theory in order to account for case assignment issues in complex predicate constructions.

One thing in common between our mapping theory and the mapping theories of Alsina (1996) and Butt (1995) is that argument mapping takes place in the syntax, rather than in the lexicon. This is a departure from what Lexical Mapping Theories (LMTs) commonly assume: in LMTs, argument realization happens in the lexicon, which implies that in languages with expletives, the expletive needs to be stipulated in the lexicon of the predicate that co-occurs with this expletive function. Chapter 5 therefore proposes an alternative approach to expletives with reduced levels of stipulation in the lexicon. We will mainly concentrate on English, claiming that the distribution of expletives follows from general principles and from the lexical entries of relevant expletives. Therefore, expletives are not subcategorized for in the lexicon. Adapting Zaenen (1989)’s WYSIWYG (i.e., what you see is what you get) principle, we claim that an expletive function cannot appear in the f-structure if it is not present in the c-structure, thus reducing the structural complexity. Though we will not look into the details of the expletive system in other languages, our theory of expletives designed for English is inspirational for a cross-linguistic study. Finally, the main conclusions are summarized in Chapter 6.

Chapter 2

Background

This chapter is made up of three parts. In the first part we analyze argument realization in intransitive verbs in Catalan, including the encoding of the intransitive argument as a grammatical function, verbal agreement, case assignment, and expression by means of clitics. Our main claim is that the single direct argument of a clause can be a nominative object. We demonstrate that the direct argument of intransitive verbs (whether unaccusative or unergative) alternates between subject and object, and that a clause may lack a subject, in violation of the Subject Condition. The second part of this chapter concerns the realization of the internal argument of transitive verbs in passive/impersonal clauses. Passivization is commonly assumed to be a detransitivization process. We show that for a passivized transitive verb in Catalan, the internal argument does not always behave like a subject and sometimes manifests object properties as well. In the third part, we conclude with a chart that contains all the possibilities of realization of the single direct argument of intransitive verbs, as well as the internal argument of transitive verbs in active and passive/impersonal clauses.

2.1 Properties of the sole argument of intransitive verbs

It is generally assumed that the single direct argument of intransitive verbs is the subject of the intransitive clause, but the intransitive argument in Catalan shows a contradicting behavior with regard to its grammatical function realization: it behaves in some ways like a subject, and in some ways like an object. We start by showing its object properties, in 2.1.1; then turn to its subject properties, in 2.1.2, focusing on the agreement facts in 2.1.3.

2.1.1 Object properties of the intransitive argument

En cliticization provides evidence that the intransitive argument can be an object in Catalan. (Other Romance languages, such as Italian and French, show a similar behavior of the cognate clitic *en* or *ne*.) The internal argument of Catalan transitive verbs can be partially or totally expressed by means of the clitic *en*:⁵ *en* in (2a) and (2b) replaces *carpetes* ‘folders’ and *carpetes de plàstic noves* ‘new plastic folders’, respectively:

- (2) a. Si vols carpetes, en tinc tres de noves.
if want.2p.sg folder.f.pl en.cl have.1p.sg three of new.f.pl
 ‘If you need folders, I have three new ones.’
- b. Si vols carpetes de plàstic noves, compra’n.
if want.2p.sg folder.f.pl of plastic new.f.pl buy.imp.2p.sg-en.cl
 ‘If you need new plastic folders, buy some.’

(Alsina 1986:97-98)

The internal argument of Catalan unaccusative verbs demonstrates a parallel behavior with the internal argument of transitive verbs in terms of the *en* cliticization:

- (3) Cada dia surten molts trens,
every day leave.3p.pl many.m.pl train.m.pl
 però avui només n’ha sortit un.
but today only en.cl-have.3p.sg leave.pp one
 ‘Every day many trains leave, but today only one has left.’

Surprisingly, although Catalan transitive verbs do not allow their external arguments to be cliticized by *en*, as in (4), the external argument of unergative verbs nevertheless can be replaced by the *en* clitic, as in (5):⁶

- (4) a. *N’aprovaran tres els exàmens.
en.cl-pass.fut.3p.pl three the.m.pl exam.m.pl
- b. *N’aprovaran els exàmens tres.
en.cl-pass.fut.3p.pl the.m.pl exam.m.pl three
 ‘Three of them will pass the exams.’

⁵ Here we are only concerned with one of the two functions of the clitic *en*, which are often referred to as “partitive” *en* (see Chapter 1), as it replaces the head noun of an indefinite object and cannot co-occur with it. In the other function – ‘genitive’ *en* – the clitic corresponds to a *de*-complement of the verb or of the verb’s object, as shown in (i), where *en* corresponds to the verb’s *de*-complement:

(i) Podria parlar avui d’aquest problema, però en parlarà demà.
could.3p.sg speak today-of-this problem but en.cl speak tomorrow
 ‘He could speak about this problem today, but he will speak about it tomorrow.’

⁶ Independent evidence for the claim that *plorar* ‘cry’ in (5a) and *parlar* ‘talk’ in (5b) are unergatives comes from tests such as the participial adjunct tests in Cortés and Gavarró (1997). Note that *poden* ‘can’ in (5b) is a restructuring verb, which inherits the argument structure of the dependent verb.

- (5) a. En ploraran sis quan sàpiguen la veritat.
en.cl cry.fut.3p.pl six when know.sbjv.3p.pl the.f.sg truth.f.sg
 ‘Six of them will cry when they find out the truth.’

(repeating (1b))

- b. – Com repartirem les conferències?’
how distribute.fut.1p.pl the.f.pl conference.f.pl
 ‘How should we arrange the conferences?’
 – Avui en poden parlar dos i demà tres més.
today en.cl can.3p.pl talk.inf two and tomorrow three more
 ‘Today two of them can give a talk and tomorrow three.’

(Gràcia 1989:82)

The possibility of *en* cliticization with unergative verbs in Catalan shows that it is not the “deep object” (i.e., the internal argument) that triggers *en* cliticization. Instead, the fact that both unaccusative and unergative verbs allow their single direct argument to be expressed by means of *en* requires assuming that the argument in question is an object (or the “surface object”, in theories such as Burzio 1986, or Cortés and Gavarró 1997, among others).⁷

The second argument for the object status of the intransitive argument is past participial agreement. In Catalan, the past participle optionally agrees in gender and number with a third person object clitic, when co-occurring with the perfective auxiliary *haver* ‘have’. But this agreement does not happen with a full NP object:

- (6) a. La directora ha defensat/*defensada la proposta.
*the.f.sg director.f.sg have.3p.sg defend.pp.m.sg/*f.sg the.f.sg proposal.f.sg*
 ‘The director has defended the proposal.’
 b. La directora l’ha **defensada**.
the.f.sg director.f.sg la.cl.f.sg-have.3p.sg defend.pp.f.sg
 ‘The director has defended it.’

(Alsina 1996:95)

Past participial agreement is possible not only with objects of transitive verbs, like the one in (6b), but also with the direct argument of intransitive verbs:⁸

⁷ Note that, with respect to the phenomena examined in this section, there is no difference in behavior among one-argument verbs between unaccusatives and unergatives in Catalan: we refer to this distinction precisely to make this point.

⁸ We have not documented past participial agreement with *en* with unergatives, although it is expected to be possible. This may be due to the fact that this construction is infrequent and formal, and not used by many speakers. We leave it to further research to decide whether unergatives are excluded from this construction.

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- (7) a. Perquè aleshores hi haurà una gran tribulació,
because then hi.cl have.fut.sg one.f.sg great distress.f.sg
com no n'hi ha haguda cap des de
like not en.cl-hi.cl have.3p.sg have.pp.f.sg never from
la creació del món...
the creation of-the world
'For then there will be great distress, as there has not been one since the creation of the world...'

(Bible [Mt 24:21]⁹)

- b. N'han arribats molts.
en.cl-have.3p.pl arrive.pp.m.pl many.m.pl
'Many have arrived.'

(Fabra 1912:160)

The fact that an intransitive argument expressed as the clitic *en* can trigger past participial agreement further confirms that the argument is an object.

The possibility of expressing the intransitive argument as a bare indefinite NP gives additional evidence for the objecthood of this argument. Bare indefinite NPs, which have a non-specific interpretation, can encode the object of a transitive verb, as shown in (2a). However, they cannot be the subject of the verb, and cannot appear in preverbal position unless focused, as illustrated in (8) with a transitive verb:

- (8) a. * Arreglen mecànics el teu cotxe.
fix.3p.pl mechanics.m.pl the.m.sg your.m.sg car.m.sg
b. * Arreglen el teu cotxe mecànics.
fix.3p.pl the.m.sg your.m.sg car.m.sg mechanics.m.pl
'Mechanics fix your car.'

(Alsina 1996:104)

By contrast, the intransitive argument can freely be expressed as a bare NP:

- (9) a. Cau aigua de la teulada.
fall.3p.sg water.f.sg from the.f.sg roof.f.sg
'Water is falling from the roof.'

(Alsina 1995:13)

- b. Treballen nens en aquesta fàbrica.
work.3p.pl child.m.pl in this.f.sg factory.f.sg
'Children work in this factory.'

(Cortés 1995:64)

The contrast between examples (8) and (9) indicates that both *aigua* 'water' in (9a) and *nens* 'children' in (9b) are objects and not subjects. The evidence from bare NPs, together with *en* cliticization and optional past participial agreement, indicates that the intransitive argument is an object.

⁹ <http://www.biblija.net/biblija.cgi?m=Mt+24%2C1-31&l=ca>, visiting time: 18:19, 07/05/2019.

2.1.2 Subject properties of the intransitive argument

Catalan is known to be a subject *pro-drop* language, in which a subject can be null and be interpreted as having a definite referent, while an object cannot be null with a definite reading:

- (10) a. Els estudiants solen sortir puntualment,
the.m.pl student.m.pl be-used-to.3p.pl leave.inf punctually
 però avui Ø surten tard.
but today leave.3p.pl late
 ‘Students usually leave on time, but today they are leaving late.’
- b. Els estudiants no volen estudiar habitualment,
the.m.pl student.m.pl not want.3p.pl study.inf usually
 però avui Ø estudien molt.
but today study.3p.pl much
 ‘Students usually do not want to study, but today they are studying a lot.’
- (11) Joan ha llegit el diari avui,
John have.3p.sg read.pp.m.sg the.m.sg newspaper.m.sg today
 però no llegirà demà.
but not read.fut.3p.sg tomorrow
 ‘John has read the newspaper today, but he will not read (*it) tomorrow.’

The contrast between (10) and (11) shows that grammatical functions other than the subject in Catalan cannot be null with a definite reading. Therefore, the fact that the intransitive argument in Catalan can be omitted and have a definite referent, as in (10), requires analyzing it as the subject of the clause.

Another subject property is the possibility of being the controlee in a control construction: only the subject of the embedded clause can be controlled by the subject or object of the matrix clause, as shown in (12) for a transitive verb in an embedded clause:

- (12) N’he obligat molts a examinar el metge.
en.cl-have.1p.sg obligate.pp many.pl to examine.inf the doctor
 ‘I have forced many to examine the doctor.’
 * ‘I have forced many to be examined by the doctor.’

In contrast, as the object of the embedded clause, the intransitive argument cannot be controlled by an argument of the embedding clause. Examples (13) and (14) illustrate this contrast.

- (13) a. * N’he obligat molts a quedar-se’n.
en.cl-have.1p.sg obligate.pp many.m.pl to stay.inf-se.cl-en.cl
 ‘I have obligated many to stay.’
- b. N’he obligat molts a quedar-se.
en.cl-have.1p.sg obligate.pp many.m.pl to stay.inf-se.cl
 ‘I have obligated many to stay.’

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- (14) a. * N'he obligat molts a estudiar-ne.
en.cl-have.1p.sg obligate.pp many.m.pl to study.inf-en.cl
 'I have obligated many to study'
- b. N'he obligat molts a estudiar.
en.cl-have.1p.sg obligate.pp many.m.pl to study.inf
 'I have obligated many to study.'

The fact that the control relation in (13b) and (14b) is grammatical indicates that the intransitive argument of the embedded clause is the subject. This is further confirmed by the ungrammaticality of (13a) and (14a), in which the clitic *en* appears in the embedded clause. If we assume that *en* cliticization is an object property, the ungrammaticality of (13a) and (14a) follows naturally: as an object, the argument of the embedded clause cannot be controlled.

A third subject property comes from the control into a gerund adjunct: again, only the subject of the gerund predicate can be controlled by a function in the matrix clause:

- (15) En Joan ha caigut tot empaitant els gossos.
the John have.3p.sg fall.pp all chase.presp the.m.pl dog.m.pl
 'John fell when he was chasing the dogs.'

The meaning of (15) can only be "John has fallen when he was chasing the dogs", and not "John has fallen when the dogs were chasing him". In other words, if *en Joan* 'the John' were the object of the gerund *empaitant* 'chasing', (15) would be ungrammatical.

Further evidence supporting the subjecthood of the controlee in constructions such as (15) comes from the verb *haver-hi* 'existential *be*'. (16) indicates that the argument of *haver-hi* as a gerund adjunct cannot be controlled by an argument in the main clause:

- (16) * Alguns nens han guanyat la loteria havent-hi a casa.
some.m.pl child.m.pl have.3p.pl win.pp the lottery be.presp-hi.cl at home
 'Some children have won the lottery being at home.'

The possible *en*-cliticization of the sole argument, the ungrammaticality of pro-dropping the argument, and the ungrammaticality of being the embedded clause in the control construction, among others, suggest that the sole argument of *haver-hi* can only be an object and not a subject:

- (17) a. Parlant de convidats, n'hi havia un a la sala.
talking about guest.m.pl en.cl-hi.cl be.imperf.3p.sg one.m.sg in the hall
 'Speaking of guests, there was one in the hall.'
 (OBJ, for the *en*-cliticization)
- b. A la sala hi havia la Maria, i *no hi havia al terrat.
in the hall hi.cl be.pst the Maria and not hi.cl be.imperf.3p.sg on-the terrace
 'Maria was in the hall, and she was not on the terrace.'
 (not SUBJ, for the ungrammaticality of being pro-dropped)
- c. * N'he obligat molts a haver-hi a l'escola.
en.cl-have.1p.sg obligate.pp many to be.inf-hi.cl in the-school
 'I have obligated many to be at school.'
 (not SUBJ, for the ungrammaticality of being controlled)

The assumption that *haver-hi* lexically specifies its argument to be realized as an object, as well as the contrast between (15) and (16) requires one to assume that the controlee is the subject of the gerund adjunct clause. Then the possibility of an intransitive verb appearing as a controlled gerund indicates that the argument of this intransitive verb is the subject:

- (18) a. Els manifestants han sortit tot cridant.
the.m.pl demonstrator.m.pl have.3p.pl leave.pp all shout.presp
 ‘The demonstrators have left while shouting.’
- b. Els nens aprenen a ballar tot cantant.
the.m.pl child.m.pl learn.3p.pl to dance.inf all sing.presp
 ‘The children learn to dance while singing.’

In a nutshell, the possibility of control into gerund clauses, as well as *pro-drop* with a definite reading and the possibility of being the controlee in “standard” control constructions, suggests that the intransitive argument can be realized as the subject of the intransitive clause.

2.1.3 Verbal agreement in intransitive clauses

It is commonly assumed that the agreement trigger of the verb is the subject (Chomsky 1981, 1995, among others). In a simple example with a transitive verb like (19), the auxiliary *haver* is in the third person plural form, agreeing with the subject *els estudiants* ‘the students’:

- (19) Els estudiants han/*ha llegit aquest llibre.
*the.pl student.pl have.3p.pl/*sg read.pp.m.sg this.sg book.sg*
 ‘The students have read this book.’

Intransitive verbs regularly agree with their single direct argument. But we would have a problem if we assumed that the agreement trigger is necessarily the subject: *molts* in (20) would have to be both a subject (as the agreement trigger) and an object (as it is expressed by means of the *en* clitic):

- (20) Avui en surten/*surt molts.
*today en.cl leave.3p.pl/*sg many.pl*
 ‘Today many are leaving.’

The verbal agreement facts of languages like Icelandic or Hindi indicate that, in such languages, the verb can agree with a grammatical function other than the subject, provided that it is in *nominative* case. In the Icelandic example (21a), the verb *likuðu* ‘like’ shows third person plural form, agreeing in person and number with the nominative object *hestarnir* ‘horse’, and not with the dative subject *henni* ‘her’. The Hindi example (21b) shows a similar situation: the verb agrees with its nominative object, rather than with its subject, which is marked as ergative:

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- (21) a. Henni líkuðu hestarnir.
she.dat.3p.sg like.pst.3p.pl horse.nom.3p.pl
'She liked the horses.'
(Icelandic, Sigurðsson 2004:139)
- b. Ravii-ne / niinaa-ne kelaa k^haayaa
Ravi-erg.m.sg/ Nina-erg.f.sg banana-nom.m.sg eat.perf.m.sg
'Ravi/Nina ate a banana.'
(Hindi, Mohanan 1994:104)

The same assumption will allow us to solve the paradox of (20): the verb agrees with a nominative argument, whether it is a subject or an object, and in (20) the verb in fact agrees with the object, which is nominative.

Independent evidence for the claim that the argument with which the verb agrees is nominative comes from the contrast between nominative and accusative with respect to the use of the preposition *a* 'to'. An indefinite pronoun allows optional *a*-marking only if it is animate and accusative:

- (22) a. (*A) molts llegeixen el llibre.
to many.m.pl read.3p.pl the.m.sg book.m.sg
'Many read the book.'
- b. En veiem (a) molts.
en.cl see.1p.pl to many.m.pl
'We see many.'

In contrast, nominatives never allow *a*-marking, whether SUBJ (as in (22a)) or OBJ (as in (23)):

- (23) En surten (*a) molts.
en.cl leave.pl to many.m.pl
'Many are leaving.'

From the facts listed above, we can conclude that the intransitive argument in Catalan alternates between subject and object, and is always nominative. The intransitive verb agrees with this argument, regardless of the function it takes.¹⁰

2.2 Argument realization with passivized verbs

Passivization is a syntactic operation that makes a transitive verb look rather similar to an unaccusative one, in that the agent argument is either not expressed or optionally expressed by a *by*-phrase, and only the internal argument is expressed as a direct function. This is why passivization is generally assumed to be a detransitivization process, and

¹⁰ The properties discussed in 2.1.2 cannot be attributed to nominative case, but rather to subjecthood. For example, the controlee has to be the subject and not just a nominative argument, as shown in (13) and (14).

passivized transitive verbs are sometimes considered as “derived” unaccusatives. Catalan, as well as other Romance languages like Spanish and Italian, has two passive constructions: one is called the “periphrastic” or “past participial” passive, consisting of the copular *ésser* ‘be’ plus the past participial form of a verb that agrees with its internal argument in gender and number. The other is known as “passive-with-*se*”,¹¹ in which the morpheme *se* combines with a predicate and yields passive/impersonal reading.

In the following, we will examine the function realization of the internal argument of transitive verbs under passivization as well as the case it is assigned, making use of the function tests adopted from 2.1 (i.e., the object properties like *en* cliticization, past participial agreement, and bare NP; and the subject properties like *pro-drop* with a definite reading, the possibility of being controlled in the “standard” control, or control into gerund adjuncts). We would like to point out that these tests may not be all applicable due to reasons other than syntactic. We start with the “passive-with-*se*” construction, in 2.2.1, then turn to the periphrastic passive in 2.2.2.

2.2.1 Passive-with-*se*

The internal argument of a transitive verb passivized by the so-called “reflexive” morpheme *se* shows all the three object properties, as we have described above about the intransitive argument. First, it can be cliticized by *en*, as in (24):

- (24) a. D’obriers sense feina, cada dia se’n veuen més.
of-worker.pl without work every day se.cl-en.cl see.3p.pl more
 ‘Everyday more unemployed workers can be seen.’

(Solà 1987:99)

- b. Es regalen molts llibres, però se’n llegeixen molt pocs.¹²
se.cl give.3p.pl many.pl book.pl but se.cl-en.cl read.3p.pl very few.pl
 ‘Many books are donated, but very few of them are read.’

Second, this internal argument can optionally agree in gender and number with the past participle when expressed in perfective tense and in pronominal form:

- (25) a. També se n’han trobats alguns que
also se.cl en.cl-have.3p.pl find.pp.m.pl some.m.pl that
hibernaven sota els ponts.¹³
hibernate.imperf.pl under the bridge
 ‘Some (examples) hibernating under the bridge have also been found.’

¹¹ For the moment, we use the name “passive-with-*se*” to refer indiscriminately to all the “predicate + *se*” constructions with passive/impersonal reading.

¹² <http://www.diaridegirona.cat/cultura/2010/04/22/regalen-llibres-sen-llegeixen-pocs/401223.html>, visiting time: 07/05/2019.

¹³ Based on *Els Sistemes Naturals del Delta de l’Ebre*, p.314, Institució Catalana d’Història Natural, 1994.

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- b. De peticions, se n'han presentades moltes.
of petition.f.pl se.cl en.cl-have.3p.pl present.f.pl many.f.pl
'As for petitions, a lot have been presented.'

(Wheeler et al. 1999:412)

Moreover, this internal argument can be expressed as a postverbal bare NP, as in (26a), where the NP *missatges* 'messages' immediately follows the passivized verb *s'envien* 'be sent'. By contrast, *missatges* 'messages' appearing in the preverbal position in the bare form is ungrammatical (when expressed with a neutral tone), as in (26b). The contrast between (27a) and (27b) as well as between (28a) and (28b) also illustrates this point:

- (26) a. S'envien missatges per alertar la població.
se.cl-send.3p.pl message.3p.pl to alert.inf the resident
b. *Missatges s'envien per alertar la població.
message.3p.pl se.cl-send.3p.pl to alert.inf the resident
'Messages are sent to alert the residents.'

(Bartra 2002:2155)

- (27) a. Es reparen rellotges.
se.cl repair.3p.pl watch.3p.pl
b. *Rellotges es reparen.
watch.3p.pl se.cl repair.3p.pl
'Watches are being repaired.'

(Wheeler et al. 1999:513)

- (28) a. Es renten plats.
se.cl wash.3p.pl dish.3p.pl
b. *Plats es renten.
dish.3p.pl se.cl wash.3p.pl
'Dishes are being washed.'

(Rigau 1991)

Evidence from verbal agreement and the impossibility of *a*-marking indicate that this internal argument realized as an object is in the nominative case: first, the internal argument agrees with the main predicate in all the instances in (24)-(28);¹⁴ and second, the *a*-marking is not allowed:

¹⁴ The linguistic facts that we are describing here are based on Central Catalan. Other dialect varieties may allow a lack of verbal agreement, as is reported in Solà (1987), Rigau (1991), or Bartra (2002), among others. For instance, the example (26a) in Northwestern Catalan will be:

- (i) S'envia missatges per alertar la població.
se.cl-send.3p.sg message.3p.pl to alert.inf the resident
'Messages are sent to alert the residents.'

Dialectal variations will not be taken into consideration in this thesis.

- (29) a. D'obriers sense feina, cada dia se'n veuen (*a) més.
of-worker.pl without work every day se.cl-en.cl see.3p.pl to more
 'Everyday more unemployed workers can be seen.'
- b. A Sant Miquel de Campmajor
in Sant Miquel of Campmajor
 se n'han matat (*a) vint-i-nou (senglars)...¹⁵
se.cl en.cl-have.3p.pl kill.pp to twenty-nine boar.pl
 'In Sant Miquel de Campmajor, twenty-nine (boars) have been killed.'

The internal argument of a transitive verb in the reflexive passive can also be the subject. The most obvious evidence comes from the *pro-drop* with a definite reading. For example, the omitted subject in the second clause in (30a) and (30b) refers to *el volant de Sant Cristòfer* 'the Saint Christopher's donut', and *l'escudella* 'the escudella',¹⁶ respectively:

- (30) a. El volant de Sant Cristòfor és un dolç
the.m.sg donut.m.sg of Saint Christopher be.3p.sg a.m.sg dessert.m.sg
 fet de pasta.
make.m.sg of dough
 Ø Es pot trobar a les pastisseries barcelonines.¹⁷
se.cl can.3p.sg find.inf in the bakeries of-Barcelona
 'Saint Christopher's donut is a kind of dessert made with dough. It can be found in the bakeries in Barcelona.'
- b. L'escudella és un brou de carn i verdura amb fideus.
the-escudella be.3p.sg a broth of meat and vegetable with noodles
 Ø Es menja sobretot a l'hivern.¹⁸
se.cl eat.3p.sg especially in the-winter
 'Escudella is a broth of meat, vegetable, and noodles. It is eaten especially during winter.'

The internal argument is in the nominative case when expressed as a subject, for agreeing with the main verb on the one hand, and for the impossibility of *a*-marking, on the other:

- (31) (*A) ella es pot trobar a les pastisseries.
to she.f.sg se.cl can.3p.sg find.inf in the bakeries
 (cf. A ella se la pot trobar a les pastisseries.)
to her.f.sg se.cl her.obj.f.sg can.3p.sg find.inf in the bakeries
 'She can be found in the bakeries.'

¹⁵ <http://www.elpuntavui.cat/punt-divers/article/585265-els-agents-rurals-van-de-nit-a-matar-senglars-perque-fan-grans-estralls-al-camp.html>,
 visiting time: 07/05/2019.

¹⁶ Escudella is a traditional Catalan soup.

¹⁷ <http://lameva.barcelona.cat/culturapopular/ca/festes-i-tradicions/gastronomia/volant-de-sant-cristofor>,
 visiting time: 01/11/2018.

¹⁸ <http://lameva.barcelona.cat/culturapopular/ca/festes-i-tradicions/gastronomia/escudella-de-nadal>,
 visiting time: 01/11/2018.

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The internal argument of a passivized transitive verb with *se* may also be realized as an accusative object. This internal argument is, above all, an object, because it can be expressed by the object clitics *el*, *la*, *els*, and *les* (but not *li*, indicating that the case is not dative), and trigger past participial agreement:

- (32) a. No se **les** ha tractades bé.
not se.cl them.obj.f.pl have.3p.sg treat.pp.f.pl well
 ‘They have not been well treated.’
- b. No se l’ha tractada bé.
not se.cl her.obj.f.sg-have.3p.sg treat.pp.f.sg well
 ‘She has not been well treated.’

(Rigau 1991)

The fact that this internal argument does not trigger verb agreement indicates that it is not in nominative case, if we assume that agreement happens between the verb and a nominative function. As (33) shows, the verb is always in default, third person singular form:

- (33) a. No se’ls ha tractat bé.
not se.cl-them.obj.m.pl have.3p.sg treat.pp well
- a’ *No se’ls han tractat bé.
not se.cl-them.obj.m.pl have.3p.pl treat.pp well
 ‘They have not been well treated.’

(Rigau 1991)

- b. Els vaguistes, no se’ls enganya fàcilment.
the.m.pl striker.m.pl not se.cl-them.obj.m.pl fool.3p.sg easily
- b’. *Els vaguistes, no se’ls enganyen fàcilment.
the.m.pl striker.m.pl not se.cl-them.obj.m.pl fool.3p.pl easily
 ‘The strikers, they are not easily fooled.’

(Solà 1987:99)

Further evidence for the non-nominative status of the internal argument in this case comes from the preposition *a*-marking. We have seen that the *a*-marking never appears before a nominative element, whether SUBJ or OBJ. Thus, the fact that the preposition *a* is allowed in (34) further proves that the internal argument is not nominative. Moreover, since the internal argument is also not dative (due to the impossibility of pronominalization as *li*), the internal argument is assumed to be accusative:

- (34) a. No se’ls tracta bé **a** ells.
not se.cl-them.obj.m.pl treat.3p.sg well to them
 ‘They are not being treated well.’
- b. No s’enganya fàcilment **a** ells.
not se.cl-fool.3p.sg easily to them
 ‘They are not easily fooled.’

In fact, the passive-with-*se* constructions discussed in this subsection are often divided into two categories. Those in which the verb agrees with its internal argument are often

referred to as “reflexive passive” (or *passive impersonal* in RAE 1973, *personal passive* in Smith 1996, etc.); whereas those in which the verb does not agree with its internal argument and shows default third person singular conjugation are often referred to as “reflexive impersonal” (or *active impersonal* in RAE 1973, *impersonal passive* in Smith 1996, etc.). If we assume verbal agreement to be the consequence of an argument being in nominative case, then the division of these two categories arises as the result of the internal argument receiving nominative or accusative case, respectively. Careful analyses about these constructions will be carried out in Chapter 4, with our proposed mapping theory couched within the Lexical-Functional Grammar framework to be introduced in the next chapter. For the moment, we will keep using the term “passive-with-*se*” to refer to both types of constructions and move on to examine the argument realization in periphrastic passive constructions.

2.2.2 Periphrastic passive

Catalan periphrastic passive construction resembles the English passive in containing the copular verb and the past participial morpheme that combines with a predicate. The internal argument of a transitive verb in the periphrastic passive also shows the alternation between a nominative subject and a nominative object. Evidence from *en*-cliticization in (35) suggests that the internal argument is an object,¹⁹ whereas evidence from *pro-drop* with a definite referent in the second clause in (36) suggests that the argument is realized as a subject:

- (35) a. En seran convidats molts a la festa.
en.cl be.fut.3p.pl invite.pp.m.pl many.m.pl to the party
 ‘Many will be invited to the party.’

(Cortés 1991)

- b. D’esmenes, només en van ser aprovades dotze.
of-amendment.f.pl only en.cl go.3p.pl be.inf approve.pp.f.pl twelve
 ‘As for amendments, only twelve were approved.’

(Gràcia 1989:61)

¹⁹ The perfective past participial agreement, as *estats* ‘been’ in (i) below, is quite rare in practice, though theoretically possible:

- (i) ?? N’han estats convidats molts a la festa.
en.cl-have.3p.pl be.pp.m.pl invite.pp.m.pl many.m.pl to the party
 ‘Many have been invited to the party.’

Likewise, the internal argument as a bare NP in postverbal position with periphrastic passive construction is also unusual, as (ii) shows:

- (ii) ?? Seran convidats periodistes a la festa.
be.3p.pl invite.pp.m.pl journalist.m.pl to the party
 ‘Journalists will be invited to the party.’

2 Background

- c. De presoners, en seran executats vint-i-cinc.
of prisoner.m.pl en.cl be.fut.pl execute.pp.m.pl twenty-five
'As for prisoners, twenty-five will be executed.'

(Gràcia 1989:61)

- (36) El director va denunciar el malestar de la plantilla
the director go.3p.sg denounce.inf the malaise of the personnel
i Ø va ser destituït.
and go.3p.sg be.inf dismiss.pp.m.sg
'The director denounced the malaise of the personnel and was dismissed.'

(IEC 2016:886)

The internal argument of the transitive verb in periphrastic passive is always assigned nominative case, first because it agrees with the copular verb, regardless of whether it is an object (as in (35)), or a subject (as in (36)); and second, because the *a*-marking is not allowed:

- (37) a. En seran convidats (*a) molts a la festa.
en.cl be.fut.3p.pl invite.pp.m.pl to many.m.pl to the party
'Many will be invited to the party.'
- b. Va ser destituït (*a) ell.
go.3p.sg be.inf dismiss.pp.m.sg to he
'The director was dismissed.'

2.3 Summary

This chapter has argued for the claim that the single direct argument of an intransitive verb in Catalan can be a nominative object. This argument shows a subject-object alternation, but is invariably in the *nominative* case. As a subject, it displays the expected subject properties, including the possibility of *pro-drop*; as an object, it displays the expected object properties, including expression by means of the object clitic *en*. The claim that the argument is a nominative expression explains its agreement with the verb, even when it is an object. The observation that a direct argument alternates between a subject and an object is also confirmed by the behavior of the internal argument of transitive verbs in passive clauses: both periphrastic passive and passive-with-*se* allow the internal argument of a transitive verb to receive nominative case and show subject-object alternation. In addition, the passive-with-*se* construction allows the internal argument of a transitive verb to have accusative case and be realized as an object, though a clearer picture about passive and impersonal constructions needs to be further refined. The table below summarizes the argument realization of the single direct argument of intransitive verbs, and of the internal argument of transitive verbs in passive and active voices, together with the case the argument at issue receives:

(38) Argument realization of intransitive arguments and internal argument of transitive verbs:

	Intransitives	Transitives with <i>se</i>	Transitives in periphrastic passive	Active transitives
NOM SUBJ	√	√	√	*
NOM OBJ	√	√	√	*
ACC OBJ	*	√	*	√
ACC SUBJ	N/A			

The chart highlights three points:

- i) The sole argument of intransitive verbs, both unergatives and unaccusatives, alternates between a subject and an object, and is always nominative (as is shown in 2.1);
- ii) Likewise, both passive-with-*se* and periphrastic passive allow the internal argument of a transitive verb to alternate between subject and object; however, accusative case is only allowed with *se*, and not with the past participial morpheme (as is shown in 2.2);
- iii) Moreover, an internal argument may only receive accusative case in the presence of an external argument.

Some more words need to be said regarding the second point, concerning the clitic *se* and the passive past participial morpheme. First, the reflexive morpheme *se* can be used with intransitive verbs (both unaccusative and unergative), whereas the past participial morpheme never combines with an intransitive:

- (39) a. Aquí es treballa molt.
here se.cl work.3p.sg much
- a'. * Aquí és treballat molt
here be.3p.sg work.pp.m.sg much
 'Here people work a lot.'
- b. A Espanya sempre s'arriba tard.
in Spain always se.cl-arrive.3p.sg late
- b'. * A Espanya sempre és arribat tard.
in Spain always be.3p.sg arrive.pp.m.sg late
 'In Spain, people always arrive late.'

Second, *se* can combine with the past participial morpheme to “double passivize” a transitive verb. Though double passives are not very frequent in Catalan (IEC 2016:895), they are nevertheless grammatical, and the agent is understood as nonspecific (Bartra 2002:2160):

2 Background

- (40) Passava aixó quan s'era expulsat
happen.imperf.3p.sg this when se.cl-be.imperf.3p.sg expel.pp.m.sg
del partit.
from-the party
'This was happening when one was expelled from the party.'

(IEC 2016:895)

All these data reported here require a formal explanation, as we will see in Chapter 4. Different function realizations of an argument and the case it has arise as a result of being licensed by different mapping principles, as well as the interaction among constraints, in terms of the theoretical framework we are going to present in Chapter 3.

Chapter 3

Theoretical Framework

The thesis is developed within the Lexical-Functional Grammar (LFG) framework, which originates in the 1970s in work by Joan Bresnan and Ronald Kaplan, with the purpose of proposing a version of generative grammar that is an alternative to transformational theories. LFG aims to present a formal representation of human languages that fits well both with psychology concerning language processing and learnability, and with computational language modelling. The early foundational work is mainly collected in Bresnan (1982a) and Dalrymple et al. (1995), and later on systematically developed into the reference work by Dalrymple (2001), and textbooks by Bresnan (2001), Falk (2001), and Bresnan et al. (2016), among others.

This chapter consists of three parts. The first part, 3.1, introduces the general theoretical framework within which this thesis is developed: Lexical-Functional Grammar (LFG), a parallel, constraint-based linguistic model that originates in work by Bresnan and Kaplan (see Bresnan 1982b-c, Kaplan and Bresnan 1982, etc.). We will present three basic structures that are of relevant importance to our study –constituent structure/c-structure, functional structure/f-structure, and argument structure/a-structure–,²⁰ their well-formedness conditions, and the correspondence between them. As our analysis also incorporates principles from Optimality Theory (OT), a brief introduction to the basic architecture and assumptions of this formal framework will be given at the end of this part. The second part gives a detailed discussion about current LFG mapping theories. We will introduce two main versions of Lexical Mapping Theory (LMT) and a version of Functional Mapping Theory (FMT), and discuss the problems they face. We will also

²⁰ Other levels of representation in LFG include but may not be limited to: the morphological or morphosyntactic structure/m-structure (Butt et al. 1996, 1999, Frank and Zaenen 2002, Belyaev 2013, Dalrymple 2015, etc.), the prosodic structure/p-structure (Butt and King 1998, Bögel et al. 2009, Dalrymple and Mycock 2011, Bögel 2012, 2013, Mycock 2006, 2010, etc.), the semantic structure/s-structure explored within the glue approach (Dalrymple 1993, 1999, 2001, Fry 1997, Andrews 2004, 2008, Dalrymple and Nikolaeva 2011, and Asudeh 2004, 2012, etc.), and the information structure/i-structure (King 1995, Choi 1999, King and Zaenen 2004, O’Connor 2006, Dalrymple and Nikolaeva 2011, Mycock 2013, Mycock and Lowe 2013, etc.). These levels of representation will not be introduced in this thesis. For more information, we refer the readers to the work listed above and the references therein.

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give a general review of the case assignment issues in LFG. Finally, the third part provides a conclusion.

3.1 The general framework

By its name, LFG is lexical, in that the word and the lexicon play a major role; it is also functional, in that grammatical functions are taken to be syntactic primitives which are not motivated either by phrasal positions or semantic notions. LFG is known as a parallel, constraint-based, and non-transformational theory: different grammatical information and components are factorized into separate yet parallel levels of representation, which are related to each other by projection principles and constrained by well-formedness conditions. A well-formed construction satisfies all the constraints licensing the mapping between its different structures, as well as all the constraints on the structures *per se*.

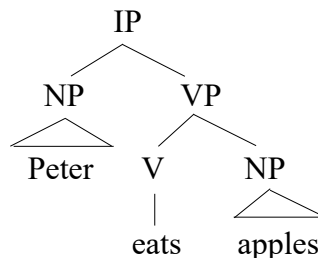
3.1.1 C-structure and f-structure

C-structure is formally represented as a phrase structure tree following X' theory. It resembles the phrase structure representation in transformational frameworks in representing syntactic information about precedence, dominance, and constituency, but differs mainly in two aspects: first, empty categories are largely avoided; and second, the terminal nodes must be complete words that are morphologically complete. For example, for a simple transitive sentence in English as (41),

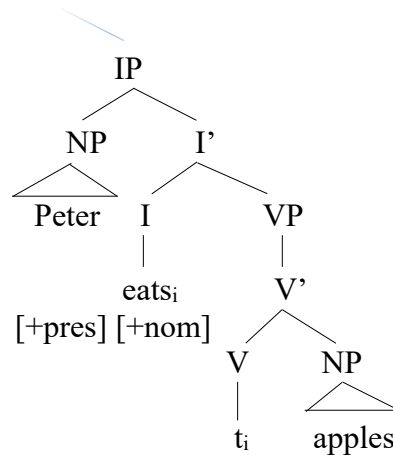
(41) Peter eats apples.

Its phrase structure in LFG and in a transformational grammar like GB/PP can be represented respectively as:

(42) a. C-structure for *Peter eats apples* in LFG:



b. Phrase structure for *Peter eats apples* in Government and Binding (GB) theory:



As we can see, no traces or empty categories are presented in the c-structure in (42a), but they exist in (42b). This difference is captured by the *Economy of Expression* principle:

(43) Economy of Expression

All syntactic structure nodes are optional and are not used unless required by independent principles (completeness, coherence, semantic expressivity).

(Bresnan 2001:91)

Another difference concerns the inflectional features: they are allowed to appear in terminal nodes in transformational grammars like GB, but are prohibited from occupying terminal nodes in LFG. To be specific, in GB, the node I is assumed to contain inflectional features, and a finite verb gets its inflection through V-to-I movement, as (42b) illustrates.²¹ In contrast, all the terminal nodes are assumed to be morphologically complete in LFG, as (42a) illustrates. This is stipulated in the *Lexical Integrity Principle*, first discussed by Simpson (1983), and later on developed into the current version as:

(44) Lexical Integrity Principle:

Morphologically complete words are leaves of the c-structure tree and each leaf corresponds to one and only one c-structure node.

(Bresnan 2001:92)

This strong lexicalist hypothesis draws a clear borderline between syntax and morphology in the phrasal domain in LFG, making the internal structure of words totally opaque to the syntactic operation on the phrase structural level (see Bresnan and Mchombo 1995

²¹ Even in the Minimalist Program (MP), where verbs are assumed to be fully inflected, inflectional features still occupy structural positions: the inflectional features of the little *v* complex are assumed to be uninterpretable and must be checked against the interpretable counterparts, which occupy the structural position T. The implication is that the internal structure of words is analyzed by syntax in transformational approaches.

3 Theoretical Framework

for a detailed discussion).²² As a consequence, inflectional features, such as person, number, and tense, etc., are factored away from the c-structure into another level of representation, i.e., the functional structure, or f-structure.

However, the strongest motivation for telling f-structure apart from c-structure comes from the observation that, though word order differs across languages, grammatical relations are largely invariant and universal. For example, whereas grammatical functions like subject and object are decided by their phrasal positions in English, their structural positions in non-configurational languages like Warlpiri or Malayalam are rather flexible. That is, languages may essentially share the same functions and other grammatical properties (such as tense or aspect) at some level(s) of representation, despite the fact that their respective superficial structural representations diverge. Grammatical functions are therefore treated as universal primitives of syntax that are not derived from phrase structure positions or semantic notions (but may be constrained by them) in LFG, and the f-structure is granted an independent status to capture the underlying and abstract regularities cross-linguistically.

F-structure is modelled as a matrix that consists of attribute-value pairs. It is therefore also known as Attribute-Value Matrixes (AVM):

$$(45) \quad \begin{bmatrix} \text{Attribute}_1 & \text{Value}_1 \\ \text{Attribute}_2 & \text{Value}_2 \\ \dots & \dots \\ \text{Attribute}_n & \text{Value}_n \end{bmatrix}$$

Abstract syntactic features (e.g. case, tense, person, number...) disallowed in the c-structure are all represented in the f-structure, together with the grammatical functions (GFs, e.g. SUBJ, OBJ, OBL...), the relationship between different syntactic constituents, and their governing restrictions. Values pairing with attributes can be either a symbol (e.g. PL for an attribute NUM), a semantic form (e.g. *food* for an attribute PRED), a subsidiary f-structure (e.g. the value for a GF), or a set of f-structures (e.g. the value for ADJ(UNCT)).

F-structure must satisfy at least three conditions in order to be well-formed:

(46) Well-formedness Conditions for f-structure:

a. Completeness Condition

An f-structure is *locally complete* if and only if it contains all the governable grammatical functions that its predicate governs. An f-structure is *complete* if and only if it and all its subsidiary f-structures are locally complete.

b. Coherence Condition

An f-structure is *locally coherent* if and only if all the governable grammatical functions that it contains are governed by a local predicate. An

²² Another implication of the Lexical Integrity Principle, which receives much less attention, is that terminal nodes cannot be larger than complete words, as Construction Grammar (Goldberg 1995) assumes. See Asudeh et al. (2008) and Asudeh and Toivonen (2010), among others for the discussion.

f-structure is *coherent* if and only if it and all its subsidiary f-structures are locally coherent.

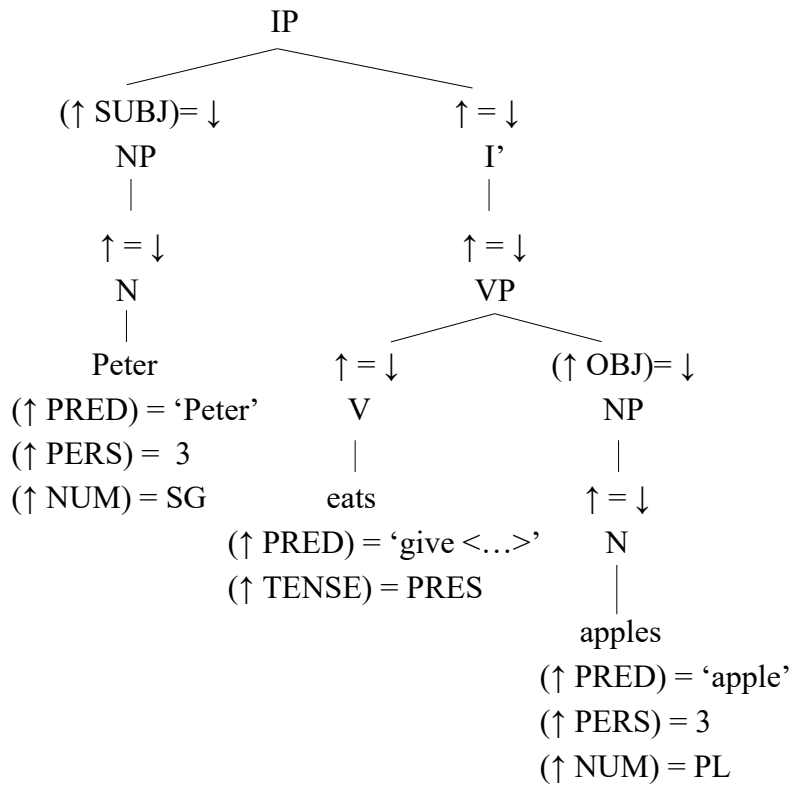
c. Uniqueness Condition (also known as Consistency Condition)

In a given f-structure a particular attribute may have at most one value.

(Kaplan and Bresnan 1982)

The structures used in LFG to model syntactic information are assumed to be parallel, being connected to each other by different mapping functions. With respect to c-structure and f-structure, it is the projection function ϕ that is responsible for their connection. Each c-structure node is supposed to correspond to an f-structure, and standard LFG formally represents this by annotating phrase structure nodes with metavariables \uparrow and \downarrow . The upwards arrow \uparrow refers to the f-structure of the c-structure node that immediately dominates the annotated node, whereas the downwards arrow \downarrow denotes the f-structure of the current annotated node. A simplified version of structural annotation of (41) and the corresponding f-structure are shown as follows:²³

(47) a.



Annotated c-structure of (41)

²³ For detailed c-structure to f-structure mapping principles, see Bresnan (2001).

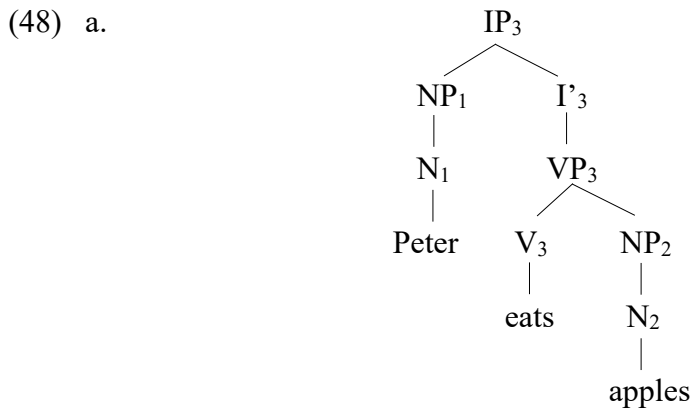
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b.

PRED	‘eat < (↑ SUBJ) (↑ OBJ)>’						
TENSE	PRES						
SUBJ	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PRED</td> <td style="padding-left: 10px;">‘Peter’</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PERS</td> <td style="padding-left: 10px;">3</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">NUM</td> <td style="padding-left: 10px;">SG</td> </tr> </table>	PRED	‘Peter’	PERS	3	NUM	SG
PRED	‘Peter’						
PERS	3						
NUM	SG						
OBJ	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PRED</td> <td style="padding-left: 10px;">‘apple’</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PERS</td> <td style="padding-left: 10px;">3</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">NUM</td> <td style="padding-left: 10px;">PL</td> </tr> </table>	PRED	‘apple’	PERS	3	NUM	PL
PRED	‘apple’						
PERS	3						
NUM	PL						

F-structure corresponding to the annotated c-structure of (41)

For the simplicity of illustration, we can also represent the correspondence between a c-structure node and its related f-structure by marking them with the same subscripted integers, as Alsina (1995, 1996, etc.) does. In this way, the c-structure and f-structure pair of (47) may also be represented as:



b.

PRED	‘eat < Arg ₁ , Arg ₂ >’						
TENSE	PRES						
SUBJ	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PRED</td> <td style="padding-left: 10px;">‘Peter’</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PERS</td> <td style="padding-left: 10px;">3</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">NUM</td> <td style="padding-left: 10px;">SG</td> </tr> </table>	PRED	‘Peter’	PERS	3	NUM	SG
PRED	‘Peter’						
PERS	3						
NUM	SG						
OBJ	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PRED</td> <td style="padding-left: 10px;">‘apple’</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">PERS</td> <td style="padding-left: 10px;">3</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px;">NUM</td> <td style="padding-left: 10px;">PL</td> </tr> </table>	PRED	‘apple’	PERS	3	NUM	PL
PRED	‘apple’						
PERS	3						
NUM	PL						

Note that representing the c-structure and f-structure correspondence in one way (i.e., using metavariables as (47b)) or the other (i.e., using co-indexations as (48b)) is not essentially different. However, the different PRED forms in (47b) and (48b) do reflect an essential distinction with respect to the assumptions about the argument-to-function realization, or rather, the different theories regarding the mapping between a-structure

and f-structure. We will address this issue in the next subsection, and more concretely in 3.2.

3.1.2 Inception of argument structure and argument realization

LFG in its early stage –as in Kaplan and Bresnan 1982– only assumes two syntactic levels of representation: the c-structure and the f-structure. At that time, argument structure did not play an important role, as verbs were assumed to directly encode the surface grammatical relations of the syntactic constructions in which they occur. Early LFG primarily concentrates on the alternative function realizations of arguments –like passivization or dative alternation–, and argues that rules based on abstract function notions work better to capture the universality of the function-changing operations than derivational approaches, which depend on phrasal transformation rules.²⁴ Grammatical relations are thus proposed to be changed directly in the lexicon with lexical redundancy rules. For example, the effect of passivization on a monotransitive lexical form in Bresnan (1982b)’s *remapping* approach is described as:

(49) Effect of passivization on a lexical form:

- a. Active: L((SUBJ), (OBJ)) →
 agent theme
- b. Passive: L((OBL)/Ø, (SUBJ))
 agent theme

(Bresnan 1982b:9)

As we can see in (49), lexical redundancy rules explaining the function-changing from active to passive encode grammatical functions in the active and passive lexical forms separately. The functional and morphological changes in this process are presented as follows:

(50) Functional and morphological changes in passivization in English:

- a. Functional change: (SUBJ) → Ø (BY OBJ)
 (OBJ) → (SUBJ)
- b. Morphological change: V → V_[Part]

(Bresnan 1982b:9)

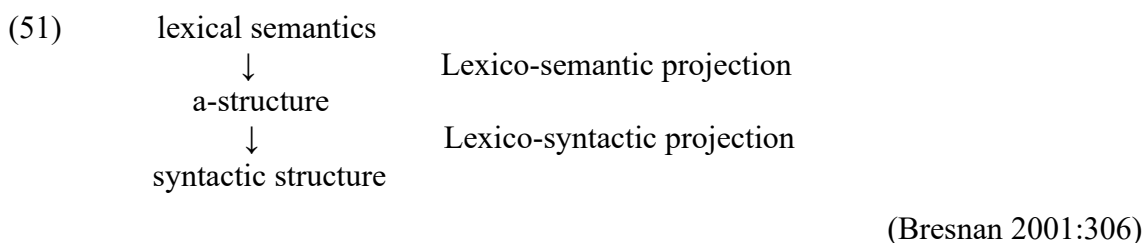
However, the early lexical redundancy rule system did not take the initial mapping issues into account, as Bresnan (1990) observes (“there are no limitations on associating functions with semantic roles”). Apart from this, the redundancy rules are insufficient to capture the generality of relation changing, such as the passivization of ditransitive verbs in symmetric and asymmetric languages. Therefore, a complete picture of how to limit the association between functions and semantic roles, as well as how to precisely describe grammatical function alternations and the interaction between relation changing and

²⁴ See discussion in Perlmutter and Postal (1983).

3 Theoretical Framework

function assignments (as in the case of passivizing a ditransitive verb) is required.²⁵ Under this background, argument structure comes to obtain an independent status that is parallel to other levels such as the c-structure and f-structure. Relevant works carried out to deal with argument to function realization issues come to be known as “mapping” or “linking” theories.

The argument structure (or a-structure) provides information that is necessary for associating thematic roles and subcategorized functions of predicates. Though the content of a-structure varies in different mapping approaches, it is generally assumed to encode the arguments denoted by the predicate, their hierarchical ordering (see Bresnan and Kanerva 1989) and information needed for their linking to functions. A-structure therefore mediates between the lexical-semantic level of a predicate and its syntactic level in terms of grammatical functions. The lexical-semantic level of representation contains the semantic participants of the event denoted by a predicate, and the syntactic level includes syntactic information needed for the clausal construction.²⁶ The relation between these three levels can be represented as:



The lexico-syntactic projection, i.e., the mapping between a-structure and f-structure, has been much explored over the years, finally being developed into distinct mapping theories, among which the “standard” and most influential is the Lexical Mapping Theory (LMT) brought up by Bresnan, together with other scholars (see Levin 1986, Bresnan and Kanerva 1989, Bresnan and Moshi 1990, Bresnan and Zaenen 1990, etc.). LMT assumes the existence of a feature decomposition system, by means of which arguments are linked to functions in the lexicon.²⁷ Other mapping theories include the Functional Mapping Theory (FMT, see Alsina 1993, 1996, etc.), the mapping theory of Butt (see Butt 1993), and the Mapping Theory of Kibort-Findlay (see Kibort 2001, 2004, Findlay 2016, etc.), etc. The FMT proposed by Alsina (1996) represents the argument structure as the value of the PRED feature of the argument-taking predicates and constrains the argument to function mapping with a *function* decomposition system. The implication is that the argument-to-function realization in FMT takes place in the *syntax*, rather than in the lexicon, as the standard LMT assumes. The mapping theory of Butt (1993, 1995, etc.) also assumes that the argument realization occurs in the syntax instead of in the lexicon, but adopts the feature decomposition system in standard LMT as the formal representation. The argument structure in her approach is also semantically much richer,

²⁵ For a detailed discussion about the problems of lexical redundancy rules, see Bresnan (1990).

²⁶ One can simply take this level to be the f-structure.

²⁷ The argument realization occurring in the lexicon is already shown in the f-structure in (47b), when we introduce the standard LFG annotation system. As we can see, grammatical functions SUBJ and OBJ are already included in the PRED value of the main predicate *eat*.

which is based on the theory of Conceptual Semantics of Jackendoff (1990).²⁸ The mapping theory of Kibort also makes use of the feature decomposition system in standard LMT. Argument structure is reformulated to contain a fixed order of syntactically identifiable argument positions, which are pre-specified with particular features. The mapping principles are reformulated as well, making full use of the markedness hierarchy of grammatical functions. This variant of mapping theory can be seen as a reformed version of the standard LMT. The mapping theory of Findlay (2016) incorporates the core idea of Kibort's LMT, but he follows Asudeh and Giorgolo (2012) in merging argument structure with semantic structure, thus doing away with a-structure as a separate level between syntax and semantics. Since the mapping proposed by Findlay (2016) shares the essential spirit with the mapping theory of Kibort, their theory is sometimes referred to together as the "mapping theory of Kibort-Findlay".²⁹

We would like to point out that, though mapping theories usually refer to the set of principles that deal with the linking between a-structure and f-structure, the terminology *mapping* can in fact refer to the correspondence between any parallel structures assumed in LFG. In the following parts of the thesis, we will use the term in its narrow sense, i.e., to refer to the argument to function mapping. We would also like to claim that, though doing away with argument structure may be rather appealing in some sense, the argument structure as a separate level of representation will be preserved in this thesis, and will play an important role in the argument realization process, as we will see in Chapter 4 and 5. Detailed introduction and discussion about current mapping theories are left to section 3.2, in which a general review of how these current theories work to account for the argument realization and function alternation –as well as their limitations– will be introduced. For the moment, we move on to see the implementation of Optimality Theory (OT) in the LFG syntax. The incorporation of OT into LFG will allow us to give an elegant account of the subject-object alternation observed in Chapter 2.

3.1.3 Syntax from an OT-LFG point of view

OT was first developed by McCarthy and Prince (1993) and Prince and Smolensky (1993) in the field of phonology and morphology. They claim that linguistic approaches to the prosodic morphology, which depend on inviolable rules, are too limited, and that a theory based on a set of violable constraints interacting with each other can give a better explanation of the morpho-phonological phenomena. The goal of OT-based analyses is therefore to distinguish grammatical from ungrammatical utterances by selecting an optimal output through an evaluation system (EVAL), from a set of competing candidates generated by the generator apparatus (GEN) with respect to a given input.

The first combination of OT with syntax is carried out by Legendre et al. (1993), but the formal implementation of OT in current syntactic theories is credited to Grimshaw (1997), in which OT is set in the framework of GB/MP to account for subject-auxiliary inversion in English interrogative constructions. The influential work of Grimshaw

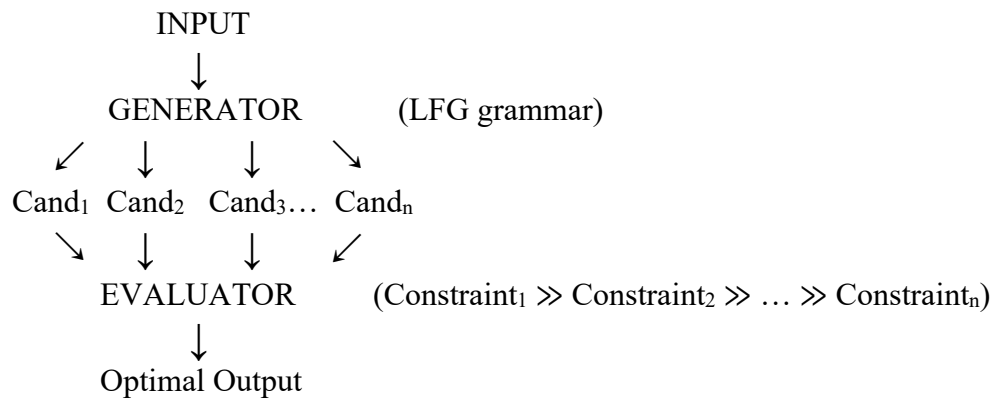
²⁸ The argument structure in Butt (1993, 1995, etc.) consists of three tiers: the Thematic Tier, the Action Tier, and the Aspectual Tier. See Butt (1993, 1995, etc.) for detailed analyses.

²⁹ For example, Lowe (2015) or Andrews (2018).

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(1997) is then recasted by Bresnan (2000) within the OT-LFG approach, on the basis of many previous work exploring the OT-LFG interface (see Choi 1996, 1999, Bresnan 1996, 1998, Johnson 1998, etc.). Systematic investigation into OT-LFG is completed by Kuhn (2003), which has become a referential book for researchers exploring this area. In the remaining part of this subsection, we will consider how OT can be implemented in our LFG framework. The basic OT-LFG framework is shown in the next scheme, followed by our definition of each component, based on Grimshaw (1997), Grimshaw and Samek-Lodovici (1998), Bresnan (2000), and Kuhn (2000, 2003).

(52) Basic OT-LFG framework:



The INPUT is understood as an underspecified f-structure encompassing an argument-taking predicate, with additional tense/aspect and focus/topic information. The f-structure is underspecified in the sense that grammatical functions are not yet determined with respect to the arguments denoted by the predicate. For example, to express *Peter eats apples*, one may have the following input f-structure in mind as:

(53)
$$\left[\begin{array}{ll} \text{PRED} & \text{'eat < Arg}_x, \text{ Arg}_y \text{'}} \\ \text{GF}_1 & \left[\begin{array}{ll} \text{PRED} & \text{'Peter'} \\ \text{PERS} & 3 \\ \text{NUM} & \text{SG} \end{array} \right]_x \\ \text{GF}_2 & \left[\begin{array}{ll} \text{PRED} & \text{'apple'} \\ \text{PERS} & 3 \\ \text{NUM} & \text{PL} \end{array} \right]_y \\ \text{TENSE} & \text{PRESNT} \end{array} \right]$$

Given the information provided by the input, the generator (GEN) produces an infinite set of candidates. In an OT-LFG setting, GEN generates all possible pairings of c-structure and f-structure according to the LFG grammar. The aspect of grammar which models the c-structure is assumed to be the context-free phrase structure rules. As for the f-structure, Kuhn (2003) proposes that it is generated complying with the faithfulness principles *Completeness* and *Coherence*.³⁰ Irrelevant components such as adjuncts or

³⁰ According to Kuhn (2003), compliance of the faithfulness principles refers only to the generation of f-structure. Unfaithfulness may arise as a tension between a candidate's c-structure and f-structure. That is,

morphosyntactic features can be freely added on the condition that the faithfulness principles are not violated.

With the candidates generated by GEN, an optimal output must be selected. This task is conducted by the evaluator (EVAL), which consists of a set of ranked yet often conflicting constraints, which are assumed to be violable. Incurring a certain constraint does not directly result in ungrammaticality, and a competitor need not satisfy all the constraints in order to be the optimal output. Constraints are nevertheless ordered with a strict dominance: the effect of a higher-ranking constraint overrides the effect of a lower-ranking one, so that the violation of a more prominent constraint cannot be compensated for by the satisfaction of any less prominent ones. A candidate may therefore violate a constraint given that the violation permits the satisfaction of another constraint that ranks higher, and the optimal output is the candidate that “best satisfies the highest-ranking constraint” (Grimshaw 1997:373). Constraints are also assumed to be universally applicable. Each language stipulates their language-specific ordering of the same set of universal constraints, out of which different grammars are constituted, and cross-linguistic variation can be seen as a reflection of different orderings of the same set of constraints. In OT-LFG syntax, since candidates are assumed to be c-structure/f-structure pairs, the assessment system is modelled referring to the c-structure and f-structure *per se*, as well as to the mapping between them. The optimal output is thus the c-structure and f-structure pair that best satisfies the set of ranked constraints, with respect to all the competitors that enter the evaluation system.

The evaluation process is represented in a tableau. Candidates are listed in the first column while constraints are listed in the first row. It is not necessary for all the constraints to appear in the tableau: for the convenience of study, listing those that are relevant to the analysis is sufficient. Constraints are ordered from left to right according to their prominence in a particular language, with the leftmost being the most prominent and the rightmost being the least prominent. The solid vertical line separating two constraints indicates the dominance of the left over the right, whereas the dotted vertical line signals the equal severity of violating the two constraints. Every time a constraint is violated, a star (*) is recorded. Therefore, the number of stars specifies the time of violation of a certain constraint. The key constraint violated that leads to the knock-out of a candidate will be marked with an exclamation mark (!), and the optimal output will be indicated by a pointing finger (☞) that appears to its left:

(54) Optimization tableau:

	Constraint ₁	Constraint ₂	Constraint ₃	...	Constraint _n
☞ Candidate ₁					*
Candidate ₂		*!			*
...			*!		*
Candidate _n	*!	**			

while a candidate’s f-structure is generated in compliance with the faithfulness principles, the generated c-structure need not faithfully reflect the information contained in the f-structure that it is paired with. Of course, pairings in which the two structures do not match (i.e., in which the c-structure is unfaithful to the f-structure) will be checked and ruled out by the evaluation system (EVAL).

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With the framework explained, we will now illustrate how the OT-LFG works with a simple English transitive clause, like the one in (41) (i.e., *Peter eats apples*). In English, the subject always occupies the left sister position of I', and the object always occupies the right sister position of V. These structural restrictions are captured by the following mapping constraints:

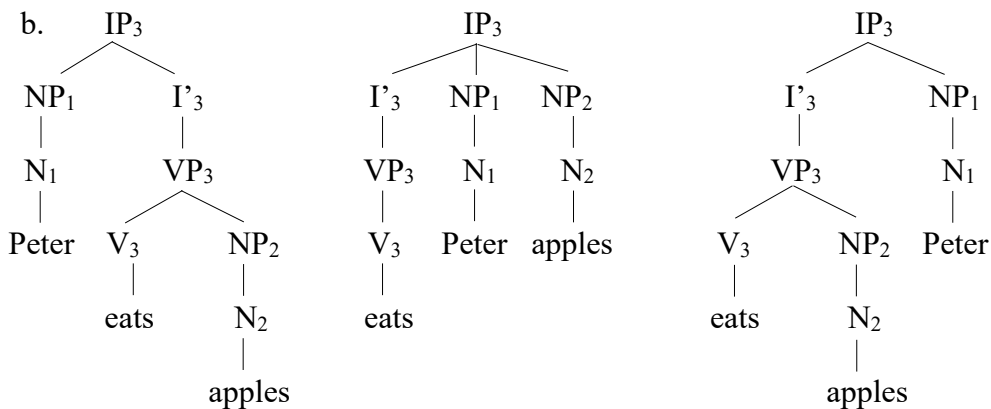
- (55) a. SUBJPOS (Subject Position): $[_{IP} XP_1 I'] \rightarrow \text{SUBJ } [\dots]_1$;
 b. OBJPOS (Object Position): $[_{VP} V XP_2] \rightarrow \text{OBJ } [\dots]_2$

With respect to the input of (41) already illustrated in (53), the generated f-structure of the candidates can be represented as (48b), repeated below as (56) for convenience:

- (56)
$$\left[\begin{array}{l} \text{PRED} \quad \text{'eat } \langle \text{Arg}_1, \text{Arg}_2 \rangle \text{' } \\ \text{TENSE} \quad \text{PRES} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'Peter'} \\ \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \end{array} \right]_1 \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'apple'} \\ \text{PERS} \quad 3 \\ \text{NUM} \quad \text{PL} \end{array} \right]_2 \end{array} \right]$$

Three potential candidates and their c-structures pairing with the generated f-structure in (56) are listed as follows:

- (57) a. Potential candidates:
 Candidate₁: Peter eats apples.
 Candidate₂: * Eats Peter apples.
 Candidate₃: * Eats apples Peter.



C-structure of candidate₁ C-structure of candidate₂ C-structure of Candidate₃

Then the ruling out of Candidate₂ and Candidate₃ follows naturally from the constraints that license the c-structure and f-structure correspondence, as established in (55). Since

we do not know the relative prominence of the two constraints (at least in the case of our study here), they are separated with a dotted vertical line in the tableau below:

(58) Optimization for (57):

	SUBJPOS	OBJPOS
Candidate ₁		
Candidate ₂	*!	*
Candidate ₃	*!	

The Candidate₁, i.e., *Peter eats apples*, is selected as the optimal, as it best satisfies the set of constraints compared to all the other competitors.

3.2 Current mapping Theories

This section presents some current mapping theories and discusses the problems they face. The structure is organized as follows: in 3.2.1, we introduce two versions of the Lexical Mapping Theory (LMT), and point out two main problems that arise when dealing with the facts given in Chapter 2. Subsection 3.2.2 introduces the Functional Mapping Theory (FMT) of Alsina (1996). As we will see, this functional approach can solve one of the two problems described in 3.2.1, but gives no solution to the other. In 3.2.3, we review how the case assignment is approached in LFG linking theories. Our conclusion is that case assignment does not play an active role in the current mapping theories, and that incorporating case assignment into the argument realization process can avoid the two problems mentioned in 3.2.1. We will give a brief summary of 3.1 and 3.2 in section 3.3, and formally propose our new mapping theory in Chapter 4.

3.2.1 Lexical Mapping Theories

The Lexical Mapping Theory is proposed to account for the correspondence between a-structure and f-structure, licensing the realization of arguments as grammatical functions in the lexicon. In this section, two versions of LMT will be discussed. The first version, which we refer to as the standard LMT or LMT of Bresnan, summarizes the work from Levin (1986), Bresnan and Kanerva (1989), Bresnan (1990), Bresnan and Moshi (1990), Bresnan and Zaenen (1990), and Bresnan (1994), among others. The second version, which we will call the LMT of Kibort-Findlay, gives an overall description of the core mapping spirit in the works of Kibort (2001, 2004, 2007, 2014, etc.), with the incorporation of later work by Findlay (2016). Both mapping theories find difficulty in

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accounting for the subject-object alternation observed in Chapter 2, in addition to the treatment of multiple objects, as we will address in turn.

3.2.1.1 Standard LMT

The standard LMT, based on Levin (1986), Bresnan and Kanerva (1989), and Bresnan and Moshi (1990), among others, consists of four parts: a hierarchical ranking of thematic roles; the classification of syntactic functions along two dimensions; principles governing the mapping between functions and arguments bearing a certain role, and the well-formedness conditions on lexical forms.

Thematic roles are ordered according to a universal hierarchy, in accordance with Givón (1984) and Kiparsky (1987), among others:

- (59) Thematic hierarchy:
ag > ben > recip/exp > inst > th/pt > loc³¹

Grammatical functions are decomposed into more primitive elements [$\pm r$] (thematically unrestricted or not) and [$\pm o$] (objective or not). The [$-r$] feature formally captures the observation that syntactic functions SUBJ and OBJ can be related to any thematic roles or even no roles, in the case of expletives; by contrast, the [$+r$] feature is used to classify the thematically restricted functions OBJ $_{\theta}$ and OBL $_{\theta}$, with the subscripted θ further specifying the thematic role that the function is restricted to. The [$+o$] feature picks objective functions OBJ and OBJ $_{\theta}$, whereas the [$-o$] feature characterizes the non-object-like functions SUBJ and OBL $_{\theta}$:

- (60) Decomposition of syntactic functions:

	$-r$	$+r$
$-o$	SUBJ	OBL $_{\theta}$
$+o$	OBJ	OBJ $_{\theta}$

On the other hand, thematic roles are partially specified with respect to their relation with grammatical functions. As Levin (1986) and Bresnan and Kanerva (1989) observe, the *theme/patient* argument can correspond alternatively to either SUBJ or OBJ; Similarly, the *agent* and *locative* argument can alternate between SUBJ and OBL (Bresnan 1994). The function underspecification of an argument is represented using intrinsic role classifications, which partially specify the syntactic function information of thematic roles according to their intrinsic semantic properties. Some thematic roles and their intrinsic classifications are listed below:

- (61) Intrinsic role classifications:
a. Agent encoding rule: ag
|
[$-o$]

³¹ Abbreviations in the hierarchy are short for *agent*, *beneficiary*, *recipient/experiencer*, *instrument*, *theme/patient*, and *locative*, respectively.

- b. Theme/patient encoding rule: *th*
 |
 [-r]
- c. Locative encoding rule: *loc*
 |
 [-o]

(Bresnan and Kanerva 1989:25-26)

These encoding rules formally state that the agent and locative argument cannot be realized as an OBJ but may alternate between a SUBJ and an OBL, whereas the theme/patient argument cannot be an OBL but alternates between a SUBJ and an OBJ.

Two more kinds of principles are needed to further specify the function realization of an argument, which include the morphological operation principles and the default syntactic specifications. Morphological specifications affect the argument realization by adding or suppressing thematic roles. For instance, passivization suppresses the highest thematic role of a predicate,³² and the antipassive operation suppresses the theme or patient argument. The default syntactic specifications are used when all the argument structure has been morphologically built up, assigning [-r] to the highest argument, and [+r] to all the remaining arguments, where possible. The default specifications ensure the highest thematic argument of a predicate to map onto the subject and the other arguments onto functions other than the subject.

Finally, well-formedness conditions are assumed to guarantee a well-governed mapping:

(62) Well-formedness conditions on lexical forms:

- a. Function-argument biuniqueness
 In every lexical form, every expressed lexical role must have a unique syntactic function, and every syntactic function must have a unique lexical role.
- b. Subject Condition
 Every lexical form must have a subject.

(Bresnan and Kanerva 1989)

The Function-Argument Biuniqueness is challenged by Alsina (1995, 1996, etc.) with evidence from Romance languages like Catalan or Spanish, in which two different arguments are argued to map onto the same grammatical function in the reflexivized construction with reflexive or reciprocal interpretation. The Subject Condition, first brought up by Baker (1983), is challenged by Mohanan (1994), Blevins (2003), and Kibort (2001, 2004, etc.), among others, with evidence from different languages. As an inviolable condition, as assumed in standard LMT, a clause lacking a syntactic subject will be considered ungrammatical. However, the Subject Condition can be seen as a violable constraint from an OT-LFG point of view, and a clause may lack a subject but still be legal, as we will see.

³² “Suppression entails that the role is syntactically unexpressed; it nevertheless remains the $\hat{\theta}$ in the argument structure of a passive verb. The agent phrase can be indirectly expressed as an optional, thematically bound adjunct.” (Bresnan and Moshi 1990:169-170)

3.2.1.2 LMT of Kibort-Findlay

Kibort (2001, 2004, etc.) divides argument structure into two levels: a semantic level containing the thematic role information of the predicate, and a syntactic level with a string of fixed argument slots ordered according to their syntactic pre-specified intrinsic features $[\pm r]$ and $[\pm o]$, which cannot be changed or deleted. This separation allows the same argument position to be linked to different participants to account for morphosemantic operations like dative shift or locative alternation. We will not discuss details of the semantic level and re-alignment issues in the current thesis, but only concentrate on the correspondence between the syntactic level of the argument structure and the f-structure (i.e., mapping in its narrow sense). The syntactic pre-specification of the argument slots is represented as follows:

$$(63) \quad \langle \text{ARG}_1 \quad \text{ARG}_2 \quad \text{ARG}_3 \quad \text{ARG}_4 \quad \dots \quad \text{ARG}_n \rangle$$

$$\quad \quad \quad [-o]/[-r] \quad [-r] \quad [+o] \quad [-o] \quad \quad \quad [-o]$$

(Kibort 2001, 2004, 2008a, 2008b, etc.)

Not all the positions in (63) are necessarily invoked, and only participants entailed by the predicate can activate the corresponding slot.

Grammatical functions are ordered according to the markedness hierarchy, following Bresnan (2001:309). Functions in higher positions are less marked than those in lower positions:

$$(64) \quad \text{Markedness hierarchy of syntactic functions:}$$

$$[-o]/[-r]\text{SUBJ} > [-r]/[+o]\text{OBJ}, [-o]/[+r]\text{OBL}_\theta > [+o]/[+r]\text{OBJ}_\theta$$

The pre-specified arguments in (63) map onto the grammatical functions in (64) according to the (default) mapping principle:

$$(65) \quad \text{(Default) Mapping Principle:}$$

The ordered arguments are mapped onto the highest (i.e., least marked) compatible function on the markedness hierarchy.

(Kibort 2001, 2004, 2008a, 2008b, etc.)

Kibort argues that this mapping theory makes the Subject Condition redundant, since a suitable argument will always map onto SUBJ whenever possible. Moreover, by discarding the obligatoriness of a SUBJ, it is now possible to account for subjectless constructions such as locative inversions without a locative, as we will discuss soon in the next subsection 3.2.1.3.

Morphosyntactic operations may interfere with default argument-to-function mappings by increasing the markedness of the arguments, i.e., by adding marked features $[+r]$ or $[+o]$ to the intrinsic ones. This gives rise to the grammatical function changing, such as passivization (by adding $[+o]$ to $[-r]$), or locative inversion (by adding $[+r]$ to $[-o]$).

The mapping theory of Findlay (2016) shares the core spirit of mapping of Kibort (2001, 2004, etc.). Following Asudeh and Giorgolo (2012), Findlay (2016) suggests encoding the information contained in the previously assumed a-structure into the semantic structure, therefore doing away with a-structure as a separate level of

representation. He also distinguishes the *core* arguments (i.e. ARG₁, ARG₂, ARG₃, and ARG₄ on the argument list proposed by Kibort) from the *derived* ones (from ARG₅ to ARG_n) following Needham and Toivonen (2011). Only core arguments are licensed by mapping rules. By contrast, derived arguments are introduced lexically or syntactically. Moreover, instead of treating GFs as primitives, as in standard LMT or the LMT of Kibort, Findlay (2016) suggests treating features R and O as primitives, which can be decomposed into the following disjunction pairs of functions:

$$(66) \quad \begin{aligned} \text{MINUSO} &\equiv \{\text{SUBJ|OBL}_\theta\}; \text{PLUSO} \equiv \{\text{OBJ|OBJ}_\theta\} \\ \text{MINUSR} &\equiv \{\text{SUBJ|OBJ}\}; \text{PLUSR} \equiv \{\text{OBJ}_\theta|\text{OBL}_\theta\} \end{aligned}$$

Each core ARG value is associated with a disjunction pair, represented in the following valency frame:

$$(67) \quad \begin{array}{ccccccc} < & \text{ARG}_1 & & \text{ARG}_2 & & \text{ARG}_3 & & \text{ARG}_4 & > \\ & & & \text{MINUSO} & & \text{MINUSR} & & \text{PLUSO} & & \text{MINUSO} \end{array}$$

The correspondence between ARGs and the disjunction pairs is formally defined by means of equations. For example, the relationship between ARG₂ and MINUSR can be represented as:

$$(68) \quad (\uparrow \text{MINUSR})_\sigma = (\uparrow_\sigma \text{ARG}_2)$$

The disjunction pair is used to account for the optionality of GF realization of an argument. For example, in a sentence like *Pedro ate a cake/Ø earlier*, the object *a cake* is optional. This is formally represented as $\{(\uparrow_\sigma \text{ARG}_2) = (\uparrow \text{MINUSR})_\sigma \mid (\uparrow_\sigma \text{ARG}_2)_{\sigma^{-1}} = \emptyset\}$,³³ in which σ^{-1} refers to the inverse mapping from ARG₂ to an f-structure, and \emptyset means that the ARG₂ maps onto no f-structure (i.e., *Pedro ate earlier*).

Then, which function corresponds exactly to which argument must be chosen. This is achieved by assuming the (default) mapping theory of Kibort, i.e., the highest available arguments are related to the least marked available GF. In a simple example of a monotransitive clause, there are two possible realizations:

$$(69) \quad \begin{array}{ll} \text{a.} & (\uparrow \text{SUBJ})_\sigma = (\uparrow_\sigma \text{ARG}_1) \\ & (\uparrow \text{OBJ})_\sigma = (\uparrow_\sigma \text{ARG}_2); \\ \text{b.} & (\uparrow \text{SUBJ})_\sigma = (\uparrow_\sigma \text{ARG}_1) \\ & (\uparrow \text{SUBJ})_\sigma = (\uparrow_\sigma \text{ARG}_2) \end{array}$$

(69b) will be ruled out by using well-formedness conditions, and in this case the Function-Argument Biuniqueness and the Subject Condition.

³³ The disjunction can also be abbreviated using templates, as (i) illustrates:

$$(i) \quad \begin{aligned} \text{MAP}(D, A) &:= \\ &(\uparrow D)_\sigma = (\uparrow_\sigma A); \\ \text{NOMAP}(A) &:= \\ &(\uparrow_\sigma A)_{\sigma^{-1}} = \emptyset \end{aligned}$$

Where *D* is short for *feature decomposition*, and *A* short for *arguments*. Then the disjunction can also be described as: $\{\text{@MAP}(\text{MINUSR}, \text{ARG}_2) \mid \text{@NOMAP}(\text{ARG}_2)\}$, with the symbol @ calling for the use of the template that follows it (see Findlay 2016).

3.2.1.3 Problems with the two LMTs

Since its inception, LFG has assumed as a general property of all languages that clauses have at most one unrestricted object and possibly one or more restricted objects. These two kinds of GFs have been designated by different names, including OBJ and OBJ_θ, to refer to unrestricted and restricted objects, respectively. While the distinction between these two types of object finds strong motivation in asymmetrical languages such as Chicheŵa (see Alsina and Mchombo 1990, 1993, and Bresnan and Moshi 1990, among others), it is unmotivated in many other languages, particularly in languages that make use of grammatical case such as Catalan and the other Romance languages.³⁴ Therefore, assuming the OBJ/OBJ_θ distinction for all languages constitutes an unnecessary complication of the analysis of multiple objects in the latter type of language.

As noted already in Alsina (1996), the relevant distinction among objects in Catalan (as well as other Romance languages) is in terms of grammatical case: dative vs. non-dative objects. Stipulating that one of the two objects is an OBJ and the other one an OBJ_θ plays no role in accounting for the facts in this language and does not allow us to maintain that this distinction has a cross-linguistically valid empirical reflex. The behavior of objects in Catalan is entirely predictable from the presence or absence of dative case. Stipulating that the dative object is the OBJ_θ is redundant, as it would stipulate that the dative object is the OBJ_θ and the non-dative object is the OBJ. Both dative and non-dative objects can be expressed by means of pronominal clitics (and in some cases, dative objects are preferentially expressed in this way), which can be taken to be the equivalent of object marking in the Bantu languages, a property not available to OBJ_θ. Both dative and non-dative objects can be reflexivized and reciprocalized, which is the equivalent of reciprocalization in Bantu, another property in which OBJ_θ does not take part. The failure of dative objects (in contrast with non-dative objects) to alternate with the SUBJ function (i.e., to passivize) is best analyzed by means of a language-particular constraint disallowing dative subjects (such as the Nominative Subject Constraint to be brought up in the next chapter). As is well known, other case-marking languages lack this constraint and allow dative subjects, or other subjects with other marked cases (e.g., Icelandic, Hindi-Urdu, etc.).

In addition, importing the OBJ/OBJ_θ distinction into Catalan would render this distinction devoid of any cross-linguistically valid empirical effect. On the basis of asymmetrical languages such as Chicheŵa, in which the OBJ/OBJ_θ distinction does play an important role, we can observe that certain properties are only available to OBJ, such as expression by means of an object marker, possibility of passivization, or accessibility to reciprocalization. In Catalan, the two types of objects are available for expression by means of a verbal clitic and for reflexivization. If dative objects were assumed to be OBJ_θ and non-dative objects were assumed to be OBJ, it would no longer be possible to maintain that certain properties (such as expression by means of object markers or clitics and accessibility to reflexivization or reciprocalization) are cross-linguistically properties of OBJ (that is, unavailable to OBJ_θ).

³⁴ Bresnan and Moshi (1990:167) already note that “many languages (including Romance) lack restricted objects altogether”. We thank an anonymous reviewer for bringing up this point in the LFG18 conference.

Therefore, we do not assume that objects in Catalan are represented as either OBJ or OBJ_θ. Instead, we assume that, cross-linguistically, there can be multiple instances of the grammatical function OBJ and that, in some languages, objects are distinguished by means of grammatical case. Catalan is one of these languages, in which objects can be either dative or non-dative. In languages such as Chicheŵa, where there are no grammatical case distinctions, objects are distinguished between restricted and unrestricted at the level of argument structure. As proposed in Alsina (2001), internal arguments may be marked as R at the level of argument structure, so that there is at most one internal argument not marked with this feature. This feature makes the marked argument unavailable to the morphosyntactic properties noted above (object marking, reciprocalization, possibility of passivization).

The proposal that objects are not distinguished in terms of grammatical function –since they all bear the function OBJ– but may be distinguished either in terms of grammatical case (as in Catalan) or in terms of the presence or absence of the feature R at the level of argument structure (as in Chicheŵa), entails rejecting the four-way classification of grammatical functions found in current versions of the Lexical Mapping Theory, which assume that there are four basic functions: SUBJ, OBJ, OBJ_θ, and OBL_θ, as we have seen. We have also seen that these theories assume a decomposition of functions by means of the features [±r] and [±o] and that arguments are classified by means of these features. Since these features combine to yield the four functions just mentioned, they also need to be discarded in the theory to be advanced in Chapter 4.

The second problem with current LFG mapping theories can be seen as a consequence of the featural decomposition of functions just discussed. The classification of an argument by means of one of these features implies the possibility of an alternation between two GFs. If an argument is classified at a-structure as [–r], as is assumed for internal arguments, it can map onto either SUBJ or OBJ; if it is classified as [+o], it can map onto either OBJ or OBJ_θ, and so on. This restricts the possible GF alternations. For example, the internal argument of unaccusative verbs under locative inversion is expressed as an object, as Bresnan and Kanerva (1989) and Bresnan (1994) claim:

- (70) a. Ku-mu-dzi ku-na-bwér-á a-lëndo.
 17-3-village 17 SB-REC PST-come-IND 2-visitor
 ‘To the village came visitors.’

(Chicheŵa, Bresnan and Kanerva 1989)

- b. Back to the village came the tax collector.

(English, Bresnan 1994)

A theme/patient argument is intrinsically classified as [–r], and a locative argument is intrinsically [–o] and by default [+r]. Bresnan and Kanerva (1989) observe that locative inversion happens when the theme argument is *presentationally focused*, i.e., when it is introduced or reintroduced on the scene referred to by the locative. In this situation, the theme argument will acquire an [f] feature, whereas the locative will acquire the [–r] feature –as opposed to its default [+r] feature– and maps onto the atypical SUBJ as a marked case. Then since there cannot be two arguments linking to the SUBJ of the same predicate according to the Function-Argument Biuniqueness, the theme argument maps onto the OBJ:

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(71)	PRED	<	<i>th</i>	<i>loc</i>	>
	intrinsic:	[−r]	[−o]		
	specified:	[−r]			
			OBJ	SUBJ	

Bresnan (1994) points out that this approach to locative inversion has two essential limitations: first, only with presentational focus will the theme argument acquire the [f] feature, so being presentationally focused is a necessary condition for locative inversion constructions; second, since agent argument is classified as [−o], it gets no chance to map onto an object, thus it is never compatible with locative inversion and with subject-object alternation in general. However, sentences like *Through the window on the second floor was shooting a sniper* (Bresnan 1994) need to be accounted for, in which the locative is predicated of the agent argument *a sniper* (that is, the sniper is located on the second floor shooting through the window), and this argument is indeed an *object*. Bresnan (1994) explains this by assuming a “presentational overlay” of the agent argument with the theme, but how to license this overlay remains mysterious. There is no doubt that the *sniper* here is still an agent, and the observation that an agent argument can be realized as an object is also reported in other languages (see for example Lødrup 1999 for Norwegian, Swedish, and Danish; or our examples for Catalan in Chapter 2).

Kibort (2001) refers to the mapping theory of Bresnan and Kanerva (1989) as a “promotion” approach, and points out that it cannot account for locative inversion without a locative:

- (72) a. And then, those visitors came.
 b. And then, came those visitors.³⁵

According to Kibort (2001), since there is no locative element, nothing can be augmented with a [−r] feature, and consequently, nothing can be promoted to the subject. She in turn proposes a “demotion” approach, which consists in adding the [+o] feature to the theme argument, thus demoting it from SUBJ to OBJ. The locative element, if there is one, is “promoted” to SUBJ as a side effect, but it does not matter if there is no locative element to be promoted:

- (73) a. Locative inversion with a locative in (70b):

	PRED	<	<i>th</i>	<i>loc</i>	>
	intrinsic:	[−r]	[−o]		
	specified:	[+o]			
			OBJ	SUBJ	

³⁵ However, this sentence is not good without *then*, which indicates that *then* is acting as a subject (a temporal subject):

- (i) * And came those visitors.

- b. Locative inversion without a locative in (72b):

	PRED < <i>th</i> >
intrinsic:	[-r]
specified:	[+o]

	OBJ

This solves the first problem brought up by Bresnan (1994). Now the *theme* argument can alternate between SUBJ and OBJ with or without a locative. The implication is that a grammatical subject is not necessary for every clause. From an OT point of view, the Subject Condition can be violated.

However, the second problem does not get solved with this “demotion” approach: it still has no way to deal with the subject-object alternation of the agent argument. With (9b), repeated below as (74), a clash will occur if the [+o] feature is added to the intrinsic [-o] of the agent argument (the grammatical function onto which the locative element is mapped does not matter):

- (74) Treballen nens en aquesta fàbrica.
work.3p.pl child.m.pl in this.f.sg factory.f.sg
 ‘Children work in this factory.’

	PRED < <i>ag</i> <i>loc</i> >
intrinsic:	[-o] [-o]
specified:	[+o]

	?

The failure of mapping above indicates that, should the agent argument or the ARG₁ position be encoded as [-o], it would have no chance to be related to an OBJ. In fact, encoding the agent argument or the ARG₁ position as [-o] in LMT in general will prevent this argument from showing the subject-object alternation. That is, current versions of LMT do not assume that the external argument will show a subject-object alternation, but what we have found in Catalan (as well as in Scandinavian languages like Norwegian, Swedish, and Danish, as described by Lødrup 1999) is that intransitive arguments, whether internal or external, shows the subject-object alternation. In contrast, the external argument of transitive verbs is constrained to map onto the SUBJ function. This shows that a [-o] argument classification is inadequate for external arguments and that the mapping of external arguments depends in part on the other arguments in the argument structure.

3.2.2 Functional Mapping Theory

The Functional Mapping Theory (FMT) of Alsina (1993, 1996) is designed mainly to deal with Romance causative constructions, based on the assumption that Romance causatives are complex predicates composed of a causative verb and a base verb. FMT treats argument structure as the PRED value of f-structure, thus recognizing the argument

3 Theoretical Framework

structure as a syntactic level of representation. This implies that the argument-to-function realization takes place in the syntax, instead of in the lexicon, as LMT assumes. The definition of argument structure incorporates the notion of *Proto-roles* of Dowty (1991),³⁶ and is assumed to only contain the list of arguments implied by the predicate ordered according to the thematic hierarchy. Specific thematic role information is abstracted away into the lexical-semantics level, which is separated from the argument structure. Arguments listed in the argument structure are *direct arguments*, including Proto-Agent ([P-A]) and Proto-Patient ([P-P]); by contrast, arguments not listed in the argument structure are considered as *indirect arguments*. The [P-A] argument occupying the most external position in the argument structure is the external argument. All the other direct arguments, either [P-A]s that are not the most external ones (as in the case of the embedded verb of a complex predicate, as we will see in Chapter 4), or the [P-P]s, are internal arguments.

Grammatical functions are divided into *thematic* and *nonthematic* functions. *Thematic* functions can be further classified as *direct functions* (SUBJ and OBJ) and *indirect functions* (OBL). Direct arguments can map onto either direct functions or indirect functions, whereas indirect arguments may only map onto indirect functions OBL. *Nonthematic functions* include discourse functions TOPIC and FOCUS, raising functions SUBJ and OBJ, and expletive functions. Different from thematic functions, nonthematic functions only exist at the functional level, with no correspondence to the a-structure. For further discussion about nonthematic functions, see Alsina (1995, 1996, etc.).

The three thematic functions are decomposed into features [subj±] and [obl±] in the following way:

- (75) a. SUBJ $\begin{bmatrix} \text{subj} & + \\ \text{obl} & - \end{bmatrix}$
- b. OBJ $\begin{bmatrix} \text{subj} & - \\ \text{obl} & - \end{bmatrix}$
- c. OBL $\begin{bmatrix} \text{subj} & - \\ \text{obl} & + \end{bmatrix}$

This way of decomposing functions has the advantage of avoiding the multiple objects problem. Objects may be distinguished by the case they bear or by the presence or absence of the feature R at the level of argument structure, but they are not distinguished in terms of grammatical functions, i.e., they indiscriminately bear the function OBJ.

The mapping between direct arguments and grammatical functions is licensed by external and internal argument mapping principles, which operate internally in the f-structure, relating two different types of units of the f-structure: arguments, which are

³⁶ Proto-role properties: (see Dowty 1991, Alsina 1996):

	P(roto) - A(gent)	P(roto) - P(atient)
Primary Properties	Causer; Volitional involvement	Incremental theme; Undergoes change of state; Causally affected
Secondary Properties	Sentience/perception	n/a

listed in the value matrix of PRED, and syntactic functions, which are represented as f-structure features (Alsina 1996:43-44).

- (76) a. External Argument Mapping Principle:
 [PRED ‘X<[P-A]₁...>’]₂ → [[subj+][]]₁₂
- b. Internal Argument Mapping Principle:
 [PRED ‘X<...[P-P]₁...>’]₂ → [[obl-][]]₁₂

The *Internal Argument Mapping Principle* allows the internal argument to alternate between subject and object, whereas under the *External Argument Mapping Principle*, the external argument must invariably be expressed as the subject in a simple active clause. Consequently, FMT is deprived of the opportunity to account for the subject-object alternation of agent arguments in intransitive clauses, since an intransitive agent is by definition external, and is forced to map onto SUBJ according to (76a). In a nutshell, current LFG mapping theories in general fail to give a satisfying explanation to the subject-object alternation issues, which, together with the multiple objects problem mentioned at the beginning of this subsection, should be taken into account if a new mapping theory is to be developed.

3.2.3 Case in LFG

Case Theory is first proposed in the Government and Binding (GB) framework (Chomsky 1981, 1986, etc.) to solve the puzzle of overt subject expression in the so-called Exceptional Case Marking (ECM) constructions in English, as *My parents believe me to be happy*, as well as in infinitival clauses containing a preposition *for*, like *My parents want for me to be happy*. The capital letter C is used to distinguish the notion of *abstract Case* from its morphological realization (i.e., the *morphological case*). At the heart of the Case theory is the Case filter, which plays a vital role in motivating many theory-internal notions and assumptions. For example, nominative and accusative Case assignment requires notions like government and c-command, among others, which in turn lead to further theoretical assumptions such as binding and movement. To be a bit specific, the assumption that accusative Case is assigned to the complement of a verb requires the complement to be c-commanded and governed by its verbal head, whereas nominative Case assignment to subject position motivates the movement of the argument, thus giving a unified account to constructions like passive, raising, and unaccusative.³⁷ It is not too much to say that Case theory is one of the main forces in GB and the subsequent Minimalist Program (MP). Though we will not go any further into the huge bulk of analyses in the transformational theories, a few words must be said about the classification of Cases therein, which is much incorporated into many other theories, as the LFG theory we are assuming in this thesis.

³⁷ There is a long discussion about the redundancy of the Case-driven movement with the postulation of the Extended Projection Principle (EPP, see Chomsky 1981, 1982, among others). Though we are not within the transformational framework, we stand in line with the view that they are not identical. Further discussion will not be entered into in this thesis.

3 Theoretical Framework

The abstract Case system in GB is divided into two types: *structural* Cases and *inherent* Cases. Structural Cases are assigned to positions in S-structure, like *nominative* to the specifier of an inflectional head and *accusative* to the complement of a verbal head, as we have just mentioned in the last paragraph. By contrast, inherent Case is assigned locally at D-structure to a nominal by the lexical head. A nominal with inherent Case usually does not appear in a case assignment position in S-structure, but when it does, the case it carries will be called *quirky Case* (Chomsky 1995:166). This dichotomy system of Case assignment is inherited by the subsequently developed Minimalist Program. In LFG, cases are distinguished roughly in a similar way, with details to be introduced below.³⁸

The earliest case assignment account in LFG to our knowledge is provided by Neidle (1982). Case is assigned on the basis of grammatical functions, which is formally represented by adding an additional equation to the functional annotations. Neidle (1982) defines two kinds of cases: *structurally predictable case* (or *structural case*) and *structurally unpredictable case* (or *idiosyncratic case*), with the former referring to a certain function and the latter specially stipulated in the lexicon. The structural case assignment is optional and can be overridden by idiosyncratic case specification with particular lexical information. The example below illustrates a possible phrase structural annotation of grammatical functions and the rule assigning dative case to the second object NP:

$$\begin{array}{l}
 (77) \text{ a. } \quad \text{VP} \rightarrow \text{V} \quad \text{NP} \quad \text{NP} \\
 \qquad \qquad \qquad (\uparrow\text{OBJ}) = \downarrow \quad (\uparrow\text{OBJ}_2) = \downarrow \\
 \text{b. } \quad \dots (\uparrow\text{OBJ}_2) = \downarrow \dots \\
 \qquad \qquad \qquad (\downarrow\text{CASE}) = \text{DAT}^{39}
 \end{array}$$

(Neidle 1982)

The case assignment mechanism in Neidle (1982), though put forward almost in the earliest period of LFG, is nevertheless adopted by most current mapping theories developed since the 90s. In the remaining part of this section, we will go through relevant work on mapping that is concerned with case assignment to see how case assignment is generally dealt with in the mapping theories of LFG.

The initial linking theory is developed in the pioneering work of Zaenen, Maling, and Thráinsson (1985) –henceforth ZMT–, which concerns the association (linking) principles between thematic roles and grammatical functions, as well as case marking in Icelandic. Three kinds of cases are identified: *semantic case*, *idiosyncratic/lexical case* (i.e., the famous *quirky case*), and *functional case*. Functional case is assigned on the basis of grammatical functions –or more precisely, on the ranking of grammatical functions– without reference to thematic roles.⁴⁰ By contrast, assignment of quirky case and semantic case does not refer to grammatical functions, but instead makes use of the semantic information from thematic roles at a level in which the valency of predicates is determined, i.e., at the level of a-structure, though the exact name of “argument structure”

³⁸ We will use the small letter *c* for the names of case in LFG.

³⁹ The original equation is represented as $(\downarrow\text{CASE}) = (+, -, +)$, in which $(+, -, +)$ equals dative case. The case decomposition system adopted by Neidle (1982) follows the proposal of Jakobson (1958).

⁴⁰ Functional cases are assigned to grammatical functions according to the default case marking rule (ZMT 1985:464-465): “The highest available GF is assigned NOM, the next highest ACC.”

is not formally brought up in this paper, nor are thematic roles ranked according to the commonly assumed hierarchy. In other words, the assignment of quirky case and semantic case in ZMT can be considered as a “pre-linking” operation referring only to a-structure, whereas the assignment of functional case can be seen as a “post-linking” operation referring only to functions.

Like ZMT, Butt and King (1991, 2004) also distinguish three kinds of cases when studying Hindi-Urdu: *structural case*, assigned on the basis of syntactic information including grammatical functions and c-structure positions;⁴¹ *idiosyncratic* or *quirky case*, predetermined in the lexical entry of the predicates with no regularity to follow; and *semantic case*, which is considered to be the most general type in Hindi-Urdu (unlike ZMT, in which semantic case is just incidentally used to refer to accusative time/duration adverbials or dative instrumentals).

Up to this point, we have reviewed the role of case assignment in the syntax-semantics interface. Before concluding this subsection, we would like to say some words about the role of case in the syntax-morphology interface in LFG, i.e., the theory of *Constructive Case*, proposed by Nordlinger (1997, 1998, etc.). According to the author, case markers in non-configurational Australian languages like Wambaya contribute information to “construct” grammatical functions, apart from contributing case values to the f-structure. This is formally captured by using inside-out function application. For example, the ergative case marker *ni-* in Wambaya specifies that the case it carries is ergative, and that the f-structure containing this case feature is the f-structure of the subject, i.e., the NP that *ni-* attaches to is the subject of the clause:⁴²

- (78) Ngajbi gin-a alaji janyi-ni.
 see 3sg.m.a-pst⁴³ boy.acc dog.erg
 ‘The dog saw the boy.’

(Nordlinger 1997)

- (79) a. Syntactic information provided by *-ni*:

-ni: (↑ CASE) = ERG
 (SUBJ ↑)

- b. Related f-structure:

$$f_x: \left[\text{SUBJ } f' \left[\begin{array}{l} \text{PRED 'dog'} \\ \text{CASE ERG} \end{array} \right] \right]$$

Butt and King (2004) share this constructive spirit when analyzing semantic case in Hindi-Urdu. For example, the ergative morpheme *-ne* in Hindi-Urdu contributes no extra semantic information to the clause when appearing in a perfective transitive clause, whereas it contributes the semantic information that the subject has a conscious choice

⁴¹ However, “structural case” in King (1995) is only used to denote those cases assigned on the basis of grammatical functions. The assignment of cases referring to c-structure positions are named configurational case there.

⁴² For a more recent approach, see Sadler and Nordlinger (2004).

⁴³ The abbreviations “m” and “a” stand for “masculine” and “transitive subject”, respectively.

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on the action denoted by the predicate in the rest of the situations. This is formally represented by using the following disjunctive entry of *-ne*:

(80) Syntactic information provided by *-ne*:

-ne: (↑CASE) = ERG
(SUBJ↑)
[(↑SEM-PROP CONTROL) = INT
∨
((SUBJ↑) OBJ)
((SUBJ↑) VFORM) PERF]

(Butt and King 2004)

The first two lines show that the morpheme *-ne* assigns ergative case to the nominal that it attaches to, and makes it the subject of the minimal f-structure containing it. The subject can either appear in a transitive clause in perfective tense, with no extra semantic information added, as the second part of disjunction represents, or have conscious control, as the first part of disjunction represents.

We now summarize different classifications of case in LFG in the literature we have reviewed in this subsection:

(81) Different classifications of cases in previous works of LFG:

Neidle (1982)

- Structurally predictable case: assignment based on GFs;
- Structurally unpredictable case: assignment by lexical stipulation.

Zaenen, Maling, and Thráinsson (1985)

- Functional case: assignment based on GFs;
- Idiosyncratic/lexical case: assignment by lexical stipulation, and comes to be known as *quirky case*;
- Semantic case: used to refer to accusative time/duration adverbials or dative instrumentals, different from the notion in Butt and King (1991, 2004).

Butt and King (1991, 2004)

- Structural case: assignment based on GFs;
- Quirky case: assignment by lexical stipulation;
- Semantic case: semantically predictable.

King (1995)

- Functional case: assignment based on GFs;
- Lexical case: assignment idiosyncratically by lexical stipulation;
- Semantic case: semantically predictable;
- Configurational case: assignment referring to c-structure positions.

Ignoring the different classifications and nomenclatures, a common factor of these studies concerning mapping theories is that case assignment has not been directly incorporated into the linking between arguments and grammatical functions. Assignment of idiosyncratic/quirky/lexical case only refers to specific thematic roles in the argument structure; structural/grammatical/functional case assignment merely refers to syntactic

information, in most cases to grammatical functions (or to the hierarchy of grammatical functions) and in some cases to phrase structure nodes (as in King 1995). As for semantic case, it is semantically predictable, i.e., “via the formulation of generalizations across predicates and constructions” (Butt and King 2004). In a nutshell, case assignment in current mapping theories either refers to a-structure alone, or to f-structure/c-structure alone, but has not been playing an active role in the argument-to-function mapping process,⁴⁴ which may fail to capture some subtle interactions among arguments, functions, and case assignment in itself (especially structural case). This is our starting point of reflecting on the necessity of such incorporation.

3.3 Summary

This chapter has presented Lexical-Functional Grammar framework that we will use in exploring the subject-object alternation puzzle and the argument realization in general. The incorporation of OT into LFG endows us with much flexibility when dealing with the function alternation phenomena, while current mapping theories developed over the years provide us with plenty of referential work to develop our theory to account for the argument to function realization. We have thus introduced three current mapping theories and discussed the problems they face.

Two main problems that current LMTs face are the treatment of multiple objects and the explanation of subject-object alternation. The multiple objects problem lies in that distinguishing objects in terms of grammatical function OBJ and OBJ_θ would lead to redundancy in Catalan and other Romance languages, as their distinction is already clear enough according to the case they bear. We therefore propose that objects uniformly bear the function OBJ, but may be distinguished either in terms of case, or in terms of the feature R at a-structure in languages that lack a case system. With respect to subject-object alternation, assuming that the agent argument is classified as [-o] in one sense or another blocks its realization as an object, which, along with the multiple objects problem, suggests discarding the [±r]/[±o] feature decomposition system altogether. The FMT of Alsina (1996) avoids the multiple objects problem by using the *function* decomposition system, but still finds no way to account for the agentive object issue, since its External Argument Mapping Principle will require the agent argument to map onto the subject. To sum up, none of the mapping approaches reviewed in this chapter can provide a satisfying explanation to the subject-object alternation puzzle brought up in Chapter 2. The initial and foundational idea in LMT that argument roles are lexically underspecified with respect to their syntactic function realizations should not be discarded. The theme argument can alternate between subject and object, and there is no reason to prevent the agent argument (and perhaps other arguments) from behaving so.

⁴⁴ There is, however, one association principle in Icelandic that may be used to argue that case does enter the linking process, i.e. “Case-marked themes are assigned to the lowest available GF (*language specific*)” (ZMT 1985:117). But notice that in this situation, the case of the theme is already decided. In other words, the case assignment *per se* does not play a role in the mapping process.

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Case is another issue much concerned in this chapter. We have reviewed the role of case assignment in current mapping theories. We conclude that case assignment has not been actively incorporated into current LFG mapping theories, and suggest doing so when proposing a new theory. Another motivation for such an incorporation comes from our discussion about the $[\pm r]/[\pm o]$ feature decomposition: if we decide to discard this decomposition system, some other elements are needed to intermediate between the a-structure and f-structure. In this situation, case assignment is a reasonable choice.

However, though we are to design a new mapping theory in which case assignment plays an active role, the case assigning system to be proposed is by no means analogous to the Case theory in GB or the Case checking system in MP and their varieties, for the following reasons. First, structural cases such as nominative or accusative are not phrase-structurally decided,⁴⁵ and grammatical functions do not *move* to get case assigned or checked, unlike what is assumed in GB/MP. Second, since functions are abstracted away from c-structure and represented in f-structure, they do not go in pairs with a fixed case. Functions and cases do not mutually identify each other in LFG, and a function is free to receive different cases as long as its licensing principles are observed.

⁴⁵ Though the “configurational case” in Russian requires further study.

Chapter 4

Towards a new mapping theory

In this chapter, we propose a new mapping theory, based on the function alternation puzzle reported in Chapter 2 and the discussion about current mapping theories in Chapter 3. In 4.1, we introduce the theory, with case assignment incorporated as an essential element. We also illustrate how the theory works with some simple active clauses. In 4.2, we attempt to solve the subject-object alternation puzzle within the OT-LFG framework. We will also talk about verbal agreement, including agreement in raising constructions. In 4.3, we will see the effect of morphosyntactic operations (such as passivization) on the mapping process, and discuss how the impersonalization in Romance languages such as Catalan or Spanish should be accounted for. Finally, section 4.4 discusses the Romance causative constructions from the point of view of complex predicates. Section 4.5 provides a conclusion.

4.1 Argument-to-function mapping theory

The present mapping theory assumes a level of argument structure, or a-structure, and three sets of principles of argument realization, which relate a-structure to f-structure: case assignment principles, argument-to-GF linking rules, and constraints on case features.

4.1.1 The theory

A-structure

A-structure consists of the list of arguments of a predicate, without any thematic information, ordered according to the thematic hierarchy, such as the commonly assumed hierarchy based on Givón (1984), Kiparsky (1987), and Bresnan and Kanerva (1989), among others:

- (82) Thematic Hierarchy:
 ag > ben > recip/exp > inst > th/pt > loc

(repeating (59) in Chapter 3)

Arguments are classified into *core* arguments (C) and *non-core* arguments (NC). As we shall see, core arguments are those that map onto direct grammatical functions (i.e., SUBJ and OBJ). Core arguments are further divided into external argument (E) and internal argument (I) and represented as such in the a-structure. The external argument E, if there is one, is the most prominent argument in the argument structure. Non-core arguments are those that map onto the indirect function OBL.

Case assignment principles

In this theory, case assignment is crucial for argument realization. For Catalan, we assume that there are three case values –dative, accusative, and nominative– for the core arguments, and that all core arguments must be assigned a case value, according to the following case assignment principles, ordered by priority:

- (83) Case Assignment Principles:
- i. Assign *dative* case to the more prominent of two internal arguments;⁴⁶
 - ii. Assign *accusative* case to the less prominent of two *core* arguments that lack case;
 - iii. Assign *nominative* case to a *core* argument that lacks case.

Argument-to-GF linking rules

We propose two rules to license the correspondence between arguments and GFs: the Core Argument Rule and the Elsewhere Mapping Rule; and Passivization, as an instance of a morphosyntactic operation that affects the argument-to-GF linking.

The Core Argument Rule requires a core argument (C) to map onto a direct grammatical function (DGF), the class of GFs that consists of SUBJ and OBJ:

⁴⁶ Notice that dative (unlike nominative and accusative) can be lexically assigned, typically to a goal, as shown in (i) below:

- (i) No li parlis.
 not li.dat.sg talk.sbjv.2p.sg
 ‘Don’t talk to him.’

See Alsina (1996) for detailed discussion.

- (84) Core Argument Rule: C
 |
 DGF

This rule allows the external argument, as well as an internal argument, to be either SUBJ or OBJ, which is not possible in previous mapping theories like Bresnan and Kanerva (1989), Kibort (2001), or Findlay (2016), because, as noted earlier, the proposal that the external argument is associated with [-o] prevents linking this argument to an OBJ.

The operation of passivization blocks the linkage of the highest argument to a DGF:⁴⁷

- (85) Passivization: $\hat{\theta}$
 †
 DGF

Finally, the Elsewhere Mapping Rule optionally links an argument to OBL:

- (86) Elsewhere Mapping Rule: A
 |
 (OBL)

This rule is ordered after the other linking rules and therefore applies to arguments to which the Core Argument Rule (84) cannot: non-core arguments as well as arguments that have their linkage to DGF cut off by morphosyntactic operations like passive or antipassive. The optionality of this rule captures the idea that in general OBLs are not obligatory. Moreover, this optionality may be overridden by having a lexical entry specifying that an argument is obligatorily mapped onto an oblique.

Constraints on case features

There are some constraints on the association of particular case features with particular GFs. Catalan, along with other Romance languages, but unlike languages such as Icelandic and Hindi-Urdu, requires subjects to be in the nominative case (or, conversely, rules out subjects in a case other than nominative). For example, in Catalan there are no dative subjects (see Alsina 1996) or accusative subjects. To account for this fact, we posit the Nominative Subject Constraint:

- (87) Nominative Subject Constraint (specific to Catalan):
 SUBJ [CASE NOM]

The effect of this constraint is to rule out structures with a non-nominative subject. Note that the implication is unidirectional: subjects must be nominative, but it is not required for a nominative expression to be a subject.

A second case constraint that we need to consider is what we may call the 1 Non-Dative Object Constraint (or 1NDO). Namely, a structure allows at most one object that is not dative.

⁴⁷ Detailed analyses about passivization and impersonalization is left to 4.3.

- (88) 1 Non-Dative Object Constraint (1NDO):
 * [CASE ¬DAT] [CASE ¬DAT]
 | |
 OBJ OBJ

This constraint rules out a structure with two accusative objects, or with two nominative objects, or with a nominative object and an accusative object. Together with constraint (87), it has the effect of requiring a nominative argument to be the subject if it co-occurs with an accusative object. Notice that the principles and constraints stated so far do not require the presence of a subject in the clause and so it is the 1NDO constraint that forces a nominative to be the subject if there is an accusative in the structure.

4.1.2 Illustration of the theory

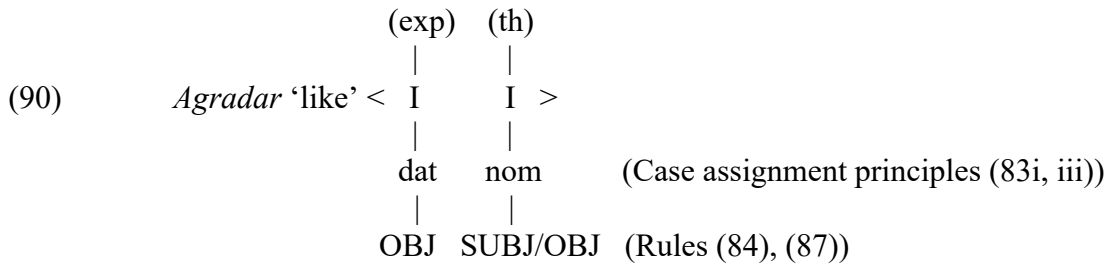
We now provide some examples of how the proposed argument realization theory works in Catalan.

A ditransitive verb like *donar* ‘give’ is lexically specified with one external and two internal arguments, as represented in (89). The goal argument is the more prominent internal argument, thus, by case assignment principle (83i), it will be assigned dative case. The theme argument, as the less prominent of the two arguments –agent and theme– lacking case, is assigned accusative case, according to principle (83ii). Finally, the external argument is assigned nominative case by principle (83iii). As for the argument-to-GF mappings, the three arguments, being core arguments, are required to map onto a direct GF by the Core Argument Rule (84). However, the goal and theme arguments can only be realized as OBJ according to the Nominative Subject Constraint (87) and the nominative agent argument must be realized as SUBJ in order to avoid violating the 1NDO constraint (88). The representation in (89) and subsequent examples show the thematic roles of the arguments involved merely for convenience, as they are not part of the a-structure or of the f-structure; the a-structure is shown in angled brackets; the case features assigned to each argument are indicated on the line below it and, on the next line, the corresponding GFs are shown; the relevant principles are given in parentheses.

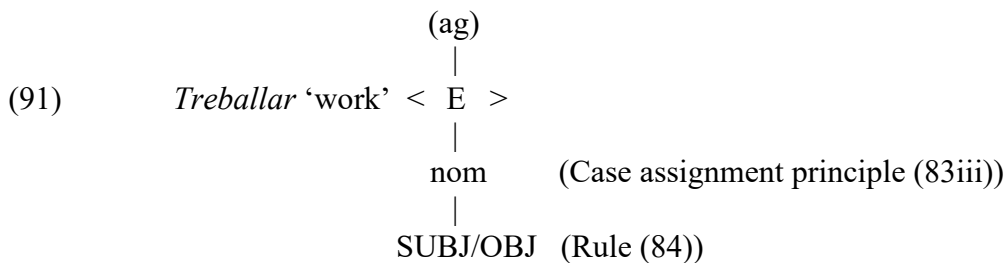
- | | | | | | | | |
|------|---------------------|---|------|-----|-----|---|-----------------------------------|
| (89) | <i>Donar</i> ‘give’ | < | E | I | I | > | |
| | | | | | | | |
| | | | nom | dat | acc | | (Case assignment principles (83)) |
| | | | | | | | |
| | | | SUBJ | OBJ | OBJ | | (Rules (84), (87), (88)) |

Like-type verbs in Catalan (as well as other Romance languages like Spanish or Italian) have two internal arguments and no external argument. The experiencer argument gets dative case by principle (83i) and maps onto OBJ because of the Nominative Subject

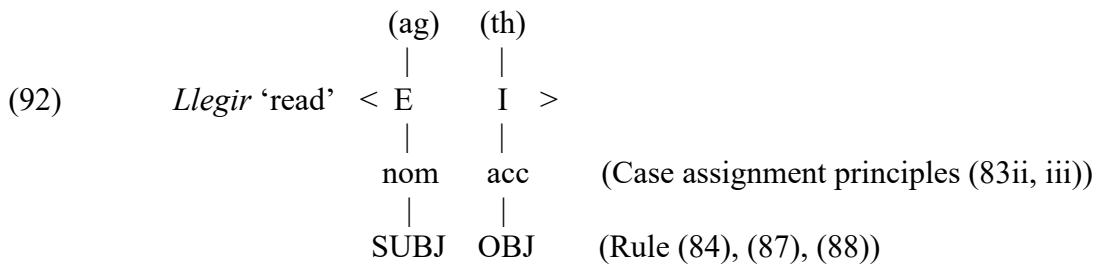
Constraint (87). The theme argument is assigned nominative case by principle (83iii), thus being compatible with both SUBJ and OBJ.⁴⁸



Intransitive verbs, whether unergative or unaccusative, only have one *core* argument (an external and an internal argument, respectively), as exemplified in (91) for the unergative *treballar* ‘work’. Case assignment principle (83iii) applies assigning nominative case. This core argument, as we have seen in section 2, alternates between SUBJ and OBJ.

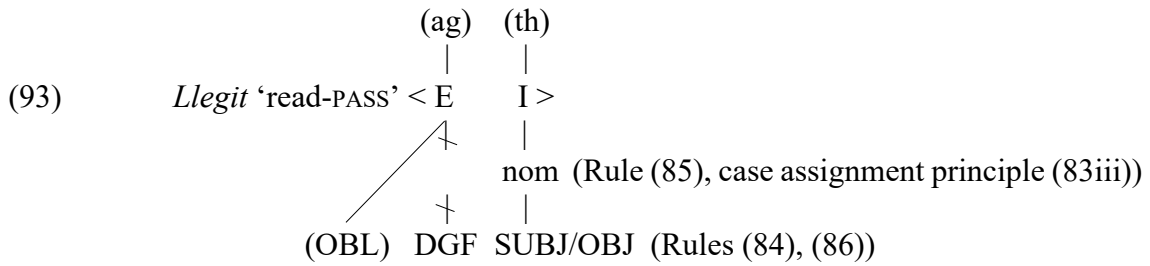


Transitive verbs like *llegir* ‘read’ have an external and an internal argument. Since there is only one internal argument, dative case is not assigned; accusative case is assigned to the less prominent argument (i.e., the internal argument); by principle (83iii), nominative case is assigned to the external argument. In accordance to the Nominative Subject Constraint and the INDO constraint, the external argument maps to the SUBJ and the internal argument to the OBJ:



When the transitive verb is passivized, the linkage of the external argument to a direct grammatical function is blocked. Since there is only one internal argument, case assignment principles (83i, ii) will not be used. Then, by principle (83iii), the internal argument is assigned nominative case. This internal argument can map onto either SUBJ or OBJ:

⁴⁸ Notice that only the theme argument can be expressed by the clitic *en*; the experiencer cannot, due to the case restriction in constraint (95) below.



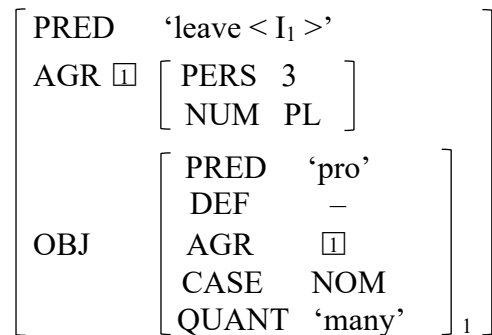
From the representations in (89)-(93), which illustrate different patterns of argument realization, we can see that a clause in Catalan: **i)** *may* contain at most one SUBJ; **ii)** *need not* contain a SUBJ, and **iii)** *may* contain more than one OBJ. The uniqueness of the subject and the multiplicity of objects can be handled in a variety of ways (see e.g. Alsina 1996 and Patejuk and Przepiórkowski 2016). This proposal can be implemented within the standard LFG formalism by assuming that the SUBJ is single-valued and OBJ is set-valued. We will not go into further details of this topic in this thesis.

4.2 Subject-object alternation and verb agreement

4.2.1 Constraints on the subject-object alternation

In Chapter 2 we saw that the intransitive argument can alternate between SUBJ and OBJ. However, if this SUBJ-OBJ alternation were completely free, nothing would require the presence of the clitic *en* in (94), as shown by the contrast between the grammatical (20), repeated as (94a), with the clitic, and the absence of the clitic in the ungrammatical (94b):

- (94) a. Avui en surten molts.
today en.cl leave.3p.pl many.pl
 ‘Today many are leaving.’



F-structure candidate₁

- b. * Avui surten molts.
today leave.3p.pl many.pl
 ‘Today many are leaving.’

$$\left[\begin{array}{l} \text{PRED} \quad \text{'leave < I}_1 \text{' } \\ \text{AGR } \boxed{1} \quad \left[\begin{array}{l} \text{PERS } 3 \\ \text{NUM } \text{PL} \end{array} \right] \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{DEF} \quad - \\ \text{AGR} \quad \boxed{1} \\ \text{CASE} \quad \text{NOM} \\ \text{QUANT} \quad \text{'many'} \end{array} \right]_1 \end{array} \right]$$

F-structure candidate₂

Consider the information the *en* clitic provides: *en* corresponds to an OBJ that is pronominal and indefinite, which can either be nominative or accusative, but not dative, as illustrated in the f-structure in (95):

$$(95) \quad \text{En:} \quad \left[\text{OBJ} \left[\begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{DEF} \quad - \\ \text{CASE} \quad \neg \text{DAT} \end{array} \right] \right]$$

The presence of this clitic indicates that it corresponds to an object, which may be expressed by an NP lacking a head N, as is the case of *molts* ‘many’ in (94a). However, if the core argument of a verb like *sortir* ‘leave’ were free to also be expressed as a subject, we would expect (94b), without the clitic *en*, to be grammatical, as this clitic cannot correspond to a subject. In order to explain the ungrammaticality of (94b), we assume that the subject-object alternation of the intransitive argument is constrained by definiteness and posit a constraint that penalizes an indefinite subject.⁴⁹

- (96) Indefinite Subject Ban (*INDEFSUBJ):
 * SUBJ [DEF -]

For an intransitive verb whose single direct argument is indefinite, this constraint (96) penalizes the subject realization and favors the object realization, as shown in (97). This explains the obligatoriness of *en* in (94):

⁴⁹ According to Bartra (2009:3), Spanish and Catalan allow plural indefinites as objects of the verb but not as external subjects. The claim refers to bare NPs, a subset of indefinites, and it is also made by Espinal (2010) and Espinal and McNally (2010).

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(97) Optimization for (94):⁵⁰

	* INDEFSUBJ
(94a)	
(94b)	*!

Note that, within an OT conception, this constraint has no effect on transitive verbs, provided 1NDO (88) ranks higher than (96): the subject realization of the external argument of a transitive verb is the optimal candidate, even if it is indefinite and violates (96). For example:

(98) Uns nens ja han llegit aquest llibre.
one.m.pl child.m.pl already have.3p.pl read.pp this book
 ‘Some children have already read this book.’

Uns nens ‘some children’ becomes the subject of the transitive verb *llegir* ‘read’ in (98), after evaluating the two candidates (99a) and (99b), as shown in the tableau in (100):

(99) a.

[PRED	‘read < E ₁ I ₂ >’]
	TENSE	PRES	
		[
SUBJ	PRED	‘child’]
	DEF	–	
	CASE	NOM] ₁
		[
OBJ	PRED	‘book’]
	DEF	+	
	NUM	ACC] ₂

F-structure candidate₁

b.

[PRED	‘read < E ₁ I ₂ >’]
	TENSE	PRES	
		[
OBJ	PRED	‘child’]
	DEF	–	
	CASE	NOM] ₁
		[
OBJ	PRED	‘book’]
	DEF	+	
	CASE	ACC] ₂

F-structure candidate₂

⁵⁰ We use the number of examples in the OT tableaux to refer to the f-structure corresponding to that example.

(100) Optimization for (98):

	1NDO	*INDEFSUBJ
☞ (99a)		!
(99b)	*!	

When the sole argument of the intransitive verb is definite, it is the subject of the clause, such as the NP *els estudiants* ‘the students’ in (101):

(101) Avui surten els estudiants tard.
today leave.3p.pl the.m.pl student.m.pl late
 ‘Today the students are leaving late.’

The reasoning is that we also assume the Subject Condition (SUBJCON) as an OT constraint. SUBJCON is a low-ranking constraint which is, in particular, lower than the Indefinite Subject Ban (*INDEFSUBJ) in Catalan.⁵¹

(102) Subject Condition (SUBJCON):
 Every verbal f-structure must include a subject.

When the intransitive argument is definite and is unconstrained by *INDEFSUBJ, the SUBJCON will penalize the candidate that lacks a subject and select the one in which the argument maps onto the subject. Two competing candidates of (101) and evaluation of them are shown in (103) and (104), respectively:

(103) a.
$$\left[\begin{array}{l} \text{PRED} \quad \text{'leave} \langle I_1 \rangle \text{' } \\ \text{TENSE} \quad \text{PRES} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'student'} \\ \text{DEF} \quad + \\ \text{CASE} \quad \text{NOM} \end{array} \right]_1 \end{array} \right]$$

F-structure candidate₁

b.
$$\left[\begin{array}{l} \text{PRED} \quad \text{'leave} \langle I_1 \rangle \text{' } \\ \text{TENSE} \quad \text{PRES} \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'student'} \\ \text{DEF} \quad + \\ \text{CASE} \quad \text{NOM} \end{array} \right]_1 \end{array} \right]$$

F-structure candidate₂

⁵¹ Notice that because of this ranking of constraints and because, in languages like Catalan, SUBJCON ranks below the faithfulness constraint requiring every GF to correspond to an argument, there are no expletive subjects in Catalan and there is no subject in a sentence like (94a). Languages with expletive subjects, such as French and English, have the opposite ranking of SUBJCON and this faithfulness constraint. We leave this topic to Chapter 5.

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(104) Optimization for (101):

	*INDEFSUBJ	SUBJCON
☞ (103a)		
(103b)		*!

An additional fact that needs to be considered is that the *en* clitic cannot be licensed by a preverbal NP, even if this NP is indefinite:

- (105) a. Ja n'han sortit quatre de l'ou.
already en.cl-have.3p.pl leave.pp four from the-egg
- b. Quatre ja (*n') han sortit de l'ou.
four already en.cl have.3p.pl leave.pp of the-egg
 'Four of them have already come out of the egg.'

(based on IEC 2016:699)

Similar observation of the clitic *en* in Catalan and *ne* in Italian has also been reported by Cortés (1991), as examples in (106) illustrate:

- (106) a. * Molts en seran convidats.
many.m.pl en.cl be.fut.3p.pl invite.pp.m.pl
 'Many will be invited.'
- b. * Molts n'arribaran.
many.m.pl en.cl-arrive.fut.3p.pl
 'Many will arrive.'
- c. * Tre ne arriveranno domani.
three ne.cl arrive.fut.3p.pl tomorrow
 'Three will arrive tomorrow.'
- d. * Molti ne sono stati invitati.
many.m.pl ne.cl be.3p.pl be.pp.m.pl invite.pp.m.pl
 'Many have been invited.'

(Cortés 1991)

We adopt the assumption in Vallduví (2002) that preverbal NPs in Catalan (such as *quatre* in (105b)) are topics (not subjects) anaphorically related to an in-clause GF. Since the topic is the antecedent of an anaphoric pronoun (possibly null, as with null subjects) and anaphoric pronouns must be definite, it follows that topics cannot be related to the clitic *en*, because the lexical information of the *en* clitic specifies that it corresponds to an indefinite object. This makes it incompatible with its nature as an anaphoric pronoun dependent on the preverbal topic, thus explaining the ungrammaticality of the *en* clitic in (105b) and (106).

At this point, one may ask if it is possible to use a definite object clitic in place of the indefinite *en*, as it would qualify as a topic-anaphoric pronoun. The fact is that the definite object clitics *el/la/els/les* are incompatible with intransitive verbs:

- (107) * Avui els surt/surten tard.
today them.obj.m.pl leave.3p.sg/leave.3p.pl late
 ‘Today they are leaving late.’

Whichever agreement form of the verb is chosen, the core argument of the intransitive verb in (107) cannot be expressed by means of *els*. According to our analysis of (101), a definite argument of an intransitive verb is the subject. Since clitics like *el*, *la*, *els*, and *les* are (non-dative) *object* pronouns, they cannot be used as subjects, which explains the ungrammaticality of (107).

4.2.2 Verb agreement

In standard LFG, verb inflection lexically specifies the person and number feature of its subject. For example, the verb form *balla* ‘dances’ is assumed to have its lexical entry formalized as:

- (108) *Balla*: (↑ PRED) = ‘dance <SUBJ>’
 (↑ SUBJ PERS) = 3
 (↑ SUBJ NUM) = SG
 (↑ TENSE) = PRES

However, in order to account for the idea that a verb can agree with either a subject or an object if it is nominative, we follow Haug and Nikitina (2012, 2016) and Alsina and Vigo (2014, 2017), among others, in assuming that verbal agreement is mediated by the feature bundle AGR, which contains the agreement features encoded by the verb. Two general constraints, adopted from Alsina and Vigo (2014, 2017), are relevant to account for the agreement of the verb with one of its dependent GFs: the requirement that the clausal AGR feature be shared with that of a dependent GF (AGRSHARE (109a)), and the requirement that the agreeing GF be nominative (*AGRCASE (109b)):

- (109) a. AGRSHARE: $\left[\begin{array}{l} \text{AGR} \ \boxed{} \\ \text{DGF} \ \left[\text{AGR} \ \boxed{} \right] \end{array} \right]_f$

For f-structure f that maps to a constituent of category V

- b. *AGRCASE: $* \left[\begin{array}{l} \text{AGR} \ \boxed{} \\ \text{GF} \ \left[\begin{array}{l} \text{AGR} \ \boxed{} \\ \text{CASE} \ \neg\text{NOM} \end{array} \right] \end{array} \right]_f$

For f-structure f that maps to a constituent of category V

Thus, verbal agreement with a subject and with an object can be represented as (110a) and (110b), respectively:

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- (110) a. Avui surten els estudiants tard.
today leave.3p.pl the.pl student.pl late
 ‘Today the students are leaving late.’

$$\left[\begin{array}{l} \text{PRED} \quad \text{‘leave < I}_1 \text{ >} \\ \text{AGR } \boxed{1} \quad \left[\begin{array}{l} \text{PERS } 3 \\ \text{NUM } \text{PL} \end{array} \right] \\ \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{‘student’} \\ \text{DEF} \quad + \\ \text{AGR} \quad \boxed{1} \\ \text{CASE} \quad \text{NOM} \end{array} \right]_1 \end{array} \right]$$

- b. Avui en surten molts.
today en.cl leave.3p.pl many.pl
 ‘Today many are leaving.’

$$\left[\begin{array}{l} \text{PRED} \quad \text{‘leave < I}_1 \text{ >} \\ \text{AGR } \boxed{1} \quad \left[\begin{array}{l} \text{PERS } 3 \\ \text{NUM } \text{PL} \end{array} \right] \\ \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{‘pro’} \\ \text{DEF} \quad - \\ \text{AGR} \quad \boxed{1} \\ \text{CASE} \quad \text{NOM} \\ \text{QUANT} \quad \text{‘many’} \end{array} \right]_1 \end{array} \right]$$

In Catalan, a raising verb like *semblar* ‘seem’ can agree with the nominative object of the embedded clause:

- (111) Semblen [arribar-ne molts].
seem.3p.pl arrive.inf-en.cl many.pl
 ‘Many seem to arrive.’

This is an instance of (apparent) long-distance agreement, as the inflected verb form *semblen* ‘seem’ in (111) does not seem to agree with any of its dependent GFs, but with the object *molts* ‘many’ in the infinitival complement clause. The only GF in the f-structure of *semblen* ‘seem’ that this verb could agree with is its complement clause, but, if the verb were to agree with it, it would have to be in the third person singular form, based on the assumption that clauses agree in the third person singular. To solve this problem, we assume that long-distance agreement such as in (111) is a combination of two local agreement relations, as in Alsina and Vigo (2017): **i**) the sharing of the AGR of the raising clause with the AGR of its infinitival complement, and **ii**) the sharing of this AGR with that of the object of the infinitive.

But not all verbs allow AGR sharing with the AGR of their embedded clause: only raising verbs do. To be formal, we assume a constraint, i.e., Clausal Opacity, which blocks the sharing of either AGR or GF in a given clause with either the AGR or a GF of its embedded clause. Raising verbs include a lexical specification overriding Clausal Opacity.

(112) Clausal Opacity:

$$* \left[\begin{array}{c} G \quad \boxed{1} \\ GF \quad [F \quad \boxed{1}]_f \end{array} \right]_g$$

For f-structures f, g that map to constituents of category V ,
and $F, G = \{DGF, AGR\}$

The cross-clausal agreement in (111) is possible because *sembler* ‘seem’ is a raising verb. Clausal Opacity does not apply to f-structures whose PRED belongs to this verb, allowing both the structure-sharing of its subject with the subject of its infinitival complement (raising, as standardly understood) and the structure-sharing of its AGR with that of its infinitival complement (“raising” of the agreement features). Therefore, the f-structure of (111) can be represented as:

$$(113) \left[\begin{array}{c} \text{PRED} \text{ ‘seem } < I_1 >’ \\ \text{AGR} \quad \boxed{1} \\ \\ \text{OBJ} \left[\begin{array}{c} \text{PRED} \text{ ‘arrive } < I_2 >’ \\ \text{AGR} \quad \boxed{1} \left[\begin{array}{c} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{PL} \end{array} \right] \\ \\ \text{OBJ} \left[\begin{array}{c} \text{PRED} \text{ ‘pro’} \\ \text{DEF} \quad - \\ \text{AGR} \quad \boxed{1} \\ \text{QUANT} \text{ ‘many’} \\ \text{CASE} \quad \text{NOM} \end{array} \right]_2 \end{array} \right]_1 \end{array} \right]$$

Just as the raising of a subject is unbounded and can cross as many clauses as contained in a raising verb, the raising of the agreement features is likewise potentially unbounded. All that is required is for there to be a chain of raising verbs overriding Clausal Opacity, as can be seen in the following example, where both *sembler* ‘seem’ and *tendir* ‘tend’ are raising verbs:

(114) *Semblen* [*tendir* [*a arribar-ne molts*]].
seem.3p.pl tend.inf to arrive.inf-en.cl many
‘Many seem to tend to arrive.’

Once we have assumed that an intransitive argument can be a nominative object, we can explain the agreement fact, namely that the verb agrees with its object and can be involved in long-distance agreement, adopting the agreement theory of Alsina and Vigo (2014, 2017) without additional assumptions.

4.3 Passivization and impersonalization

In this section, we give an account for passive and impersonal constructions in Catalan within LFG. In 4.3.1, we review current LFG approaches to passivization and propose our own account to periphrastic passive and reflexive passive constructions. In 4.3.2, we review some LFG approaches to impersonalization and give a proposal to the reflexive impersonal construction in Catalan. We will also discuss the possibility of giving a unified analysis of the reflexive passive and reflexive impersonal constructions. 4.3.3 then provides a conclusion.

4.3.1 LFG passivization and Catalan passive constructions

4.3.1.1 Current approaches to passivization in LFG

As we mentioned in Chapter 2, passivization in LFG is initially accounted for by using lexical redundancy rules:

(115) Effect of passivization on a lexical form:

- a. Active: $L((\text{SUBJ}), (\text{OBJ})) \rightarrow$
agent theme
- b. Passive: $L((\text{OBL})/\emptyset, (\text{SUBJ}))$
agent theme

(repeating (49))

With the development of current mapping theories, passivization is no longer considered as a function *remapping* process, but a morphosyntactic operation that affects argument realization. For example, the standard LMT proposed by Bresnan and Kanerva (1989) and Bresnan and Moshi (1990), etc., treats passivization as a morpholexical rule that suppresses the highest thematic role in the argument structure:

(116) Passive: $\hat{\theta}$
|
 \emptyset

On this view of passivization in standard LMT, the suppressed argument remains the highest argument status in the argument structure of the passive verb, and the function corresponding to the suppressed argument –if overtly expressed by *by*-phrase– is a modifying *adjunct*.

On the contrary, Kibort (2001, 2004, etc.) claims that, if the agent nominal in passive is syntactically expressed, it has the grammatical status *oblique*. This is achieved by assuming passivization to be a “demotional” approach by adding a [+r] feature to the highest argument, thus demoting it to an oblique, as shown below:⁵²

⁵² The study of morphosyntactic operations in the mapping theory of Kibort is mainly based on evidence from Polish. See Kibort (2001, 2004, 2006, 2007, 2008a, 2008b, 2009, 2014, etc.).

(117) a. Passive of transitive:

	$\langle \text{arg}_1$	$\text{arg}_2 \rangle$
intrinsic	[−o]	[−r]
specified	[+r]	
(OBL) SUBJ		

b. Passive of intransitive (unergative):

	$\langle \text{arg}_1 \rangle$
intrinsic	[−o]
specified	[+r]
(OBL)	

c. * Passive of intransitive (unaccusative):

	$\langle \text{arg}_2 \rangle$
intrinsic	[−r]
specified	[+r]
?	

This downgrading approach captures the fact that the Polish passive morpheme can be used with both transitive and unergative verbs, but not with unaccusatives, as the imposed [+r] feature will come into conflict with the intrinsic feature [−r] of arg_2 , but not with the intrinsic [−o] of arg_1 . The highest argument, with its intrinsic [−o] and the newly added [+r], will map onto the oblique function. However, this demoting approach cannot explain the *optionality* of the oblique agent: being augmented with [+r] feature, the arg_1 has no choice but to *obligatorily* map onto an oblique. In other words, a *by*-phrase in passive is mandatory with this approach, which contradicts the fact that it is optional in Polish passive –as described in the work of Kibort– and possibly in passive constructions in general.

The optionality of *by*-phrase is explained by Kelling (2006) within standard LMT. She treats passivization as a process that *blocks* the realization of the agent argument as a direct function (i.e., as the SUBJ), but allows it to optionally map onto an oblique. In this way, the agent argument can either go unexpressed or be freely expressed as a *by*-phrase, since the blocking process does not force it to do so. The passivization proposed by Kelling (2006) is represented as follows:

(118) Los contratos fueron firmados.
the.m.pl contract.m.pl be.pst.3p.pl sign.pp.m.pl
 ‘The contracts were signed.’

LCS ⁵³		agent	theme
features	PRED _{pass}	[−o]	[−r]
a-structure		$\langle x$	$y \rangle$
f-structure		(OBL)	SUBJ

⁵³ LCS is short for Lexical Conceptual Structure in Kelling (2006).

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However, the blocking operation is only assumed to account for (Spanish) periphrastic passive in Kelling (2006). In the case of what we call reflexive passive construction, the author suggests eliminating the [-o] feature of the agent argument, blocking its presence in a-structure, thus further restraining its realization in f-structure. This means that the agent argument may only appear at the lexical-semantics level, but not at a-structure nor f-structure level:

- (119) Se firmaron los contratos.
se.cl sign.pst.3p.pl the.m.pl contract.m.pl
 ‘The contracts were signed.’

LCS		agent	theme
features	PRED	–	[-r]
a-structure		–	< y >
f-structure	REFL+	–	SUBJ

A theoretical concern about the elimination of intrinsic features is that it violates the *Monotonicity* principle assumed in LMT, which states that intrinsic features cannot be either changed or deleted.⁵⁴ Apart from this, if the agent is assumed to be present only in the a-structure in periphrastic passive but not in passive-with-*se*, we cannot explain why a control-into-adjunct clause is possible in both constructions, if we also assume that control is an operation on the syntactic level, instead of on a semantic, lexical conceptual level:⁵⁵

⁵⁴ “A constraint on all lexical mapping principles is the preservation of syntactic information: they can only *add* syntactic features, and not delete or change them.” (Bresnan and Kanerva 1989:25).

⁵⁵ In fact, Maling (2006) has proposed four syntactic properties with opposite values for passive and active, including the agentive *by* phrase, bound anaphors in object position, control of subject-oriented adjuncts, and non-agentive (i.e., unaccusative) verbs, as follows:

Syntactic Properties	Active	Passive
Agentive <i>by</i> -phrase	*	ok
Bound anaphors in object position	ok	*
Control of subject-oriented adjuncts	ok	*
Nonagentive (“unaccusative”) verbs	ok	*

(Maling 2006:204)

These syntactic properties are also used by Maling (2010), Maling and Kibort (2015) and Kibort and Maling (2015), etc., to decide whether a superficial impersonal construction is passive or active. Our examples in (120) indicate that, at least the third property does not work in Spanish (and Catalan as well), since control into adjunct clauses is apparently allowed in both passive constructions. We will not give more discussions about these properties in the thesis, and leave the issue for further study.

- (120) a. Los culpables fueron castigados para mostrar
the.m.pl culprit.m.3p.pl be.pst.pl punish.pp.m.pl to show.inf
 el poder de la policía.
the.m.pl power of the police
 ‘The culprits were punished in order to show the power of the police.’
 (Demonte 1986:55)
- b. Se han destruido todas las pruebas
se.cl have.3p.pl destroy.pp.m.sg all.f.pl the.f.pl proof.f.pl
 para engañar a los inspectores.
to mislead.inf to the.m.pl inspector.m.pl
 ‘All the proofs have been destroyed in order to mislead the inspectors.’
 (based on Bartra 2002:2153)

The fact that control into adjunct clause is allowed in both types of passives indicates that the agent argument should be present in the a-structure in both passive constructions: if the agent argument did not appear in the a-structure in passive-with-*se* construction, as Kelling (2006) claims, the control would not happen in (120b). Moreover, (120) indicates that the two passive morphemes should have some properties in common. We leave this issue for the moment and come back to it later.

In FMT, passivization is treated as a morphosyntactic operation that suppresses the logical subject (i.e., the highest argument) of the predicate, which is formally represented as circling the subscripted index of the logical subject. The passive morpheme is assumed to include in its lexical entry “an underspecified a-structure that composes with the a-structure of a predicate to yield the passivized form of the predicate” (Alsina 1996:51). For example, the passivization of a monotransitive verb can be represented as:

- (121) $P_{[Part]}$: [PRED P ‘<[P-A]_⊙ [P-P]₂>’]

Once the external argument is suppressed, it cannot be licensed by the External Argument Mapping Principle and cannot map onto a direct function. However, it can still be expressed as an indirect function, since mapping principles only license the linking between arguments and direct functions, and do not limit the mapping of arguments onto indirect functions. As a consequence, the logical subject can either be freely expressed as a *by*-phrase or simply keep unexpressed. Note that, when expressed, the logical subject is an oblique and not an adjunct, because it is still a core argument, but is not licensed by a mapping principle. On the other hand, according to the Internal Argument Mapping Principle, the [P-P] argument maps onto an [obl-] function, which can alternate between a SUBJ and an OBJ. Since the Subject Condition is assumed to be an inviolable well-formedness restriction in FMT, and in this case there is no other SUBJ, the internal argument becomes the subject of the passive clause:

- (122) $\left[\begin{array}{l} \text{PRED} \quad \text{‘P < [P-A]_{\odot} [P-P]_2 \text{ >}’} \\ \text{SUBJ} \quad [\quad]_2 \\ (\text{OBL} \quad [\quad]_1) \end{array} \right]$

In summary, passivization is treated as a morpholexical operation that suppresses the highest argument in the a-structure in standard LMT, as proposed by Bresnan and Kanerva (1989) and Bresnan and Moshi (1990), among others. However, the suppressed argument expressed by the *by*-phrase is assumed to be an adjunct. The *demoting* approach in the LMT of Kibort makes the demoted argument map onto an oblique function, but the operation of adding [+r] feature to the intrinsic [-o] of arg_1 will result in an *obligatory* oblique, which is in fact optional. The *blocking* operation of Kelling (2006) within the standard LMT explains the optionality of the oblique argument, but the assumption is only made for periphrastic passive and not for passive-with-*se*, thus failing to capture some common properties shared by the two. The suppression assumption in FMT by Alsina (1996) avoids all the problems mentioned above, but is not able to explain the subject-object alternation of the internal argument in the passive construction (as described in Chapter 2), which is, obviously, a common problem for all the approaches mentioned above.

Once we decide to discard the $[\pm r]/[\pm o]$ classification, assumptions about passivization associated with these features should not be made further use of. Our proposal about the passive constructions in Catalan is in line with Alsina (1996) in treating passivization as a morphosyntactic operation that blocks the linkage between the highest argument and direct functions. We assume that there are two passive morphemes in Catalan: the passive past participial morpheme, and the passive clitic *se*. We concentrate on the passive past participial morpheme in 4.3.1.2 and turn to the passive clitic *se* in 4.3.1.3.

4.3.1.2 Catalan periphrastic passive

We assume that periphrastic passive in Catalan is a raising construction, with the past participial clause being the object complement of the copular verb *ésser* ‘be’. The passive past participle morpheme blocks the linkage between the highest argument of the passivized predicate and a DGF, and requires a SUBJ function in the f-structure of the predicate it attaches to. The suppressed argument can either map onto an OBL or simply remain unexpressed.

(123) Passive past participial morpheme:

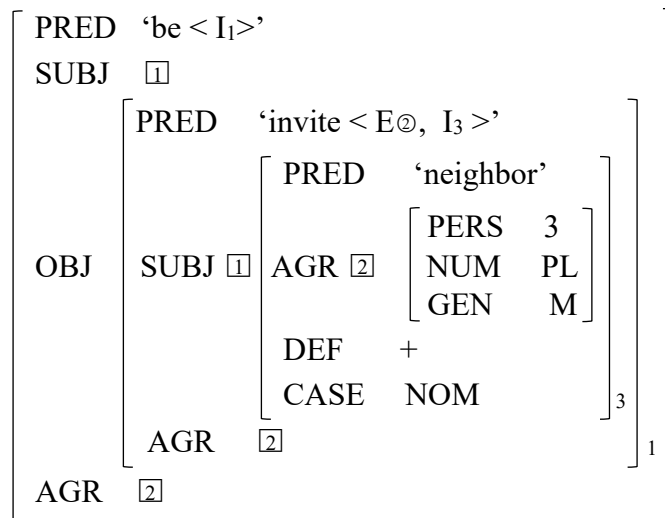
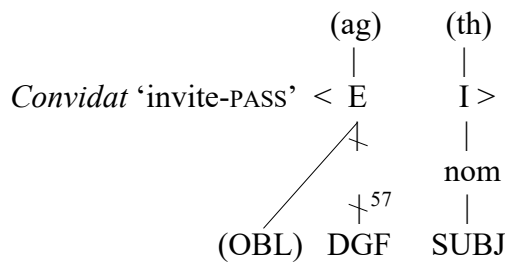
$$\left[\begin{array}{l} \text{PRED } \text{'P } \langle \text{Arg}_\oplus \rangle \text{' } \\ \text{SUBJ} \end{array} \right]$$

Note that the information in (123) may conflict with the Indefinite Subject Ban (96) (*INDEFsubj). Therefore, in order to guarantee a SUBJ in the f-structure of the passivized predicate, we assume the relative prominence between (96) and (123) to be (123) >> (96). However, (123) only requires that the SUBJ is present in the f-structure of the predicate that the passive past participle morpheme attaches to, and has no requirement regarding the nonthematic function of the copular verb. In other words, if we treat the periphrastic passive as a raising construction, the subject requirement in (123) does not prevent the raising function (by a raising function we refer to the nonthematic GF that functionally controls a GF in the embedded clause) from alternating between

subject and object.⁵⁶ For example, when used with a monotransitive verb, the mapping of the external argument to a direct function is blocked. Since there is only one internal argument, case assignment principles i) and ii) in (83) will not be used. By principle iii), the internal argument is assigned nominative case and maps onto the SUBJ of the passivized predicate, which raises as a *nonthematic* SUBJ or OBJ of the copular verb. (124) and (125) illustrate cases where the internal argument of a transitive verb is realized as a nominative subject and a nominative object in the periphrastic passive construction, respectively:

(124) Van ser convidats els meus veïns a la festa.
go.3p.pl be.inf invite.pp.m.pl the.m.pl my.m.pl neighbor.m.pl to the party
 ‘My neighbors were invited to the party.’

(Internal argument realized as nominative subject)



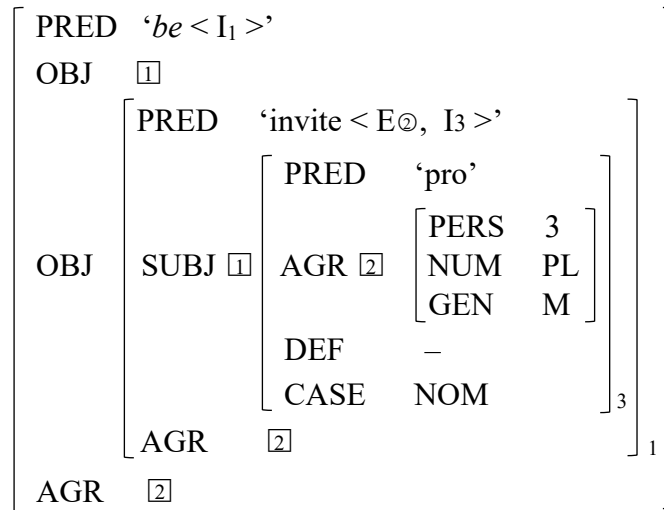
⁵⁶ The subject-object alternation here is essentially the same as the function alternation of intransitive arguments, as discussed earlier in this chapter.

⁵⁷ The representation of suppression here equates to the circling of the subscripted number 2 in the f-structure following it. We give both forms of representation here (and other examples below) for a better illustration.

4 Towards a new mapping theory

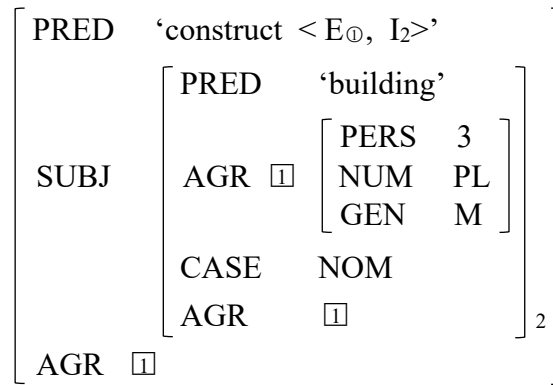
- (125) En seran convidats molts a la festa.
en.cl be.fut.3p.pl invite.pp.m.pl many.m.pl to the party
 ‘Many will be invited to the party.’

(Internal argument realized as nominative object)



As we can see from the f-structure in (124) and (125), the internal argument of the passivized transitive predicate (*convidar* ‘invite’ in this case) is invariably expressed as SUBJ in the f-structure of the passivized transitive verb, but when raising to a nonthematic function in the f-structure of the copular verb, it can either be a subject (as in (124)) or an object (as in (125)), according to its definiteness. We consider this way of representing the periphrastic passive to have the advantage of accounting for the feature agreement among the copular verb, the passivized predicate, and its subject. The passivized predicate shares the AGR feature with its subject, the copular verb shares the AGR feature with the raising nonthematic function (no matter whether it is realized as a subject or an object), and the subject of the passivized predicate is functionally controlled by the raising function of the copular verb. As a consequence, the AGR feature is shared among the passivized predicate, its subject, and the copular verb. In this way, we can also account for the past participial passive without a copular verb (i.e., the absolute passive):

- (126) Construïts els edificis,
construct.pp.m.pl the.m.pl building.m.pl
 els refugiats tindran un lloc per descansar.
the.pl refugee.pl have.fut.3p.pl a place to rest
 ‘With the buildings constructed, the refugees will have a place to rest.’



The f-structure in (126) resembles the f-structures in (124) and (125) in representing the passivized predicate and the nominative subject that it is predicated of, but differs in not containing a raising structure.

We can also explain why the internal argument of passivized transitive verbs in periphrastic passive cannot be assigned accusative case, as we mentioned in Chapter 2:

- (127) En seran convidats (*a) molts a la festa.
en.cl be.fut.3p.pl invite.pp.3p.pl to many.m.pl to the party
 ‘Many will be invited to the party.’

(repeating (37a))

Since an indefinite pronoun only allows *a*-marking when it is animate and accusative, the fact that *a*-marking is not allowed in (127) indicates that *molts* ‘many’ is in nominative case, instead of accusative case. The explanation for this is that when the external argument of *convidar* ‘invite’ is suppressed, the predicate only has one core argument (i.e., its internal argument) that needs to be licensed by case assignment principles. Therefore, only principle iii) will be used, and no accusative case will be assigned. From another point of view, if we assume that the passive past participial morpheme requires a SUBJ in the f-structure of the predicate it attaches to, and that a SUBJ can only be nominative in Catalan, the f-structure of the passivized predicate containing an accusative function will be ruled out. For the same reason, periphrastic passive with intransitive verbs would also be ungrammatical, as shown in (128):

- (128) a. * Aquí és arribat tard.
here be.3p.sg arrive.pp.m.sg late
 ‘Here people arrive late.’
 b. * Aquí és treballat molt.
here be.3p.sg work.pp.m.sg much
 ‘Here people work a lot.’

When the sole argument of an intransitive verb is suppressed, there is no other core argument left to be realized as a direct function, let alone a SUBJ. The ungrammaticality of (128) thus is naturally explained with the SUBJ requirement of the passive past participial morpheme.⁵⁸

⁵⁸ Note that since Catalan has no expletive subjects, there is no option of inserting an expletive subject to rescue the examples in (128).

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As for passivized ditransitive verbs, only the patient/theme argument and not the beneficiary argument can be realized as the subject of the passivized predicate, as illustrated below:

- (129) a. * *La Maria va ser donada dos cotxes.*
the Maria go.3p.sg be.inf give.pp.f.sg two car.pl
'Maria was given two cars.'
- b. *Van ser donats dos cotxes a la Maria.*
go.3p.pl be.inf give.pp.m.pl two car.pl to the Maria
'Two cars were given to Maria.'

The reason why (129a) is bad but (129b) is good follows naturally from our case assignment principles and the nominative subject requirement. The beneficiary argument, *la Maria* 'the Maria', is higher than the theme *un cotxe* 'a car', so it is assigned dative case according to the case principle i); with the suppression of the agent argument and the beneficiary argument receiving dative case, the theme is the only core argument to be licensed by case assignment principles, so it is assigned nominative case according to principle iii). Since a dative subject would be ruled out in Catalan according to the Nominative Subject Constraint, *la Maria* 'the Maria', being dative, cannot be realized as subject; on the other hand, *un cotxe* 'a car' is realized as the subject of the passivized predicate, and alternates between subject and object when raising to the nonthematic function of the copular verb.

4.3.1.3 Catalan reflexive passive

We assume that Catalan has a reflexive passive *se*, which resembles the passive past participial morpheme in blocking the linkage between the highest argument of the passivized predicate and a DGF, but differs in that it requires the AGR of the clause to be in third person, as shown in (130):

- (130) Reflexive passive *se*:

PRED	'P < Arg _Ⓣ >'
AGR	[PERS 3]

The third person feature requirement is stipulated in consideration of the fact that this kind of passive construction does not allow the internal argument to have the first or second person feature, unlike periphrastic passive:

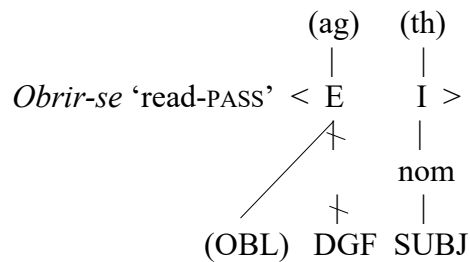
- (131) a. *Serem /sereu /seran interrogats.*
be.fut.1p/2p/3p.pl question.pp.m.pl
'We/you/they will be questioned.'

- b. * Ens interrogarem /
ens.cl.1p.pl question.fut.1p.pl
- b'. * Us interrogareu /
us.cl.2p.pl question.fut.2p.pl
- b''). S'interrogaran.⁵⁹
se.cl.3p.pl-question.fut.3p.pl
 '*We/*you/they will be questioned.'

With a monotransitive verb, the linkage of the external argument is suppressed by *se*. Then, according to the case assignment principle iii), the internal argument receives nominative case and maps onto either a subject (as in (132)) or an object (as in (133)):

- (132) Ja es poden obrir les finestres.
now se.cl.can.3p.pl open.inf the.f.pl window.f.pl
 'These windows can be opened now.'

(Internal argument being a nominative subject)



⁵⁹ With a passive and not true reflexive reading (i.e., not in the meaning of "We/you/they will question each other"). However, the internal argument in this kind of passive is more likely inanimate. When animate, it tends to be expressed as an accusative object, as shown in (i) below. This construction is actually an impersonal construction, which we will analyze in detail in 4.3.2:

- (i) Se'ls interrogarà.
se.cl-them.obj.3p.pl question.fut.3p.sg
 'They will be questioned.'

Moreover, notice that the *pro-dropped* subject in (131b'') cannot be overtly expressed as a strong pronoun (Josep M. Fontana, p.c.), as shown in the following example:

- (ii) * S'interrogaran ells.
se.cl-question.fut.3p.pl they.3p.pl
 'They will be questioned.'

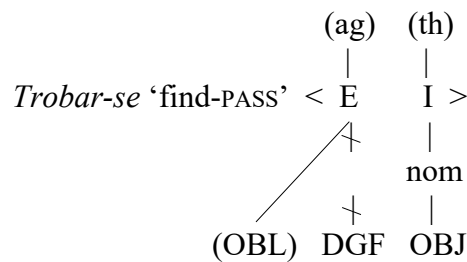
At this moment, it is unclear why a strong pronoun such as *ells* 'they' is not allowed in (ii). We leave this issue for further study.

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$$\left[\begin{array}{l} \text{PRED} \text{ 'open } \langle E \oplus, I_2 \rangle \\ \text{AGR } \boxed{1} \left[\begin{array}{l} \text{PERS } 3 \\ \text{NUM } \text{PL} \end{array} \right] \\ \text{SUBJ} \left[\begin{array}{l} \text{PRED} \text{ 'window'} \\ \text{AGR} \quad \boxed{1} \\ \text{CASE} \quad \text{NOM} \end{array} \right]_2 \end{array} \right]$$

- (133) Se n'han trobats alguns.
se.cl en.cl-have.3p.pl find.pp.m.pl some.m.pl
 'Some have been found.'

(Internal argument being a nominative object)



$$\left[\begin{array}{l} \text{PRED} \text{ 'find } \langle E \oplus, I_2 \rangle \\ \text{AGR } \boxed{1} \left[\begin{array}{l} \text{PERS } 3 \\ \text{NUM } \text{PL} \end{array} \right] \\ \text{OBJ} \left[\begin{array}{l} \text{PRED} \text{ 'pro'} \\ \text{AGR} \quad \boxed{1} \\ \text{QUANT} \text{ 'some'} \\ \text{CASE} \quad \text{NOM} \end{array} \right]_2 \end{array} \right]$$

Note that the f-structures in (132) and (133) are not treated as raising constructions, unlike what happens with periphrastic passive: since there is no raising copular verb in this type of passive construction, nothing needs to be raised.

As in periphrastic passive, ditransitive verbs passivized by *se* do not allow their dative argument to be the subject of the clause:

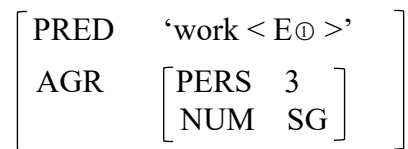
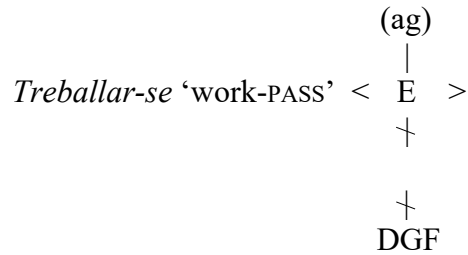
- (134) a. *La Maria es va donar dos cotxes.⁶⁰
the Maria se.cl go.3p.sg give.inf two car.pl
 'Maria was given two cars.'
- b. Es van donar dos cotxes a la Maria.
se.cl go.3p.pl give.inf two car.pl to the Maria
 'Two cars were given to Maria.'

⁶⁰ With the (intended) passive meaning of "Someone gave Maria two cars" and not the reflexive reading of "Maria gave herself two cars".

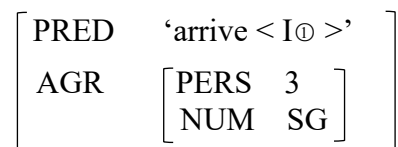
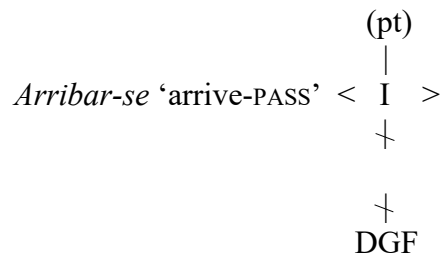
The reason is the same as in (129): under the nominative subject requirement, a dative subject will be ruled out in Catalan, thus *la Maria* ‘the Maria’ cannot be the subject of the clause; by contrast, *un cotxe* ‘a car’, is assigned nominative case and alternates between subject and object.

Notice that unlike passive past participial morpheme, the reflexive *se* morpheme does not require a SUBJ, since it may combine with intransitive verbs:

- (135) a. Aquí es treballa molt.
 here *se.cl work.3p.sg much*
 ‘Here people work a lot.’



- b. Aquí s’arriba tard.
 here *se.cl-arrive.3p.sg late*
 ‘Here people arrive late.’



Furthermore, unlike passive past participial morpheme, *se* can also combine with transitive verbs and allow the internal argument to be realized as an accusative object, as indicated by the appearance of *a*-marking before *molts* ‘many’ in the example below:

- (136) Es convidarà a molts a la festa.
se.cl invite.fut.3p.sg to many.m.pl to the party
 ‘Many will be invited to the party.’

As we will see in 4.3.2, (136) will be analyzed as an impersonal construction, while its grammaticality will be ascribed to another lexical entry of *se*.⁶¹ We will call it “reflexive impersonal *se*”, which is distinct from the reflexive passive *se* discussed in this subsection.

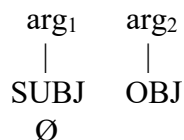
4.3.2 LFG impersonalization and Catalan impersonal constructions

4.3.2.1 Current approaches to impersonalization in LFG

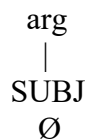
In LFG, impersonalization has so far not received as much attention as passivization, despite the different formalizations of the latter discussed in 4.3.1.1. Among the studies on impersonalization in LFG stands out the work of Kibort (2001, 2006, 2008a, 2008b, etc.), Berman (2003), Kelling (2006), Kibort and Maling (2015), Maling and Kibort (2015), and so on. In this subsection, we first introduce the core ideas regarding impersonalization in the work of Kibort and Kelling, and propose our assumptions about reflexive impersonal construction in Catalan. We consider the clitic *se* to be multifunctional: apart from the passive function that we have discussed in 4.3.1 (i.e., reflexive passive *se*), it may also be used to impersonalize a clause (i.e., reflexive impersonal *se*). However, given that a unified analysis of the reflexive passive *se* and the reflexive impersonal *se* has been proposed in LFG, as in Cardona (2015), we will also discuss the possibility of giving a unified analysis. Our decision is that they should be treated as two *ses* with different lexical entries.

Kibort (2001, 2004, 2008b, etc.) defends the non-passive status of the two morpholexical impersonal constructions in Polish, which include a *-no/-to* impersonal (used only in the past tense) and a reflexive *się* impersonal (used in all tenses). Impersonalization is treated as a “function-preserving” process that maintains the active status of a clause, as it does not allow the SUBJ to be overtly expressed in the c-structure:

(137) a. Impersonal of transitive:



b. Impersonal of intransitive:



(Kibort 2004:291)

⁶¹ In fact, the examples given in (135) can be analyzed as reflexive impersonal as well. We will clarify this point in 4.3.2.

With respect to the representation of the SUBJ in f-structure, Kibort suggests that the inflections in both impersonal constructions in Polish provide the specification (\uparrow SUBJ PRED) = ‘PRO’.⁶²

Kelling (2006) adopts a similar approach to the Spanish impersonal *se* construction, suggesting that the agent argument should map onto an indefinite PRO SUBJ:

- (138) a. Se invitó a todos los empleados.
se.cl invite.pst.3p.sg to all.m.pl the.m.pl employee.m.pl
 ‘All employees were invited.’

LCS		agent	theme
features	<i>invitar</i>	[-o]	[-r]
a-structure	‘invite’	<x	y>
f-structure	REFL +	SUBJ=PRO	OBJ

- b. Se entra por aquí.
se.cl enter.3p.sg by here
 ‘One enters here.’

LCS		theme
features	<i>entrar</i>	[-r]
a-structure	‘enter’	<x>
f-structure	REFL +	SUBJ=PRO

4.3.2.2 Catalan reflexive impersonal

Our assumptions about the reflexive impersonal construction in Catalan resemble the proposal of Kibort (2001, 2006, 2008b, etc.) and Kelling (2006). We assume that the morpheme *se* is multifunctional in Catalan, and that there is a reflexive impersonal *se* that licenses a SUBJ with arbitrary reference in the f-structure of the impersonal clause, the AGR of which is invariably third person:

- (139) Reflexive impersonal *se*:

$$\left[\begin{array}{ll} \text{SUBJ} & [\text{PRED 'pro'}] \\ \text{AGR} & [\text{PERS 3}] \end{array} \right]$$

The third person feature requirement of the reflexive impersonal *se* is stipulated based on the fact that this kind of impersonal construction cannot be in first or second person, illustrated as follows:

⁶² Kibort in her work takes the position that the subject should have its PRED value as big *PRO*, instead of little *pro* used to represent a pro-dropped subject. She argues that the referent of a *pro-dropped* subject can be tracked in the context, while the PRO subject in impersonalized constructions often has arbitrary referents. We consider this distinction to be better represented at the semantic level, instead of at the syntactic level. We therefore uniformly use little *pro* in our proposal.

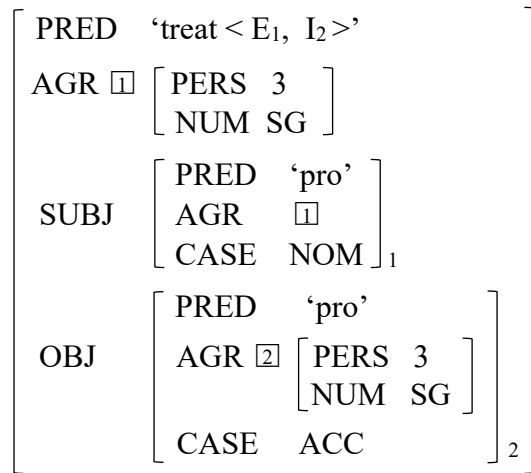
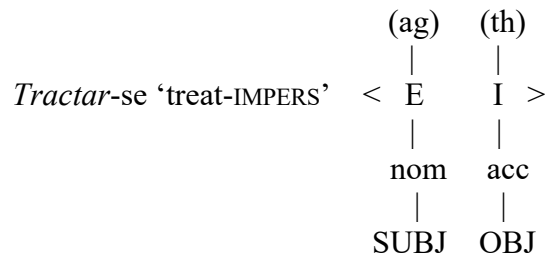
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- (140) a. * M'interrogarè els presoners.
 me.cl.1p.sg-question.1p.sg the.m.pl prisoner.m.pl
- b. * T'interrogaràs els presoners.
 te.cl.2p.sg-question.2p.sg the.m.pl prisoner.m.pl
- c. S'interrogarà els presoners.
 se.cl.3p.sg-question.3p.sg the.m.pl prisoner.m.pl
 'The prisoners will be questioned.'

We can explain why the *se* morpheme can be used with a transitive verb while the internal argument remains as an accusative object. For example:

- (141) No *se*'ls ha tractat bé.
 not se.cl-them.obj.m.pl have.3p.sg treat.pp well
 'They have not been well treated.'

(Internal argument being an accusative object)



The object in (141) receives accusative case and is pronominalized as *els* 'them'.⁶³ An accusative object in reflexive impersonal is permitted because the mapping of the agent argument to a direct GF is not blocked by the reflexive impersonal *se*. Therefore, the internal argument receives accusative case according to the case assignment principle ii) in (83) and maps onto an object, whereas the external argument receives nominative case according to the principle iii) and maps onto a subject. Since the reflexive impersonal *se*

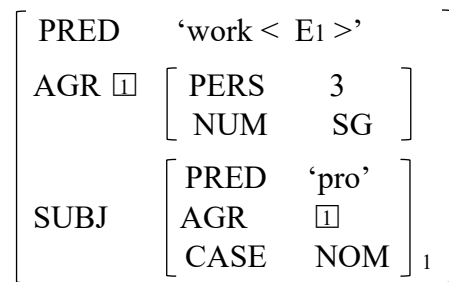
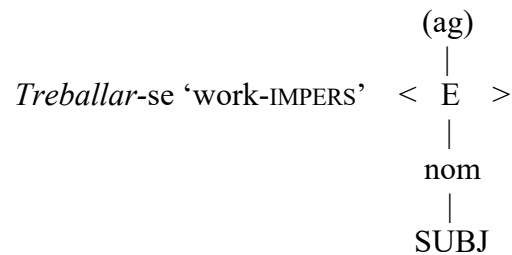
⁶³ The pronoun *els* and clitic *se* are pronounced together as *se'ls*, according to the weak pronoun combination rules in Catalan.

requires a *pro* SUBJ, the external argument is finally realized as a *pro* SUBJ with nominative case.

We can also explain why *se* may combine with intransitive verbs from the point of view of impersonal constructions. Since reflexive impersonal *se* licenses a *pro* SUBJ, the intransitive argument receives nominative case with case assignment principle iii) and maps onto a *pro* SUBJ according to the requirement of the reflexive impersonal *se*, illustrated as follows:

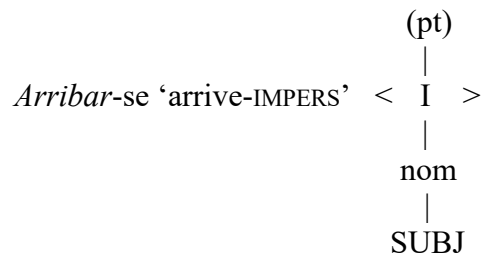
- (142) a. Aquí es treballa molt.
here se.cl work.3p.sg much
 ‘Here people work a lot.’

(Unergative)



- b. Aquí s'arriba tard.
here se.cl-arrive.3p.sg late
 ‘Here people arrive late.’

(Unaccusative)



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$$\left[\begin{array}{l} \text{PRED} \quad \text{'arrive} < I_1 > \\ \text{AGR } \boxed{1} \quad \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \end{array} \right] \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{AGR} \quad \boxed{1} \\ \text{CASE} \quad \text{NOM} \end{array} \right]_1 \end{array} \right]$$

Our analyses of the “se + intransitive” as “reflexive passive” in 4.3.1 and “reflexive impersonal” in this current subsection imply that sentences like (142a-b) are ambiguous between passive and impersonal. But whether they are syntactically analyzed one way or the other, their semantic reading is invariant, i.e., the logical subject of the clause has arbitrary reference.

Finally, ditransitive verbs can also be impersonalized by *se*. Case assignment and argument realization in this case resemble normal active ditransitive verbs, except that the PRED value of SUBJ is *pro* with arbitrary reference, instead of a concrete value such as “president” or “manager”:

- (143) Es va donar dos cotxes a la Maria.
se.cl go.3p.sg give.inf two car.pl to the Maria
 ‘Maria was given two cars.’

	(ag)	(go)	(th)	
<i>Donar</i> ‘give’	< E	I	I	>
	nom	dat	acc	
	SUBJ	OBJ	OBJ	

$$\left[\begin{array}{l} \text{PRED} \quad \text{'give} < E_1, I_2, I_3 > \\ \text{AGR } \boxed{1} \quad \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \end{array} \right] \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{AGR} \quad \boxed{1} \\ \text{CASE} \quad \text{NOM} \end{array} \right]_1 \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'Maria'} \\ \text{AGR } \boxed{2} \quad \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \end{array} \right] \\ \text{CASE} \quad \text{DAT} \end{array} \right]_2 \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'car'} \\ \text{AGR } \boxed{3} \quad \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{PL} \end{array} \right] \\ \text{CASE} \quad \text{ACC} \end{array} \right]_3 \end{array} \right]$$

4.3.2.3 Viability of a unified analysis

One may wonder whether the impersonal construction can be analyzed as “reflexive passive”, which uniformly suppresses the highest argument of a predicate (i.e., whether the passive and impersonal *se* are indeed identical). In fact, Maling and Sigurjónsdóttir (2002), Maling (2006), Kibort and Maling (2015), and Maling and Kibort (2015), among others, have already pointed out that “impersonal constructions are in principle syntactically ambiguous, and can be analyzed as either a non-promotional passive, or an impersonal active with a null, unspecified subject” (Kibort and Maling 2015). Our analyses in 4.3.1 and 4.3.2 imply treating *se* separately as passive and impersonal morphemes. However, there has always been research attempting to give a unified analysis to these two constructions in the literature.⁶⁴ One such attempt in LFG is given by Cardona (2015), who proposes that both so-called “reflexive passive” and “reflexive impersonal” constructions should be analyzed equally as passive constructions, with the highest argument suppressed and the patient argument (if there is one) being “promoted” to the subject or remaining as an accusative object. A unified analysis –if it works– will be more elegant and attractive than a split one (i.e., to assume that there is a passive *se* and an impersonal *se*). We therefore discuss the viability of a unified analysis as proposed by Cardona (2015) below.

Let us assume that the *se* morpheme uniformly suppresses the logical subject of a predicate, but does not require a subject in the f-structure of the verb stem with which it combines, unlike the passive past participial morpheme:⁶⁵

(144) Clitic *se*:

$$\left[\begin{array}{l} \text{PRED} \text{ 'P <Arg}_\oplus \text{ ... >'} \\ \text{AGR} \text{ [PERS 3]} \end{array} \right]$$

When used with intransitive verbs, we will find an f-structure without a subject. This is not a problem within an OT-LFG framework. Since the Subject Condition is assumed to be violable, clauses may lack a subject, but still be grammatical:

(145) *Aquí es treballa molt.*
here se.cl work.3p.sg much
 ‘Here people work a lot.’

$$\begin{array}{c} \text{(ag)} \\ | \\ \textit{Treballar-se} \text{ 'work-PASS'} < \text{E} > \\ \vdash \\ \vdash \\ \text{DGF} \end{array}$$

⁶⁴ See for example Mendikoetxea (1992, 1997, 2008, 2012) and references therein.

⁶⁵ Our assumption about the past participial morpheme does not change. That is, “unified analysis” only refers to the *se* morpheme.

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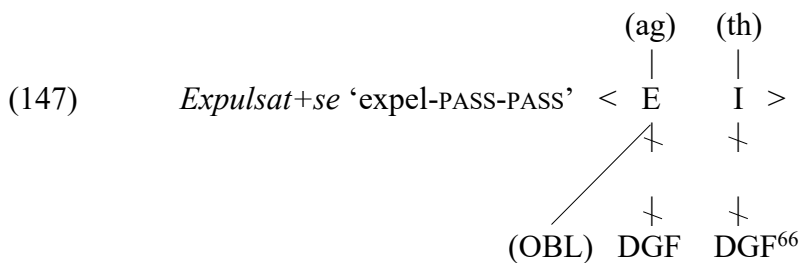
$$\left[\begin{array}{l} \text{PRED} \quad \text{'work < E >} \\ \text{AGR} \quad \left[\begin{array}{l} \text{PERS} \quad 3 \\ \text{NUM} \quad \text{SG} \end{array} \right] \end{array} \right]$$

The first problem emerges when *se* is used with transitive verbs. If *se* in sentences such as (141) should be analyzed as suppressing the highest argument, accusative case would no longer be available for the internal argument, because it would be the only argument that lacks case. In this situation, only case assignment principle iii) would apply, and the internal argument would get nominative case, as in reflexive passive constructions.

Now consider the so-called “double passive” construction in Catalan, in which the past participial morpheme and the clitic *se* co-occur:

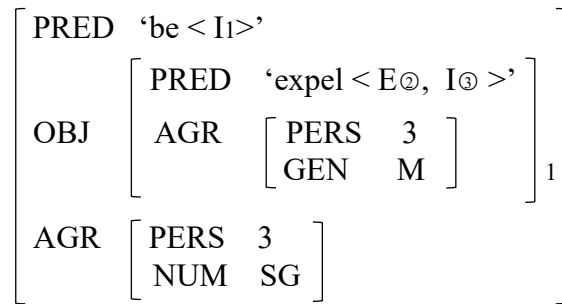
- (146) Passava aixó quan s'era expulsat
happen.imperf.3p.sg this when se.cl-be.imperf.3p.sg expel.pp.m.sg
 del partit.
from-the party
 ‘This was happening when one was expelled from the party’
 (repeating (40))

Another three problems will emerge with the unified analysis. First, if both the passive past participial morpheme and the *se* morpheme are supposed to suppress the highest argument, then it is senseless to suppress an argument twice. Second, even if the two morphemes were to suppress two different arguments, the subject requirement by the passive past participial morpheme would not be satisfied, since there would be no argument left to map onto a direct GF, let alone to SUBJ:



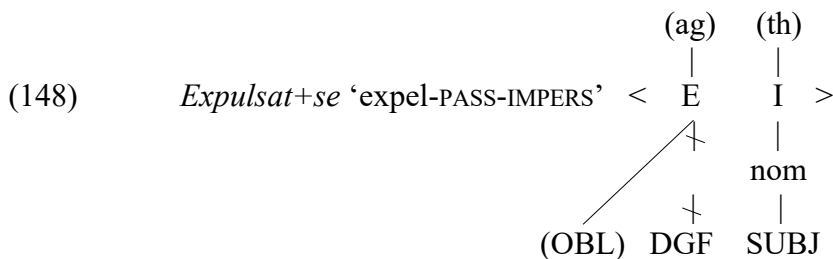
⁶⁶ Only the external argument (and not the internal argument) of *expulsar* ‘expel’ may be overtly expressed in double passive:

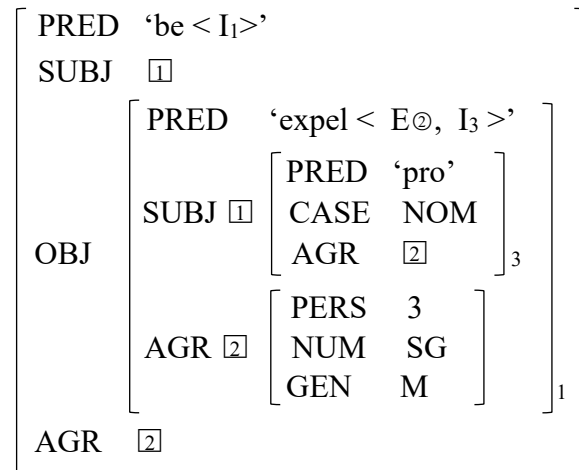
- (i) ...s'era expulsat pel senat...
se.cl-be.imperf.3p.sg expel.pp.m.sg by-the.m.sg senate.m.sg
 ‘One was expelled by the senate.’
- (ii) ...s'era expulsat (*pels dissidents)...
se.cl-be.imperf.3p.sg expel.pp.m.sg by-the.m.pl dissident.m.pl
 (Intended meaning) ‘The dissidents were expelled.’



The f-structure above reveals the third problem. Logically speaking, morphemes should operate on the argument structure of the predicate with which they combine. So in principle, the *se* morpheme should suppress the argument of the copular *ésser* ‘be’ instead of suppressing the argument of the embedded verb (i.e., *expulsat* ‘expelled’). In other words, the *se* morpheme in (147) in fact penetrates the f-structure of the copular verb to operate on the predicate passivized by the passive past participial morpheme, instead of affecting the a-structure of the matrix copular verb with which it actually combines.

All these problems will be resolved if we assume the existence of a reflexive impersonal *se*, which requires a *pro* subject, instead of uniformly assuming a singular passive *se* morpheme to suppress the highest argument. Let us consider then one by one. First, the accusative case of the internal argument in sentences such as (141) is explained, because the linking between the agent argument and a direct function (i.e., the subject) is not blocked. The internal and external arguments in (141) are assigned accusative and nominative cases, respectively, according to the case assignment principles ii) and iii). Second, the external argument of *expulsat* ‘expelled’ in (147) is only suppressed once, and it is suppressed by the passive past participial morpheme. This means there would be no worry that an argument may be suppressed twice. Third, the internal argument of *expulsat* ‘expelled’ is not (and should not be) suppressed, and it maps onto the SUBJ of the f-structure of *expulsat* ‘expelled’, satisfying the subject requirement of the passive past participial morpheme. Fourth, if we assume that *se* in (147) is reflexive impersonal and not reflexive passive, it will require a *pro* SUBJ in the f-structure of the predicate it combines with, which is the f-structure of the copular verb. In this case, we assume that the internal argument of *expulsat* ‘expelled’ is realized as a *pro* SUBJ that raises to the nonthematic SUBJ of the copular verb. In this way, the *pro* SUBJ requirement of the reflexive impersonal *se* is satisfied. We illustrate our last three points about “double passive” constructions like (146) as follows:





Therefore, the so-called “double passive” constructions may better be named as “reflexive impersonal of periphrastic passive” constructions.

4.3.3 Summary and further discussion

In this section, we have discussed the passive and impersonal constructions in Catalan. We assume that Catalan has two passive morphemes: the passive past participial morpheme, and the reflexive passive *se* clitic, both of which suppress the highest argument of the predicate they combine with. The passive past participial morpheme in addition requires a SUBJ in the f-structure of the passivized predicate, whereas the reflexive passive *se* requires the AGR of the clause to be in third person. Along with the reflexive passive *se*, we also assume a reflexive impersonal *se*, in order to explain, for example, the “*se* + transitive” structure in which the internal argument is realized as an accusative object, as well as the so-called “double passive” construction. We argue that the structures analyzed in 4.3.1.3 and 4.3.2.2 as “reflexive passive” and “reflexive impersonal” respectively cannot be uniformly analyzed as being licensed by the reflexive passive *se*, which is assumed to suppress the highest argument of the predicate. This implies that the morpheme *se* has different lexical entries. In other words, the *se* morpheme is multifunctional.⁶⁷

Careful readers may have noticed that we have not talked about *like*-type verbs in passive and impersonal constructions. The fact is that *like*-type verbs in Catalan cannot be passivized, but can be impersonalized:

- (149) a. *Els nens són agradats per la Maria.
the.m.pl child.m.pl be.3p.pl like.pp.m.pl by the Maria
 ‘The children are liked by Maria.’

(Intended periphrastic passive)

⁶⁷ Multiple use of a morpheme is quite common. See for example Patejuk and Przepiókowski (2015) for proposing multiple lexical entries for *się* in Polish, or Theiler and Bouma (2012) for discussion about multiple use of *es* in German.

b. * Els nens s'agraden per la Maria.
the.3p.pl child.m.pl se.cl-like.3p.pl by the Maria

b'. * S'agraden els nens per la Maria.
se.cl-like.3p.pl the.3p.pl child.m.pl by the Maria

'The children are liked by Maria.'

(Intended reflexive passive)

c. Si s'agrada als contraris,
if se.cl-like.3p.sg to-the.m.pl opponent.m.pl
 també es pot agradar als simpatitzants.
also se.cl can.3p.sg like.inf to-the.m.pl supporter.m.pl

'If one can please the opponents, one can also please the supporters.'

(Reflexive impersonal)

The mapping of *like*-type verbs in reflexive impersonal constructions resembles the mapping of this type of verbs in active voice, except that the *experiencer* argument maps onto a nominative *pro* SUBJ to satisfy the requirement of the reflexive impersonal *se*. Note that the contrast between (149b-b') and (149c) provides further evidence that reflexive passive *se* and reflexive impersonal *se* should not be reduced to the reflexive passive *se*, because if so, the grammaticality of (149c) cannot get explained. However, the reason why *like*-type verbs in Catalan cannot be passivized is not quite clear. Their ungrammaticality may be explained by assuming that only the external argument (or, the agent argument) can be suppressed, because so far all the suppressed arguments we have seen are external. But the real reason remains unknown to us for the moment, and we leave this issue for further study.

4.4 Causative as a complex predicate

In this section, we will see how our mapping theory can be used with causative constructions in Romance languages like Catalan and Spanish. We follow Hernanz (1999) in considering the "make + infinitive" structure⁶⁸ to be a typical causative construction. We also follow Alsina (1993, 1996, 2002, etc.) and Butt (1993, 1995, 1998, etc.), among others, in assuming the causative construction to be monoclausal, with the causative verb "make" and an infinitive base verb undergoing predicate composition to yield a complex predicate with one single argument structure. Alsina (1996) suggests that causative verbs have two arguments: a *causer* and a *causee*.⁶⁹ The *causee* binds an argument of the base verb, which is formally represented by marking the two arguments involved in the binding relationship with the same subscripted integers, implying their mapping together onto the same function. Butt (1993, 2006, etc.) in turn considers the predicate composition to be a

⁶⁸ Verbs corresponding to "make" can be *hacer* in Spanish, *fer* in Catalan, or *faire* in French, etc.

⁶⁹ Which are represented as [P(oto)-A(gent)] and [P(oto)-P(atient)], respectively.

fusion process that melds the matrix patient with an argument of the embedded base verb. Once fused, the embedded argument is no longer available for mapping, and linking rules will only be used with the remaining arguments. Though formal representations in these two approaches differ, their essential spirit is the same: both of them assume causative constructions to be complex predicates with one single argument structure, and both imply that predicate composition and argument mapping take place in the syntax, rather than in the lexicon.

This section is made up of three parts. In 4.4.1, we analyze Catalan causative constructions with the base verb being intransitive, transitive, ditransitive, and *like*-type verbs, respectively. We will update our statement about Case Assignment Principles as well as the Core Argument Rule to account for case assignment issues with complex predicates. In 4.4.2, we discuss situations in which the causative construction interacts with the reflexivization. 4.4.3 concludes.

4.4.1 Catalan general causative constructions

Our treatment of argument realization in Romance causative constructions combines the two proposals mentioned above. We assume that the causative construction in Romance languages consists of a causative verb and a base verb, and includes an argument binding relation between the internal argument of the causative verb (i.e., the *causee*) and an argument of the base verb. We also assume that the mapping of the arguments involved in an argument binding relation is licensed by the argument binding principle, stated as follows:

(150) Argument Binding Principle:

The bound argument involved in the argument binding relation cannot be independently licensed by a mapping principle. It will be licensed by the principle that licenses its binder.

As a consequence, the bound argument will map onto the same function that its binder maps onto. The binding relation is formally represented via co-indexation of the two arguments. For example:

(151) L'alcalde ha fet enderrocar el pont a un especialista.
the-mayor have.3p.sg make.pp demolish.inf the bridge to a specialist
 'The mayor has made an expert demolish the bridge.'

$$\left[\begin{array}{l} \text{PRED} \text{ 'cause} \langle E_1 \ I_2 \text{ demolish} \langle E_2 \ I_3 \rangle \rangle' \\ \text{SUBJ} \text{ [CASE NOM]}_1 \\ \text{OBJ} \text{ [CASE DAT]}_2 \\ \text{OBJ} \text{ [CASE ACC]}_3 \end{array} \right]$$

As we can see from the f-structure above, the internal argument of the causative verb *fer* 'make' and the external argument of the base verb *enderrocar* 'demolish' are marked with the same subscripted integer 2 (i.e., I_2 and E_2), which indicates that they are in a

binding relationship. Now we should use the case assignment principles to make arguments realized. Before doing so, however, we must update our definition of argument prominence. If Romance causative constructions should be analyzed as complex predicates with one single argument structure, then a composed a-structure with two arguments with the same thematic role may exist. In this situation, it is impossible to depend only on the thematic hierarchy to decide their relative prominence, as is the case with I_2 and I_3 above: they are equally prominent according to the thematic hierarchy, but they are obviously assigned different cases and map onto different functions. We therefore restate our assumption about argument prominence as follows:

- (152) Argument prominence (updated version):
 An argument is more prominent than another, iff
 i) it is higher in the thematic hierarchy; or
 ii) it is less embedded.⁷⁰

According to the renewed version of argument prominence, I_2 is more prominent than I_3 for being less embedded. Therefore, it is assigned dative case according to the case assignment principle i), and maps onto OBJ_2 . As for E_2 , it maps together with I_2 onto OBJ_2 , since according to the Argument Binding Principle (150), its independent mapping is disabled by the binding relation with its binder I_2 . Then there are two arguments left to be case-assigned: the external argument E_1 and the internal argument I_3 . I_3 is assigned accusative case with principle ii), whereas E_1 receives nominative case with principle iii). Since according to the Nominative Subject Constraint, structures with a subject in cases other than nominative will be ruled out, the argument E_1 finally maps onto the subject, while I_2/E_2 and I_3 map onto two different objects, with dative and accusative cases, respectively.

Apart from being realized as an object, the logical subject of the base verb may alternatively map onto an oblique function, as Alsina (1996) and Butt (1998) observe. The example below illustrates a case where the complex predicate is the same as in (151), but the logical subject of the base verb (i.e., *un especialista* ‘a specialist’) is expressed as an oblique, instead of an object:

- (153) L'alcalde ha fet enderrocar el pont per un especialista.
the-mayor have.3p.sg make.pp demolish.inf the bridge by a specialist
 ‘The mayor had the bridge demolished by a specialist.’

(Alsina 1996:187)

PRED	‘cause < E_1 I_2 demolish < E_3 I_2 >>’				
SUBJ	[CASE NOM] ₁				
OBJ	[CASE ACC] ₂				
OBL	[<table style="border-collapse: collapse; display: inline-table; vertical-align: middle;"> <tr> <td style="border-right: 1px solid black; padding: 5px;"> PRED </td> <td style="padding: 5px;"> ‘by < I >’ </td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"> OBJ </td> <td style="padding: 5px;"> [PRED ‘specialist’] </td> </tr> </table>] ₃	PRED	‘by < I >’	OBJ	[PRED ‘specialist’]
PRED	‘by < I >’				
OBJ	[PRED ‘specialist’]				

⁷⁰ In the case of complex predicates. Moreover, notice that criteria i) only applies to co-arguments, that is, the arguments of a same predicate (see Sag et al. 2003:5).

We consider the object-oblique alternation of the logical subject of the base verb to be the consequence of different a-structure bindings. If the logical subject of the base verb forms the argument binding relationship with the *causee*, it will be expressed as an object, as in (151). By contrast, if an argument other than the logical subject of the base verb is bound by the *causee*, the logical subject of the base verb will be expressed as an oblique. This is the case of (153), in which arguments entering into the binding relationship are the internal argument of the causative verb and the internal argument of the base verb. The binding relationship renders the more embedded internal argument “invisible” to case assignment principles. There are three arguments to undergo case assignment: E_1 , I_2 (of the causative verb) and E_3 . According to our argument prominence criteria, the relative prominence among the three core arguments is: $E_1 > I_2 > E_3$. However, we face two problems with our original case assignment principles, when using them to assign case to the three core arguments. The first problem concerns the principle ii), which originally states: “Assign accusative case to the less prominent of two core arguments that lack case”. Since now we have three core arguments, some changes need to be made to this principle to guarantee that only I_2 is assigned accusative case. The second problem concerns the principle iii), which is previously stated as “Assign nominative case to a core argument that lacks case”. Under this principle, both E_1 and E_3 qualify to receive nominative case; however, only E_1 is nominative, whereas E_3 is oblique. Such problems emerge as a consequence of not having taken complex predicates into consideration when we were elaborating the case assignment principles at the beginning of the chapter. We therefore restate our case assignment principles as follows:

- (154) Case Assignment Principles (updated version):
- i. Assign *dative* case to the more prominent of two internal arguments;
 - ii. Assign *accusative* case to an internal argument that is the least prominent of two or more arguments that lack case;
 - iii. Assign *nominative* case to the most prominent core argument that lacks case.

The restated principles do not affect case assignment in any of the previous examples we have analyzed so far. Returning to the case assignment issues in (153), with the refined principle ii),⁷¹ the I_2 argument (of the causative verb) receives accusative case, as it is the least prominent internal argument. Then, according to principle iii), nominative case is assigned to E_1 , because it is the most prominent argument, for being less embedded than E_3 . E_3 , in principle, should map onto a direct function, because it is a core argument according to the Core Argument Rule (84). It nevertheless is expressed by a *by*-phrase, as shown in (153), implying that the function it bears is oblique. We therefore refine our Core Argument Rule as follows:

- (155) Core Argument Rule:
A case-assigned core argument maps onto a direct function.

According to the refined Core Argument Rule, E_3 cannot map onto a direct function because it lacks case. Therefore, it will be licensed by the Elsewhere Mapping Principle and maps onto an optional oblique function. Furthermore, since this oblique is optional, it need not be expressed, as shown below:

⁷¹ From now on, case assignment principles refer to the refined ones in (154).

- (156) L'alcalde ha fet enderrocar el pont.
the-mayor have.3p.sg make.pp demolish.inf the bridge
 'The mayor had the bridge demolished.'

(Alsina 1996:194)

However, the object-oblique alternation of the logical subject of base verbs is not always possible. For instance, when the base verb is *veure* 'see', its logical subject can only be an object, and not an oblique:

- (157) a. He fet veure el problema al director.
have.1p.sg make.pp see.inf the problem to-the director
 b. *He fet veure el problema **pel** director.
have.1p.sg make.pp see.inf the problem by-the director
 'I made the director see the problem.'

(Alsina 1996:197)

Factors affecting the object-oblique alternation have been argued to be related to thematic roles, according to Bordelois (1988) or Guasti (1990), among others. According to this assumption, the logical subject of the base verb can be expressed as an oblique function when its thematic role is *agent*. This explains why the logical subject of the base verb, i.e. *el director* 'the director' cannot be expressed as an oblique in (157b), because its thematic role is *experiencer*, rather than agent. Alsina (1996) observes that this requirement cannot explain why the agent argument of *treballar* 'work' cannot be expressed as an oblique, as illustrated in (158):

- (158) a. El mestre els ha fet treballar molt.
the teacher them.obj.acc have.3p.sg make.pp work.inf much
 'The teacher has made them work a lot.'
 b. *El mestre ha fet treballar molt **pels** estudiants.
the teacher have.3p.sg make.pp work.inf much by-the.pl student.pl
 'The teacher has made the students work a lot.'

(Alsina 1996:198)

Our explanation of the ungrammaticality of (157b) and (158b) comes from the assumption of affectedness, inspired by the work of Matsumoto (1998) or Butt (1998), among others. We assume that only affected arguments can form a binding relationship with the *causee* (i.e., the internal argument of the causative verb).⁷² In (157), only *el director* 'the director' is affected, because he is forced to do something (i.e., to see the problem); in contrast, *el problema* 'the problem' is not affected, as the causative action does not have any influence on it. Therefore, only the argument corresponding to *el director* 'the director' is bound by the *causer*. We illustrate the binding relation as follows:

⁷² We would like to stress that, affectedness is a semantic notion that is not and should not be presented in the a-structure.

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(159) F-structure for (157a):

$$\left[\begin{array}{l} \text{PRED} \text{ 'cause } \langle E_1 \ I_2 \ \text{see} \langle E_2 \ I_3 \ \rangle \rangle' \\ \text{SUBJ} \text{ [CASE NOM]}_1 \\ \text{OBJ} \text{ [CASE DAT]}_2 \\ \text{OBJ} \text{ [CASE ACC]}_3 \end{array} \right]$$

Since *el problema* ‘the problem’ is not affected, it cannot form a binding relationship with the *causee*. Consequently, *el director* ‘the director’ cannot be expressed as an oblique, as shown in (160):

(160) F-structure for (157b):

$$* \left[\begin{array}{l} \text{PRED} \text{ 'cause } \langle E_1 \ I_2 \ \text{see} \langle E_3 \ I_2 \ \rangle \rangle' \\ \text{SUBJ} \text{ [CASE NOM]}_1 \\ \text{OBJ} \text{ [CASE ACC]}_2 \\ \text{OBL} \left[\begin{array}{l} \text{PRED} \text{ 'by } \langle I \ \rangle' \\ \text{OBJ} \text{ [PRED 'director']}_3 \end{array} \right]_3 \end{array} \right]$$

We can also explain the ungrammaticality of (158b). The single argument of the base verb (i.e., *els estudiants* ‘the students’) is affected by the causative action because their professor makes them work. According to our assumption, this argument will be bound by the internal argument of the causative verb. As a consequence, it will be assigned accusative case and map onto an object together with its binder according to the principle ii). This means that there is no chance for it to be expressed as an oblique:⁷³

⁷³ Alsina (1996:197) points out that in this case, *els estudiants* ‘the students’ may choose not to express, as in (i):

- (i) El mestre ha fet treballar molt aquest curs.
the teacher have.3p.sg make.pp work.inf much this term
 ‘The teacher has made people work a lot this term.’

The possibility of omitting the logical subject of the base verb in (i) is assumed to be due to a different lexical entry of causative verbs in Catalan, which lacks an internal argument that binds an argument of the embedded base verb, as in (ii):

- (ii) *fer* [PRED ‘cause < E P* < ... > >’]

Alsina (1996) argues that this alternative entry of causative predicate in Catalan is also motivated by the causative constructions in which the base verb lacks an argument, such as weather verbs like *ploure* ‘to rain’ or *nevar* ‘to snow’. For a detailed discussion, we refer the readers to Alsina (1996).

(161) F-structure for (158a):

$$\left[\begin{array}{ll} \text{PRED} & \text{'cause } \langle E_1 \text{ } I_2 \text{ work } \langle E_2 \rangle \rangle \text{' } \\ \text{SUBJ} & [\text{CASE NOM}]_1 \\ \text{OBJ} & [\text{CASE ACC}]_2 \end{array} \right]$$

The intransitive base verb can also be unaccusative, like *sortir* ‘leave’, with the case assignment and argument realization being precisely the same as the case where the intransitive base verb is unergative. In fact, no matter which type the intransitive base verb is, the intransitive argument always maps onto an accusative object, and never onto an oblique:

(162) a. La calor els ha fet sortir de la casa.
the heat them.obj.acc have.3p.sg make.pp leave.inf from the house
 ‘The heat has made them go out of the house.’

$$\left[\begin{array}{ll} \text{PRED} & \text{'cause } \langle E_1 \text{ } I_2 \text{ leave } \langle I_2 \rangle \rangle \text{' } \\ \text{SUBJ} & [\text{CASE NOM}]_1 \\ \text{OBJ} & [\text{CASE ACC}]_2 \\ \text{OBL} & \left[\begin{array}{ll} \text{PRED} & \text{'out-of } \langle I \rangle \text{' } \\ \text{OBJ} & [\text{PRED 'house'}] \end{array} \right] \end{array} \right]$$

b. * La calor ha fet sortir de la casa **per** ells.
the heat have.3p.sg make.pp leave.inf from the house by they
 ‘The heat has made them go out of the house.’

$$\left[\begin{array}{ll} \text{PRED} & \text{'cause } \langle E_1 \text{ } I_2 \text{ leave } \langle I_2 \rangle \rangle \text{' } \\ \text{SUBJ} & [\text{CASE NOM}]_1 \\ \text{OBL} & \left[\begin{array}{ll} \text{PRED} & \text{'by } \langle I \rangle \text{' } \\ \text{OBJ} & [\text{PRED 'pro'}] \end{array} \right]_2 \\ \text{OBL} & \left[\begin{array}{ll} \text{PRED} & \text{'out-of } \langle I \rangle \text{' } \\ \text{OBJ} & [\text{PRED 'home'}] \end{array} \right] \end{array} \right]$$

Aside from being transitive or intransitive, the base verb can also be a ditransitive or a *like*-type verb, though such cases are less common. (163) is an example in which the base verb is ditransitive:

(163) El professor li ha fet donar llibres als nens.
the professor li.cl.dat.sg have.3p.sg make.pp give.inf book.pl to-the.pl child.pl
 ‘The professor has made him give books to the children.’

$$\left[\begin{array}{l} \text{PRED} \text{ 'cause} \langle E_1 \ I_2 \ \text{give} \langle E_2 \ I_3 \ I_4 \ \rangle \rangle' \\ \text{SUBJ} \text{ [CASE NOM]}_1 \\ \text{OBJ} \text{ [CASE DAT]}_2 \\ \text{OBJ} \text{ [CASE ACC]}_4 \\ \text{OBJ} \text{ [CASE DAT]}_3 \end{array} \right]$$

The agent argument of *donar* 'give', i.e., E_2 , is bound to I_2 , because it is affected by the causative action. The relative argument prominence in this complex predicate construction is $E_1 > I_2 > I_3 > I_4$. According to case assignment principle i), I_2 (along with E_2) and I_3 receives dative case and maps onto two different objects (i.e., OBJ_2 and OBJ_3); according to the principle ii), I_4 receives accusative case and maps onto a different object (i.e., OBJ_4). Finally, E_1 is assigned nominative case with the principle iii) and is realized as the subject of the clause.

(164) illustrates the case where the base verb is *like*-type:

- (164) Aquest tastavins li farà agradar el Xarel·lo
this.m.sg wine-tasting li.cl.dat.sg have.fut.3p.sg like.inf the Xarel·lo
 (a la Maria).
to the Maria
 'This wine tasting will make Maria like the Xarel·lo.'

$$\left[\begin{array}{l} \text{PRED} \text{ 'cause} \langle E_1 \ I_2 \ \langle I_2 \ I_3 \ \rangle \rangle' \\ \text{SUBJ} \text{ [CASE NOM]}_1 \\ \text{OBJ} \text{ [CASE DAT]}_2 \\ \text{OBJ} \text{ [CASE ACC]}_3 \end{array} \right]$$

The relative argument prominence of the complex predicate is $E_1 > I_2 > I_3$. They receive nominative, dative, and accusative cases according to the case assignment principles, and map onto SUBJ and two different OBJs, respectively.

4.4.2 Reflexivization in complex predicates

In this subsection, we discuss argument realization in causative constructions in which reflexivization is involved. Argument binding in Romance reflexive constructions is proposed by Alsina (1996) to capture the intuition that the two arguments of reflexivized verbs correspond to the same participant. Romance reflexive clitic is thus analyzed as a morpheme that specifies the co-linking of the two arguments.⁷⁴ In Catalan, this is formally represented in the lexical entry of the reflexive morpheme *se*:

⁷⁴ One should note that arguments entering into reflexive binding relationship should be co-arguments.

(165) Lexical entry of reflexive *se*:

$$\left[\begin{array}{l} \text{PRED} \quad \text{'P} < []_1 []_1 > \text{' } \\ \text{SUBJ}_1 \end{array} \right]$$

The co-indexation of the two arguments in the lexical entry of reflexive *se* indicates their binding relationship and their mapping onto the same function. In 4.4.1, we have assumed that Romance causative constructions include an a-structure binding that takes place between the internal argument of the causative verb and an argument of the base verb. With the incorporation of reflexivization, the reflexive binding will be introduced into the argument structure of the complex predicate. When the two bindings interact, different argument realizations will be produced.

Alsina (1996) points out that, when the reflexive clitic *se* attaches to the causative verb (i.e., when the causative verb is reflexivized), the logical subject of the base verb can only map onto an oblique function. The observation comes from examples like (166), where *la Maria* ‘the Maria’ can be introduced by *per* ‘by’, but not by *a* ‘to’:

(166) En Ferran es farà pentinar per/ *a la Maria.
the Ferran se.cl make.fut.3p.sg comb.inf by/ to the Maria
 ‘Ferran will have himself combed by Maria.’

(Alsina 1996:220)

Hernanz (1999) has reported a similar contrast in Spanish:

(167) La cantante se hizo maquillar por/ *a la peluquera.
the singer se.cl make.pst.3p.sg make-up.inf by/ to the hairdresser
 ‘The singer had herself made up by the hairdresser.’

(Hernanz 1999:2252)

Hernanz (1999:2250) has also observed that, when the reflexive clitic *se* attaches to the base verb (i.e., when the base verb is reflexivized), its logical subject will be realized as an object. Furthermore, though not indicated by the author but confirmed with native speakers, this agent argument cannot be realized as an oblique:

(168) El director hizo maquillarse a/ *por la cantante.
the director make.pst.3p.sg make-up.inf-se.cl to/ by the singer
 ‘The director had a singer make up herself.’

From the examples above we can summarize two contrasts: first, when the causative verb is reflexivized, the logical subject of the base verb will be realized as an oblique function rather than as an object; second, if the base verb is reflexivized, its logical subject will be realized as an object in place of an oblique. We change (168) to (169) as a contrast with (166) for a better illustration:

4 Towards a new mapping theory

- (169) En Ferran farà pentinar-(se)⁷⁵ (***per**) la Maria.
the Ferran make.fut.3p.sg comb.inf-se.cl by the Maria
 ‘Ferran will have Maria comb herself.’

$$\left[\begin{array}{l} \text{PRED} \quad \text{'cause} < E_1 \ I_2 \ \text{comb} < E_2 \ I_2 >> \text{' } \\ \text{SUBJ} \quad [\text{CASE} \ \text{NOM}]_1 \\ \text{OBJ} \quad [\text{CASE} \ \text{ACC}]_2 \end{array} \right]$$

Two a-structure bindings are involved in (169): the reflexive binding between E_2 and the more embedded I_2 , indicated by the lexical entry of the reflexive morpheme *se*; and the causative binding between the less embedded I_2 and more embedded I_2 , as assumed for the causative construction. The result is that both E_2 and the more embedded I_2 are bound to the less embedded I_2 . Relative argument prominence in this structure is $E_1 > I_2$. The two arguments will receive nominative and accusative cases according to the principle iii) and ii), respectively. Since I_2 is assigned accusative case, it will map onto an object, in place of an oblique, thus explaining why *Maria* in (169) cannot be introduced by *per* ‘by’.

We now explain why *Maria* in (166) is introduced by *per* ‘by’ instead of *a* ‘to’. For a clearer representation, we repeat (166) together with the f-structure of the clause in (170):

- (170) En Ferran es farà pentinar per/ *a la Maria.
the Ferran se.cl make.fut.3p.sg comb.inf by/ to the Maria
 ‘Ferran will have himself combed by Maria.’

$$\left[\begin{array}{l} \text{PRED} \quad \text{'cause} < E_1 \ I_1 \ \text{comb} < E_2 \ I_1 >> \text{' } \\ \text{SUBJ} \quad [\text{CASE} \ \text{NOM}]_1 \\ \text{OBL} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'by} < I > \text{' } \\ \text{OBJ} \quad [\text{PRED} \ \text{'Maria'}] \end{array} \right]_2 \end{array} \right]$$

In the f-structure above, the more embedded I_1 is bound by the less embedded one, which is in turn bound by E_1 . Consequently, both I_1 s map onto the function that E_1 maps onto. So the relative argument prominence in this construction is $E_1 > E_2$. According to the case assignment principle iii), E_1 receives nominative case and maps onto the subject. As none of the principles can be used with E_2 , it will be licensed by the Elsewhere Mapping Principle and optionally map onto an oblique. At this point, we would like to point out that our revision to the case assignment principle ii) does not mean that an external argument cannot be assigned accusative case at all: an external argument may receive accusative case indirectly, by being bound to an argument that is licensed by a case principle, as in (158a) or (169); but it may never be directly assigned accusative case, as in (170).

⁷⁵ In Catalan, when the base verb is reflexivized, the reflexive clitic *se* is usually not expressed, but the base verb still has reflexive meaning.

4.4.3 Summary

This subsection deals with the argument realization in causative constructions. We follow Alsina (1996) in treating causative construction in Catalan (and in Romance languages in general) as a complex predicate with one single argument structure. The composed predicate consists of a causative verb and a base verb, and encompasses a binding relationship between the internal argument of the causative verb (i.e., the *causee*) and an argument of the base verb. The binding relation is assumed to occur when the bound argument is affected by the causative action. The assumption of affectedness can account for the object-oblique alternation of the logical subject of the base verb: if the logical subject of the base verb is affected, it is bound by *causee* and maps onto a direct function; if an argument other than the logical subject of the base verb is affected, the logical subject will map onto an oblique function; if both arguments of the base verb are affected, then logical subject can alternate between an object and an oblique. We have also discussed the incorporation of reflexivization in causative constructions. We follow Alsina (1996) in assuming a “true” reflexive *se*, the lexical entry of which requires the two arguments of reflexivized predicates to be co-indexed and map onto the same function. The reflexivizations of causative and base verbs introduce different argument binding relations into the causative construction. Thus different argument realizations in causative constructions with reflexivization incorporated emerge as a natural consequence of the interaction between reflexive binding and causative binding. Finally, necessary changes are made to the case assignment principles as well as the core argument rule to guarantee the correct argument realization in causative constructions.

4.5 Summary

In this chapter, we have proposed a new mapping theory in which case assignment acts as a linking node between arguments and functions. The theory is a simple one, as it assumes only two argument-to-GF mapping rules, three case assignment principles, and a small set of constraints restricting the grammatical function assignment on the basis of case features and definiteness of the arguments, in addition to morphosyntactic operations such as passivization, causativization, and so on. The subject-object alternation puzzle put forward in Chapter 2 is solved with our case assignment principles and within the OT-LFG framework. An intransitive argument, a patient/theme argument of passivized predicates, as well as a patient/theme argument of *like*-type predicates, may all show subject-object alternation, but are invariably in the nominative case. This alternation is constrained by definiteness: the argument is a subject if it is definite and is an object if it is indefinite. The claim that the argument is a nominative expression explains the observation that it agrees with the verb, even when it is an object, applying a theory of verbal agreement proposed independently of the facts of Catalan.

We have also discussed the effect of morphosyntactic operations on the mapping process. We consider passivization in Catalan to be licensed by two passive morphemes, a passive past participial morpheme, and a reflexive passive *se*, which are assumed to

4 Towards a new mapping theory

suppress the highest argument of the predicate. As for impersonalization, we assume that there is a reflexive impersonal *se* that licenses a *pro* SUBJ in this kind of construction. An implication is that a morpheme can be homonymous and multifunctional, with different lexical entries having different effects on syntactic structures. As for causative constructions in Catalan and in Romance in general, we assume that the construction includes a causative verb and a base verb, which undergo composition to yield a complex predicate with a single argument structure. Improvements have been made regarding case assignment principles and the core argument rule so that arguments are correctly realized.

Chapter 5

Extension of the study

The mapping theory we have proposed in Chapter 4 is in line with the Functional Mapping Theory of Alsina (1996) and the Mapping Theory of Butt (1995) in assuming that argument realization takes place in the syntax, since we consider the argument structure of a predicate to be the PRED value in the f-structure. However, in early stages of LFG – when lexical redundancy rules were made use of – and in subsequent Lexical Mapping Theories, all function assignments and relation changes are assumed to take place in the lexicon, as we have seen in Chapter 3 and 4. Therefore, one implication of LMT concerning languages with expletives⁷⁶ (as in English) is that an expletive must be stipulated in the lexical entry of the predicate.

In this chapter, we aim to present a theory of expletives in English within LFG. We claim that the distribution of expletives follows from general principles and from the lexical entries of relevant expletives. We argue that expletives are not subcategorized for, i.e. verbs do not lexically specify whether they take an expletive or what expletive they take. There are no alternative lexical entries for verbs depending on whether they co-occur with an expletive or not. This chapter is organized as follows: in 5.1, we review current analyses of expletives and point out some problems they may face; in 5.2, we propose our own theory about expletives in English and indicate the implications. We conclude with a brief summary in 5.3.

⁷⁶ By an expletive we refer to a grammatical function with no semantic content.

5.1 Current analyses of expletives

A commonly accepted assumption in LFG is that an expletive GF has to be included in the lexical entry of the predicate that co-occurs with this GF in the clause. For example, Bresnan (1982b) assumes that the lexical entry of *be*, as used in examples like *There is a pig running through the garden*, includes only one thematic argument in its PRED value (i.e., the XCOMP), and has to stipulate that **i**) it takes a SUBJ, **ii**) this SUBJ is an expletive, and **iii**) the form of the expletive is *there*, represented as follows:

- (171) a. *There*: NP_[PRO], (FORM) = there
 b. V, ‘there-be((XCOMP))’, X = P, V, A
 (OBJ) = (XCOMP SUBJ)
 (SUBJ FORM) =_C there
 (SUBJ NUM) = (OBJ NUM)

(Bresnan 1982b:73)

Berman (2003) takes a similar position, proposing that in German constructions in which a non-thematic, non-referential subject *es* appears, the main predicate should be analyzed as subcategorizing for an expletive subject, with a special requirement on the form of the expletive. Namely, the non-thematic subject must be realized as *es* in such constructions:

- (172) ... weil es keine Hoffnung gibt.
because it no hope give.3p.sg
 ‘... because there is no hope.’

(Berman 2003:67)

Therefore, the lexical entry of *geben* ‘give’ in (172) and the requirement on the form of the non-thematic subject is suggested to be represented as follows:

- (173) *Geben*: V (↑ PRED) = ‘give <(↑ OBJ)> (↑ SUBJ)’
 (↑ SUBJ FORM) =_C es

(Berman 2003:67)

An implication of the assumption in current LFG that expletives are lexically selected is that there are two lexical entries for predicates that may take an expletive as their subject. In other words, predicates must have two different lexical entries depending on whether they use an expletive or not. This is the case with Kaplan and Zaenen (1995),⁷⁷ who propose two different lexical entries for *likely*, one with and one without the expletive subject.⁷⁸

⁷⁷ See also Falk (2001) within LFG, or Kim and Sag (2005) within HPSG.

⁷⁸ This is achieved by positing an extraposition rule for “extraposable” lexical entries, which licenses a second lexical entry with a non-thematic subject:

- (i) Extraposition rule:
 a. Extraposable entry:
 (↑ PRED) = ‘R <(↑ SUBJ) ... >’

- (174) a. That Susan will be late is likely.
 likely: (↑ PRED) = ‘likely <(↑ SUBJ)>’
 b. It is likely that Susan will be late.
 likely: (↑ PRED) = ‘likely <(↑ COMP)> (↑ SUBJ)’

Another implication of having expletives lexically specified is that the distribution of expletives does not follow from general principles (such as the Subject Condition), unlike what happens in GB/MP, where it is a direct consequence of the Extended Projection Principle (EPP, Chomsky 1981, 1982, etc.).

Apart from stipulating the presence of an expletive in the lexical entry, current LFG theories also stipulate the specific expletive required, either by means of the feature FORM, which is also present in the lexical entry of the expletive (as in Bresnan 1982b and Berman 2003), or by stipulating the person, number, and gender features in the lexical entry of the predicate, which can only match those of the expletive that the predicate co-occurs with, as in Kaplan and Zaenen (1995):

- (175) It is likely that Susan will be late.
 likely: (↑ PRED) = ‘likely <(↑ COMP)> (↑ SUBJ)’
 (↑ SUBJ PERS) = 3
 (↑ SUBJ NUM) = SG
 (↑ SUBJ GEND) = NEUT
 it: (↑ PERS) = 3
 (↑ NUM) = SG
 (↑ GEND) = NEUT
 ¬ (↑ PRED)

(Kaplan and Zaenen 1995:158)

A consequence for both stipulations is that they do not provide a way to explain the distribution of the expletives *there* and *it*. Namely, in standard modern English, expletive *there* co-occurs with a postverbal NP, while expletive *it* co-occurs with phrases with propositional content, such as infinitival phrases or full clauses:⁷⁹

- (176) a. There/*it are [flowers] in the yard.
 b. It/*there seems [that a new idea is emerging].
 c. It/*there surprised me [that you won the lottery].

-
- b. Lexical entry added:
 (↑ PRED) = ‘R <(↑ COMP) ... > (↑ SUBJ)’
 (↑ SUBJ PERS) = 3
 (↑ SUBJ NUM) = SG
 (↑ SUBJ GEND) = NEUT

(Kaplan and Zaenen 1995:158)

⁷⁹ Expletive *it* was also used in existential constructions in earlier stages of English, and is still used in African American Vernacular English (Louise McNally, p.c., see also McNally 1997).

Moreover, the lexical rule proposed by Kaplan and Zaenen (1995) (see footnote 78) cannot account for constructions that include an object expletive, as in (177):

- (177) a. I resent it greatly that you didn't call me.
 b. I regret it very much that we could not hire Mosconi.

(Postal and Pullum 1988:64)

5.2 Proposal about expletives in English

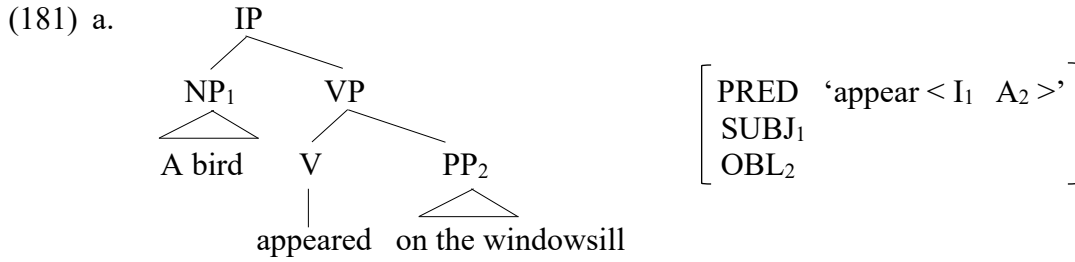
We assume that the distribution of the forms of expletives is regulated by the lexical entries of “expletive *there*” and “propositional *it*” and by independently required conditions, such as the Subject Condition. Verbs like *appear* or *stand* allow their NP argument to be realized alternatively as SUBJ or OBJ, and when the OBJ realization is chosen, the expletive *there* becomes the syntactic SUBJ. This is illustrated by examples in (178) and (179), respectively:

- (178) a. A bird appeared on the windowsill.
 b. There appeared a bird on the windowsill.
 (179) a. A monument stood in the square.
 b. There stood a monument in the square.

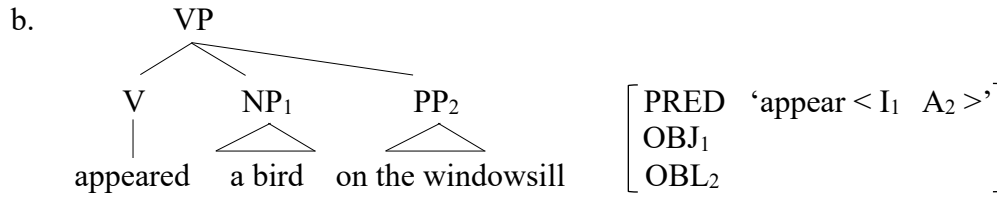
We propose that verbs like *appear* or *stand*, despite having two alternative realizations of their NP argument, have only one lexical entry, with an a-structure consisting of one core argument, as shown in (180) for *appear*. The mapping principles allow a core argument to map onto either SUBJ or OBJ, as assumed for internal arguments in LMT and FMT, and for both external and internal arguments in our mapping theory. Since we assume that the association between arguments and GFs takes place in the f-structure and not in the lexicon, the a-structure in (180) can be used in all the c-structure/f-structure pairs in (181), where the subscripted integers signal the correspondence between arguments, GFs, and c-structure nodes.

- (180) ‘Appear < I A >’⁸⁰

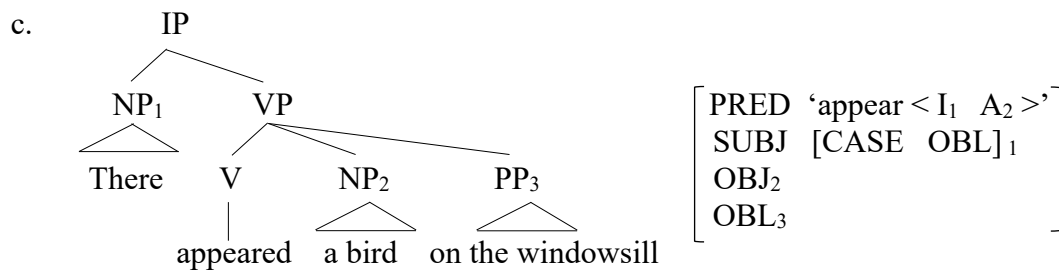
⁸⁰ Here we use *A* to represent the non-core locative argument.



C-structure/f-structure pair of (178a)



Possible c-structure/f-structure pair₁ of (178b)



Possible c-structure/f-structure pair₂ of (178b)

Let us assume the following two well-formedness conditions on f-structures, i.e., the Subject Condition (SUBJCON) and GF Faithfulness (GF-FAITH), stated respectively as:

- (182) Subject Condition (SUBJCON):
Every verbal f-structure must include a subject.

(repeating (102))

- (183) GF Faithfulness (GF-FAITH):
- i) Every direct GF must be lexically required (i.e., required by information, such as the a-structure, or by lexical entries of the elements of the clause)
 - ii) A GF is semantically interpretable iff it has a PRED value.

GF-FAITH is roughly equivalent to the Coherence Condition mentioned in Chapter 3 and replaces the latter condition in the present theory. It is clear that the f-structure in (181a) satisfies both SUBJCON and GF-FAITH, as it contains a subject which maps onto an argument. However, (181b) does not satisfy SUBJCON, as it lacks a subject. Adopting the OT point of view, two rankings of these constraints are possible, listed as follows:

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- (184) a. Ranking 1: SUBJCON » GF-FAITH
 b. Ranking 2: GF-FAITH » SUBJCON

With Ranking 1, we have a language in which every clause must include a subject, even if that incurs a violation of GF-FAITH, as in the case of a structure with an expletive subject that is not lexically required. English is an example of such a language. In contrast, with Ranking 2, we have a language in which expletive subjects are not possible, as every direct GF must be lexically required (typically, an argument in the a-structure), at the cost of violating SUBJCON. Spanish or Catalan is an example of such a language.

As for the lexical entry of expletive *there*, we assume that it merely states that its category is NP and that it maps onto a GF with oblique case.⁸¹

- (185) There: NP₁ [GF₁ [CASE OBL]₁]_n if [OBJ]_n
 where OBJ maps onto an NP

Given this assumption, expletive *there* can only be used when it is required to satisfy SUBJCON, as it violates GF-FAITH for not being lexically required. This includes sentences in which the expletive is in Spec of IP, as in (176a), (178b), and (179b), as well as raising to object constructions, where the expletive is in the object position, rather than in Spec of IP, but satisfies SUBJCON in the complement clause, as in (186a):

- (186) a. Kim believed there to be flowers in the yard.
 b. * Kim believed Ø to be flowers in the yard.

Let us first see (178b), in which the expletive *there* occupies the Spec of IP. There is a difference in information structure between (178a) and (178b), as in such constructions, the OBJ realization of the internal argument is discourse-new, unlike what we find in sentences with the SUBJ realization.⁸² Given this difference in information structure, the c-structure/f-structure pair in (181b) is not in competition with that in (181a), but it is in competition with the one in (181c), where, in addition to the OBJ corresponding to the argument of *appear*, there is a non-thematic SUBJ. The optimization for (178b) is represented in the tableau in (187):

- (187) Optimization for (178b):

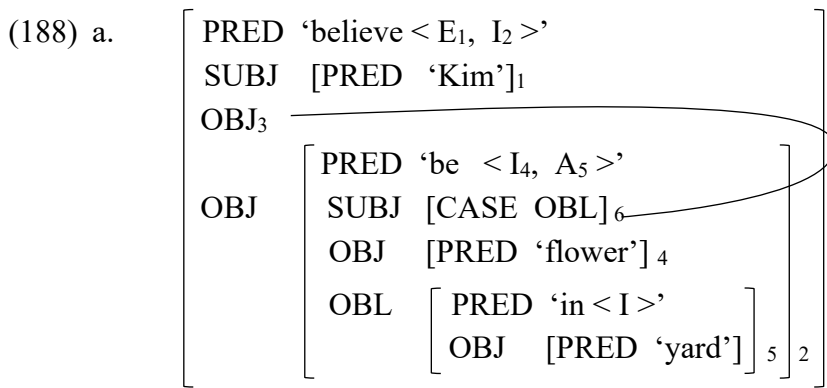
	SUBJCON	GF-FAITH
(181b)	*!	
^{GF} (181c)		*

As the optimization above illustrates, (181c) satisfies SUBJCON and, although it violates GF-FAITH, it is chosen over (181b), resulting in the grammatical sentence with an expletive subject, i.e., *There appeared a bird on the windowsill*.

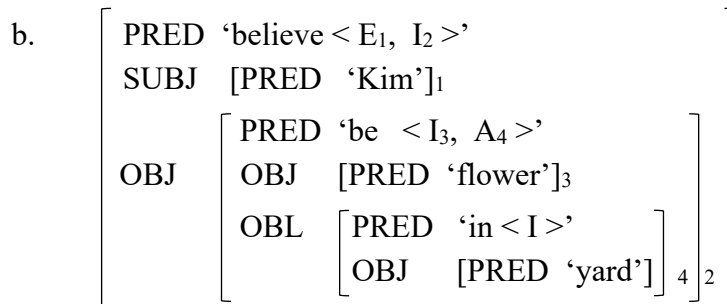
⁸¹ Reference to oblique case in the lexical entry of expletive *there* serves to block verb agreement with the expletive subject, allowing the object to be the agreement trigger, as in Bresnan (1994).

⁸² Huddleston and Pullum (2002:1396-1397).

As for raising to object constructions, such as (186a), it is chosen over (186b) for the following reasons. In consideration of the fact that not every verb taking a non-finite clausal complement will allow raising to object, we assume that raising to object verbs such as *believe* or *expect* specify in their lexical entry (but not in their a-structure) that they take a direct GF that is not an argument of the verb. This non-thematic GF is the one that is structure-shared with the subject of the clausal complement of the raising to object verb. The expletive subject in the embedded f-structure of (186a) satisfies SUBJCON but violates GF-FAITH, because it is not lexically required by *be*. With respect to the raising object in the main clause, it does not violate GF-FAITH, since it is lexically required by *believe*. By contrast, the f-structure of (186b) violates SUBJCON in the embedded clause and GF-FAITH in the main clause, as it does not have an expletive subject in the embedded clause and a raising object in the main clause, respectively. The two f-structures and the optimization are represented as follows:



F-structure of (186a)



F-structure of (186b)

(189) Optimization for (186):

	SUBJCON	GF-FAITH
☞ (188a)		*
(188b)	*!	*

With regard to propositional *it*, the present analysis considers that it is not restricted to satisfy SUBJCON, unlike expletive *there*. Propositional *it* can only occur in sentences with a propositional constituent. One might be tempted to assume that there is a mapping constraint which allows propositional arguments to map onto a non-subject function, thereby vacating a position that can be filled by this expletive (as in Kaplan and Zaenen 1995, also Falk 2001:138). We argue that there are three reasons against this assumption. First, “proposition” is not an a-structure notion: it is not a thematic role, but the semantic content that an argument may have. An argument role can be semantically a “thing” or a “proposition”, among other types:

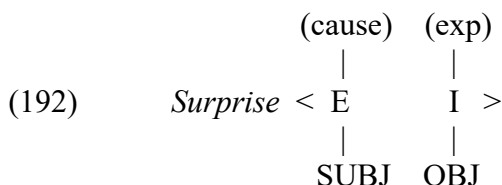
- (190) a. [That you won the lottery] surprised me.
 b. [The result] surprised me.

Thus there should not be two a-structures depending on whether the theme argument of *surprise* is a “thing” or a “proposition”. Likewise, the theme argument of *expect* can also be a thing or a proposition, as in (191), and there should not be two a-structures of *expect* for these two cases. There is just one a-structure with an experiencer and a theme:

- (191) a. Nobody expected [anything] of me.
 b. Nobody expected (it) of you [that you could be so cruel].

(Kim and Sag 2005)

Second, it would be very problematic to assume that there is a mapping principle that allows a propositional argument to map onto a non-subject GF (OBJ, COMP, XCOMP, etc.), overriding general mapping principles (such as the external argument mapping onto the subject in English active transitive clauses). For example, *surprise* is a verb whose a-structure includes a cause, which can be a thing or a proposition, and an experiencer argument, expressed as an object, as (192) illustrates. The canonical mapping to GF is:



If we employed the special propositional mapping rule mentioned, which would allow the propositional *cause* argument to map onto an OBJ/COMP,⁸³ there should be no reason to insert an *it* to fill the SUBJ function, as with *there*, because the *experiencer* argument would be forced to fill the SUBJ, resulting in the ungrammatical **I surprised that you won the lottery*.

Third, as is well known since Postal and Pullum (1988), propositional *it* is not restricted to fill the SUBJ function: it may also be an OBJ, for instance. We repeat examples in (176) and (177) for a better illustration:

- (193) a. I resent it greatly that you didn't call me. [It: OBJ; Proposition: OBJ]

⁸³ There are scholars that suggest eliminating COMP from the inventory of GFs in LFG. See Alsina et. al. (2005), Forst (2006), or Patejuk and Przepiórkowski (2016) for relevant argumentation.

- b. I regret it very much that we could not hire Mosconi. [It: OBJ; Proposition: OBJ]
 c. It surprised me that you won the lottery. [It: SUBJ; Proposition: OBJ]
 d. It seems that a new idea is emerging. [It: SUBJ; Proposition: OBJ]

We thus assume that arguments map onto GFs regardless of their semantic type as things or propositions. In addition, there is a special lexical entry for *it* that allows it to be used in the presence of a non-subject GF with propositional semantics, provided that the former linearly precedes the latter:

(194) Lexical entry of propositional *it*:

$$It: NP_1 \left[\begin{array}{l} GF_1 \left[\begin{array}{l} (PRED \text{ 'pro'}) \\ PERS \ 3 \\ NUM \ SG \end{array} \right]_1 \\ GF_2 \end{array} \right] \quad \begin{array}{l} \text{Semantic Structure} \\ \left[\text{TYPE} \ \text{proposition} \right]_2 \end{array}$$

Such that $NP_1 \gg XP_2$ (NP_1 linearly precedes XP_2), and XP_2 is the c-structure correspondence of GF_2 .

This lexical entry allows *it* to be used in two different situations. On the one hand, it allows any argument that can potentially correspond to a proposition to be expressed by means of *it*, while at the same time licensing a clausal non-subject, which provides the propositional content of the argument. This is the extraposition *it*, which we find in (193a-c). In these examples, *it* is not a true expletive (taking *true expletive* to be a GF that does not map onto a semantic participant), as it maps onto an argument of the predicate. In these cases, there is a GF with propositional content that does not correspond to an argument of the verb, but yet satisfies GF-FAITH, as it is required by the lexical entry of *it*. On the other hand, *it* can also be used in sentences like (193d), in which the verb has a single argument with propositional content that maps onto a non-subject function. Here *it* is a true expletive, as the only argument of *seem* maps onto a non-subject propositional GF, and propositional *it* fills the non-thematic SUBJ function, satisfying the SUBJCON. The optionality of the PRED feature in (194) allows for the possibility of *it* being either a thematic or a non-thematic GF.⁸⁴ The extraposition *it* has the PRED feature and the true expletive *it* does not have the PRED feature, since a GF is semantically interpretable if and only if it has a PRED value, according to GF-FAITH.

Though propositional *it* can bear either the SUBJ function (as in (193c-d)) or the OBJ function (as in (193a-b)), the requirement that expletive *it* linearly precedes the propositional element ensures that the expletive cannot be an object in the presence of a propositional subject, and explains the fact that the extraposed constituent cannot be topicalized, as shown below:

- (195) * [That you won the lottery] surprised me [it].
 (Propositional subject linearly preceding the expletive *it*, cf. (193c))

⁸⁴ See Heycock (2013) for evidence for distinguishing between the true expletive and the argumental expletive status of *it*.

- (196) * [That you won the lottery], [it] surprised me.
 (Topicalized proposition linearly preceding the expletive *it*, cf. also (193c))

The lexical entry in (194) does not restrict the c-structure realization of the propositional complement: it can be a *that*-CP, as in the examples given, or an *if*-CP, a *for-to*-infinitive clause, a *to*-infinitive clause, etc. For example:

- (197) a. It is important to buy a lottery ticket.
 b. It is advisable for there to be a guard on duty.

Last, note that we have not discussed the so-called “weather *it*” or “meteorological *it*”, as in examples like *It is raining today*, which has often been considered as an expletive (see Rothstein 2001, Huddleston and Pullum 2002, etc.). We will not deal with this topic here, given compelling arguments for its non-expletive status (see Bolinger 1973, Krejci 2014, and Levin 2017, etc.). We leave this issue for further study.

5.3 Summary and further discussion

In this chapter, we have proposed a theory in which expletives are not stipulated in the lexical entry of the predicate, but their distribution instead follows from general principles like the Subject Condition and from the lexical entries of the relevant expletives. As a result, there are no expletive insertion rules or lexical rules to generate verbs that select expletives, no alternative lexical entries for verbs depending on whether they have an expletive or not, and no need to stipulate in any way the FORM feature of the expletives. The proposed analysis indicates that there are two kinds of expletives: true, or non-thematic expletives and argumental expletives.

A further implication and strong point implied by our theory about expletives is that constructions without overt expletives do not have expletives in f-structure. This is in contradiction to Berman (1999, 2003, etc.), who proposes that German verbal agreement morphology can introduce an expletive subject without a semantic feature (i.e., containing only person and number information) in the f-structure, in cases where predicates lexically stipulate an expletive non-thematic subject *es*, as in (172),⁸⁵ or in cases where predicates do not subcategorize for a subject, such as verbs with lexically case-marked arguments or impersonal passives. Thus, according to Berman (2003), a verb like *grauen* ‘dread’, which has a dative-marked argument mapping onto an OBJ_θ, will have the f-

⁸⁵ Sells (2005) takes a similar position for Icelandic expletive *það* ‘it’, assuming that *það* lacks a PRED value. In the absence of other clausal SUBJ value sources, the finite verb in its default form will provide the third singular agreement features in order satisfy the Completeness Condition.

structure of the clause as follows, with the person and number feature of the SUBJ provided by the verbal agreement morphology *-t*:

- (198) ... weil mir graut.
because me.dat dread.3p.sg
 ‘...because I’m dreading it.’

$\left[\begin{array}{l} \text{SUBJ} \left[\begin{array}{l} \text{NUM} \quad \text{SG} \\ \text{PERS} \quad 3 \end{array} \right] \\ \text{PRED} \quad \text{‘dread} < (\uparrow \text{OBJ}_\theta) >’ \\ \text{TENSE} \quad \text{PRESENT} \\ \text{OBJ}_\theta \left[\begin{array}{l} \text{PRED} \quad \text{‘pro’} \\ \text{PERS} \quad 1 \\ \text{NUM} \quad \text{SG} \\ \text{CASE} \quad \text{DAT} \end{array} \right] \end{array} \right]$	$-t \quad V_{infl} \quad (\uparrow \text{TENSE}) = \text{PRESENT}$ $(\uparrow \text{SUBJ}) = \downarrow$ $(\downarrow \text{PERS}) = 3$ $(\downarrow \text{NUM}) = \text{SG}$
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(Berman 2003:56-57)

Adapting Zaenen (1989)’s WYSIWYG (i.e. What you see is what you get) Principle, every GF either has a PRED value or is realized in the c-structure. An implication is that there would be no phonologically null expletives. In the case of (198), this means an expletive subject cannot appear in the f-structure if it does not appear in the c-structure. An f-structure without a subject, as we argue, can still be grammatical, as long as it satisfies constraints that rank higher than the SUBJCON, such as WYSIWYG:

- (199) F-structure of (198) according to our analysis:

$\left[\begin{array}{l} \text{PRED} \quad \text{‘dread} < (\uparrow \text{OBJ}_\theta) >’ \\ \text{TENSE} \quad \text{PRESENT} \\ \text{OBJ}_\theta \left[\begin{array}{l} \text{PRED} \quad \text{‘pro’} \\ \text{PERS} \quad 1 \\ \text{NUM} \quad \text{SG} \\ \text{CASE} \quad \text{DAT} \end{array} \right] \end{array} \right]$

In this way, and at least in the case of (198), we have illustrated that LFG has at its disposal the mechanism to “obviate the need for inaudible dummies in favor of a more concrete characterization of the properties of verbal arguments” (Zaenen 1989).

In a nutshell, we are proposing an alternative theory to the current accounts of English expletives in this chapter, a theory that does not rely on multiple lexical entries and stipulation of expletive form. Though our proposal mainly concerns English, it nevertheless casts new perspectives on cross-linguistic accounts of expletives, such as the German example we have discussed in the last few paragraphs.

Chapter 6

Conclusions

This dissertation aims to propose a new mapping theory within the OT-LFG framework in which case assignment plays an active role in the argument-to-GF mapping process. The proposed theory is a simple one, with three case assignment principles, two argument-to-GF mapping rules, and a small set of constraints restricting the GF assignment on the basis of case features and definiteness of the arguments, in addition to morphosyntactic operations such as passivization, causativization, and reflexivization.

Starting from the description of argument realization of intransitive verbs in Catalan, we show that the single direct argument of an intransitive verb alternates between a subject and an object, but is invariably in the nominative case. The claim that the intransitive argument is always nominative explains its agreement with the predicate, even when it is expressed as an object. With argument realization and verbal agreement in intransitive constructions clarified, we turn to argument realization in passive clauses, showing that both periphrastic passive and reflexive passive constructions in Catalan allow the internal argument of a transitive verb to be assigned nominative case and alternate between a subject and an object. We also observe that there is a type of passive-with-*se* construction (i.e., the reflexive impersonal construction) that allows the internal argument of transitive verbs to be expressed as an accusative object, which is analogous to its active counterpart.

Having set out the facts we need to account for, we present the OT-LFG framework within which the dissertation is developed, focusing mainly on current mapping theories. We claim that current LMTs –which generally assume a $[\pm r]/[\pm o]$ feature decomposition system– face two problems with respect to the facts considered in the thesis: the treatment of multiple objects, and the difficulty in accounting for subject-object alternation. First, stipulating that one of the two objects is an OBJ and the other one is OBJ_θ would lead to redundancy in Catalan and other Romance languages, as they can be distinguished by means of the case they bear. We therefore propose that objects uniformly bear the function OBJ, but may be distinguished either in terms of case in languages like Catalan, or in terms of the feature R at a-structure in languages like Chicheŵa. Second, should the featural decomposition be assumed, the mapping of the agent argument to an object will be blocked by its $[-o]$ feature, which goes against the fact that an agent argument can be

expressed as an object in intransitive clauses. On the other hand, the external argument of transitive verbs is constrained to map onto the SUBJ, indicating that a [-o] classification is inadequate for external arguments. We consider the two problems to be a motivation to discard the [$\pm r$]/[$\pm o$] decomposition system, which is at the core of LMTs. As for the FMT proposed by Alsina (1996), it avoids the multiple objects problem but still cannot account for the agentive object problem, since the External Argument Mapping Principle will require the agent argument to map onto the SUBJ. In a nutshell, none of the current mapping theories can give a satisfying explanation to the subject-object alternation puzzle. In addition, case assignment in current mapping theories does not play an active role in the argument-to-GF mapping process. In consideration of all the observations stated above, we suggest using case assignment rules to establish a connection between a-structure and f-structure in our new mapping theory. We have also clarified that the new theory is by no means analogous to the Case theories in transformational frameworks, because in our theory, the so-called “structural cases” (i.e., nominative and accusative cases) are not structurally defined, and functions and cases do not always mutually identify each other. For example, a nominative function is not necessarily a subject: it can be an object as well.

In our mapping theory developed within OT-LFG, the subject-object alternation in intransitive verbs is constrained by definiteness: the argument is a subject if it is definite and is an object if it is indefinite. The claim that verbs agree with a nominative function (either subject or object) is explained by applying a theory of agreement proposed independently of the facts of Catalan, namely, by unifying the AGR bundle that encodes verbal agreement features with the AGR bundle of a nominative GF. We have illustrated our theory with four types of verbs in active form in Catalan (i.e., intransitive verbs, transitive verbs, ditransitive verbs, and *like-type* verbs) and discussed the effect of morphosyntactic operations on the argument-to-GF linking process, such as passivization, impersonalization, causativization, and reflexivization. We argue that there are two passive constructions in Catalan: the periphrastic passive, and the reflexive passive, which are licensed by the passive past participial morpheme and the reflexive passive *se* clitic respectively. Both passive morphemes are assumed to suppress the highest argument of the predicate that they attach to. We also assume two other lexical entries of the clitic *se*: a reflexive impersonal *se*, which licenses the reflexive impersonal construction, and a “true” reflexive *se*, which licenses constructions with a true reflexive or reciprocal reading. The assumption of different lexical entries of *se* implies that a morpheme can be multifunctional and affect syntactic structures in different manners. Finally, we have also discussed causative constructions, assuming that Romance causative constructions are complex predicates composed of a causative verb and a base verb, with one PRED value in the f-structure. Having tested our mapping theory with Catalan causative constructions, we modified our case assignment principles ii) and iii), as well as the Core Argument Rule, so that argument-to-GF linking in causative constructions are correctly achieved.

In the final part of this dissertation, we have discussed theories of expletives in LFG. We argue that argument realization takes place in the syntax, instead of in the lexicon. Should the argument-to-function linking take place in the lexicon, predicates with an expletive function would have to stipulate the expletive in its lexical entry, as current theories concerning expletives assume. We propose a theory with a reduced level of stipulation, in which expletives are not subcategorized for, but their distribution follows from general principles and from lexical entries of the expletives. Consequently, expletive

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insertion rules and stipulations about the FORM features are no longer needed, and predicates do not need to depend on alternative entries to select expletives.

As the concluding remark of the dissertation, we would like to stress that the core idea of our mapping theory is that a core argument maps onto a direct grammatical function. Other principles, rules, and constraints in the theory are language specific. Our theory works with Romance languages such as Catalan or Spanish, with closely resembling case systems. For languages with other case systems and languages lacking a case system, their language-specific mapping rules and constraints need to be further worked out.

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