A Compositional Semantics for Free Choice Constituent Unconditionals[1]

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Abstract. The realization of unconditionals is subject to variation across different languages (Haspelmath and König, 1998). In this paper, we zoom in on European French, and propose a unified analysis of two types of constituent unconditionals (CUs) in the language. On the syntactic side, we propose that in both types of CUs, the adjunct clause always contains a FCI, but this FCI can be partially elided. On the semantic side, we propose a fully compositional analysis of these two types of CUs. We further derive the characteristic properties of CUs (Haspelmath and König, 1998; Rawlins, 2013) from exhaustification (Chierchia, 2013: a.o.) and the principle of viability (Dayal, 2013), which have been argued to play a crucial role in the semantics of FCIs. Our approach is thus closely related to recent work on alternative unconditionals in Hungarian (Szabolcsi, 2019) and free choice in Romance (Caponigro and Fălăuş, 2018), and contrasts with previous work on English, where the CU adjunct clause is analyzed as a *wh*-question (Rawlins, 2013).

Keywords: Unconditionals, Free Choice, French, exhaustification, viability.

1. Introduction

There is considerable cross-linguistic variation in the realization of constituent unconditionals (CUs) (Haspelmath and König, 1998; Quer and Vicente, 2009; Balusu, 2019; Šimík, 2019; Szabolcsi, 2019). In this contribution, we focus on European French (henceforth, 'French'), where the adjunct clause can be headed by a bare-looking *wh* (1a) or a *wh que ce soit* free choice item (FCI) (1b).[2] For ease of presentation, we will call the relevant CUs 'short' and 'long'.[3] As far as we know, there is no discernible difference in meaning between long and short CUs.

[1]Our names appear in alphabetical order. We would like to thank Anamaria Fălăuş and the audiences of the New York Philosophy of Language Workshop, Sinn und Bedeutung 24, the Synsem seminar in Nantes, and CSSP 2019 in Paris for discussion and insightful comments. We would also like to thank Juliette Angot, Léna Baunaz, Adélie Crépin, Paloma Jeretič, Chloé Odet, Mélanie Claire Peak, Louise Raynaud, and Johan Rooryck for sharing their judgments with us at various points of this project. All mistakes are our own.

[2]Like English *any*, French *wh que ce soit* items are both FCIs and negative polarity items.

[3]In this paper, we do not discuss constructions that only involve a copular relative clause in the adjunct clause (i) or constructions that contain a pronoun in the main clause (ii). Although similar on the surface and intuitively related in meaning, these constructions have different syntactic and semantic properties than the examples in (1), suggesting that a distinct analysis may be needed. We leave constructions like (i) and (ii) for future investigation.

(i) [*ad junct* *Quelle que soit sa décision*], [*main* *Lou sera contente.*]
which REL is.SBJ her decision Lou is.FUT happy
'Whichever decision they make, Lou will be happy.'

(ii) [*ad junct* *Quoi que Zoé cuisine*], [*main* *c'est excellent.*]
what REL Zoé cooks.SBJ it-is excellent
'Whatever Zoé cooks, it is excellent.'

(1) a. [***Quoi*** *que Zoé cuisine*]$_{CU-adjunct}$, [Short]
what REL Zoé cooks.SBJ

Lou sera contente.
Lou is.FUT happy

b. [***Quoi que ce soit*** *que Zoé cuisine*]$_{CU-adjunct}$, [Long]
what REL it is.SBJ REL Zoé cooks.SBJ

Lou sera contente.
Lou is.FUT happy

'Whatever Zoé cooks, Lou will be happy.'

The first goal of our contribution is to provide a unified syntactic analysis of short and long CUs. In previous work, the existence of short and long CUs has been noticed, but no tenable unified analysis has been proposed. For example, Corblin (2010) proposes that long CU adjuncts are formed by moving a *wh*-word in two steps, as in (2).[4] While Corblin does not discuss the analysis of short CUs, one may assume that their adjuncts simply lack the second, higher movement step under Corblin's account.

(2) [$_{CP}$ quoi$_i$ [que [$_{TP}$ ce soit [t_i [que Zoé cuisine t_i]]]]]

There is a major issue with this approach, however: in (2), there is no constituent corresponding to the FCI *quoi que ce soit*, but as we show in this paper, there is independent evidence showing that long CU adjuncts do contain such FCIs. This in turn raises the question of whether a unified analysis of short and long CUs – especially with respect to the elements they contain – is possible. In this paper, we argue that it is.

The second goal of our contribution is to provide a fully compositional semantic analysis of short and long CUs in French. We show in detail that French CUs cannot be accounted for using the question-based analysis of CUs proposed by Rawlins (2013). For Rawlins, English CU adjuncts are underlyingly *wh*-questions, which means that they denote sets of propositions (3a). Under this analysis, CUs are built composing each adjunct-contained alternative pointwise with the modalized main clause. This produces a set of conditionals (one conditional per adjunct-contained alternative), which then undergoes universal closure at the top (3b). Rawlins therefore formalizes the long-standing intuition that unconditionals denote conjunctions of conditionals (Haspelmath and König, 1998).

(3) [Whatever Zoé cooks]$_{CU-adjunct}$, Lou will be happy

a. $[\![$Whatever Zoé cooks$]\!] = \{$Zoé cooks a, Zoé cooks b, ... $\}$
b. $[\![$Whatever Zoé cooks, Lou will be happy$]\!]$
$= \{$If Zoé cooks a, Lou will be happy $\wedge$ If Zoé cooks b, Lou will be happy $\wedge$ ... $\}$

[4]Noe that Corblin (2010) actually takes the relative clause *que Zoé cuisine* to attach at the level of S (i.e., TP). However, given that the relative clause contains the trace of the moved *wh*-phrase, we let it directly modify the *wh*-phrase in (2).

Whether they are French or English, CUs are characterized by (at least) two core interpretational properties: consequent entailment and speaker ignorance. On Rawlins' account, consequent entailment is closely tied to the use of *wh*-semantics, and especially the Q(uestion)-operator. To illustrate, consider (3). It is clear that the use of (3) presupposes that Zoé cooks something, i.e., (3) has an existential presupposition.[5] For Rawlins, this presupposition comes from the semantics of the Q-operator.[6] Now, given that some alternative in (3a) is presupposed to be true, the CU as a whole entails the consequent, i.e., that Zoé will be happy.[7] Consequent entailment is a core semantic property of CUs, and as such, any semantic account of CUs – whether or not it uses question semantics – must deliver it.

The second core semantic property, namely, speaker ignorance, is not directly linked to question semantics under Rawlins' analysis. This property is illustrated in (4), where the infelicitous *namely*-phrase specifies the identity of the entity that is being cooked (see Dayal, 1997).[8] Rawlins proposes that in English, speaker ignorance is due to the presence of *-ever*, which also appears in many *wh-ever* free relatives, and *wh-ever* questions.

(4) Whatever Zoé cooks – #namely, tomato soup – Lou will be happy.

Thus, as we argue that short and long CUs in French cannot be accounted for using a question-based analysis, we must provide an alternative explanation of the forementioned core interpretational properties of CUs. We do this by assuming that both types of CUs we consider involve the relativization of a FCI, and this FCI is partly elided in short CUs. Under our analysis, speaker ignorance and consequent entailment follow from the semantics of free choice, or more specifically, exhaustification (Chierchia, 2013: a.o.) and the principle of viability (Dayal, 2013). Given our reliance on free choice semantics, our approach is closely related to recent work on unconditionals in Hungarian (Szabolcsi, 2019) and free choice phenomena in Romance (Caponigro and Fălăuş, 2018).

This paper is organized as follows. We begin in section 2 by presenting a number of arguments against adopting a question-based analysis of French CUs, and in favour of an analysis involving FCIs. We then propose a syntactic and semantic analysis of long and short CU adjuncts in section 3. In section 4, we show how the viability condition on the licensing of FCIs is responsible for speaker ignorance in French CUs. Section 5 shows how the adjunct clause composes with the main clause, and how viability is also responsible for consequent entailment under our analysis. Section 6 concludes.

[5]Rawlins refers to this presupposition as *exhaustivity*, as it dictates that the adjunct clause alternatives exhaustively cover the space of possibilities, which means that they cannot all be false.

[6]On Rawlins' account, the Q-operator also gives rise to an *exclusivity* presupposition whereby the adjunct clause alternatives cannot overlap, meaning that they cannot be true at the same time. Our data indicates that exclusivity does not play a role in French CUs, but due to lack of space, we must leave the discussion of the issue for future work.

[7]Any of the adjunct-alternatives is just as good an option as the other ones, and the truth of the consequent does not depend on which adjunct clause alternative is true in the end ('relative indifference' in Rawlins, 2013).

[8]Speaker ignorance is obligatory in episodic CUs, which is what we will focus on in this contribution. See Rawlins (2013) and Szabolcsi (2019) for a discussion on how non-episodicity affects speaker ignorance in unconditionals.

2. Arguments for the involvement of FCIs in French CUs

In this section, we present a number of arguments for the involvement of free choice and FCIs in French CUs. On the one hand, these arguments serve as the foundation on which we build our analysis of French CUs. On the other hand, they also serve as arguments against a potential alternative analysis of French CUs as involving *wh*-questions (Rawlins, 2013).

2.1. Matching paradigm gaps

The first argument for the involvement of FCIs and not *wh*-phrases in French CU adjuncts comes from an interesting match in paradigm gaps. Specifically, only those *wh*-phrases that appear in *wh que ce soit* FCIs appear in short and long CUs. For example, (5) shows that *où* can appear in both a FCI and CU, and (6) shows that *quand* can appear in neither. Table 1 illustrates the matching paradigm gaps for all French *wh*-phrases.

(5) a. *Zoé peut cuisiner* [***où*** *que ce soit*]. [FCI]
Zoé can cook.INF where REL it is.SBJ
'Zoé can cook anywhere.'

b. ***Où*** *(que ce soit) que Zoé cuisine, ...* [CU]
where REL it is.SBJ REL Zoé cooks.SBJ
'Wherever Zoé cooks, ...'

(6) a. **Zoé peut cuisiner* [***quand*** *que ce soit*]. [FCI]
Zoé can cook.INF when REL it is.SBJ
Int. 'Zoé can cook anytime/whenever.'

b. ****Quand*** *(que ce soit) que Zoé cuisine, ...* [CU]
when REL it is.SBJ REL Zoé cooks.SBJ
Int. 'Whenever Zoé cooks, ...'

Wh-word	FCI ___ *que ce soit*	Short or long CU ___ *(que ce soit) que...*
quoi 'what'	✓	✓
qui 'who'	✓	✓
où 'where'	✓	✓
quand 'when'	*	*
comment 'how'	*	*
pourquoi 'why'	*	*
combien 'how much'	*	*

Table 1: Matching paradigm gaps in *wh que ce soit* FCIs and short/long CUs in French

Under our proposal, the ungrammaticality of the FCIs – whatever its reason – explains the ungrammaticality of the corresponding CUs, which lends support to a FCI-based analysis of

CUs. In contrast, a question-based analysis would need additional assumptions to account for the data, given that *quand*, *comment*, *pourquoi* and *combien* form *wh*-questions in French (data not shown). These *wh*-phrases would thus be expected to be able to form at least short CU adjuncts, contrary to fact.

2.2. Modification by *d'autre* and *diable*

The second argument for the non-involvement of questions and in favor of the involvement of FCIs comes from the modifiers *d'autre* 'else' and *diable* lit. 'devil', of which the latter plays the role of *the hell* in French. To begin, note that French allows *d'autre* and *diable* to directly attach to a fronted *wh*-phrase in *wh*-questions.

(7) a. ***Qui*** { ***d'autre / diable*** } *as-tu vu?* [WH]
who of-other devil have-you seen
'Who else have you seen?' or 'Who the hell have you seen?'

b. *De* ***quoi*** { ***d'autre / diable*** } *as-tu besoin?* [WH]
of what of-other devil have-you need
'What else do you need?' or 'What the hell do you need?'

Let us first consider *d'autre*. In contrast to *wh*-phrases in *wh*-questions, *d'autre* cannot modify the *wh*-part of a FCI directly (8a), and must instead appear at the very end of the FCI (8b).

(8) a. **Tu peux manger* [***quoi d'autre*** *que ce soit*], *mais pas ça.* [FCI]
you can eat.INF what of-other REL it is.SBJ but not that

b. *Tu peux manger* [***quoi*** *que ce soit* ***d'autre***], *mais pas ça.* [FCI]
you can eat.INF what REL it is.SBJ of-other but not that
'You can eat anything else, but not that.'

Crucially, both short and long CU adjuncts pattern like FCIs, and not like *wh*-questions, with respect to *d'autre* (9). The question-based analysis leaves the unacceptability of short CUs with *d'autre* unexplained (9a).

(9) a.* ***Quoi d'autre*** *(que ce soit) que tu cuisines, ...* [CU]
what of-other REL it is.SBJ REL you cook.SBJ

b. ***Quoi*** *que ce soit* ***d'autre*** *que tu cuisines, ...* [CU]
what REL it is.SBJ of-other REL you cook.SBJ
'Whatever else you cook, ...'

Now, moving to *diable*, it should be noted first that *diable* is restricted to appearing in *wh*-questions in French. Thus, under a question-based analysis of CUs, *diable* should be just as acceptable in CUs as it is in (7). This is not the case – not even in short CUs – as (10) shows.

(10) a. * ***Qui diable*** *(que ce soit) que Zoé ait vu, ...*
who devil REL it is.SBJ REL Zoé have.SBJ seen
Int. 'Whatever the hell Zoe has seen, ...'

b. * ***Qui*** *que ce soit* ***diable*** *que Zoé ait vu, ...*
what REL it is.SBJ devil REL Zoé have.SBJ seen
Int. 'Whatever the hell Zoe has seen, ...'

Thus, data from modification by *d'autre* and *diable* support a FCI-based analysis of French CUs, and not a question-based analysis.

2.3. Speaker ignorance and indifference

The third argument for the involvement of FCIs in French CUs comes from the fact that FCIs and CUs give rise to the same modal inferences. First, like FCIs in argument position (11a), short and long CUs require speaker ignorance (11b), as shown by the *namely*-test (Dayal 1997):

(11) a. *#J'utiliserai* ***quoi que ce soit*** *qu'on ait* [FCI]
I-use.FUT what REL it is.SBJ REL-we have.SBJ
*dans la cave – **à savoir** une pince coupante.*
in the basement namely a wire cutter
'To fix the sink, I will use what we have in the basement (#namely, a wire cutter).'

b. ***#Quoi (que ce soit)*** *qu'on ait dans la cave,* [CU]
what REL it is.SBJ REL-we have.SBJ in the basement
*– **à savoir** une pince coupante – je pourrai réparer l'évier.*
namely a wire cutter I can.FUT fix the-sink
'Whatever we have in the basement (#namely, a wire cutter), I will be able to fix the sink.'

In addition to speaker ignorance, FCIs and CUs are similar in that they may both be accompanied by an indifference inference. This inference pertains to the agent's indifference with respect to the identity of the entity (von Fintel, 2000; Condoravdi, 2015). Normally, this type of inference can be probed by adding a phrase like *as it happens*. However, given that both FCIs and CUs come with obligatory speaker ignorance in examples such as (11), and *as it happens* and equivalent test phrases are incompatible with speaker ignorance, it is not possible to bring out the indifference inference with this test in French, as shown by the infelicity of (12).

(12) a. *#J'ai sélectionné* ***qui que ce soit*** *que Zoé* [FCI]
I-have chosen who REL it is.SBJ REL Zoé
*ait nominé – **en l'occurrence**, Emma.*
has.SBJ nominated in this case Emma
'I selected whoever Zoe nominated – #Emma, as it happens.'

b. #***Qui (que ce soit)*** *que j'aie sélectionné,* [CU]
who REL it is.SBJ REL I-have.SBJ chosen

– ***en l'occurrence***, *Emma – Lou était ravie.*
in this case Emma Lou is.PAST happy

'Whoever I selected – #Emma, as it happens – Lou was happy.'

In sum, the modal inference data form another argument for grouping FCIs and CUs together.

2.4. Other FCIs in CUs

As the final piece of evidence for the presence of FCIs in French CU adjuncts, we show that two other types of FCIs may also occur in CU adjuncts: an example with a *n'importe wh* FCI is given in (13), and an example with a *quelque N que ce soit* FCI is given in (14).[9] A pure question-based analysis does not predict the appearance of FCIs in CUs.

(13) a. *Zoé peut cuisiner* [***n'importe quoi***]. [FCI]
Zoé can cook.INF NE-matters what
'Zoé can cook anything.'

b. ***N'importe quoi*** *que Zoé cuisine, ...* [CU]
NE-matters what REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'

(14) a. *Zoé peut cuisiner* [***quelque plat*** *que ce soit*]. [FCI]
Zoé can cook.SBJ some dish REL it is.SBJ
'Zoé can cook any dish.'

b. ***Quelque plat*** *(que ce soit) que Zoé cuisine, ...* [CU]
some dish REL it is.SBJ REL Zoé cooks.SBJ
'Whichever dish Zoé cooks, ...'

In conclusion, in section 2, we have provided different types of evidence for our claim that French CUs involve FCIs, and are not formed from *wh*-questions (Rawlins, 2013). In addition, we have shown that short and long CUs behave alike in many respects, which calls for a unified analysis of the two types of CUs.

3. Syntax and semantics of CU adjunct clauses

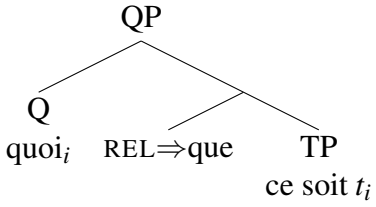
In this section, we begin by providing a unified syntactic analysis of short and long CUs. We then give a fully compositional semantics for CU adjunct clauses.

[9]Muller (2006) notes the appearance of *n'importe wh* FCIs in CUs, but not *quelque N que ce soit* FCIs.

3.1. Structure of CU adjunct clauses

We propose that the syntax of French CU adjunct clauses involves a double relativization process. First, we form a FCI by relativizing a *wh*-word from inside a copular clause. In (15), this *wh*-word is *quoi*, and the result is a *quoi que ce soit* FCI.[10]

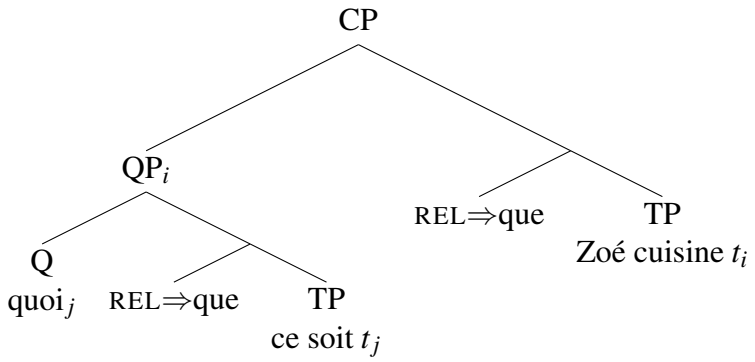
(15)



Then, this FCI is itself relativized, and ends up heading the CU adjuct clause. On this analysis, the CU adjunct in (16a) has the structure in (16b).

(16) a. *Quoi que ce soit que Zoé cuisine, ...*
what REL it is.SBJ REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'

b.



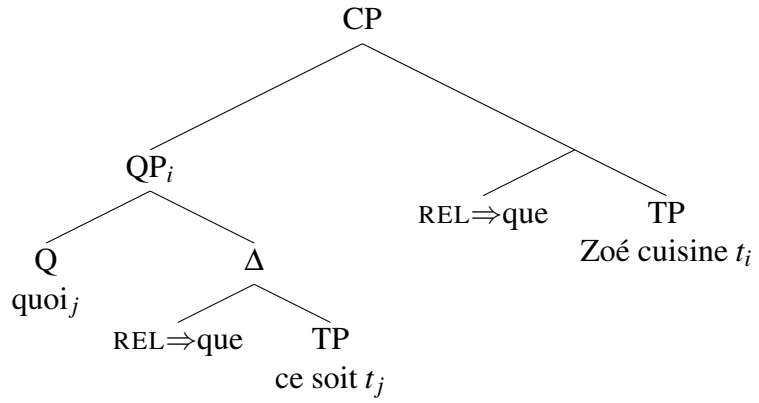
Having argued in Section 2 that both short and long CUs involve FCIs, we now propose a unified syntactic analysis of these two constructions. Specifically, we claim that the structure of both short and long CU adjunct clauses involve the relativization of a *wh que ce soit* FCI, as in (16). The difference between short and long CUs is due to ellipsis: short CU adjuncts are short, because the whole *que ce soit* relative clause (RC) has been elided. As an illustration, (17b) shows the structure of the short CU adjunct in (17a). Δ marks the RC that is elided.[11]

[10] At this point, we do not provide any independent arguments for our analysis of *wh que ce soit* FCIs, as that is not the main goal of our contribution. Crucially, our analysis of CU adjunct clauses remains the same regardless of whether the inner syntax of the FCI involves relativization. We leave it for further work to determine whether the presented analysis of *wh que ce soit* FCIs is correct.

[11] For a detailed explanation and arguments in favor of this syntactic analysis, we refer the reader to Gonzalez and Lohiniva (2019).

(17) a. *Quoi que Zoé cuisine, ...*
what REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'

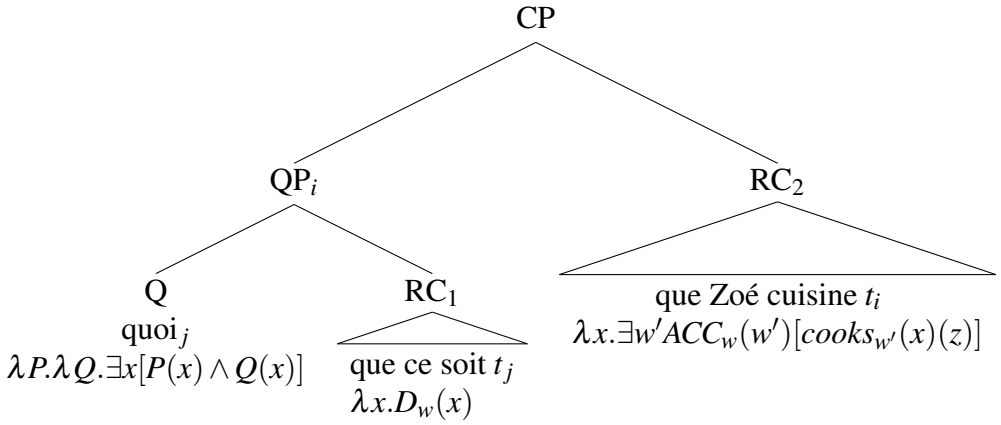
b.



3.2. Composition of CU adjunct clauses

We propose a transparent mapping between the syntax and semantics of CU adjunct clauses. In a nutshell, we claim that the *wh* is an existential generalized quantifier that combines with two RCs, as shown in (18). RC$_1$ (*que ce soit*) provides the quantificational domain of the *wh*. The *wh que ce soit* FCI then combines with the subjunctive RC$_2$, which contains a covert epistemic modal (Quer 1998, Chierchia 2013, Dayal 2013).

(18)



We detail the composition of each RC as well as the composition of the whole adjunct clause in the next sections.

3.2.1. Composition of RC$_1$

The first RC in (18) is a copular structure that contains the pronoun *ce* ('it, that') and the subjunctive copula *soit*. The question is, what type of copular clause are we dealing with? Higgins (1979) recognizes four types of copular clauses: predicational, specificational, equative, and

identificational. The class of specificational copular clauses (19a) has been argued to also contain truncated clefts (19b), in which the subject is a pronoun (*it* or *that*) (Mikkelsen, 2007). Building on the clear parallel between truncated clefts and the structure of RC_1, we propose that RC_1 is also a specificational copular clause with a pronominal subject.

(19) a. The best runner is Zoé. [Specificational copular clause]
b. It is Zoé. [Truncated cleft]
c. *Qui*$_i$ [$_{RC_1}$ *que ce soit* t_i] ... [RC_1]
who REL it is.SBJ

For Mikkelsen, the subject pronoun in truncated clefts is a property anaphor (type <e,t>). Just like any other pronoun, it must find its antecedent either in the linguistic context (20a) or the non-linguistic context (20b). In (20a), *it* is anaphoric to the set of people who make the best pies, and in (20b) to the set of people who are on the other side of the street.

(20) a. A: Who makes the best pies?
B: It is Zoé.
b. *Looking at someone on the other side of the street:*
That might be Zoé.

(21) shows that within CUs, *ce* can also find its antecedent (here, the set of things that Zoé could be cooking) in the linguistic context (21a) or the non-linguistic context (21b).

(21) a. A: What is Zoé cooking?
B: *Quoi que ce soit qu'elle cuisine, ...*
what REL it is.SBJ REL-she cooks.SBJ
'Whatever she cooks, ...'
b. *Smelling an odor coming from the kitchen:*
Quoi que ce soit qu'elle cuisine, ...
what REL it is.SBJ REL-she cooks.SBJ
'Whatever she cooks, ...'

Thus, following Mikkelsen (2007), we analyze *ce* in RC_1 as a property anaphor. We modelize this property extensionally as $\lambda x.D_w(x)$, where the set denoted by D is context-dependent. As a result, we obtain (22) as the meaning of the FCI *wh que ce soit* in our CU adjunct.

(22) a. [$_{FCI}$ *Quoi*$_i$ [$_{RC_1}$ *que ce soit* t_i]]...
what REL it is.SBJ
b. $[\![\text{(22a)}]\!] = \lambda Q.\exists x[D_w(x) \wedge Q(x)]$

3.2.2. Composition of RC_2

Just like other FCIs, *wh que ce soit* FCIs appear in a limited set of environments (Muller 2006, Vlachou 2007, Corblin 2010). For instance, they can occur in modal contexts (23a), but are usually not licensed in episodic statements (23b). To occur in episodic statements, they have to be modified by a RC (LeGrand 1975, Dayal 1998, a.o.), as shown in (23c). These episodic contexts in which FCIs are licensed have been called *subtrigging* environments.

(23) a. *Zoé peut lire quoi que ce soit.*
Zoé can read what REL it is.SBJ
'Zoe can read anything.'

b. **Zoé a lu quoi que ce soit.*
Zoé has read what REL it is.SBJ

c. *Zoé a lu quoi que ce soit qui puisse être pertinent.*
Zoé has read what REL it is.SBJ REL can.SBJ be relevant
'Zoe had read anything that could be relevant.'

In many Romance languages, the RCs modifying FCIs in subtrigging environments have to occur in the subjunctive mood.[12] This is illustrated in (24) for Catalan: when the RC modifying the FCI *qualsevol* is in the indicative mood, the sentence is ill-formed (24a), but when the RC is in the subjunctive mood, the FCI *qualsevol* is licensed, and the sentence is well-formed (24b).

(24) Catalan (Quer 2000):

a. **Van felicitar qualsevol voluntari que* ***havia*** *participat en l'operació de rescat.*
AUX to.congratulate any volunteer that have.IND participated in the.operation of rescue

b. *Van felicitar qualsevol voluntari que* ***hagués*** *participat en l'operació de rescat.*
AUX to.congratulate any volunteer that have.SBJ participated in the.operation of rescue
'They congratulated any volunteer that had taken part in the rescue operation.'

Similarly, in French CUs, the verb in RC_2 has to be in the subjunctive mood. (25) shows that the CU adjunct clause is not well-formed when it occurs in the indicative mood.

[12] See Quer (1998, 2000) on Catalan, and Chierchia (2013) on Italian.

(25) a. * *Quoi que ce soit que Zoé **fait**, ...*
what REL it is.SBJ REL Zoé does.IND
b. *Quoi que ce soit que Zoé **fasse**, ...*
what REL it is.SBJ REL Zoé does.SBJ
'Whatever Zoé does, ... '

The use of the subjunctive mood in subtrigging environments has been tied to the presence of a covert modal in the RC (Quer, 1998, 2000; Dayal, 2009; Chierchia, 2013).[13] We follow Dayal (2013) in assuming that the relevant modal is a covert epistemic possibility modal quantifying over worlds that are compatible with the speaker's beliefs. We thus obtain (26b) as the meaning of RC_2. Composing (26b) with the meaning of the FCI *quoi que ce soit* in (26c), we obtain (26d) as the meaning of the whole adjunct clause.

(26) a. $[_{CU-adjunct}$ [*Quoi*$_j$ $[_{RC_1}$ *que ce soit* t_j]]$_i$ $[_{RC_2}$ *que Zoé cuisine* t_i]], ...
what REL it is.SBJ REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'
b. $[\![\text{RC}_2]\!] = \lambda y.\exists w' \in ACC_w(w')[cooks_{w'}(y)(z)]$
c. $[\![$ Quoi$_j$ $[_{RC_1}$ que ce soit t_j] $]\!] = \lambda Q.\exists x[D_w(x) \wedge Q(x)]$
d. $[\![(26a)]\!] = \exists x[D_w(x) \wedge \exists w' \in ACC_w(w')\ [cooks_{w'}(x)(z)]]$

3.2.3. Exhaustification within the adjunct clause

We adopt an alternative-based approach to free choice (Chierchia 2006, Fox 2007 Chierchia 2013, Dayal 2013, a.o.). On this view, FCIs are existentials that obligatorily activate alternatives, and some FCIs like *any* and *wh que ce soit* acquire a universal interpretation through recursive exhaustification. In this section, we show how this is achieved.

First, an FCI like *any* has the same denotation as a plain indefinite (27a), but it also activates a set of domain alternatives (ALT) (27b). These alternatives consist of subsets of the relevant quantificational domain.

(27) a. $[\![any]\!] = \lambda P_{<e,t>}.\lambda Q_{<e,t>}.\exists x \in D[P(x) \wedge Q(x)]$
b. ALT: $\{\lambda P_{<e,t>}.\lambda Q_{<e,t>}.\exists x \in D'[P(x) \wedge Q(x)], D' \subseteq D\}$

[13] The astute reader may have noticed that just like the verb in RC_2, the verb in RC_1 appears in the subjunctive mood. (i) shows that if the latter were in the indicative mood, the sentence would be ill-formed.

(i) * *Quoi que c'**est** que Zoé fasse, ...*
what REL it-is.IND REL Zoé does.SBJ

For now, we tentatively propose that the modal establishes a syntactic relationship with any verbs below it, leading to SBJ-marking (e.g., Oikonomou, 2016). On this view, RC_1 contains a subjunctive verb because it is base-generated inside RC_2 which contains a modal.

Any active alternatives must be factored into meaning. One way to do this is by inserting the exhaustification operator EXH, akin to silent *only*, defined in (28). Given a sentence ϕ and a set of alternatives ALT of ϕ, $EXH\ \phi$ asserts the conjunction of ϕ and the negations of all alternatives that are not entailed by the assertion.

(28) $[\![EXH]\!]^{g,w}(\phi) = \phi_w \wedge \forall p \in ALT(\phi)\ [p_w \rightarrow \phi \subseteq p]$

As mentioned above, with FCIs like *wh que ce soit*, exhaustification is recursive. First, the alternatives are themselves exhaustified through a process that is often called pre-exhaustification (Fox, 2007; Chierchia, 2013). The pre-exhaustified alternatives are then combined with the basic meaning via a second round of exhaustification. To illustrate, consider the CU adjunct clause in (29) and its basic meaning in (29a). For ease of presentation, we assume that D contains only two members, a and b. Given the connection between existential quantification and disjunction, the logical translation in (29a) can be rewritten as in (29b) using a disjunction.

(29) *Quoi que ce soit que Zoé cuisine, ...*
what REL it is.SBJ REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'

a. $\exists x[D_w(x) \wedge \exists w' \in ACC_w(w')\ [cooks_{w'}(x)(z)]]$
b. Let $D_w = \{a, b\}$.
$[\![(29a)]\!] = [D_w(a) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(a)(z)]] \vee$
$[D_w(b) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(b)(z)]]$

The set of alternatives of a disjunctive statement contains each individual disjunct (Sauerland, 2004). Therefore, each disjunct in (29b) is an alternative of the assertion, as shown in (30). To refer back to these alternatives, we will use the abbreviations A and B.

(30) Alternatives for (29b):

a. $A = [D_w(a) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(a)(z)]]$
b. $B = [D_w(b) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(b)(z)]]$

As previously mentioned, these alternatives have to be pre-exhaustified. This means that they are both conjoined with the negation of all other (non-entailed) alternatives, as shown in (31).

(31) Pre-exhaustified set of ALT for (29b):

a. $[D_w(a) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(a)(z)]] \wedge \neg[D_w(b) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(b)(z)]]$
$= A \wedge \neg B$
b. $[D_w(b) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(b)(z)]] \wedge \neg[D_w(a) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(a)(z)]]$
$= B \wedge \neg A$

Then, because (29b) entails neither of the alternatives in (31), the second round of exhaustification conjoins the assertion with the negations of both pre-exhaustified alternatives (32).

(32) Applying EXH to a pre-exhaustified set of ALT:
$EXH([A \vee B]) = [A \vee B] \wedge \neg[A \wedge \neg B] \wedge \neg[B \wedge \neg A] = A \wedge B$

As the conjunction of the two alternatives $A \wedge B$ is equivalent to a universal statement, we derive the FC implicature in (33b) for the CU adjunct clause in (33a).

(33) a. *Quoi que ce soit que Zoé cuisine, ...*
what REL it is.SBJ REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'

b. $\forall x[D_w(x) \rightarrow \exists w' \in ACC_w(w')[cooks_{w'}(x)(z)]]$
(For all x, if x is in D at w, then there is a world w' that is epistemically accessible from w where Zoe cooks x.)

Of course, one crucial piece of meaning is still missing from (33b): for (33a) to be felicitously uttered, Zoé has to cook something in the actual world. As things stand, (33b) does not guarantee that. At this point, we simply propose that the missing piece comes from an existential presupposition triggered by the *wh* or the FCI as a whole, and leave the closer investigation of this presupposition for future work. We deem this choice justified due to the fact that contrary to Rawlins (2013), our account of consequent entailment does not rely on the existential presupposition, but on the semantics of free choice, as we will show in section 5.2.

4. Viability and ignorance

In this section, we argue that a semantic condition on the licensing of FCIs known as viability is responsible for speaker ignorance in CUs.

4.1. Viability constraint

As mentioned in section 3.2.2, FCIs (including *wh que ce soit*) have a restricted distribution: they can occur in modal contexts, and are only licensed in episodic statements when subtrigged. Dayal (2013) argues that the restricted distribution of FCIs can be captured by assuming that a FCI is licensed only if its pre-exhaustified alternatives are viable (34).

(34) a. An alternative A is *viable* iff there exists a model M, a world w, and a conversational background $g(w)$ such that A is true at w w.r.t to some (non-empty) subset of $\cap g(w)$.

b. *Viability constraint:* A FCI is licensed in a sentence ϕ iff all of the pre-exhaustified alternatives of ϕ are viable.

To illustrate how the viability constraint affects the licensing of *wh que ce soit* FCIs in CUs, consider again the adjunct clause in (35), its basic meaning in (35a), its pre-exhaustified alternatives in (35b,) and the FC implicature it gives rise to in (35c).

(35) *Quoi que ce soit que Zoé cuisine, ...*
what REL it is.SBJ REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'

a. $\exists x[D_w(x) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(x)(z)]]$ [Basic meaning]
b. $A' = A \wedge \neg B$ [Pre-exhaustified alternatives]
$B' = B \wedge \neg A$
c. $\forall x[D_w(x) \rightarrow \exists w' \in ACC_w(w')[cooks_{w'}(x)(z)]]$ [FC implicature]
d. M_1: $\cap g(w) = \{w_1, w_2\}$; $\forall w\ D_w = \{a, b\}$
$Zoe.cooks = \{\langle w_1, \{a\}\rangle, \langle w_2, \{b\}\rangle\}$

$$w_1 \longrightarrow \{a\}$$

$$w_2 \longrightarrow \{b\}$$

Figure 1: Model M_1

In model M_1 (35d), the assertion in (35a) is true and every pre-exhaustified alternative in (35b) is false. That is, M_1 is a model in which the FC implicature given in (35c) arises. In addition, the pre-exhaustified alternatives A' and B' are both viable in M_1: there is a subset of $\cap g(w)$ that makes $[A' = A \wedge \neg B]$ true, namely, $\{w_1\}$, and there is a subset of $\cap g(w)$ that makes $[B' = B \wedge \neg A]$ true, namely, $\{w_2\}$. Given that both A' and B' are viable, the viability constraint in (34b) is satisfied. Thus, the FCI is licensed in the CU-adjunct clause in (35).

Next, we show how speaker ignorance in CUs follows from Viability.

4.2. Speaker ignorance

As discussed in sections 1 and 2.3, a core interpretational property of CUs is that they require speaker ignorance. For example, a speaker who utters (36) does not know whether Zoé will cook a or b. We propose that the viability constraint in (34) is responsible for this inference. To show that this is the case, let us assume to the contrary that the speaker knows that Zoé will cook a and b. Given that $\cap g(w)$ only contains worlds compatible with speaker beliefs at w_0, our new model M_2 (36b) only contains worlds where Zoé cooks a and b.

(36) *Quoi que ce soit que Zoé cuisine, ...*
what REL it is.SBJ REL Zoé cooks.SBJ
'Whatever Zoé cooks, ...'

a. Pre-exhaustified alternatives:
$A' = A \wedge \neg B$
$B' = B \wedge \neg A$

b. M_2: $\cap g(w) = \{w_1, w_2\}$; $\forall w\, D_w = \{a, b\}$
$Zoe.cooks = \{\langle w_1, \{a, b\}\rangle, \langle w_2, \{a, b\}\rangle\}$

In model M_2, the assertion is true and every pre-exhaustified alternative in (36a) is false. That means that even though M_2 is a model in which the universal FC implicature arises, A' and B' are not viable in M_2 because there is no subset of worlds in $\cap g(w)$ that makes A' true, and there is no subset that makes B' true.

Thus, in French CUs, speaker ignorance effects can be directly modeled as a consequence of the licensing conditions of FCIs.

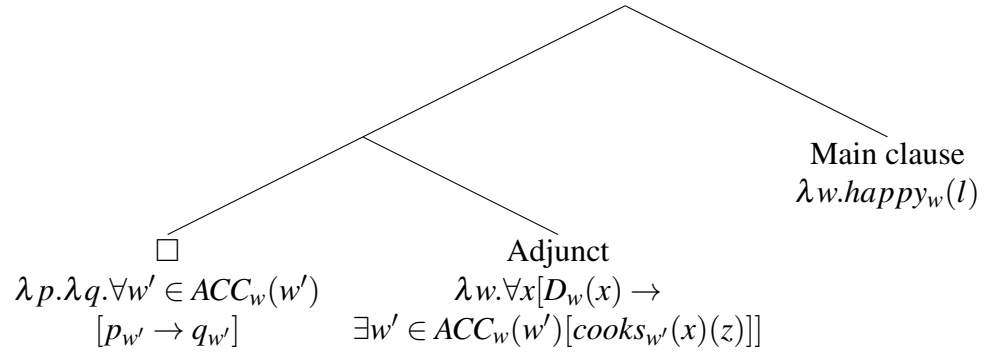
5. Composition with matrix clause

In this final content section, we show how the CU adjunct clause is composed with the matrix clause to form a full CU using a standard Heim-Kratzer-Lewis semantics for conditionals. We also show that the second main interpretative property of French CUs – consequent entailment – results from the interaction of the viability constraint and the semantics of the conditional.

5.1. Conditional semantics

We propose that French CU adjuncts are conditional antecedents in the sense of standard conditional semantics (Heim 1982, Kratzer 1977, Lewis 1975). Under this view, conditionals involve a covert necessity modal ($\Box$), and the adjunct clause provides the restrictor for it. This analysis is illustrated in (37) using the denotation of the exhaustified CU adjunct clause in (33b).

(37)



Composing $\Box$ with the CU adjunct clause and the main clause, we obtain (38) at w_0.

(38) $\forall w' \in ACC_{w_0}(w')$
$[\forall x[D_{w'}(x) \rightarrow \exists w'' \in ACC_{w'}(w'')[cooks_{w''}(x)(z)]]$ (p)
$\rightarrow happy_{w'}(l)]$ (q)
(In all worlds w' epistemically accessible from w_0, if it is the case for all x in D at w' that Zoe may cook x at w', then Lou is happy in w'.)

We now want to ensure that the truth of the consequent (q) is always entailed.

5.2. Consequent entailment

To derive consequent entailment, we must make sure that the antecedent of the conditional is always true. In other words, for (38), we must ensure that all x in D at w' are things that Zoe could cook in w'. To see how this follows, we must go back and look at the semantics of the adjunct clause (sections 3.2.3 and 4.1). Recall that our adjunct clause can be rewritten as a conjunction of the two alternatives A and B.

(39) $[D_w(a) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(a)(z)]] \wedge [D_w(b) \wedge \exists w' \in ACC_w(w')[cooks_{w'}(b)(z)]]$
$= A \wedge B$

The conjunction in (39) is true only if both conjuncts A and B are true. Note that the conjuncts themselves are modal, and require the existence of an accessible world where Zoe cooks something in D. Crucially, the truth of both conjuncts is guaranteed by the viability constraint: both $A \wedge \neg B$ and $B \wedge \neg A$ have to be viable, which in turn means that there are accessible worlds w' in which only A is true (entailing the truth of A), and accessible worlds w' in which only B is true (entailing the truth of B). Thus, consequent entailment appears as a by-product of viability, just like speaker ignorance.

6. Conclusion

In conclusion, this paper presents a unified, fully compositional analysis of short and long CUs in French. We argue that underlyingly, both short and long CUs contain a *wh que ce soit* FCI, and derive short CUs through relative clause ellipsis. We use the presence of a FCI to explain two core interpretational properties of CUs, namely, consequent entailment and speaker ignorance. Our reliance on free choice in the analysis of CUs connects our work to previous work on Hungarian (Szabolcsi, 2019) and Dravidian (Balusu, 2019) unconditionals, and on free choice phenomena in Romance (Caponigro and Fălăuş, 2018).

In future work, we hope to detail the exact source of the existential presupposition that accompanies all CUs and unconditionals in general. Moreover, we wish to extend the analysis of French to CUs in other Romance languages, and Spanish and Portuguese in particular.

Overall, our work provides more evidence for the claim that unconditionals can be formed using various morphosyntactic and semantic ingredients across languages (Balusu, 2019; Šimík, 2019; Szabolcsi, 2019).

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