

ON THE READINGS OF *POURQUOI* IN WH-QUESTIONS

SOBRE AS LEITURAS DE POURQUOI EM INTERROGATIVAS WH-

Flore Kédochim¹

Simone Guessser²

ABSTRACT

The literature on wh-items such as *why* in English points out that this element can be associated with two readings, reason and purpose. Following Reinhart's (2003) typology for causal relations between two events, Tsai (2008) assumes that the semantics of reason involves a relation called Enable, according to which one event is a necessary condition for the other. On the other hand, purpose reading involves a Motivate relation, in which one event either enables or causes the other, mediated by a mental state. Semantic and syntactic restrictions suggest that reason/Enable and purpose/Motivate are readings that involve different syntactic positions, the first being related to the CP system, and the second to the vP area. With regard to the French wh-item *pourquoi*, there are few studies that address this issue. According to these studies, the reason/Enable reading is the only possible reading for *pourquoi*. In order to deepen the matter in question, this work investigated the interpretation properties of *pourquoi* through a non-chronometric offline experimental study. The results show that this wh-item can have a purpose/Motivate reading in addition to a reason/Enable reading in interrogative sentences³.

Key-words: Wh-questions; *pourquoi*; Experimental Linguistics.

RESUMO

A literatura sobre sintagmas-wh como o *why* do inglês aponta que esse elemento pode veicular dois tipos de leitura, de razão e de propósito. Seguindo a tipologia de Reinhart (2003) para relações causais entre dois eventos, Tsai (2008) assume que a semântica de razão envolve uma relação chamada Habilitação, segundo a qual um evento é uma condição necessária para o outro. Por outro lado, a leitura de propósito envolve a relação de Motivação, segundo a qual um evento habilita ou causa o outro, sendo mediado pelo estado mental de um sujeito agente. Restrições semânticas e sintáticas sugerem que razão/Habilitação e propósito/Motivação são leituras que envolvem diferentes posições sintáticas, sendo a primeira relacionada ao sistema CP, e a segunda ligada à área do vP. No que diz respeito a *pourquoi*, são poucos os estudos que tratam do assunto. Segundo esses estudos, apenas a leitura de razão/Habilitação é veiculada por esse elemento. Com o objetivo de aprofundar essa questão, o presente trabalho investigou as propriedades interpretativas de *pourquoi* através de um estudo experimental *off-line* não cronométrico. Os resultados mostram que esse sintagma, além de veicular a interpretação de razão/Habilitação, pode também apresentar a leitura propósito/Motivação em sentenças interrogativas.

Palavras-chave: Interrogativas *wh-*; *pourquoi*; Linguística Experimental.

¹ Federal University of Roraima (UFRR), Brazil – Master Degree student. ORCID: 0000-0002-7593-9034.

² Federal University of Roraima (UFRR), Brazil – Adjunct Professor; Federal University of Southern Frontier (UFFS), Brazil – Visiting Professor. ORCID: 0000-0002-0064-9251.

³ The reported experiment, as well as the central discussions in this paper, were developed in the first author's undergraduate thesis (KÉDOCHIM, 2018), under the guidance of the second author.

1. Introduction

As pointed out in the literature, French wh-questions present a wide range of possibilities for syntactic structures. As illustrated in (1), in this language the wh-element can remain *in situ*.

(1) a. Tu as vu **qui**?

You have seen who
'Who have you seen?'

b. Tu es parti **quand**?

You have left when
'When have you left?'

c. Tu as fait ça **comment**?

You have done that how
'How have you done that?'

(SHLONSKY, 2017, p. 1)

The wh-item can also move to a left peripheral position, as shown in (2). In this case, there is the possibility of movement from I to C, that is, the inversion of the clitic subject with the verb (cf. (3)).

(2) a. **Qui** tu as vu?

Who you have seen
'Who have you seen?'

b. **Quand** tu es parti?

When you have left
'When have you left?'

c. **Comment** tu as fait ça?

How you have done that
'How have you done that?'

(SHLONSKY, 2017, p. 1)

(3) a. **Qui** as-tu vu?

Who have-you seen
'Who have you seen?'

b. **Quand** es-tu parti ?

When have- you left
'When have you left?'

c. **Comment** as-tu fait ça?

How have- you done that

‘How have you done that?’

There is also the possibility of producing a cleft interrogative (4), an interrogative with movement of the cleft pivot (5) or an interrogative with wh-movement and the expression *est-ce que* (6).

(4) C’est **qui** que tu as quitté?

It is who that you have left

‘Who have you left?’

(5) **Qui** c’est que tu as quitté?

Who it is that you have left

‘Who have you left?’

(6) **Qui** est-ce que tu as quitté ?

Who is-it that you have left

‘Who have you left?’

(SHLONSKY, 2012, p. 1)

In addition, when the subject is a NP, it may appear in a post-verbal position, as illustrated in (7), showing the so-called stylistic inversion (cf. POLLOCK, 2003; POLLOCK; POLETTI, 2015; CANEL, 2012, among others).

(7) **Qu**’as dit Jean?

What has said Jean

‘What has Jean said?’

(POLLOCK, 2003, p. 253)

Finally, Pollock (2003) observes that in this language there are “complex inversion interrogatives”, in which a non-clitic pre-verbal subject and a clitic post-verbal subject are present in (8).

(8) **Quand** Pierre donnera-t-il sa réponse à Paul?

When Pierre will give-he his answer to Paul

‘When will Pierre give his answer to Paul?’

(POLLOCK, 2003, p. 263)

In this scenario of a wide range of possibilities for syntactic structures in French wh-questions, interesting data arise when we consider the wh-item *pourquoi*. First, the contrast

between (9a) and (9b) shows that, unlike structures as the ones in (1), *pourquoi* can only stand in the left periphery of the sentence (LEFEUVRE, 2001).

- (9) a. **Pourquoi** Jean est parti? (left peripheral *pourquoi*)
Why Jean has left
'Why did Jean leave?'
- b. *Jean est parti **pourquoi** ? (*pourquoi in situ*)
Jean has left why
'Why did Jean leave?'

Second, while inversion between the clitic subject and the verb, as illustrated in (3), is possible (cf. (10a)), *pourquoi* does not allow stylistic inversion, contrasting with other wh-elements (KORZEN, 1990).

- (10) a. **Pourquoi** est-il parti? (Clitic subject Inversion)
Why has-he left
'Why did he leave?'
- b. ***Pourquoi** est parti Jean? (Stylistic inversion)
Why has left Jean
'Why did Jean leave?'

Complex inversion and wh-movement + *est-ce que* are possible, as shown respectively, in (11a) and (11b) (cf. KORZEN, 1990), but wh-cleft and the movement of cleft pivot are not (cf. (11d) and (11e)).

- (11) a. **Pourquoi** Jean est-il parti? (Complex Inversion)
Why Jean has-he left
'Why did Jean leave?'
- b. **Pourquoi** est-ce que Jean est parti? (Wh-movement + *est-ce que*)
Why is-it that Jean has left
'Why did Jean leave?'
- c. ***Pourquoi** c'est que Jean est parti? (Movement of the cleft pivot)
Why it is that Jean has left
'Why did Jean leave?'
- d. *C'est **pourquoi** que Jean est parti? (Wh-cleft)
It is why that Jean has left
'Why did Jean leave?'

Many studies have discussed the syntactic particularities of interrogatives with *pourquoi* counterparts (ZWICKY; ZWICKY, 1973; COLLINS, 1991; TSAI, 1999; 2008; RIZZI, 2001; SHLONSKY; SOARE 2011, among others). As we will see, an important property that has been pointed out in order to explain the special behavior of these elements is the fact that they are sentential operators. They are consequently merged in a very high position in the clause, more specifically, in the left peripheral domain.

It is important to mention that, from a semantic point of view, wh-elements as *pourquoi* establish causal relations between events and, crosslinguistically, tend to present at least two different readings, that of reason and that of purpose⁴ (cf. ZWICKY, ZWICKY, 1973; TSAI, 1999; 2008). In (12) and (13). Below, we present these two readings using data from English and Brazilian Portuguese:

- (12) a. Why did Steve go to London?
b. Because he had an appointment there [reason]
c. To see his grand-parents [purpose]
- (13) a. Por que o Paulo comprou um carro novo?
'Why did Paulo buy a new car?'
b. Porque o carro antigo quebrou [reason]
'Because his old car broke.'
c. Para se exibir para sua nova namorada [purpose]
'To show off for his new girlfriend.'

Interestingly, these two readings have been associated with different positions in the clausal structure (cf. TSAI, 1999; 2008). As far as French is concerned, we are not aware of syntactic studies that take into account the possible readings of *pourquoi* in interrogatives. For all we know, the only interpretation mentioned in the literature for French questions with *pourquoi* is reason (cf. LEFEUVRE; 2001; LE GOFFIC; 1997). According to this description, we can deduce that a question like (14a) would allow an answer as the one illustrated in (14b), but not a purpose reading as in (14c):

- (14) a. Pourquoi tu as acheté une voiture neuve?
'Why did you buy a new car?'

⁴ In section 2, following Tsai (2008), we will call the reason and purpose readings as Enable and Motivate readings, respectively.

- b. Mon ancienne voiture était très vieille [reason]
'My former car was too old.'
- c. Pour économiser en essence [purpose]
'To save on gas.'

On the other hand, since the beginning of our research, the native speaker intuition of one of us, as well as the intuition of other speakers, seemed to indicate that the purpose reading is also available for questions with *pourquoi*.

In order to deepen this question and, in particular, as to contribute to syntactic studies on *pourquoi* in interrogatives, the present article investigates, through an experimental study, if *pourquoi* can be associated with the purpose reading, besides that of reason. To reach this goal, this paper is organized as follows. In section 2, we look into the readings of English *why* and Chinese *weishenme* and *wei(-le)shenme*, taking these elements as examples of counterparts of *pourquoi* in French. Section 3 reports the results of an offline experiment on possible *pourquoi* readings and section 4 concludes the article.

2. On the readings of *why*, *weishenme* and *wei(-le) shenme*

Considering the few studies related to the semantics of questions with *pourquoi* in French, it is worth to present some of the semantic discussion developed for its (possible) equivalents in other languages. Here we will consider the case of English *why* and Chinese *weishenme* and *wei(-le) shenme*.

The first considerations about the semantics of *why* in formal syntax seem to have been made by Zwicky and Zwicky (1973). In this work, which compared the syntax and semantics of *how come* to *what for*, the authors note that *how come* and *what for* are reason adverbials, as well as *why*. This is evidenced by the fact that all questions from (15) to (17) can be associated with the answers in (18) and (19):

(15) How come there is a mark on this page?

(16) What is there a mark on this page for?

(17) Why is there a mark on this page?

(18) There is a mark on this page for some reason

(19) There is some reason for there being a mark on this page

(ZWICKY; ZWICKY, 1973, p. 923)

However, the authors point out a crucial distinction between *how come* and *what for*: the first question is a cause, which is seen as an external explanation for an event or state, while the second is associated with a purpose reading, an explanation that involves an intention on the part of some agent. These different readings are illustrated in (20) and (21), respectively.

(20) a. How come there is a mark on this page?

b. Because the dye in the binding ran [cause]

(21) a. What is there a mark on this page for?

b. Because I wanted you to be sure to read it [purpose]

(ZWICKY; ZWICKY, 1973, p. 923)

Therefore, a crucial difference between the semantics of *how come* and the semantics of *what for*, is that *what for*, despite acting in the domain of reason, is linked to the agentivity of the subject. This is corroborated by data like those in (22) and (23); sentences like (22) are perfectly acceptable, while sentences like (23) are odd because one's height and sensations of temperature are not controllable matters.

(22) a. How come George is tall?

b. How come you feel cold?

(23) a. ?What is George tall for?

b. ?What do you feel cold for?

(ZWICKY; ZWICKY, 1973, p. 924)

Taking this data into account, Zwicky and Zwicky (1973) propose that the reading they initially call reason is, in fact, subdivided between cause and purpose: "Cause is a relation between one state of affairs and another, purpose between the actions of an agent and an (intended) state of affairs. In both cases the first state of affairs temporally precedes the second and is in some way an explanation of it." (ZWICKY, ZWICKY, 1973, p. 926)

Insofar why is concerned, Zwicky and Zwicky (1973) observe that interrogatives with this wh-item may have both readings of cause and purpose. Hence, they claim that, semantically, *how come* and *what for* cover together the why domain.

Following these discussions, Tsai (2008) also proposes a semantic analysis for *why*, taking into account Reinhart's (2003) typology for causal relations between two events. Deepening the description presented by Zwicky and Zwicky (1973), Tsai (2008) observes that there is a distinction between the interpretations of questions with *why* and *how come*:

(24) How come Pasuya hit Mo'o?

(25) How come the snow is white?

(26) Why did Pasuya hit Moo?

(27) Why is the snow white?

(TSAI, 2008, p. 88-91)

Tsai (2008) points out that questions like (24) and (25) involve a causal relation called Cause. According to this relation, one event is a sufficient condition for the other (TSAI, 2008, p. 90). For these questions, there is, on the one hand, the presupposition that Pasuya hit Mo'o and something caused Pasuya hit Mo'o and, on the other, that the snow is white and something caused it to be white. When a speaker asks (24) and (25), he wants to know, respectively, what caused Pasuya to hit Mo'o and what caused the snow to be white. In addition, a counter-expectation of the speaker is associated with the pragmatics of these sentences: Pasuya shouldn't hit Mo'o/The snow shouldn't be white. In (28a-b), the semantic representations for (24) and (25) are given, showing that there is a causation between two events, the cause event e and the effect event e' (28a), or between the cause event e and the resultant state s (28b). The subject of the question is the cause event.

(28) a. $?e\exists e'$ (hitting(e') & Agent(e' , Pasuya) & Theme(e' , Mo'o) & CAUSE(e , e'))

b. $?e\exists s$ (being-white(s) & Theme(s , the snow) & CAUSE(e , s))

(TSAI, 2008, p. 90)

In contrast, interrogatives with *why*, like (26) and (27), simply presuppose that Pasuya hit Mo'o, and that the snow is white. When the speaker utters these questions, he wants to know, respectively, what enables Pasuya to hit Mo'o and what enables the snow to be white. In these cases, there is no counter-expectation of the speaker. According to Tsai (2008), these sentences have a causal relation called Enable (One event is a necessary condition for the other), being represented as in (29):

(29) a. $?e\exists e'$ (hitting(e') & Agent(e' , Pasuya) & Theme(e' , Mo'o) & ENABLE(e , e'))

b. $?e\exists s$ (being-white(s) & Theme(s , the snow) & ENABLE(e , s))

(TSAI, 2008, p. 91)

In addition to the Enable reading, Tsai (2008), as do Zwicky and Zwicky (1973), observes that questions with *why* can have a purpose reading. He argues that this interpretation corresponds to a causal relation called Motivate: one event either enables or causes the other, mediated by a mental state of an agent subject. Thus, a sentence like (30a), in the purpose reading, would be semantically represented as in (30b):

(30) a. Why will Akiu leave? (= For what purpose will Akiu leave?)

b. $?e\exists e'$ (leaving(e') & Agent(e' , Akiu) & MOTIVATE(e , e'))

(Adapted from TSAI, 2008, p. 94)

In Chinese, there are two wh-elements serving as counterpart for *why*: *weishenme*, which has the reason/Enable reading, and *wei(-le) shenme*, which is associated with the purpose/Motivate reading. Chinese is particularly interesting to mention here because, besides having a different wh-item for each reading, this language shows that the two readings are linked to distinct syntactic positions. Tsai (2008) shows, for example, that *weishenme* and *wei(-le) shenme* do not present the same syntactic behavior in relation to the future modal, as illustrated in (31) and (32).

(31) a. Akiu weishenme hui zou? (reason>modal)

Akiu why will leave

‘Why would Akiu leave?’

b. *Akiu hui weishenme zou?

Akiu will why leave

(32) a. Akiu hui wei(-le)shenme cizhi? (modal>purpose)

Akiu will for(-Prf) what resign

‘For what purpose would Akiu resign?’

b. ?? Akiu wei(-le)shenme hui cizhi?

Akiu for(-Prf) what will resign

(TSAI, 2008, p.93)

Tsai (2008) argues that reason/Enable *weishenme* corresponds to a sentential/CP linked wh-adverbial, whereas purpose/Motivate *wei(-le) shenme* is a low/vP linked wh-adverbial (cf. also TSAI, 1999). This syntactic difference would also play a role in the fact that *wei(-le)shenme*, in contrast to *weishenme*, is blocked in constructions where the subject is not an agent, showing agentivity restrictions along the lines pointed out by Zwicky and Zwicky (1973) for questions with *what for*. The contrast between *weishenme* and *wei(-le)shenme* is shown in (33): *wei(-le)shenme* is not compatible with stative predicates (33a), non-causative psych predicates (33b) and non-agentive psych-verb constructions (33c). On the other hand, the reason/purpose asymmetry breaks down in agentive psych-verb constructions (34).

(33) a. Akiu weishenme/*wei(-le) shenme zheme mang/congming?

Akiu why/for(-Prf) what so busy/smart

‘Why/ For what (purpose) is Akiu so busy/smart?’

b. Akiu weishenme/*wei(-le) shenme xihuan/pa Xiaodi?

Akiu why/for(-Prf) what like/fear Xiaodi

‘Why does Akiu like/fear Xiaodi?’

c. Zhe-chu dianying weishenme/*wei(-le) shenme zheme taohao/xia-ren?
This-CL movie why/for(-Prf) what so pleasing/scare-people
'Why is this movie so pleasing/scaring?'

(34) Akiu weishenme/wei(-le) shenme taohao/xia Xiaodi?
Akiu why/for(-Prf) what please/scare Xiaodi
Why/For what (purpose) does Akiu please/scare Xiaodi?'

(TSAI, 1999, p. 26)

3. The readings of *pourquoi* in wh-questions

In French, the possibility of reason/Enable reading and purpose/Motivate reading for interrogatives with *pourquoi* is not clear to us. As we said in the introduction, what we could find in the literature is the possibility of reason/Enable reading (LEFEUVRE, 2001; LE GOFFIC, 1997), but we are not aware of any study showing that interrogatives with *pourquoi* can be associated with the purpose/Motivate reading. On the other hand, this reading seems to be accepted by French native speakers. In the following sections, our aim is to test experimentally the existence of the reason/Enable and purpose/Motivate readings for *pourquoi*.

3.1. Experiment and tested hypothesis

The purpose of this experiment is to investigate the interpretative properties of the wh-item *pourquoi* in French, as illustrated in (35):

(35) A : Pourquoi Alice a-t-elle acheté une nouvelle voiture ?
'Why did Alice buy a new car?'

The experiment hypothesis is that there are two different readings for *pourquoi*: Enable and Motivate, following Tsai's (2008) terminology. Consequently, we expect participants to choose options that contain readings of reason/Enable and purpose/Motivate. Thus, a sentence like (35) can be answered as (36a) and (36b).

(36) a. À cause de la super promotion de ce weekend. [reason/Enable]
'Because of the super weekend promotion.'

b. Pour montrer à sa famille qu'elle gagne bien. [purpose/Motivate]
'To show the family that you make a good living.'

In (36a), *pourquoi* operated on the event expressed by the sentence and asks for a reason for the event. In (36b), *pourquoi* asks about a purpose.

3.2. Experimental design

The design consisted of a single two-level variable where the reading factor of the wh-item *pourquoi* is manipulated. Therefore, the experimental conditions are: RP (reason/Enable *pourquoi*) and PP (purpose/Motivate *pourquoi*). Regarding the independent variables, we are considering the index of choice of the participants. Table 1 gives a sample of the experimental conditions.

A : Pourquoi Alain a-t-il vendu sa maison ? 'Why did Alain sell his house?'	
B: _____	
a. À cause de son divorce.	[RP]
'Because of his divorce.'	
b. Pour voyager plus souvent.	[PP]
'To travel more frequently.'	

Table 1: Sample of experimental conditions (KÉDOCHIM, 2018)

3.3. Methods

3.3.1. Participants

The participants were 16 native French speakers aged from 24 to 34 years old. 16.7% of the participants have a degree, 16.7% a PhD and 66.7% a Master's Degree. They were not linguistic specialists and were naïve as to the purpose of the experiment. They all agreed to participate to the experiment.

3.3.2. Materials

We generated 12 experimental sets. Each set contains a two-part dialogue between speakers A and B. Part A consists of a question with the wh-item *pourquoi* initiating a dialogue. Part B consists of a gap, which corresponds to an appropriate answer to question A. The participant should choose, according to four possible options, up to two options. If they think that none of the options is adequate to complete the answer of speaker B, they had the possibility to choose the alternative “None of the above” (NOA). Among the four possible answer options, there is an option with a reason/Enable reading, one with a purpose/Motivate reading, one distractor and one NOA. The order of presentation of the four optional answers was randomized. We also prepared 25 sets of fillers, which consisted of dialogues like in the experimental sets. A questionnaire of 37 dialogues was presented to the participants. The questionnaire consisted of 12 experimental sets randomly intermixed with 25 fillers. It is important to emphasize that, for both experimental sets and fillers, an attempt was made to use a simple and daily used lexicon. Each participant was exposed to all experimental and distracting sets. The experiment was distributed within participants.

Experimental set

A : Pourquoi Claire a-t-elle démissionné ?

‘Why did Claire resign?’

B: _____

- | | |
|---|----------------------------|
| a. Du fait des mauvaises conditions de travail. | [reason/Enable reading] |
| ‘Due to the poor working conditions.’ | |
| b. Pour faire un traitement de santé. | [purpose/Motivate reading] |
| ‘To do a health treatment.’ | |
| c. Il me semble que Claire ne travaille pas. | [distractor] |
| ‘It seems to me that Claire does not work.’ | |
| d. Aucune des options ci-dessus. | [NOA] |
| ‘None of the above.’ | |

Table 2: Sample of an experimental set (KÉDOCHIM, 2018)

3.3.3. Procedures

We sent a Google Forms questionnaire by email to the participants. The task was simple and objective: the participants had to read the dialogues and mark the answers using the mouse of their own computers or the screen of their smartphones. In addition, a tutorial was designed to ensure a satisfactory understanding of the experiment instructions. After completing the questionnaire, the answers were recorded for posterior analysis.

3.4. Results

The results are summarized in Appendix 1. For each experiment set, we have the number of times each answer option was chosen, that is, the frequency of response. We also calculated the participant preference index as follows: preference index = frequency of response/number of participants (cf. Table 3).

Experimental sets	Reason	Purpose	Distractor	NOA
1	81,25	87,5	0	0
2	50	100	18,75	0
3	81,25	100	0	0
4	93,75	62,5	6,25	6,25
5	93,75	100	0	0
6	68,75	81,25	0	12,5
7	100	100	12,5	0
8	100	93,75	0	0
9	100	100	0	0
10	81,25	81,25	0	6,25
11	81,25	100	0	0
12	81,25	87,5	0	6,25

Table 3: Preference index for each experimental set (KÉDOCHIM, 2018)

According to Table 3, we can see that the participants' preference index for the reason/Enable reading ranges from 50% to 100% and for the purpose/Motivate reading from 81.25% to 100%. Thus, although the participants did not choose the two readings for all

experimental sets, the choice index shows that the two tested readings were chosen in a significant way. We represented the results in the box plot of Figure 1.

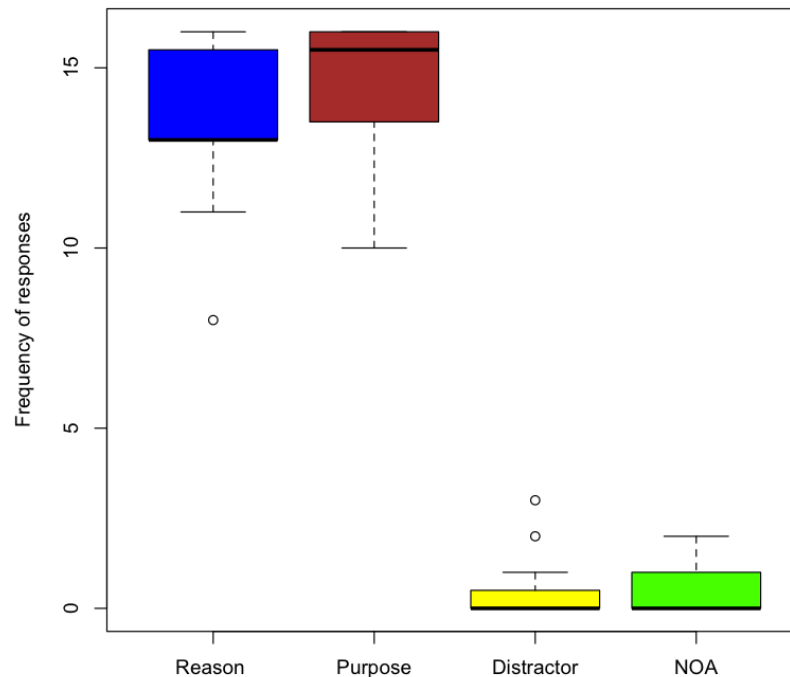


Figure 1. Dispersion of response frequencies according to the tested readings (KÉDOCHIM, 2018)

In this graph, the reason/Enable and purpose/Motivate responses seem to be the most frequent, when compared to the distractor and NOA options. In addition, the response frequencies of reason/Enable and purpose/Motivate readings seem close. Furthermore, this graph illustrates the dispersion of the data for each reading. For the purpose/Motivate reading, there is a greater variability in the response frequency than for the reason/Enable reading. There is an outlier for the reason/Enable reading that corresponds to the experimental set number two (cf. (37)). For this set, the response frequency was 8, which is much lower than the average response for this reading, which is 13.5.

(37) A: Pourquoi Fabien a-t-il laissé tomber l’université?

‘Why did Fabien leave university?’

B: _____

- | | |
|---|----------------------------|
| a. Du fait des horaires impossibles de son travail | [reason/Enable reading] |
| ‘Due to impossible working hours.’ | |
| b. Pour trouver un travail et être indépendant | [purpose/Motivate reading] |
| ‘To find a job and be independent.’ | |
| c. C’est son frère que a laissé tomber l’université | [distractor] |
| ‘It is his brother who left university.’ | |

d. Aucune des options ci-dessus

[NOA]

‘None of the above.’

One possible explanation is the fact that few students study and work at the same time in France, which could make the reason/Enable reading less acceptable in this experimental set. It is worth mentioning that three experimental sets were chosen by all participants for the reason/Enable reading and six for the purpose/Motivate reading, which represents half of the experimental sets. On the other hand, the responses frequencies for distractor and NOA options are low (0.4 and 0.5 respectively). Comparing these frequencies to the reason/Enable and purpose/Motivate reading frequencies allows us to deduce whether the tested readings were accepted or not by the participants. In fact, for each experimental set, the participants can choose one or two answers from the four options. If the participant does not consider the reason/Enable or purpose/Motivate reading to be adequate answers to questions with *pourquoi*, they will choose the distractor and/or NOA options. In this case, the average frequency of responses for the distractor or NOA options would be higher than the average frequency of responses for the two readings tested. On the contrary, if the participant considers the tested readings adequate answers, the average response frequency of the reason/Enable and purpose/Motivate readings will be higher than the average frequency for the distractor and NOA options.

We used a statistical test to verify whether the observations made with Figure 1 are significant. The most common test to compare the frequency homogeneity is the chi-square test. However, the test only applies when the variables are independent and when they have a normal distribution. The normality of distribution of our data was tested with the Shapiro test, using the statistical program R. According to this test, the data does not have a normal distribution. In addition, the reason and purpose options are not independent since the participant can choose two answers for each question. Thus, the chi-square test was discarded considering these two facts. Instead, we used the Wilcoxon test, which is a non-parametric test used to compare two related samples to assess whether the means differ or not. Initially, we checked if the frequencies of reason and purpose differed from the other options (distractor and NOA).

We applied the Wilcoxon test with the R program. The R script is available in Appendix 2 and the statistical results are summarized in Appendix 3.

All the p values being less than 0.01 and Z values greater than 1.96, we can conclude that the average frequency of reason/Enable and purpose/Motivate readings are not statistically equal to the other options.

We also verified with the Wilcoxon test whether the average frequency response of reason/Enable and purpose/Motivate were statistically equal. We found a non-significant difference with $p > 0.01$ and $Z < 1.96$, which confirmed the observation made in Figure 1: the participants chose the reason/Enable and purpose/Motivate readings in the same proportion.

3.5. Discussion

The literature has assumed that wh-elements such as *why* are base-generated in a very high position in the syntactic structure, in general in the left periphery of the clause. Within the Cartographic Approach, for example, Rizzi (2001) assumes the hierarchy of functional heads for the matrix-CP system in (38) and proposes that, in matrix clauses, Italian *perché* is generated directly in the specifier position of IntP.

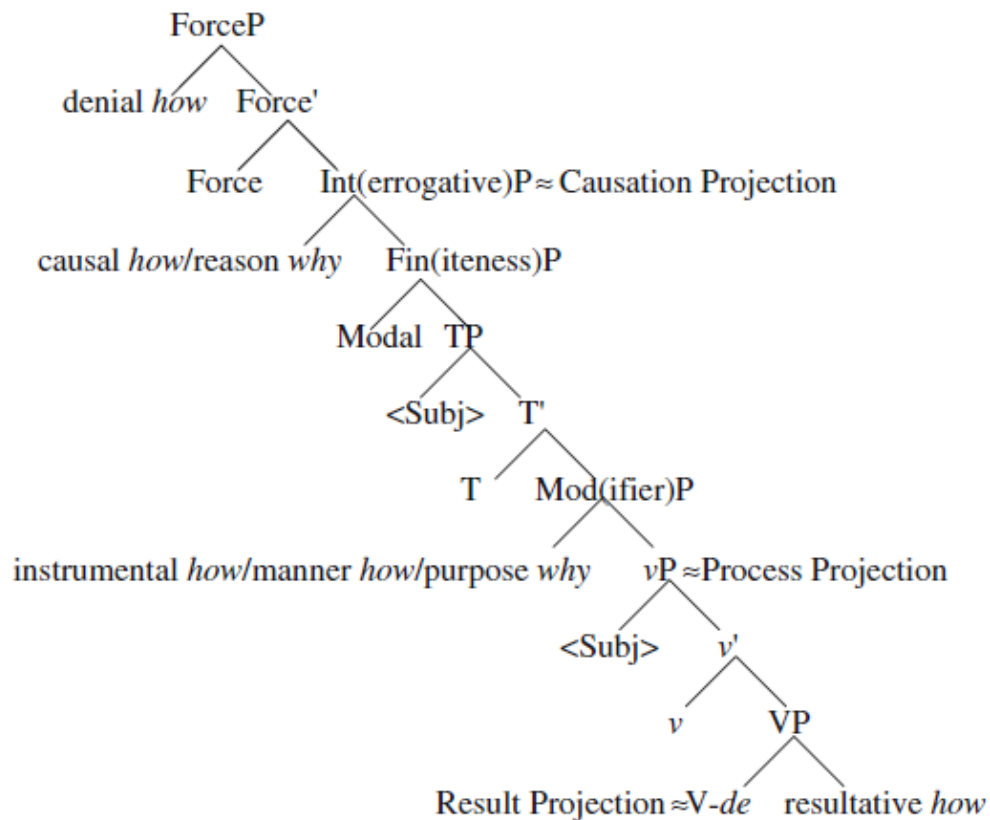
(38) [ForceP [TopP [IntP [TopP [FocusP[TopP [FinP

Successively, Shlonsky and Soare (2011) present a refinement of Rizzi's approach (2001), considering the Criterial Freezing principle (RIZZI, 2006). By presenting arguments based on the English syntax of *why* and its corresponding phrase in Romanian, *de ce*, the authors assume a dissociation between the external merge position and the criterial position of *why/perché* and propose that *why*, as well as its counterparts in some languages, is generated in the specifier of a non-criterial projection, located below IntP, named ReasonP. In local reading, *perché/why/de ce* move from Spec,ReasonP to Spec,IntP:

(39) ... IntP > TopP > FocP > WhP > ReasonP ... (SHLONSKY; SOARE, 2011, p. 663)

These studies have mainly been proposed considering the syntactic peculiarities of *why*-like elements (in relation to argumental wh-elements or wh-items corresponding to low adverbials) with the reason/Enable reading. Complementing this perspective, the investigation presented in Tsai (1999, 2008) considers also the purpose/Motivate reading of *why*-like items and shows its syntactic and semantic peculiarities in relation to the reason/Enable reading. According to the author, these properties can be accounted for assuming that while reason/Enable *why* is generated in the CP level, the purpose/Motivate *why* is linked to the vP area. Tsai (2008) proposes the following positions for the generation of the different wh-elements in Chinese:

(40)



(TSAI, 2008, p. 113)

From the discussion presented in section 2, we can conclude that, in some languages, the readings of reason/Enable and purpose/Motivate can be represented by different items, as with *weishenme* and *wei(-le) shenme* in Chinese. In other languages, a wh-item can express both causal relations, such as *why* in English. However, semantic and syntactic restrictions suggest that in both types of language the readings of reason/Enable and purpose/Motivate are related to different syntactic positions. Therefore, in a language like English, although the *why* element always appears in the left periphery of the clause, it is generated in different positions according to its reading: in the reason/Enable reading it is generated in the CP domain and in the purpose/Motivate reading it is generated in the vP area.

Contrasting with studies like Le Goffic (1997) and Lefevre (2001), the results of our experiment attest that French *pourquoi* can have both the reason/Enable and purpose/Motivate readings. Both readings are associated with interrogatives in which *pourquoi* appears in the left periphery; as shown in Section 1, *pourquoi* cannot occur in a clause internal position (cf. the data in (9), repeated bellow):

(41) a. *Pourquoi Jean est parti?* (left peripheral *pourquoi*)

Why Jean has left

‘Why did Jean leave?’

b. *Jean est parti pourquoi? (*pourquoi in situ*)

Jean has left why

‘Why did Jean leave?’

In addition, we can observe that the purpose/Motivate reading shows agentivity restrictions. Consider the examples in (42) – (46), adapted from Tsai (1999), to French: (42a) involves a stative predicate, (43a) and (44a) a non-causative psych predicate and (45a) a non-agentive psych-verb construction.

(42) a. Pourquoi Jean est-il si intelligent?

‘Why is Jean so intelligent?’

b. Parce que ses parents le sont aussi

‘Because his parents are too.’

c. #Pour résoudre des problèmes mathématiques

‘To solve mathematic problems.’

(43) a. Pourquoi Jean aime-t-il Marie?

‘Why does Jean like Marie?’

b. Parce qu’elle est très belle

‘Because she is very beautiful.’

c. #Pour l’épouse

‘To marry her.’

(44) a. Pourquoi Jean a-t-il peur de Marie ?

‘Why is Jean afraid of Marie?’

b. Parce qu’elle l’a menacé.

‘Because she threatened him.’

c. #Pour ne pas lui parler.

‘To not talk to her.’

(45) a. Pourquoi ce film est-il si plaisant ?

‘Why is this movie so pleasing?’

b. Parce que les acteurs sont très bons.

‘Because the actors are very good.’

c. #Pour plaire aux jeunes.

‘To please young people.’

The purpose/Motivate answers in (42c), (43c), (44c) and (45c) are inappropriate. However, as expected, the reason/purpose contrast does not hold in agentive psych-verb construction (46).

(46) a. Pourquoi Jean a fait peur à Marie ?

‘Why did Jean scare Marie?’

b. Parce qu’il est joueur

‘Because he is playful.’

c. Pour l’embêter

‘To bother her.’

Therefore, French *pourquoi* has a similar behavior to English *why* and its counterparts in Chinese, exploiting two possible base positions, according to the relevant reading. Drawing parallel with the proposals of Rizzi (2001), Tsai (2008) and Shlonsky and Soare (2011), we came to the following two external merge positions for *pourquoi*⁵:

(47) [ForceP [IntP [ReasonP *pourquoi* [Enable reading]

(48) [ForceP [FinP [TP [XP *pourquoi* [vP [Motivate reading]

4. Conclusion

In this paper, our aim was to investigate the interpretation properties of wh-questions with *pourquoi* in French. After a discussion of the possible readings associated with elements such as *why* in English and *weishenme* and *wei(le)shenme* in Chinese, we presented a non-chronometric offline experiment to investigate whether *pourquoi* is associated with a purpose/Motivate reading in addition to a reason/Enable one. The results showed that *pourquoi* is associated with both readings, a result that can open interesting discussions on the syntax of this wh-item.

Before concluding, it is important to mention that in French besides the adverb *pourquoi*, there is also *pour quoi* (*for what*) that consists of a preposition (*pour*) and a wh-item (*quoi*). It is worth mentioning that although *pourquoi* and *pour quoi* are cognates, the syntax and semantics of *pour quoi*, appears to be still little known. Lefeuvre (2001) argues that while *pourquoi* has a reason reading, *pour quoi* presents an interpretation that she calls “destination”, although she does not fully describe this reading. Consequently, studying the readings

⁵ In (48), we leave the question of the label for the category above vP in which Motivate *pourquoi* is merged open to discussion. A next step in our research is to investigate whether this position can be the specifier of a projection of the vP periphery according to Belletti (2004).

associated with *pour quoi* is essential to better understand the syntax and semantic of *pourquoi*, a point that we will develop in further research.

REFERENCES

- CANEL, Angela. *Les interrogative in situ en français: une étude syntaxique*. 2012. Dissertação (Curso di Laurea Magistrale in Scienze del Linguaggio), 2012.
- COLLINS, Chris. *Why and how come*. *MIT Working Papers in Linguistics*, v. 15, p. 31-45, 1991.
- KEDOCHIM, Flore. *Um estudo cartográfico sobre pourquoi e pour quoi em interrogativas do francês*. 2018. 99 f. Trabalho de conclusão de curso – Universidade Federal de Roraima, Boa Vista, 2018.
- KORZEN, Hanne. *Pourquoi pourquoi est-il différent: l'adverbial de cause et la classification des adverbiaux en général*. *Langue française*, n. 88, p. 60-79, 1990.
- LEFEUVRE, Florence. *Pour quoi*. *Travaux de Linguistique*, n.42-43, p. 199-210, 2001.
- LE GOFFIC, Pierre. *Forme et place du sujet dans l'interrogation partielle*. *La place du sujet en français contemporain*, p. 15-42, 1997.
- POLLOCK, J.Y. *Three arguments for remnant IP movement in Romance*. In: Di SCIULLO, A. M. *Asymmetry Grammar*. Volume 1: Syntax and semantics. 2003. p. 251-277.
- REINHART, Tanya. *The Theta System-An Overview*. *Theoretical Linguistics*, v. 28, n. 3, p. 229-290, 2003.
- RIZZI, Luigi. *Residual Verb second and the Wh Criterion*. In: BELLETTI, Adriana; RIZZI, Luigi. (ed.). *Parameters and Functional Heads*. Oxford: Oxford University Press, 1996 [1991], p. 63-90.
- _____. *The Fine Structure of the Left Periphery*. In: HAEGEMAN L. *Elements of Grammar: a handbook of generative syntax*. Kluwer: Dordrecht, 1997.
- _____. *On the Position of Interrogative in the Left Periphery of the Clause*. In: CINQUE, G.; SALVI, G. (Eds.). *Current studies in Italian syntax. Essays offered to Lorenzo Renzi*. Amsterdam: Elsevier North-Holland, 2001. p. 287-296.
- SHLONSKY, Ur; SOARE, Gabriela. *Where's 'why'?*. In: GOBBO, F. D.; HOSHI, H. (ed.) *Linguistic Inquiry*, v. 42, n. 4, p. 651 – 669, 2011.
- _____. *Notes on Wh In Situ in French*. *Functional Heads*. The cartography of syntactic structures, vol.7, p.242-252, 2012. New York: Oxford University Press.
- _____. *Wh in situ and criterial freezing*. In: Aboh, E.; Haerberli, E. ; Puskàs, G ; Schönenberger, M. *Elements of Comparative Syntax*. Berlin : De Gruyter, 2017. p. 349-369.
- TSAI, Wei-Tien Dylan. 1999. *The hows of why and the whys of how*. *UCI Working Papers in Linguistics*, vol. 5, p. 155–184.

TSAI, Wei-Tien Dylan. Left periphery and how-why alternations. *Journal of East Asian Linguistics*. p. 83-115. 2008.

ZWICKY, Ann; ZWICKY, Arnold. *How come* and *what for*. In: ELIOT, D. (Ed.). *Working papers in linguistics*. Ohio State University: n. 8, p. 923-933, 1973.

Appendix 1: Frequency of responses for each experimental set

Experimental sets	Reason/Enable	Purpose/Motivate	Distractor	NOA
1	13	14	0	0
2	8	16	3	0
3	13	16	0	0
4	15	10	1	1
5	15	16	0	0
6	11	13	0	2
7	16	16	2	0
8	16	15	0	0
9	16	16	0	0
10	13	13	0	1
11	13	16	0	0
12	13	14	0	1
Average	13,5	14,6	0,5	0,4

Appendix 2: Wilcoxon test R script

```
> data = read.table (file.choose(), header=TRUE,sep="\t")
> print(data)
  Sentences Reason Purpose Distractor NOA
1      1      13      14      0      0
2      2       8      16      3      0
3      3      13      16      0      0
4      4      15      10      1      1
5      5      15      16      0      0
6      6      11      13      0      2
7      7      16      16      2      0
8      8      16      15      0      0
9      9      16      16      0      0
10     10      13      13      0      1
11     11      13      16      0      0
12     12      13      14      0      1

# Comparison 1.
> test<-wilcox.test(data$Reason, data$Distractor, exact=FALSE, correct=FALSE,
paired=TRUE, alternative="two.sided")
> print(test)
  Wilcoxon signed rank test
data: data$Reason and data$Distractor
V = 78, p-value = 0.002031
alternative hypothesis: true location shift is not equal to 0
> Zstat<-qnorm(test$p.value/2, lower.tail=F)
> print(Zstat)
[1] 3.085632

# Comparison 2.
> test<-wilcox.test(data$Reason, data$NOA, exact=FALSE, correct=FALSE, paired=TRUE,
alternative="two.sided")
> print(test)
  Wilcoxon signed rank test
data: data$Reason and data$NOA
V = 78, p-value = 0.00214
alternative hypothesis: true location shift is not equal to 0
> Zstat<-qnorm(test$p.value/2, lower.tail=F)
> print(Zstat)
[1] 3.070057
```

Comparison 3.

```
> test<-wilcox.test(data$Purpose, data$Distractor, exact=FALSE, correct=FALSE,
paired=TRUE, alternative="two.sided")
> print(test)
      Wilcoxon signed rank test
data: data$Purpose and data$Distractor
V = 78, p-value = 0.002064
alternative hypothesis: true location shift is not equal to 0
> Zstat<-qnorm(test$p.value/2, lower.tail=F)
> print(Zstat)
[1] 3.080815
```

Comparison 4.

```
> test<-wilcox.test(data$Purpose, data$NOA, exact=FALSE, correct=FALSE, paired=TRUE,
alternative="two.sided")
> print(test)
      Wilcoxon signed rank test
data: data$Purpose and data$NOA
V = 78, p-value = 0.001926
alternative hypothesis: true location shift is not equal to 0
> Zstat<-qnorm(test$p.value/2, lower.tail=F)
> print(Zstat)
[1] 3.101447
```

Comparison 5.

```
> test<-wilcox.test(data$Reason, data$Purpose, exact=FALSE, correct=FALSE,
paired=TRUE, alternative="two.sided")
> print(test)
      Wilcoxon signed rank test
data: data$Reason and data$Purpose
V = 10.5, p-value = 0.1511
alternative hypothesis: true location shift is not equal to 0
> Zstat<-qnorm(test$p.value/2, lower.tail=F)
> print(Zstat)
[1] 1.435557
```


Appendix 3: Wilcoxon test results

Comparison 1	H0: average_{reason}(13,5) = average_{distractor}(0,5)
V	78
p-value	0,002031
Z	3,085632
Results	p-value (0,002031) < 0,01 e Z(3,085632) > 1,96, we reject H0 The average frequency of the reason reading is different from the average frequency of the distractor option.
Comparison 2	H0: average_{reason} (13,5) = average_{NOA}(0,4)
V	78
p-value	0,00214
Z	3,070057
Results	p-value (0,00214) < 0,01 e Z(3,070057) > 1,96, we reject H0 The average frequency of the reason reading is different from the average frequency of the NOA option.
Comparison 3	H0: average_{purpose}(14,6) = average_{distractor}(0,5)
V	78
p-value	0,002064
Z	3,080815
Results	p-value (0,002064) < 0,01 e Z(3,080815) > 1,96, we reject H0 The average frequency of the purpose reading is different from the average frequency of the distractor option.
Comparison 4	H0: average_{purpose}(14,6) = average_{NOA}(0,4)
V	78
p-value	0,001926
Z	3,101447
Results	p-value (0,001926) < 0,01 e Z(3,101447) > 1,96, we reject H0 The average frequency of the purpose reading is different from the average frequency of the NOA option.
Comparison 5	H0: average_{reason}(13,5) = average_{purpose}(14,6)
V	10,5
p-value	0,1511
Z	1,435557
Results	p-value (0,1511) > 0,01 e Z(1,435557) < 1,96, we accept H0 The average frequency of the reason reading is equal to the average frequency of the purpose reading.