(C)overt Operators and Verb Inversion in Catalan Absolute Interrogatives

Operadores (implícitos y explícitos) e inversión verbal en interrogativas absolutas en catalán

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Resumen: *Este trabajo se centra en dos aspectos. Primero, explora la variación sintáctica en las interrogativas absolutas en catalán. Las preguntas absolutas en catalán muestran de forma inconsistente operadores interrogativos explícitos o implícitos. Un operador interrogativo explícito es opcional en catalán central mientras que es siempre implícito en el resto de dialectos. Además, las preguntas absolutas no siempre experimentan inversión verbal. En catalán central la inversión verbal ocurre con tal de que el operador explícito esté presente. Por otra parte, la inversión es opcional en el resto de dialectos. Segundo, analiza la variación sintáctica en las interrogativas absolutas en catalán mediante el minimalismo sintáctico, la Teoría de la Optimidad estándar y la Conjunción Local dentro de la Teoría de la Optimidad y concluye que ninguno de estos modelos teóricos ofrece una explicación satisfactoria de los datos.*

Palabras clave: *catalán, sintaxis, operadores interrogativos, minimalismo sintáctico, Teoría de la Optimidad, Conjunción Local.*

Abstract: *The focus of this paper is twofold. First, it explores syntactic variation in Catalan absolute interrogative main clauses. Yes-no questions in Catalan use explicit or implicit interrogative operators inconsistently. An explicit interrogative operator is optional in Central Catalan, but it is always implicit in the rest of Catalan varieties. In addition, absolute questions do not always undergo verb inversion. Verb inversion occurs in Central Catalan as long as the explicit interrogative operator is present. Conversely, inversion is optional in the rest of Catalan varieties. The second focus of this paper is the analysis of syntactic variation in Catalan absolute interrogative sentences using syntactic minimalism, standard Optimality Theory, and Local Conjunction within Optimality Theory, and concludes that none of the models offers a completely satisfactory explanation of the data.*

Keywords: *Catalan, syntax, interrogative operators, syntactic minimalism, Optimality Theory, Local Conjunction.*

1. Introduction

Catalan absolute interrogative main clauses display optional verb inversion, as seen below (the gloss for all the examples in this section is 'Has Miquel left?').

(1) (a) El Miquel ha sortit?
(b) Ha sortit el Miquel?

The examples in (1) are semantically equivalent (Wheeler *et al*., 1999: 486). The example (a), whose verb remains *in situ*, is like its declarative counterpart in displaying canonical SV word order, but is different to declaratives in their syntactic structure (see next section) and intonation patterns (Prieto i Vives, 2002). On the other hand, the example in (1) (b) displays a VS word order.

Another observation regarding Central Catalan yes-no interrogatives is the presence or absence of an explicit interrogative operator: *que* ([kə], Rigau, 1998: 75; Hualde, 1999: 2; Villalba, 2002: 2267).

(2) Que ha sortit el Miquel?

Apart from the presence of an overt interrogative operator, the interrogative in (2) is different from its semantically equivalent interrogatives of (1) in their intonation contours (Prieto i Vives, 2002).

Central Catalan interrogatives obligatorily display inversion when *que* is present. Questions whose verb remains *in situ* are ungrammatical with an explicit interrogative operator, as seen below.

(3) *Que el Miquel ha sortit?

The remaining of this paper examines this asymmetry in Central Catalan absolute interrogatives using different theoretical frameworks —syntactic minimalism, standard Optimality Theory, and Local Conjunction within Optimality Theory—. It is organized as follows. Sections 2 and 3 explore the data using syntactic minimalism (Chomsky, 1995). Section 2 offers an introduction to the analysis of interrogatives using minimalism. Section 3 analyzes the Romance data under minimalist principles. Sections 4 to 6 contend with Optimality Theory (OT, Prince & Smolensky, 1993). Section 4 introduces the apparatus necessary to deal with interrogatives within OT. Section 5 includes a first attempt to analyze the Romance data using standard OT. Section 6 expands the OT analyses with Local Conjunction (LC, Smolensky, 1993) to adequately explain the data. Finally, section 7 summarizes the crucial points investigated in this paper.

2. A minimalist analysis of absolute interrogative sentences

In a recent analysis of English interrogative sentences (Chomsky, 1995, 2008, summarized in Radford, 2009), inverted auxiliaries and interrogative operators are

hypothesized to occupy the head C(omplementizer) position of CP(hrase) and the specifier position of CP, respectively.[1]

An English auxiliary is hypothesized to move from its original position (head T(ense) position of TP) to C in main-clause questions. This movement is concluded to be driven by the affixal characteristic of null complementizers in interrogative main clauses. This affixal C, which is assumed to carry a tense feature [TNS], must be attached to an overt tensed host. Hence, (assuming C cannot lower itself to T) C attracts an auxiliary in T to adjoin to the affix in C, hereby satisfying the requirement imposed by the affix.

For instance, using an example in Radford (2009: 146), The English question *Will you marry me* is generated as follows: the verb *marry* merges with the pronoun *me* to form a VP. This VP is then merged with the tensed auxiliary *will* in T to create an intermediate T′ projection *will marry me*. The TP *you will marry me* is created by merging T′ with the pronoun *you*. The TP is merged with an affixal null interrogative complementizer ø creating a CP. The [TNS] feature in C is deleted after it attracted the auxiliary will to move from T to C. The resulting structure is shown below:

(4) [CP [C′ [T will] [C [~~TNS~~] ø]] [TP [PRN you] [T′ [T ~~will~~] [VP marry me]]]]

An additional feature of C, the edge feature (Chomsky, 2008, outlined in Radford, 2009), is thought to be responsible for wh-movement. Wh-movement or operator movement involves the movement of a wh-operator from TP to Spec-CP in root questions. Chomsky explains that just as T carries an EPP (Extended Projection Principle) feature in finite clauses that requires it to be extended into a TP projection containing a specifier, so too C carries an E(dge) F(eature) requiring it to be extended into a CP with a specifier on the left edge of CP. Since the EP feature requires the left edge of the CP to contain an interrogative expression, Radford *et al*. (1999) conclude that languages such as English are subject to the Interrogative Condition, as defined below.

(5) Interrogative Condition
A clause is interpreted as non-echoic question if (and only if) it is a CP with an interrogative specifier (i.e. a specifier containing an interrogative word).

[1] For simplicity, this paper assumes a basic model of clause structure in which complete clauses are CP+TP+VP structures. Within the unsplit CP analysis, wh-operators are either moved to spec-C or directly generated there. In Rizzi's (1997) split CP analysis (including a Force Phrase, a Topic Phrase and a Focus Phrase) wh-operators would occupy the highest specifier position, spec-Force.

For instance, the derivation of an English root question with both wh-movement and auxiliary inversion like *Who were you phoning?* proceeds as follows (as outlined in Radford 2009: 195): The wh-pronoun *who* merges with the verb *phoning* to form the VP *phoning who*. The VP then merges with the auxiliary *were* to form the intermediate projection T' *were phoning who*, which is merged with the pronoun *you* to form the TP *you were phoning who*. This TP is merged with a null interrogative C carrying an edge feature [EF] and, since it is a main-clause question, a tense feature [TNS]. The tense feature on C attracts the tensed auxiliary *were* to move to C and, thus, attach to a null affixal interrogative complementizer. The edge feature on C drives movement of the interrogative pronoun who to spec-C, resulting in the following structure:

(6) [CP [PRN who] [C′ [C [~~TNS~~, ~~EF~~] were + ø] [TP [PRN you] [T′ [T ~~were~~] [VP [V phoning] [PRN ~~who~~]]]]]]

To satisfy the Interrogative Condition, Radford (2009: 196), following previous research by Katz and Postal (1964), Grimshaw (1997) and Roberts (1993) suggests that English absolute questions contain a null yes-no question particle, in spec-CP not by the result of movement but directly generated there.

Following the derivation of an English absolute question such as *Is it raining?* shows how it contains a null yes-no particle (Radford, 2009: 197). The verb *raining* and the tensed auxiliary *is* are merged together to form the T' is raining. This intermediate projection is merged with the pronoun *it* forming the PT it *is raining*. This TP is merged with a null C with a tense feature and an edge feature. The tense feature attracts the auxiliary in T to C. The edge feature requires an interrogative specifier in spec-C. This requirement is satisfied by merging a null yes-no question particle in spec-C. The resultant structure is seen below:

(7) [CP [ADV ?] [C′ [C [~~TNS~~, ~~EF~~] is + ø] [TP [PRN it] [T′ [T ~~is~~] [V raining]]]]]

Radford uses the symbol '~~whether~~' to represent the yes-no question particle. An alternate symbol '?', not linked to any particular language, is used in this study. Radford justifies ~~whether~~ since *whether* is used in present day English to introduce yes-no questions in reported speech (*'Are you feeling better?' He asked, He asked whether I was feeling better*). Radford explains that '~~whether~~' is justified in English for historical reasons. Radford explains that *whether* was used in Elizabethan English as an overt interrogative particle in yes-no questions and gives the following examples: *Whether had you rather lead mine eyes or eye your master's heels?* (Mrs. Page, *Merry Wives of Windsor*, III.ii), *Whether dost thou profess thyself a knave or a fool?* (Lafeu, *All's Well That Ends Well*, IV.v).

In sum, this section presented an overview of how English interrogatives can be analyzed using a minimalist syntax framework. According to such a model, interrogatives have a covert interrogative operator in spec-C position in the leftmost edge of the main clause. In root questions a copy of the wh-operator moves from TP, whereas the operator is directly generated in spec-C in yes-no questions. Wh-operator movement is hypothesized to be motivated by the presence of an edge feature in C. Verb inversion is theorized to be driven by another feature in C, the tense feature. The next section tests this minimalist syntax model against Romance absolute interrogatives.

3. A minimalist analysis of Catalan absolute interrogatives

This section explores the application of the minimalist model explained above in section 2 to Catalan absolute questions.

Central Catalan displays an unstressed interrogative particle in the leftmost edge of an absolute question. The interrogative particle *que* optionally occurs in Central Catalan interrogatives, as seen next.

(8) (a) Que ha sortit el Miquel?
[CP [ADV que][C' [C ha sortit][TP el Miquel ~~ha sortit~~]]]

(b) Ha sortit el Miquel?
[CP [ADV ?][C' [C ha sortit][TP el Miquel ~~ha sortit~~]]]

In other words, the feature [TNS] is present in Central Catalan complementizers, thus attracting the tensed verb to C. Additionally, verb inversion is obligatory when *que* is present, but it is optional when *que* is not present, as seen here.

(9) (a) *Que el Miquel ha sortit?
[CP [ADV que][C' [C ø][TP el Miquel ha sortit]]]

(b) El Miquel ha sortit?
[CP [ADV ?][C' [C ø][TP el Miquel ha sortit]]]

In sum, Central Catalan yes-no interrogative main clauses display complementizers with an edge feature, forcing an interrogative operator (overt or covert) to surface in the leftmost edge of the clause. On the other hand, absolute interrogative main clauses show complementizers with or without the tense feature, thus allowing interrogative sentences with or without verb inversion. However, absolute interrogative main clauses whose complementizers contain overt

interrogative particles and the absence of the tense feature are ungrammatical. The minimalist model outlined above fails to account for this asymmetry.

(10)

		[EF]	[TNS]	*Qu e*	?
	Que ha sortit el Miquel? (Central Catalan)	+	+	+	-
*	*Que el Miquel ha sortit?*	+	-	+	-
	El Miquel ha sortit? (all dialects)	+	-	-	+
	Ha sortit el Miquel? (all dialects)	+	+	-	+

In sum, this section has evaluated a minimalist syntactic analysis Catalan yes-no questions. In the minimalist model considered in this study and outlined in section 1, the interaction between two features in C (an obligatory edge feature and an optional tense feature) produce absolute interrogatives with or without verb inversion. First, due to the Interrogative Condition, main-clause interrogatives obligatorily have an interrogative operator in spec-C. This interrogative operator is claimed in this section to be either overt or covert in Romance. Second, optional verb inversion motivates the use of a traditional "strong-weak" metaphor. Strong complementizers attract a tensed verb to move to C. This movement is described to be driven by the requirement attached to a tense feature in C. On the other hand, languages that do not show verb inversion in interrogatives are concluded to lack the tense feature in C. The model outlined in section 1 and summarized here fails to predict why Central Catalan interrogatives with an overt particle obligatorily have to display verbal inversion. In an effort to overcome this shortcoming, the next sections analyze the Catalan data under scrutiny using Optimality Theory.

4. An OT analysis of absolute interrogative sentences

Grimshaw's (1997) influential work offers an OT analysis on, among other issues, verbal inversion in English interrogatives. According to Grimshaw (1997: 374), there are three key universal violable constraints responsible for verbal inversion, namely STAY, OP-SPEC, and OB-HD.

(11) (a) STAY (ECONOMY OF MOVEMENT):
Trace is not allowed.
(b) OP-SPEC (OPERATOR IN SPECIFIER):
Syntactic operators must be in specifier position.
(c) OB-HD (OBLIGATORY HEADS):
A projection has a head.

Grimshaw argues the OP-SPEC captures the analysis that wh-operators are required to be in a specifier position, motivating an additional projection (CP). The movement of wh-operators is required by OP-SPEC, at the cost of minimally violating Stay. On the other hand, this new projection is headless, thus violating OB-HD. Head movement (verb inversion) provides the head for CP, thus satisfying OB-HD, but violating Stay. In declarative sentences, CP is missing altogether, thus there is no need to move anything to satisfy OB-HD. The previously defined constraints are put to the test in the following tableaux (the examples used come from Grimshaw (1997: 377), as well as the constraint ranking, but the bracketed analysis —based on Radford's notation used above— and the tableau are mine).

(12)

		OP-SPEC	OB-HD	STAY
☞ 1.	[CP [DP which books][C' [C will] [TP they ~~will~~ read ~~which books~~]]]			*
2.	[CP [DP which books][C' [C ø] [TP they will read ~~which books~~]]]		*!	*
3.	[TP they will read which books]	*!		

In the previous tableau, candidate 3 displays an *in situ* interrogative expression that does not comply with highly ranked OP-SPEC, which requires wh-operators to move to Spec-C. Candidate 2 does not display verbal movement to C, thus violating OB-HD, a constraint that disallows headless projections. The winner, candidate 1, displays both wh-operator and auxiliary movement, in compliance with highly ranked OP-SPEC and OB-HD, but necessarily violating STAY, the anti-movement constraint. In the next tableau, declarative sentences are analyzed using the previous constraint ranking.

(13)

		OP-SPEC	OB-HD	STAY
☞ 1.	[TP they will read some books]			
2.	[CP [C' [C will][TP they ~~will~~ read some books]]]			*!

Here we see how declarative sentences are considered TPs (IPs in Grimshaw's terminology) and, thus, there is no extra projection CP. Candidate 1 wins as nothing moves anywhere (since there is nowhere for anything to move to). Candidate 2, displaying a CP and an auxiliary verb moving to C to satisfy OB-HD, fails to emerge since it critically violates STAY.

This section has reviewed three key constraints proposed by Grimshaw (1997) that are responsible for verb inversion and wh-operator raising in English interrogatives. The next section explores the interaction of these constraints to account for absolute interrogatives and proposes additional analyses to deal with Catalan yes-no questions.

5. An OT analysis of Catalan yes-no questions

The different hierarchical arrangement of Grimshaw's (1997) three key constraints outlined above produce three rankings capable of dealing with three different scenarios related to verb inversion: mandatory inversion, no inversion, and optional inversion. First, mandatory inversion is secured by the following ranking: OP-SPEC, OB-HD >> STAY. As required by OB-HD, verbal inversion is necessary to fill C, even at the cost of violating low ranked STAY. Highly ranked OP-SPEC is satisfied by the interrogative operator directly generated in Spec-C. Second, the following constraint ranking ensures no inversion is possible: OP-SPEC, STAY >> OB-HD. Highly ranked OP-SPEC is satisfied by the interrogative operator directly generated in Spec-C. The lack of verb inversion, encouraged by highly ranked STAY, prevents C to be filled, which necessarily violates OB-HD. Third, the next ranking ensures that inversion be optional: OP-SPEC >> OB-HD, STAY. OB-HD and STAY are not ranked against one another, allowing both candidates with and without verb inversion to surface.

(14) (a) OP-SPEC, OB-HD >> STAY (Inversion)
(b) OP-SPEC, STAY >> OB-HD (No inversion)
(c) OP-SPEC >> OB-HD, STAY (Optional inversion)

The second ranking outlined above in (14) (b), requiring verbs to remain *in situ*, is not relevant for this study. As seen previously, Catalan absolute interrogatives require inversion be optional. The relevant ranking to deal with optional verbal inversion is the third option outlined above in (14) (c) Next, this ranking is put to the test through the analysis of Catalan interrogatives.

(15)

		OP-SPEC	OB-HD	STAY
☞ 1.	[CP [ADV ?][C' [C ha sortit][TP el Miquel ~~ha sortit~~]]]			*
2.	[CP [ADV ?][C' [C ø][TP el Miquel ha sortit]]]		*	
3.	[CP [ADV ø][C' [C ?][TP el Miquel ha sortit]]]	*!		

Candidate 3, which complies with OB-HD by filling C with the interrogative operator, is ungrammatical since the operator is not in Spec-C, thus violating highly ranked OP-SPEC. Candidates 1 and 2 comply with OP-SPEC because the interrogative operator is in the position required by the constraint. The verb in candidate 1 moves to C, complying with OB-HD but violating STAY. The opposite happens with candidate 2. The verb fails to fill C by staying in TP, violating OB-HD but complying with STAY. Since the two constraints, OB-HD and STAY, are not ranked with one another, their violations are equally crucial. Therefore, the first two candidates surface.

Another Romance language, Gascon, is an example of the first ranking seen above in (14) (a), requiring obligatory verb inversion. In Gascon, absolute interrogative sentences are built with an explicit interrogative particle *e* ([e]), with a VS word order: *E vòu viéner Pèir?* 'Does Pèir want to come?' (Morin, 2005: 61).[2]

(16)

		OP-SPEC	OB-HD	STAY
☞ 1.	[CP [ADV e][C' [C vòu viéner][TP Pèir ~~vòu viéner~~]]]			*

[2] The explicit interrogative word is phonetically unpronounced when the verb starts with a vowel: *(*E) Ets maridat (tú)?* (Campos, 1992: 13. Gloss: 'Are you married?'). It is assumed here that *e* is erased due to prosodic well-formedness constraints. Namely, the hiatus *e*+V in Gascon is disallowed, even at the cost of erasing a segment (*e*) originally present in the input. Using very familiar optimality theoretical violable constraints, MAX-IO (a faithfulness constraint penalizing input segment deletion) is outranked by ONSET (a markedness constraints that requires syllables have onsets) and DEP-IO (a faithfulness constraint militating against segment epenthesis to break the hiatus).

2.	[CP [ADV e][C' [C ø][TP Pèir vòu viéner]]]		*!	
3.	[CP [ADV ø][C' [C e][TP Pèir vòu viéner]]]	*!		

Candidate 1 displays verb inversion, thus violating STAY. However, this violation is minimal since inversion (subsequently filling C) makes the winning candidate comply with higher ranked OB-HD. Conversely, candidate 2, which displays lack of movement but an unfilled C, is ungrammatical. Highly ranked OP-SPEC would ban candidates with the interrogative operator *e* in a position other than Spec-C. Candidate 3 complies with OB-HD by filling C. However, it fills C with an interrogative operator *e*, which is required by OP-SPEC to be in Spec-C.

It is necessary to expand the OT analysis seen so far to account for the presence or absence of (c)overt interrogatives operators. Three options are possible: explicit operators only (Gascon), implicit and explicit operators (Central Catalan), and implicit operators only (the rest of Catalan varieties). Next, the three options are explored and analyzed using OT.

First, as just seen, Gascon obligatorily exhibits an explicit interrogative operator *e*. The obligatory overt operator in Gascon is not tackled in the previous analysis. An ungrammatical candidate * [CP [ADV ?][C' [C vòu viéner][TP Pèir ~~vòu viéner~~]]] is mistakenly selected by the previous tableau. This extra candidate would incur in the same violations as the grammatical candidate 1: both obey OB-HD and minimally violate STAY once. Similarly, both candidates comply with OP-SPEC: candidate 1 displays an overt operator *e* and the extra candidate shows a covert operator '?'. Two more constraints are needed to account for the nature of the interrogative operator. First, EXP-OP requires interrogative operators to have a phonetic realization. Second, FULL-INT rejects semantically empty items.

(17) (a) FULL-INT (FULL INTERPRETATION (Grimshaw, 1997: 374):
Lexical conceptual structure is parsed
(b) EXP-OP (EXPRESS OPERATORS):
Syntactic operators are phonetically realized.

EXP-OP must outrank FULL-INT to account for the observation that only an overt interrogative operator is present in Gascon.[3]

[3] EXP-OP is outranked by ONSET, thus guaranteeing the deletion of *e* before a vowel (see the previous footnote).

(18)

		EXP-OP	FULL-INT
☞ 1.	[CP [ADV e][C' [C…		*
2.	[CP [ADV ?][C' [C…	*!	

A semantically empty (but phonetically full) operator in the winning candidate 1 complies with highly ranked EXP-OP, but minimally violates low ranked FULL-INT. The losing candidate does not have any semantically empty lexical items, thus complying with Full-Int. However, it fatally violates the constraint that bans covert operators, EXP-OP.

Second, this ranking is reversed in the majority of dialects of Catalan, where no explicit interrogative operators are attested.

(19)

		FULL-INT	EXP-OP
☞ 1.	[CP [ADV ?][C' [C…		*
2.	[CP [ADV que][C' [C…	*!	

The semantically empty explicit operator *que* in candidate 2 fatally violates highly ranked FULL-INT. Candidates showing the winning implicit operator '?' complies with FULL-INT, at the cost of minimally violating EXP-OP.

The last possible combination of the two constraints in (17) is that they are not ranked with one another, which guarantees that the presence of the overt interrogative operator be optional. This is the case of Central Catalan, as seen in the next tableau.

(20)

		FULL-INT	EXP-OP
☞ 1.	[CP [ADV ?][C' [C…		*
☞ 2.	[CP [ADV que][C' [C…	*	

Both candidates incur in one violation of either constraint, which allows them to surface.

Back to verb inversion, as mentioned before, it is optional in Catalan. The striking fact about this dialect is that inversion is optional if and only if the interrogative operator is implicit. For the sake of clarity, relevant examples are repeated next.

(21) (a) El Miquel ha sortit?
[CP [ADV ?][C' [C ø][TP el Miquel ha sortit]]]
(b) Ha sortit el Miquel?
[CP [ADV ?][C' [C ha sortit][TP el Miquel ~~ha sortit~~]]]

Central Catalan interrogatives obligatorily display inversion when *que* is present, as seen in the examples below.

(22) (a) Que ha sortit el Miquel?
[CP [ADV que][C' [C ha sortit][TP el Miquel ~~ha sortit~~]]]
(b) *Que el Miquel ha sortit?
[CP [ADV que][C' [C ø][TP el Miquel ha sortit]]]

The analysis outlined so far does not account for the asymmetry in Central Catalan. As seen before, the ranking OP-SPEC >> OB-HD, STAY, which requires that inversion be optional, does not distinguish between candidates with an overt or a covert operator and predicts the emergence of both candidates with and without verb inversion, including the ungrammatical candidate listed above in (22) (b).

The next section will be devoted to exploring a possible expansion of the OT analysis outlined so far to attempt to adequately deal with the asymmetry in Catalan just described in this section.

6. Local Conjunction in Central Catalan yes-no interrogatives

The purpose of this section is to offer an analysis of Central Catalan absolute interrogatives using Local Conjunction within OT.

In Local Conjunction (LC, Smolensky (1993), summarized in Kager (1999)) two constraints are joined together in a single complex constraint. This complex constraint is violated if and only if both of its components are violated within a specific domain. For instance, a constraint 1 (C_1) and a constraint 2 (C_2) form a composite constraint $[C_1 \& C_2]_\delta$. This complex constraint is violated if and only if C_1 and C_2 are violated in a domain δ. C_1 and C_2, as separate individual constraints are not replaced by $[C_1 \& C_2]_\delta$, but are separately ranked, normally under the composite constraint. Consider the following tableau in which the composite constraint outranks the individual constraints —modified from Kager (1999: 393)—.

(23)

		$[C_1 \& C_2]_\delta$	C_1	C_2
☞ 1.	Candidate			
2.	Candidate	*	*	*
3.	Candidate		*	
4.	Candidate			*

This tableau shows all possible combinations of violations of C_1, C_2 and the composite constraint $[C_1 \& C_2]_\delta$. Candidate 1 shows no violations of any of the individual constraints and, therefore, no violations of the complex constraint. Candidate 2 displays violations of C_1 and C_2, which necessarily imply the violation of $[C_1 \& C_2]_\delta$. Lastly, candidates 3 and 4 show one violation of C_1 and C_2, respectively, which is not enough to constitute a violation of $[C_1 \& C_2]_\delta$.

LC has been used to deal with chain shifts, a kind of counterfeeding opacity. A chain shift happens when sounds are promoted or demoted in stepwise along some scale in some context: A → B, B → C, but not *A → C ("A occupies the original position of B, B moves to where C was, etc." Kager 1999: 393).

An example of chain shift is the case of Western Basque —Kirchner (1996), summarized in Kager (1999: 393-395)—. In this language, mid vowels and high vowels that precede another vowel are raised by one degree.

(24)

			Indefinite	Definite	Gloss
(a)	Mid to high	e → i	*seme bat*	*semie*	'son'
		o → u	*asto bat*	*astue*	'donkey'
(b)	High to raised	i → i^j	*erri bet*	*erri^{j}e*	'village'
		u → u^w	*buru bet*	*buru^{w}e*	'head'

Using serial rules, two counterfeeding rules raise high and mid vowels, as seen below:

(25)

/seme-a/	/erri-a/	Input
---	erri^{j}a	High vowel raising
semia	---	Mid vowel raising
[semie]	[erri^{j}e]	Output

A standard OT analysis of the data needs the following constraints:

(26) (a) HIATUS-RAISING:
In V_1 V_2, maximize height of V_1

(b) IDENT-IO (high):
If an input segment is [αhigh], then its output correspondent is [αhigh]

(c) IDENT-IO (raised):
If an input segment is [αraised], then its output correspondent is [αraised]

Hiatus-Raising must outrank the two faithfulness constraints to ensure that raising occurs, as seen in the next tableaux.

(27)

	HIATUS-RAISING	IDENT-IO (high)	IDENT-IO (raised)
1.1 e → e	*!*		
☞ 1.2 e → i	*	*	
2.1 i → i	*!		
☞ 2.2 i → i^j			*

Candidate 1.1, showing two mid vowels, displays two violations of HIATUS-RAISING, which makes it worse than 1.2, which only has one mid vowel and, thus, violates the same constraint only once. Candidate 2.1 has two high vowels, but no raising. This fact makes it not as harmonic as its counterpart 2.2.

With the addition of a third candidate [i^j] to the tableau of /e/, this ranking wrongfully predicts the emergence of the candidate that is raised two steps, not one (as indicated by a sad face '☹').

(28)

	HIATUS-RAISING	IDENT-IO (high)	IDENT-IO (raised)
1.1 e → e	*!*		
1.2 e → i	*	*	
☹ 1.3 e → i^j		*	*

This ranking alone cannot prevent mid vowels to go directly to raised. According to Kager, the change e → iʲ involves the violation of the two faithfulness constraints, whereas the changes involving one step incur in the violation of one faithfulness constraint. Therefore, the joining of the two faithfulness constraints together into a composite constraint is needed. This composite constraint needs to outrank HIATUS-RAISING to guarantee vowel raising be a one-step process, as seen in the tableaux below.

(29)

		[IDENT-IO (high) & IDENT-IO (raised)]ᵟ	HIATUS - RAISING	IDENT-IO (high)	IDENT-IO (raised)
1.1	e → e		**!		
☞ 1.2	e → i		*	*	
1.3	e → iʲ	*!		*	*
2.1	i → e		**!	*	
2.2	i → i		*!		
☞ 2.3	i → iʲ				*

Candidate 1.3, which displays a two-step raising, violates the two faithfulness constraints and, thus, fails the evaluation of the composite constraint. On the other hand, candidate 2.3, showing a one-step raising, is successful since it only violates IDENT-IO (raised).

Despite its successful implementation to explain chain shifts, Kager (1999: 400) lists a series of drawbacks of LC. First, it adds extra machinery to the theory. By accepting LC as a valid OT mechanism, minimal violation of constraints is not enough to deal with excessive violation of faithfulness constraints. Second, LC undermines strict domination, another core principle of OT. Under strict domination, violation of a higher ranked constraint is not compensated by the satisfaction of a lower ranked constraint. This is because, under LC, two constraints, ranked too low to force the violation of a third constraint, can join forces in a complex constraint against a third constraint. Finally, LC allows a huge increase of possible constraints, which affects learnability negatively.

This section claims that Central Catalan absolute interrogatives can be examined under LC. However, typical chain shifts and the Romance case under scrutiny in this paper are different in, at least, two ways. First, chain shifts involve sounds and the focus of this paper is sentences. Second, in chain shifts sounds are promoted or demoted stepwise along some scale in some context: A → B, B → C, but not * A → C. In the Romance case studied here, a type of sentence A does not

reoccupy the position left vacant by B, which itself occupies C, etc. Nevertheless, the following discussion proves LC can adequately deal with the Catalan data studied in this paper.

Standard OT cannot adequately deal with the Cental Catalan data analyzed above. Under the constraint ranking OP-SPEC >> OB-HD, STAY, EX-OP, FULL-INT, which allows interrogatives with optional verb inversion and optional overt interrogative operator, ungrammatical Central Catalan interrogatives arise (as indicated by a sad face '☹').

(30)

		OP-SPEC	OB-HD	STAY	EX-OP	FULL-
☞ 1.	[CP [ADV ?][C' [C ha sortit][TP el Miquel ~~ha sortit~~]]]			*	*	
☞ 2.	[CP [ADV ?][C' [C ø][TP el Miquel ha sortit]]]		*		*	
☞ 3.	[CP [ADV que][C' [C ha sortit][TP el Miquel ~~ha sortit~~]]]			*		*
☹ 4.	[CP [ADV que][C' [C ø][TP el Miquel ha sortit]]]		*			*

In this tableau, every candidate has a total of two minimal violations of any of the four markedness constraints unranked with one another. The ranking in the previous tableau allows interrogatives with an optional overt interrogative word and optional verb inversion. There is no possible ranking that bans the ungrammatical candidate 4. Candidate 2, displaying a covert interrogative word and no verb inversion, is allowed. The same ranking guarantees the emergence of ungrammatical candidate 4, a candidate that shows an overt interrogative word and no verb inversion. In sum, the ranking in the previous tableau alone is not enough to account for the ungrammaticality of unwanted candidate 4. The following discussion focuses on an LC analysis of Central Catalan absolute interrogatives.

Looking at the tableau above, the ungrammatical candidate 4 (*[CP [ADV que][C' [C ø][TP el Miquel ha sortit]]]) displays the verb *in situ*, which leaves C unfilled, thus violating OB-HD. Candidate 4 also exhibits the overt interrogative word *que*, thus violating FULL-INT. To capture the generalization that Central Catalan interrogatives with an overt interrogative word are incompatible with *in situ* verbs, a composite constraint [OB-HD & FULL-INT]$_{\delta}$ is needed. The domain δ in which the composite

constraint functions is yes-no interrogatives. In the next tableau, highly ranked [OB-HD & FULL-INT]$_\delta$ outranks the individual constraints OB-HD and FULL-INT, disallowing *[$_{CP}$ [$_{ADV}$ que][$_{C'}$ [$_{C}$ ø][$_{TP}$ el Miquel ha sortit]]] to surface.

(31)

		OP-SPEC	[OB-HD & FULL-INT]$_\delta$	OB-HD	STAY	EX-OP	FULL-
☞ 1.	[$_{CP}$ [$_{ADV}$?][$_{C'}$ [$_{C}$ ha sortit][$_{TP}$ el Miquel ~~ha sortit~~]]]				*	*	
☞ 2.	[$_{CP}$ [$_{ADV}$?][$_{C'}$ [$_{C}$ ø][$_{TP}$ el Miquel ha sortit]]]			*		*	
☞ 3.	[$_{CP}$ [$_{ADV}$ que][$_{C'}$ [$_{C}$ ha sortit][$_{TP}$ el Miquel ~~ha sortit~~]]]				*		*
4.	[$_{CP}$ [$_{ADV}$ que][$_{C'}$ [$_{C}$ ø][$_{TP}$ el Miquel ha sortit]]]		*!	*			*

Here, ungrammatical candidate 4 is the only one that violates OB-HD and FULL-INT, which makes it the only one violating the highly ranked composite constraint [OB-HD & FULL-INT]$_\delta$.

In sum, the ranking used under standard OT (OP-SPEC >> OB-HD, STAY, EX-OP, FULL-INT) allows all interrogatives with optional verb inversion and optional overt interrogative operator to arise and it is not capable of disallowing Central Catalan ungrammatical candidates, which display an explicit interrogative operator and no verb inversion. LC, although originally driven by phonological chain shifts, successfully tackles the ungrammatical interrogatives by joining two markedness constraints together into a composite constraint. The observation that explicit interrogative operators (which violate FULL-INT) are incompatible with empty complementizers (thus violating OB-HD) is formalized with a complex constraint [OB-HD & FULL-INT]$_\delta$.

Despite its successful implementation to explain the data, the drawbacks of LC cannot be ignored. As mentioned before, LC adds extra machinery to the theory and it undermines strict domination (core principles of OT). LC also allows a huge increase of possible constraints. In this case, the composite constraint [OB-HD & FULL-INT]$_\delta$ is successful in explaining the asymmetry in Central Catalan absolute interrogatives, but it is somewhat *ad hoc*, since it is a language-specific constraint stipulated to account for a particular phenomenon. This language-specificity

violates one of the core properties of OT constraints: their universality, a principle that assumes that all constraints are part of the grammar of all languages.

7. Summary of conclusions

This paper examined absolute interrogatives in Central Catalan and evaluated them using syntactic minimalism, standard Optimality Theory, and Local Conjunction within OT. These are the main conclusions.

First, with optionality of verb inversion, the presence of an overt interrogative operator did not yield the four different grammatical examples (overt operator+verb inversion, overt operator+verb *in situ*, covert operator+verb inversion, covert operator+verb *in situ*), but three. Central Catalan interrogatives obligatorily displayed inversion when *que* was present.

Second, a minimalist syntactic model was outlined and put to the test against Central Catalan absolute questions. The interaction between two features in C (an obligatory edge feature and an optional tense feature) produced absolute interrogatives with or without verb inversion. Due to the Interrogative Condition, main-clause interrogatives obligatorily have an interrogative operator in spec-C. This interrogative operator was claimed to be either overt or covert in Catalan. Optional verb inversion motivated the use of a traditional "strong-weak" metaphor. Strong complementizers attracted a tensed verb to move to C. This movement was described to be driven by the requirement attached to a tense feature in C. On the other hand, languages that do not show verb inversion in interrogatives were concluded to lack the tense feature in C. The syntactic minimalist model was proven to be unsatisfactory, since it failed to explain why Central Catalan interrogatives with an overt particle obligatorily have to display verbal inversion.

A third conclusion is that standard OT alone did not account for the asymmetry in Central Catalan yes-no questions. The ranking used under standard OT (OP-SPEC >> OB-HD, STAY, EX-OP, FULL-INT) allowed all interrogatives with optional verb inversion and optional overt interrogative operator to arise, including ungrammatical candidates.

Finally, LC, although originally driven by phonological chain shifts, successfully tackled the ungrammatical Central Catalan interrogatives. The observation that the explicit interrogative operator *que* (which violate FULL-INT) was incompatible with an empty complementizer (thus violating OB-HD) was formalized with a complex constraint [OB-HD & FULL-INT]$_{\delta}$. Despite its successful implementation to explain the data, LC was concluded to be somewhat unsatisfactory. The composite constraint was stipulated to solve a specific problem in a specific language, thus violating the universal quality of OT constraints.

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