DeQue: A Lexicon of Complex Prepositions and Conjunctions in French

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Abstract

We introduce *DeQue*, a lexicon covering French complex prepositions (CPRE) like *à partir de (from)* and complex conjunctions (CCONJ) like *bien que (although)*. The lexicon includes fine-grained linguistic description based on empirical evidence. We describe the general characteristics of CPRE and CCONJ in French, with special focus on syntactic ambiguity. Then, we list the selection criteria used to build the lexicon and the corpus-based methodology employed to collect entries. Finally, we quantify the ambiguity of each construction by annotating around 100 sentences randomly taken from the FRWaC. In addition to its theoretical value, the resource has many potential practical applications. We intend to employ *DeQue* for treebank annotation and to train a dependency parser that takes complex constructions into account.

Keywords: Compex prepositions, complex conjunctions, multiword expressions, lexicon, French, dependency parsing.

1. Introduction

Complex prepositions (CPRE) and complex conjunctions (CCONJ) are two types of function words that consist of more than one orthographic word (Piot, 1993). They can be considered as fixed multiword expressions that allow little or no variability. Examples in English include CCONJs *even though*, *as well as* and CPREs *up to* and *in front of*. Examples in French are shown in Table 1 along with their English (EN) meaningful and literal translations.

CPRE and CCONJ constructions are quite frequent in French. Their linguistic description in the literature is generally limited to building comprehensive lists of such constructions (Sagot, 2010). Most authors assume that these constructions allow no or very little variability (inflection, insertion). Therefore, they would not require a very sophisticated description and representation in machine-readable lexicons and NLP systems, such as the ones required for verbs, for instance (Dubois and Dubois-Charlier, 2004).

An aspect which is often neglected is the segmentation and structural ambiguity that arises when the words composing the complex function word co-occur by pure chance. Consider examples 1 and 2 containing the French CCONJ *bien que*. It is composed by the words *bien* (*well*) and *que* (*that*), but when they act as a CCONJ they mean *although*.

(1) *Je mange* **bien que** *je n'aie pas faim*
I eat **although** *I am not hungry*

(2) *Je pense* **bien que** *je n'ai pas faim*
I think **indeed that** *I am not hungry*

In example 1, *bien que* is indeed a CCONJ that opposes the main clause (*I eat*) and the subordinate clause (*I am not hungry*). In example 2, however, *bien que* is not a CCONJ and the two words co-occur by chance. The adverb *indeed* modifies the verb of the main clause *think*, while the conjunction *that* introduces the clausal object. Since the word *bien* is a very common intensifier in French, such accidental co-occurrence cases are likely to occur with all verbs that accept *que*-clausal complements like *think*, *say* and *forget*.

From an NLP perspective, it is relevant to study these constructions in a parsing pipeline. Most of the time, we would be tempted to simplify the model and treat all of them as multiword tokens or words-with-spaces (Sag et al., 2002). However, accidental co-occurrence, like in example 2, creates ambiguities that are hard to solve at tokenisation time, specially given the simplicity of most automatic tokenisation approaches in French. A simplistic approach such as treating all occurrences of *bien que* as a single word with spaces inside would introduce an error for sentences like example 2. Conversely, ignoring it in example 1 would mean that both words are treated independently, not capturing the fact that the whole behaves like a conjunction. And what is more, these errors would be propagated to the following processing steps like POS tagging and parsing, certainly generating a wrong analysis.

The creation of *DeQue* takes place in the context of the development of a statistical dependency parser for French (Nasr et al., 2011). The need to quantify ambiguity has a practical consequence: unambiguous constructions can be included in the lexicon as frozen multiword tokens, while ambiguous ones need to be annotated and dealt with at parsing time.

One way of disambiguating ambiguous multiword units is to keep the tokens as individual lexical units during tokenisation and POS tagging, and then use special syntactic dependencies to indicate the presence of a CPRE or a CCONJ (McDonald et al., 2013; Candito and Constant, 2014; Green et al., 2013). In previous experiments, we demonstrated that this approach is superior to treating all units systematically as words with spaces (Nasr et al., 2015). However, this was only demonstrated for a small set of 8 CCONJs and 4 determiners in French. The present work substantially extends the coverage of the list of potentially ambiguous constructions that can be modelled using that approach.

In the remainder of this paper, we discuss the general properties and syntactic behaviour of prepositions and constructions in French (§ 2.). Then, we present the criteria (§ 3.) and methodology (§ 4.) used to construct the lexicon. Finally, we present the lexicon's structure and examples (§ 5.). We conclude by listing future extensions planned for this resource (§ 6.).

Construction	Type	EN meaning	EN literal
à partir de	CPRE	*starting from*	*to leave of*
par rapport à	CPRE	*with respect to*	*for relation to*
bien que	CCONJ	*although*	*well that*
de sorte que	CCONJ	*so that*	*of sort that*

Table 1: Examples of CPRE and CCONJ in French.

2. Prepositions and Conjunctions

Before we can describe the criteria to select CPRE and CCONJ entries for *DeQue*, we must specify what we consider as simple prepositions (PRE) and conjunctions (CONJ). Indeed, criterion C1.3 below states that CPRE and CCONJ can be replaced by single-word PRE and CONJ. Therefore, we cannot apply it if we do not have a clear definition for these two categories. We distinguish PRE and CONJ according to the criteria below, based on the notion of active and passive valency.

In the framework of dependency syntax, the **active valency** of a word is defined as its set of acceptable syntactic dependants. For example, nouns can govern determiners, so the active valency of nouns includes determiners. The **passive valency** is defined as the set of acceptable syntactic governors. For example, adjectives can be governed by nouns, so nouns are in the passive valency of adjectives. Because some complex adverbs behave similarly as complex conjunctions, we also have to define the passive and active valency of adverbs.

Preposition (PRE) Closed-class words (*to, for, before*) that relate two elements in a sentence, typically introducing verbal or nominal complements as the heads of prepositional phrases.

- **Active valency**: a PRE can govern noun phrases (*à la maison, at home*), infinitive verbs (*sans pleurer, without crying*), clauses introduced by conjunctions (*pour que je vienne*,lit. *for that I come*), etc. However, they can never govern bare clauses with inflected verbs not introduced by a conjunction (**pour je vienne, *for I come*).
- **Passive valency**: a PRE cannot be the root of a dependency tree, it is necessarily governed by another word. If it is not governed, it is an idiomatic construction: *en avant ! (move forward!)*, *au secours ! (help!)*

Conjunction (CONJ) Closed-class words (*that, if, when*) that relate two elements in a sentence, typically linking two full clauses.[1]

- **Active valency**: differently from a PRE, a CONJ can govern a bare clause, but it can never govern another phrase introduced by a CONJ.
- **Passive valency**: a CONJ cannot be the root of a dependency tree, it is necessarily governed by another word. If it is not governed, it is an idiomatic construction: *si on allait au cinéma ? (what if we went to the movies?)*. In other words, conjunctions cannot introduce single clauses, they can only link two clauses.

Adverbs (ADV) Open-class words that generally modify verbs, adjectives or other adverbs.

- **Active/passive valency**: Adverbs induce a special relation between active and passive valency. An ADV cannot govern a CONJ when it is itself governed by another word (**je pense que peut-être qu'il vient (*I think that perhaps that he will come*). In French, an ADV can govern a CONJ if the ADV is the root of the dependency tree (*peut-être qu'elle viendra*, lit. *perhaps that she will come*). This distinguishes PRE+*que* constructions (*pour que je vienne, so that I come*) from ADV+*que* constructions (*peut-être que, perhaps that*). When a governed adverb can govern a clause introduced by *que* (*surtout que, alors que, bien que*), we consider it as a CCONJ (see examples provided in criterion C1 below).

3. Complex Prepositions and Conjunctions

This paper presents *DeQue*, a new computational lexicon under development. *DeQue* lists and models the syntactic behaviour of around 280 CPREs headed by *de* and CCONJs headed by *que* in French. The goal of this resource is twofold:

- Provide a detailed and broad-coverage linguistic description of the possible syntactic analyses of each construction.
- Quantify the ambiguity of CPRE and CCONJ constructions based on corpus evidence.

Constructions in *DeQue* are CPREs headed by the preposition *de* (*of*) and CCONJs headed by the conjunction *que* (*that*). These are undoubtedly the most frequent simple prepositions and conjunctions in French. Moreover, they present a very rich co-occurrence pattern, that is, their usages distribution is very heterogeneous.

When used as prepositions and conjunctions, *de* and *que* are quite "promiscuous" and combine with many types of modifiers. For instance, the conjunction *que* can combine with adverbs (*bien que*, lit. *well that*), prepositional phrases (*à condition que*, lit. *at condition that*), noun phrases (*le temps de*, lit. *the time of*), and so on. These modifiers often change or specify the meaning of the relation. For instance, while *que* expresses a quite general subordinating relation, *bien que* expresses opposition, *si bien que* expresses consequences, and so on.

One of the challenges in building *DeQue* was the fact that *de* and *que* combine with several complements, including open-class words like nouns, verbs and adverbs. Therefore, it is impossible to guarantee that our lexicon is exhaustive. In addition to that, when we query the corpus for fine POS sequences (see Section 4.), many false positives are returned because of frequent open-class words that accidentally co-occur with *de* and *que*.

We define CCONJ and CPRE for inclusion in *DeQue* based on three criteria. First, they are groups of words that

[1] The distinction between subordinating and coordinating conjunctions is not relevant for this work.

function as prepositions or conjunctions as a whole. Second, they are potentially ambiguous and contain words that could co-occur by chance. Third, they present some degree of idiomaticity, realised through syntactic and semantic fixedness. Figure 1 summarizes the decision tree used to apply the criteria below in order.

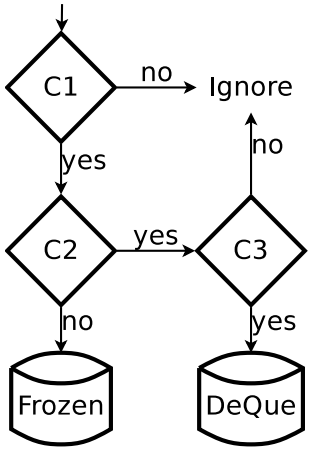


Figure 1: Decision tree corresponding to the application of criteria for lexical entries selection in *DeQue*.

C1: Function as PRE/CONJ

C1.1 A CPRE/CCONJ in *DeQue* consists of groups of at least two words ending with *de/que*.

C1.2 A CPRE/CCONJ in *DeQue* includes at least one open-class (or content) word, that is, one noun, adjective, adverb or verb.

C1.3 A CPRE/CCONJ in *DeQue* commutes with a similar single-word PRE/CONJ keeping the sentence's acceptability and similar meaning.

Criterion C1.1 guarantees that the construction is "complex", meaning that it is composed by more than one token. The last part of the criterion, that is, the fact that the last word is *de* or *que*, is only justified because, for the moment, we wanted to limit the scope of *DeQue* to the most frequent endogenous[2] CPRE and CCONJ. In the future, we intend to extend our lexicon to less frequent function words like CPREs headed by *à* (*to*) and CCONJs headed by *où* (*where*).

Criterion C1.2 aims at excluding regular syntactic constructions such as simple prepositions followed by *que*. Most prepositions in French, like *pour* (*for*) and *après* (*after*), can have their complement introduced by *que*, which allows using a full clause as the complement of the preposition (see examples 3 and 4). Since this is the case for most prepositions, there is nothing special about the syntactic structure of this construction. Every time it appears, it can be modeled as a preposition that governs a *que*-clause. Moreover, prepositions always require some postponed complement, and there is no possible accidental cooccurrence here.

[2]A group is endogenous if the POS of the whole, in our case, PRE and CONJ, can be found in one of the parts, in our case *de* and *que*.

(3) *Il travaille* **pour** *la collecte d'aliments*
He works **for** *the food drive*

(4) *Il travaille* **pour que** *les aliments soient collectés*
He works **so that** *food is collected*

Criterion C1.3 helps excluding constructions that look like CPRE and CCONJ but actually are not. For instance, *peut-être que* (lit. *maybe that*) looks like a CCONJ where *que* is modified by the adverb *peut-être*. One argument against this interpretation is the fact that it can appear in an isolated clause (example 5). That is, it does not respect the passive valency definition for CONJ described in Section 2.. Moreover, here the adverb is the syntactic head, inasmuch as *que* can be omitted (example 6). Many modal adverbs in French exhibit this behaviour, like *certainement* (*certainly*), *probablement* (*probably*), *sans doute* (*undoubtedly*).

(5) **Peut-être que** *je viendrai ce soir*
Maybe *I will come this evening*

(6) **Peut-être** *je viendrai ce soir*
Maybe *I will come this evening*

C2: Autonomous Lexical Units We require that the individual words composing a CPRE/CCONJ are autonomous lexical units. This means that they have their own distribution, cooccurring with other words in other contexts. Criterion C2 aims at excluding constructions that are surely not ambiguous. For instance, *parce que* (*because*) contains the word *parce*, which does never co-occur with a word other than *que*. This means that there is no possible accidental co-occurrence, and this sequence of tokens is never ambiguous. Tokenization as a word with spaces suffices to represent it in treebanks and parsers. Expresions that pass the tests for C1 and not C2 are not directly discarded, but listed in a separate lexicon of *frozen constructions*.

C3: Fixedness We keep in *DeQue* only those constructions that are somehow fixed. We assume that fixedness is a good proxy for semantic idiomaticity, but offers more formal ways of being tested. The traditional definition of idiomaticity is based on semantic non-compositionality. In other words, the meaning of the parts does not add up to the meaning of the whole. Here, it would be hard (if not impossible) to apply this test since most of the time our entries only contain a single content word.

We cite below some fixedness tests applied depending on the POS of the words preceding *de* and *que*. The restrictions below are observed with respect to free combinations of each POS forming the unit. We list below some tests used depending on the POS of the open-class word in the construction.

C3.1 If the unit includes a prepositional phrase, changing the preposition, or using the unit without the preposition, entails a change of meaning of the open-class word. For example, while the meaning of the noun *centre* is unchanged in the sequences *au centre de - vers le centre de* (*in the centre of - toward the centre of*), this does not happen for *moins* (*less*) in *à moins de - pour moins de* (*unless - for less than*).

C3.2 If the unit includes a determiner, no change of determiner is possible without changing the meaning

of the open-class word. For example, *en raison de* means roughly *because*, but *en la raison de* can only literally mean *in the reason of*.

C3.3 Restrictions are observed on the range of acceptable insertions and substitutions of the open-class word:

(a) Parenthetical or appositive modifiers are allowed:
en fonction, évidemment, de la météo
(depending, of course, on the weather).

(b) If the open-class word is a noun, qualifying adjectives are prohibited, intensifying adjectives are allowed:
à proportion exacte de
(at the precise proportion of)
**à proportion logarithmique de*
*(*at the logarithmic proportion of)*.

(c) If the open-class word is an infinitive verb, qualifying adverbials are prohibited, intensifying adverbials are allowed
à partir précisément de 8h
(from precisely 8:00)
**à partir tardivement de 8h*
*(*from late 8:00)*

(d) If the open-class word is an adverb, it cannot be replaced by similar adverbs:
à moins que (unless)
**à plus que (*unmore)*

Criterion C3, and specially C3.1, helps us excluding compositional and quite productive combinations, specially including relational nouns like *south*, *beginning*, *center*. We distinguish qualifying from intensifying modifiers because most CPRE and CCONJ that include nouns and verbs allow some type of intensifier, like *au sens [exact] de* (*in the [exact] sense of*), but never allow qualifiers like **au sens [littéral] de* (**in the [literal] sense of*).

4. Methodology

The first step in the creation of *DeQue* was the selection of our target lexical entries. In order to construct this initial lexicon, we design a methodology that combines linguistic expertise and corpora evidence. This methodology helped us to define precise criteria listed in Section 3. for inclusion of an entry in *DeQue*. Once the list of entries in the lexicon was stabilized, we model ambiguity using a similar process, combining linguistic expertise and corpora evidence.
The corpus used in our queries is the French web-as-corpus (FRWaC), which contains a web dump of 1.613 billion words of French (Baroni et al., 2009). It was chosen mainly for its size, availability and because it presents a fairly decent balance between formal and informal writing. Additionally, it was automatically tagged with parts of speech (POS) using the TreeTagger.

4.1. Selection of Lexical Entries

The selection of lexical entries to include in *DeQue* was performed as follows:

1. We list potential *de*-CPRE and *que*-CCONJ based on introspection and existing general-purpose lexical resources like LEFFF (Sagot, 2010). For example, this initial list includes candidate conjunctions like *si bien que* (*so that*, lit. *so well that*) and *bien sûr que* (*sure that*).
2. For each candidate in this list, we manually annotate the fine POS sequence and global chunk tag of the elements that co-occur with *de* and *que*. For instance, *si bien que* has the fine POS sequence ADV-ADV-*que*, and the chunk tag GADV-*que*.[3]
3. We query the FRWaC, retrieving all n-grams that have the fine POS sequences annotated in the previous step, and that occur more than 20 times. For instance, the search for ADV-ADV-*que* returned new entries like *alors même que* and *si peu que*.
4. We select, in this list, additional CPRE and CCONJ entries that we consider relevant according to the criteria described above. Some of the entries that were initially selected in step 1 were removed because they do not respect the inclusion criteria. For instance, *bien sûr que* was discarded because it does not behave as a conjunction and cannot be replaced by a single-word CONJ, not meeting criterion C1.3.

Some constructions selected as initial candidates turned out to be quite infrequent in the corpus (e.g. *au moment que*). We decided to keep them in the lexicon because this is due to the nature and quite informal register of the FRWaC. The final list of selected constructions contains 228 CPRE and 49 CCONJ.

4.2. Ambiguity Assessment

For each target construction, we would like to estimate whether it is ambiguous. In that case, we would also like to know what proportion of uses correspond to CPRE and CCONJ readings with respect to accidental cooccurrence. Therefore, we also employ a heterogeneous methodology mixing linguistic expertise and corpus linguistics.

1. We build artificial sentences that exemplify the usage of each lexical entry. We number the examples, 1 for a use as a CPRE/CCONJ and 2 for other uses. For instance, examples 1 and 2 discussed in Section 1. are the sentences that exemplify the usages of the lexical entry *bien que*.

2. We select sentences in the FRWaC containing the word sequence of the lexical entry. as follows:

   (a) We select any sentence in the FRWaC that contains exactly one occurrence of the target construction, including contractions like *du* (*de+le*) and *qu'* (*que*+vowel).

   (b) We keep only sentences that have more than 10 words (enough context is provided) and less than 20 words (annotation is faster).

[3] For fine POS sequences, we use the POS tagset of the FRWaC corpus. Chunk tags are: adverbial phrase (GADV), prepositional phrase (GPRE), noun phrase (GNOM), subordinate clause phrase (GCSU) and verb phrase (GVRB), suffixed by *de* or *que*.

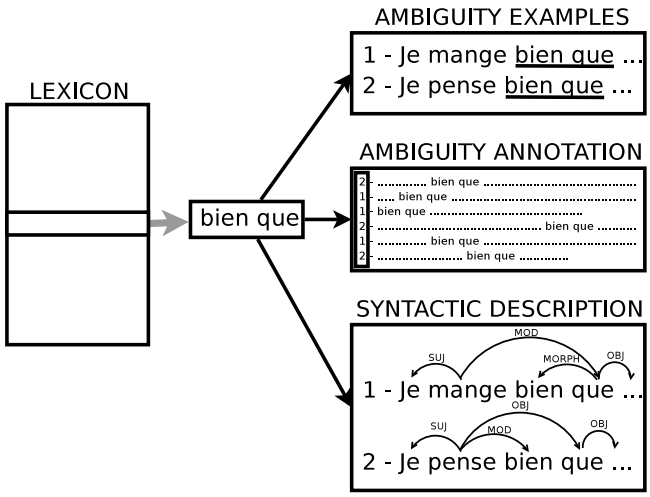


Figure 2: Structure of *DeQue* lexicon and example entry.

(c) We shuffle the order of sentences to favour variability.

(d) We highlight the target construction to facilitate subsequent annotation.

3. For each sentence, we annotate it as 1 (CPRE/CCONJ) or 2 (other uses). Sentences that have too many orthography and/or grammar errors are discarded. Sentences that are ambiguous and require extra context (previous/next sentence) are discarded as well. We annotate around 100 sentences per construction (or less, according to their frequency in the corpus). Each sentence was annotated by at least 2 experts, and conflicts were resolved during meetings.

4. Based on the insights from annotation, we describe the full syntactic structure of the construction by annotating the full dependency tree of the example sentences of each usage case. This includes comments about the most natural internal structure. For instance, it is reasonable to argue in favor of *que* acting as a syntactic head and *bien* being its dependent in *bien que* (Nasr et al., 2015).

The first step models the ambiguity of each construction *in theory*. Therefore, it is possible to know whether a construction is potentially ambiguous and requires some special treatment. Steps 2 and 3 quantify this ambiguity *in practice*, through empirical evidence. For example, in the case of *bien que*, we have annotated 99 sentences, from which 37.4% are CCONJ uses and 62.6% are other uses. The result of the last step details the syntactic ambiguity and suggests a representation for the target construction in a parser and/or treebank.

5. Resource Structure

The methodology outlined in the previous section results in a modular resource, composed of 4 parts, shown in Figure 2.

Lexicon The main lexicon contains information about the CPRE or CCONJ entries. Some examples of lexical entries are shown in Tables 2 and 3. In addition to the entry's canonical form, it provides fine and chunk POS tags. The fine POS sequence corresponds to the POS tags of the individual words used in corpus searches. The tagset comes from the POS tags in the FRWaC corpus, which was automatically tagged by the TreeTagger. The third column shows the number of entries in *DeQue* that follow each fine POS pattern. We observe that prepositional phrases are the most productive complements of *de*-CPREs while adverbs seem to be the most common types of complements in *que*-CCONJs. The chunk POS is useful to group similar patterns and observe paradigms on a coarser scale. In addition to the fields shown in the tables, we also provide corpus-related information such as the number of sentences of the FRWaC that contain the lexical entry's tokens. This is a raw number, and represents all uses regardless of whether the entry was really used as a CPRE/CCONJ or if it was an accidental co-occurrence.

Fine POS + que	Chunk	#Conj	Example
ADV ADV	GADV	14	alors même que
ADV	GADV	20	ainsi que
DET NOM	GNOM	3	la preuve que
NOM	GNOM	3	faute que
PRE ADJ NOM	GPRE	5	à tel point que
PRE ADV ADV	GPRE	1	d'autant plus que
PRE ADV	GPRE	11	à moins que
PRE DET ADJ NOM	GPRE	3	au même titre que
PRE DET NOM	GPRE	9	à l'idée que
PRE NOM	GPRE	12	à condition que
VPP	GVRB	2	attendu que
Total CCONJ		49	

Table 2: Example CCONJ patterns in *DeQue* main lexicon.

Fine POS + de	Chunk	#Pre	Example
ADV CSU	GCSU	1	plutôt que de
ADV	GADV	3	autour de
DET NOM	GNOM	1	le temps de
NOM	GNOM	4	faute de
PRE ADV	GPRE	7	à court de
PRE DET NOM	GPRE	121	à l'abri de
PRE DET VINF	GPRE	1	au sortir de
PRE NOM	GPRE	85	à base de
PRE VINF	GPRE	5	à compter de
Total CPRE		228	

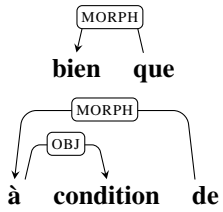
Table 3: Example CPRE patterns in *DeQue* main lexicon.

Ambiguity Examples We represent the ambiguity of lexical entries in two different ways, which account for the *possibility* and the *likelihood* of an entry to be ambiguous. *Ambiguity examples* are artificial sentences that we build up in order to illustrate all possible uses of an entry. They correspond to prototypical uses of the construction that help annotators understanding the ambiguity. Most of the time, they are adapted from annotated sentences described below.

Ambiguity Annotation Some constructions are likely to be employed in different uses, but others have a skewed distribution that makes one of the uses very rare. As explained above, in order to quantify this ambiguity, we selected a set of around 100 sentences per entry which were annotated using a simple distinction: 1 for CPRE/CCONJ and 2 for other uses. The examples below show some real sentences annotated for *bien que*. We note that "other uses" merges different phenomena. For example, the second sentence below contains the noun *bien* (*goods*), which is different from the first sentence where *bien* has its more usual role as adverb. Both are annotated as 2 because we consider that POS ambiguities will arise and be solved by an exterior process, not using information in *DeQue*.

2 *Il semble* **bien que** *la profession préfère temporiser pour rafler une part des recettes provenant d'internet.*
2 *Je veux toutefois être encore de vos amis ; mais ne demandez plus un* **bien que** *j'ai promis.*
1 **Bien qu'***elle l'ait inspiré, la religion védique est très différente de l'hindouisme d'aujourd'hui.*
1 *La pièce n'a besoin de rien,* **bien qu'** *il n'y ait rien là.*
2 *Je sais* **bien que** *votre coeur ne se détachera pas de lui-même.*

Syntactic Description We propose a full dependency tree for the ambiguity examples. This provides a way to distinguish CPRE and CCONJ constructions from accidental cooccurrence using special relation MORPH between the constituting elements (Nasr et al., 2015). When interpreted as a CPRE or CCONJ, the whole MWE acts as a single preposition or conjunction. Therefore, we argue that *de* and *que* should be the syntactic heads. Modifiers like noun phrases and adverbs often have regular syntactic structure, and their heads are governed by the preposition or conjunction. For instance, the syntactic structure of expressions *bien que (although)* and *à condition de (conditioned to)* in reading 1 is shown below:



6. Future Developments

In the future, we would like to extend this lexicon to other CPRE and CCONJ constructions. This includes, for instance, CCONJ headed by *si* (*if*), *quand* (*when*) and *où* (*where*), CPRE headed by *à* (*to*) and *en* (*in*) and also complex determiners and pronouns.

This lexicon can be very useful for parser development and adaptation to a given domain. For instance, if we want to build a very robust parser for literary texts, we would need to model all theoretically ambiguous constructions using MORPH links. On the other hand, a fast parser for speech transcriptions could safely ignore constructions that rarely co-occur by accident, setting a threshold on the proportion. For instance, all combinations that occur 90% of the times as complex function words will be simply concatenated as a single token. This helps the parser designers to make more informed decisions about the best moment to deal with these complex function words in the analysis pipeline.

We would like to build more fine-grained syntactic-semantic clusters for each construction type, depending on the distribution and fixedness of internal elements. For instance, locative relational nouns like *north*, *centre*, etc can build relational CPREs like *au nord de (north of)*. They accept similar modifications and are very different from causative CPREs like *en raison de* and *à cause de* (both mean roughly *because*). We would like to obtain this information by studying the link between the corpus distribution and cooccurrence pattern of the internal elements and of the whole expression. This can be related either to the linguistic context of the construction itself, but also to the usage context, that is, genre and domain of the text.

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