

**A CORPUS-BASED ANALYSIS OF THE *WHAT'S X DOING* Y CONSTRUCTION IN ENGLISH**

**UN ANÁLISIS DE CORPUS DE LA CONSTRUCCIÓN  
*WHAT'S X DOING* Y EN INGLÉS**



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## ABSTRACT

The *What's X doing Y?* construction is a grammatical structure that has been studied by many authors, mainly from the perspective of Construction Grammar, and, although it has already been investigated in previous works, I think that new contributions to its analysis can still be added. An approach to the formalisation of the roles, semantics and syntax of this construction is carried out in this paper as well as a discussion of its properties and frequency of use. Different linguistic corpora have been used in order to collect the data that allow the analysis of the idiosyncratic features of the WXDY construction taking into account its use in real language.

**KEY WORDS:** construction, linguistic corpus, semantic roles, frequency, WXDY.

## RESUMEN

La construcción gramatical *What's X doing Y?* es una estructura que ha sido estudiada por varios autores, principalmente desde la perspectiva de la Gramática de Construcciones, y, aunque ya ha sido investigada en trabajos anteriores, pienso que aún se pueden añadir nuevas contribuciones. En este proyecto se lleva a cabo un estudio sobre la formalización de los roles, la semántica y la sintaxis de esta construcción además del análisis de sus propiedades y frecuencia de uso. Se han usado diferentes corpus lingüísticos para recoger la información que permita el examen de los rasgos idiosincrásicos de la construcción WXDY teniendo en cuenta su uso en el lenguaje real.

**PALABRAS CLAVE:** construcción, análisis de corpus, roles semánticos, frecuencia, WXDY.



## ANEXO II

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## **Table of contents**

1. Introduction.....	1
2. Objectives.....	2
3. Methodology.....	2
4. Construction Grammar.....	3
4.1. Definition of construction.....	4
4.2. <i>What's X doing Y?</i> construction.....	7
5. Corpus Analysis.....	14
5.1. Syntax.....	14
5.1.1. What.....	14
5.1.2. Progressive aspect.....	15
5.1.3. Do.....	16
5.1.4. X.....	17
5.1.5. Y.....	19
5.2. Semantics associated with the construction.....	20
5.3. Argument structure.....	22
5.4. Frequency.....	26
6. Conclusion.....	29
7. References.....	31

## 1. Introduction

The term *grammatical construction* is a difficult one to define since it has been studied from many different perspectives, among them and most recently, from the point of view of Construction Grammar. Construction Grammar is a cognitive model of grammar that takes constructions as an essential element for the analysis of language. Constructions are considered to be form-meaning pairings that, sometimes, have idiosyncratic properties. This approach to grammar has many features in common with other models, such as Generative Grammar. For instance, it is a cognitive system that looks for a relevant theory needed for language learning. Nevertheless, there are also differences between Construction and generative theories of grammar, for example, one of the main characteristics of the former is the fact that the meaning of constructions is considered to be non-compositional, in other words, the meaning of utterances is not only formed by the combination of each individual word inside them but the construction itself contributes part of the overall meaning.

The *What's X doing Y?* construction, also known as *WXDY* construction, is a grammatical construction that has been studied most recently from the perspective of Construction Grammar. This grammatical structure may be exemplified as follows:

- (1) What was Mueller doing answering questions? (BNC)

The complexity of this construction is reflected on its properties and on the fact that the number of instances found in the linguistic corpora is extremely low, what makes it difficult to provide definite results. Most of the authors who have analysed the *WXDY* construction take as a reference Kay and Fillmore's article published in 1999. Taking into account the article just mentioned, other works and the study of the data collected from the corpora, the objective of this work is to provide an analysis of the syntactic and semantic features and the frequency of use of the *WXDY* construction as well as the formalisation of its argument roles and their linking to grammatical functions from the perspective of Construction Grammar.

## 2. Objectives

The main objective of this project is to carry out a detailed analysis of the English construction *What's X doing Y?*, especially in terms of its argument structure and frequency of use. To achieve this aim, this paper will take into account the approaches to Construction Grammar in Fillmore and Kay (1999), and Goldberg (1995, 2006). The study of the frequency of use of this construction will be based on the data extracted from different linguistic corpora, since my objective is to develop a deep analysis of the construction through the study of the data found in real language. The research of the WXDY construction will also provide an investigation and formalisation of the participant and argument roles of the structure together with the linking pattern between its semantics and syntax.

## 3. Methodology

The discussion of this grammatical structure is based on the results found on different linguistic corpora, since this study takes into account the use of the construction in real language. The corpora used in this work are the BNC (British National Corpus), COCA (Corpus of Contemporary American English), COHA (Corpus of Historical American English), GloWbE (Corpus of Global Web-Based English), Strathy (Corpus of Canadian English) and NOW (News on the Web) corpora.

The pattern “what \_vb\* \_n\* doing” has been used in order to look for instances of the WXDY construction in each corpus. This pattern specifies all the elements of the construction, except for the *Y* element, which cannot be specified beforehand because its gap can be filled by a wide range of phrases. On the one hand, “what” and “doing” have been used with a fixed form, since they are invariable elements in this construction. On the other hand, “\_vb\*” and “\_n\*” indicate that any form of the verb *be* and any nominal phrase can appear in the results of the corpora since both of them are variable elements.

This project is divided into two main sections. The first part focuses on the definition and explanation of the concept *grammatical construction* and its principal

properties. It also introduces the most relevant features of Construction Grammar as presented in Goldberg (1995, 2006) and Kay and Fillmore (1999), since it is the model of grammar that I have followed in order to do this work. The first section offers a review of some previous studies of this construction. Among these works, the most relevant ones are the studies carried out by Kay and Fillmore (1999), and Holmes and Hudson (2005).

The second section of this project looks into the main morphosyntactic features of the *What's X doing Y?* construction as well as its idiosyncratic semantic properties. The analysis of the argument roles of the WXDY construction, the linking of syntactic functions and its formalisation are also carried out in this section taking into account the works of Goldberg (1995, 2006). Finally, this section shows the frequency of use based on the analysis of the data found in the different corpora mentioned above.

#### **4. Construction Grammar**

Language has usually been analysed from a compositional point of view, what means that linguists have normally thought that the meaning of an utterance is created by the combination of the meaning of all the words and elements that constitute it. However, some scholars noticed that idioms are problematic to this model of grammar, since their meaning is not always formed by the combination of the meaning of its elements.

Fillmore, Kay and O'Connor (1988) are some of the first researchers who have adopted this model of grammar. In fact, Fillmore's Case Grammar, which tries to analyse grammar from a semantic perspective, is considered to be the precursor to Construction Grammar. The purpose of these three linguists is to explain the relationship between form and meaning. They state that "...the proper units of grammar are more similar to the notion of construction in traditional and pedagogical grammars than to that of rule in most versions of generative grammar" (Fillmore, Kay and O'Connor, 1988, p.501). In this way, they point to one of the most central differences that exists between constructionist and generative approaches to grammar.

Construction Grammar has emerged recently, as has been said above, as a reaction to the traditional compositional approaches to grammar. According to Fried and Östman

(2004), Construction Grammar is seen as generative in its traditional sense, since it “...aims to account for all of the grammatical sentences of the language and only those (...) which requires some measure of formalization” (p.24). However, it can be said that, although Construction Grammar emerged as a reaction to generative approaches to grammar, both of them have some features in common. For example, both models “...consider language as a cognitive (mental) system, both approaches acknowledge that there must be a way to combine structures to create novel utterances, and both approaches recognize that a non-trivial theory of language learning is needed” (Goldberg, 2003, p.219).

CG takes constructions as the basic component of grammar. Unlike generative grammarians, constructionist grammarians claim that the primitive forms of language are constructions. In this sense, language can be seen as a repertory of constructions. Another central feature of Construction Grammar is that this theory of grammar is monostratal, i.e., it contains only one level of representation, unlike generative models of grammar which contain a sequence of structures linked by transformations. This feature of Construction Grammar leads to the fact that the representations of constructions contain syntactic, semantic and pragmatic information.

It should be also mentioned that many researchers, like Goldberg, Fillmore, Kay, and Croft, study Construction Grammar from their own perspectives, which vary in some aspects, creating thus different types of Construction Grammar, such as Fillmore and Kay's, Goldberg's, Embodied Construction Grammar or Radical Construction Grammars. I will take into account Goldberg's and Fillmore and Kay's Construction Grammar (also known as Berkeley Construction Grammar) to analyse the *What's X doing Y?* structure in the following pages. Before analysing it, I will define the term *construction* adopted by these approaches.

#### **4.1. Definition of Construction**

Constructionist grammarians define constructions as form-meaning pairings that can be words, phrases, sentences, etc. In other words, constructions are generally defined as grammatical structures larger than a morpheme. Common grammatical patterns such as

passive and relative clauses are also understood as constructions because they are learned form-meaning pairings. In addition, basic patterns of sentences, such as verb phrases, are also considered to be constructions, since “...the main verb can be understood to combine with an argument-structure construction” (Goldberg, 2003, p.220). Barcelona and Valenzuela (2011) mentioned that there are some lexically defined expressions, which are also considered constructions, in between simple and complex sentences, for instance, the construction that is going to be analysed in this paper, the *What’s X doing Y?* construction. Most constructionist grammarians have focused their studies on the analysis of these ‘mid-level constructions’, since these are the ones who can demonstrate that the form-meaning pairings (or syntax-lexicon continuum, as some linguists call those pairings) exist in the language.

Many constructionist linguists agree on the idea that the term *construction* or *grammatical construction* is difficult to define. Svenonius (2015) describes the term *construction* as “...a characteristic formal pattern of syntactic categories or features, usually associated with some meaning and/or discourse function” (p.2). However, many authors take as a reference the definition proposed by Goldberg (1995), which is stated as follows:

C is a CONSTRUCTION iff<sub>def</sub> C is a form-meaning pair  $\langle F_i, S_i \rangle$  such that some aspect of  $F_i$  or some aspect of  $S_i$  is not strictly predictable from C’s component parts or from other previously established constructions. (p.4)

In this definition, in which F stands for *Form* and S stands for *Semantics*, Goldberg proposes that constructions are pairings of form and meaning which may not be predictable, in other words, the meaning of the construction cannot be predicted from the combination of the meaning of its component words or from other constructions that already exist in the language. The meaning conveyed by the combination of the words that appear in the construction differs from the overall meaning of the construction as a whole, so constructions are considered to be non-compositional. For example, the expression *hit the road* does not mean to actually hit the road or street but *to leave*.

Expressions like the one mentioned above are represented as independent constructions due to their non-compositionality feature. Constructions, instead of being

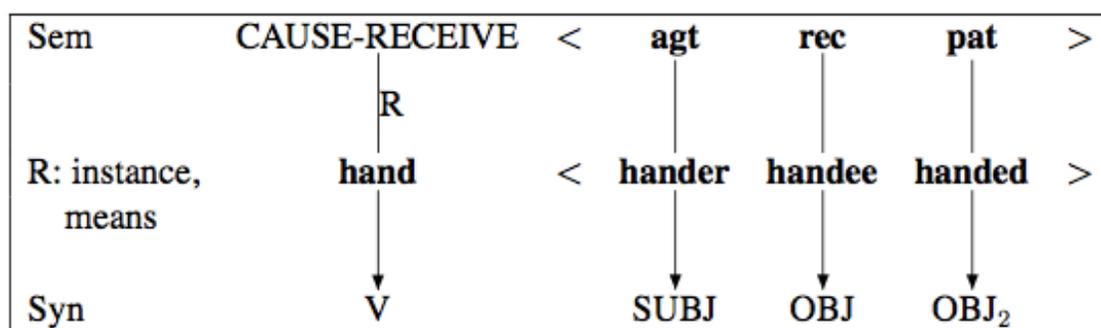
compositional, have symbolic links that join the elements of the syntactic and semantic structures together. In other words, a construction as a symbolic whole is made up of symbolic units as parts. In addition, Fillmore (1988) states that constructions have external and internal syntactic properties. External properties are those properties of the whole construction: "...anything speakers know about the construction that is relevant to the larger syntactic contexts in which it is welcome" (p.36). Internal syntactic properties, on the other hand, are those related to the properties of each element that forms the construction.

Another feature of constructions is that some "...patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency" (Goldberg, 2006, p.5). According to Barcelona and Valenzuela (2011, p.25), this is related to the fact that constructions are considered to be usage-based, which means that grammatical structures are learned throughout the use of conventionalized patterns, they are not innate.

Furthermore, it must be also said that Hilpert (2014) states that there are four strategies to identify if an expression is a construction. The first strategy aims to "...look out for structural traits that deviate from more canonical patterns" (p.23), what can be related to the fact that constructions are considered to be non-predictable. The second strategy focuses on identifying non-compositional meanings of the expression. The third one aims to find out if the expression has idiosyncratic constraints or not, since constructions are normally limited by certain features. If these three strategies fail to identify an expression as a construction, then we have to apply the last strategy, which tries to analyse collocational preferences because they can "...reveal that the expression in question does in fact have status of a construction" (Hilpert, 2004, p.23).

These four strategies offered by Hilpert are also related to the features of constructions that Goldberg refers to in her definition of construction mentioned above. Hilpert and Goldberg agree on the idea that constructions, or a part of a construction, are non-predictable. The fact that an aspect of a structure may not be predictable is related to the non-compositionality feature of constructions that Hilpert mentions, since their meaning is not formed by the combination of the meaning of each word that appears in the sentence.

It should be also remarked that Goldberg studies the argument structure of grammatical constructions, that is, she analyses the participant and argument roles of verbs and constructions in order to give shape to their syntactic and semantic properties. She distinguishes and defines participant and argument roles and proposes the representation of the linking pattern between the semantic level and the syntactic level of grammatical functions of constructions as shown in the following schema, which represents the ditransitive construction (Goldberg, 1995, p.51).



*Justin handed Ariana the book.*

The argument roles of the construction (agent, recipient and patient) appear in the first line and the participant roles of the verb (hander, handee and handed) appear in the second line. The last line provides the syntactic functions (subject and two objects) in the sentence. Finally, *Sem* stands for *semantics*, term that is used in order to show the meaning of the construction.

#### 4.2. *What's X doing Y? construction*

There are many linguists who mention in passing the *What's X doing Y?* construction, but only a few of them have analysed it thoroughly. Most of the grammarians that study this construction base their works on Kay and Fillmore's article about the *What's X doing Y?* construction. Kay and Fillmore (1999) termed this structure *What's X doing Y?* construction, but they also refer to it as *WXDY* in order to make it shorter. Both labels make reference to the elements that appear in all the instances of the construction. A typical example of this structure would be:

(2) What is this bottle doing on my table?

In (2), it can be seen that *this bottle* represents the X element in the construction's name and *on my table* represents the element Y. The main purpose of Kay and Fillmore is "...to introduce, by means of the detailed analysis of a single grammatical problem, the rudiments of a grammatical theory which assigns a central role to the notion of *grammatical construction*" (Kay and Fillmore, 1999, p.1). In other words, both authors try to explain the features of Construction Grammar through the analysis of the *What's X doing Y?* construction.

Kay and Fillmore focus on "...the formal system in which this and all other constructions can be represented in a grammar and the relations that obtain between the construction under study and the more general, so-called core, construction of English" (Kay and Fillmore, 1999, p.2). According to them, the WXDY construction is composed of other structures that are smaller and more general, such as the Verb Phrase construction, so they focus on their formal analysis. In addition, the *What's X doing Y?* structure inherits properties from those smaller constructions.

The name that these authors give to this construction has the form of a main-clause question with a single clause (3), however, it can also have the form of an embedded interrogative clause (4) and also a long-distance dependency between the elements *what* and *doing* (5).

(3) What is this scratch doing on my table?

(4) I wonder what the salesman will say this house is doing without a kitchen.

(5) I don't suppose the police had anything to say about what their so-called detective thought the footprints were doing under the bedroom window. (Kay and Fillmore, 1999, p.3)

Although some of the properties of the WXDY construction can also be found in other patterns of the language, the special feature of this structure is the fact that it has an idiosyncratic non-compositional semantic interpretation that is not derived from

conversational processes. Kay and Fillmore, as well as other authors, study the semantic interpretation of this construction by analysing the ambiguity that is found in the following joke:

- (6) Diner:                   Waiter, what's this fly doing in my soup?  
      Waiter:                 Madam, I believe that's the backstroke.

According to Kay and Fillmore, the question the diner asks has two interpretations and the waiter chooses the wrong one. The waiter has interpreted the diner's utterance literally when it should be understood as an instance of the WXDY construction; its actual meaning is indicating an unanticipated and surprising situation that the speaker disapproves. The waiter has understood the question as (7a) while the diner is actually asking (7b):

- (7) a. What's this fly in my soup doing?  
      b. How come there's a fly in my soup?

According to Kay and Fillmore (1999, p.4), the instances of the WXDY construction are not actual questions that request a literal answer, in fact, this structure requests an explanation for a situation that is considered to be incongruous.

Kay and Fillmore (1999, p.6) also specify the idiosyncratic morphosyntactic properties of the WXDY construction. They claim that the construction must contain the verb *do* since, if it does not appear in the sentence, there would be no incongruity meaning. They show this feature with the following examples:

- (8) a. What was she doing under the bed?  
      b. What activity was she engaged in under the bed?

(8a) is an instance of the WXDY construction while (8b) is not. It can be seen that only the meaning of (8a) refers to an unexpected event.

Another property of this construction is the fact that the verb *do* should appear in its progressive form. Otherwise, the sentence would be ungrammatical, as Kay and Fillmore show with the following examples:

- (9) a. \*What does this scratch do on the table?  
b. \*I wonder what the salesman will say this house does without a kitchen.

The sentences in (9a) and (9b) are ungrammatical since the progressive tense of the verb *do* has not been used.

In addition, Kay and Fillmore (1999, p.6) also claim that although the verb *doing* in other sentences can appear as a complement to verbs other than *be*, in the WXDY construction it can only appear accompanied by *be* because this structure requires the use of the progressive tense for the sentence to display its incongruity meaning:

- (10) a. What did he keep doing in the tool shed?  
b. What was he still doing in the tool shed?

According to these authors, (10a), unlike (10b), does not allow the meaning of the construction because it does not use the progressive form of the verb *do*. Nevertheless, the verb *doing* does not imply a progressive aspect in spite of the fact that it takes the progressive form, as the following examples found in the linguistic corpus show:

- (11) a. What's Beth doing this week? (BNC)  
b. What was Dana doing on a catwalk? (BNC)

Both instances show the progressive form of the verb *do*, but only (11b) is an instance of the WXDY construction. Therefore, only (11a) implies an actual progressive aspect, i.e., the speaker is asking for information about the activities that *Beth* will perform.

In addition to the properties already mentioned, Kay and Fillmore (1999, p.7) also state that the interrogative pronoun *what* does not accept *else*, contrary to other similar sentences, as the following instances show:

- (12) a. Why else are you eating cold pizza?
- b. What else are you going to tell her?
- c. \*What else are you doing eating cold pizza?

(12a) and (12b) demonstrate that *why*-questions and ordinary *what*-questions allow the use of *else* while (12c) shows that the instances of the WXDY construction do not permit its use. Kay and Fillmore (1999) point out that the fact that the WXDY structure does not allow the use of *else* is related to the non-referentiality of the *what* element, since “...the expression *what else* requests identification of an entity (*what*) in addition to or instead of (*else*) a given entity. But WXDY-*what* can’t point to an entity whose identification is requested since it is non-referential.” (p.32).

Finally, Kay and Fillmore (1999, p.7) also claim that the *What’s X doing Y?* construction does not allow the negation of *do* and *be*, only the *Y* element can be negated, as can be seen in the following examples:

- (13) a. \*What aren’t my brushes doing soaking in water?
- b. \*What are my brushes not doing soaking in water?
- c. What are my brushes doing not soaking in water?
- d. How come my brushes aren’t soaking in water?

According to Kay and Fillmore (1999), the fact that *be* and *do* cannot be negated is not attributed to the meaning of the construction because the instances of *How come* questions, like the one in (13d) allow the negation of the verb *be* and they still have the incongruity meaning. In my opinion, it may be related to the morphosyntactic properties of the construction, since the verb does not have its usual features, that is, the progressive aspect in the construction does not work in the same way it does in ordinary sentences, as I will explain later.

Syntactically, Kay and Fillmore (1999) state that the verb *be* is considered to be the head of the sentence. In this sense, they claim that:

In every WXDY clause the Coinstantiation construction will figure twice. Within the outer valence set Coinstantiation will unify the subject, i.e., the *X* element, with the subject of the verbal complement, the *doing* VP. Within the *doing* valence set, Coinstantiation will unify the subject of the complement of *doing* (the *Y* element) with the subject of *doing*. (p.29)

The Coinstantiation construction links elements of the same sentence together. Kay and Fillmore (1999) claim that this construction is related to the WXDY construction in the sense that the former links an element to another one inside the construction. In other words, these authors state that the elements of the WXDY construction cannot be represented individually due to the properties that it inherits from the Coinstantiation construction.

As regards the *Y* element of the WXDY construction, it can take the form of a wide range of syntactic categories, such as prepositional phrases, adverbial phrases, participial V-ing phrases, or noun phrases. Finally, the authors state that the *X* element is a nominal phrase that functions as the subject of the sentence. Kay and Fillmore (1999, p.34-35) conclude that this expression should be considered a grammatical construction due to its idiosyncratic properties, since these special properties are the ones which make the structure special.

Another important approach to the analysis of the *What's X doing Y?* construction is provided by Holmes and Hudson (2005). These authors analyse the WXDY construction from the perspective of Word Grammar, which takes words as the primitive elements of language. In this model of grammar, the structure of the sentence is contained in the information about individual words. In their analysis of the WXDY construction, Holmes and Hudson (2005) reach the same general conclusions advanced by Fillmore and Kay (1999): what makes this structure special is the combination of the idiosyncratic properties of the construction itself and not the elements that form it, since they can be found in other patterns.

As regards the meaning of the construction, Holmes and Hudson (2005) state that "...according to the general principle of WG semantics, the meaning of the whole construction is a property of the head word, WHAT" (p.258). The analysis proposes that *doing* is a special case of the verb *do* because it has no meaning and takes two

complements, *what* and a sharer. The sharer of *do* is the *Y* element, which takes the same subject as the lexical verb and that is the reason why these authors call it *sharer*. Holmes and Hudson (2005, p.259) also claim that the verb *be* takes the verb *do* as its sharer and, therefore, it has to be tensed. *Be* has the properties of a normal tensed verb, so it needs a subject, but it is shared with the sharer of *be*, that is to say, *be* and *do* share the same subject.

Finally, Holmes and Hudson (2005) state that the *What's X doing Y?* construction is defined by three words "...which are linked directly to one another in a simple dependency chain" (p.259-260). In this construction, these three words acquire "...special restrictions on the usual range of possibilities or special extra possibilities which are not usually available" (Holmes and Hudson, 2005, p.260), although they can be also found as ordinary words.

In addition to the analysis of the *What's X doing Y?* construction carried out by Kay and Fillmore (1999) and Holmes and Hudson (2005), there are some other studies about this construction which deserve being mentioned to highlight some additional but relevant ideas about the WXDY structure.

Taylor (2012) investigates the *What's X doing Y?* construction and states that the form of this idiomatic expression can vary by introducing expletives such as *what the hell*, *what do you think*, etc., to the interrogative pronoun *what*. According to this author, the use of expletives in this construction can highlight "...the speaker's sense of surprise or even outrage" (p.92). Moreover, according to Lee-Goldman (2006), the *What's X doing Y?* construction can be analysed as a rhetorical question. Rhetorical questions are those questions which do not expect an answer, they make a statement. Therefore, it could be said that the *What's X doing Y?* construction is also a rhetorical question because it does not expect a literal answer. In spite of the form of this construction, the answer that the speaker expects is an explanation of the situation described in the utterance, since the event described is considered to be unexpected.

Although most linguists agree with Kay and Fillmore (1999) on the idea that the meaning of the construction represents an unexpected situation, some of them argue about the ambiguity that this grammatical construction exhibits, since it can sometimes be interpreted literally. In this sense, Brône, Feyaerts and Veale (2015) state that the purpose

of the WXDY construction could be related to “...enquire as to the origin of X, to suggest that the X does not belong at location Y, or even to make accusations about responsibility for the X being located at Y” (p.53).

## 5. Corpus Analysis

In the following pages, I will develop a thorough study of the syntactic and semantic features of the *What's X doing Y?* construction based on the analysis data found on different linguistic corpora. I will also formalise the semantic and syntactic features of this construction following the line of analysis proposed in Goldberg (1995, 2006). Finally, I will analyse the frequency of use of the WXDY construction.

### 5.1. Syntax

The *What's X doing Y?* construction has many idiosyncratic morphosyntactic features which have already been studied by many authors, as we have seen above. In the following subsections I will discuss the main defining features of the elements that form the WXDY construction. This construction has two fixed elements, *what* and the *progressive tense*, and two variable elements, *X* and *Y*. If an element is fixed, it means that it will always appear in the construction in a specific form, while variable elements are present in different shapes.

#### 5.1.1. What

The *what* element is one of the fixed elements of the *What's X doing Y?* construction. This element is an interrogative pronoun and it functions as the ordinary interrogative pronoun *what*, in other words, its syntactic properties in the construction are identical to those in usual contexts. The pronoun *what* in the WXDY construction allows the use of expletives, since it can appear in a long-distance dependency relation with the rest of the elements of the construction, as can be seen in the following examples, in which the structure takes *the hell* as an expletive:

(14) What the hell is bamboo doing on a Georgia golf course? (COCA)

Nevertheless, this element differs from the ordinary interrogative pronoun *what* because it is non-referential, as it does not ask for real information. Therefore, it does not allow the use of *else*, since *what else* requests the identification of an actual event. This feature can be exemplified as follows:

- (15) a. What are Muslims doing fighting Muslims? (GloWbE)  
b. \*What else are Muslims doing fighting Muslims?

The use of *else* in (15b) makes the instance of the WXDY construction ungrammatical due to the lack of referentiality of the *what* element. However, the combination of *what* and *else* in ordinary questions usually requests the identification of an entity or event.

### 5.1.2. Progressive tense

There are certain verbs than can or cannot appear in some constructions due to their idiosyncratic features. In the case of the *What's X doing Y?* construction only two verbs can be used, the verbs *be* and *do*. If other verbs are used, the construction would not have its constructional meaning or it would be ungrammatical. As regards the verbal tense in the sentence, the progressive is the only one that can be used.

With respect to the verb *be*, it is a fixed element of the WXDY construction. This verb always appears in the construction, but its form can vary according to the different tenses used, for instance:

- (16) a. What's Richard doing here? (COCA)  
b. What was Biff doing there? (BNC)

Moreover, if the verb *be* does not appear, the construction would not have the incongruity meaning because it would not display the aspect needed:

(17) a. What was Emilio doing on the carpet, baby? (COCA)

b. What does Emilio do on the carpet, baby?

While the utterance in (17a) is an instance of the *What's X doing Y?* construction, the utterance in (17b) is an instance of an ordinary *what* question whose meaning implies action. The syntactic difference between both examples is that the first one uses the progressive aspect and the second one does.

As regards the use of present or past tense, an interesting feature is the fact that a 66.67% of the instances use the present tense of the verb *be* while only a 33.33% use the past tense. Another idiosyncratic syntactic feature of the verb *be* in this construction is the fact that it cannot be negated:

(18) a. What was Rochelle doing out this late at night? (COCA)

b. \*What was not Rochelle doing out this late at night?

c. He is not doing much to help himself (BNC)

Contrary to the *WXDY* construction, the verb *be* can be negated in ordinary sentences using the progressive aspect, as can be seen in the example (18c) above. It may be argued that this grammatical construction does not allow the negation of the verbs *be* and *do* due to its idiosyncratic properties, since the sentence in (18c) is grammatical and it contains the same verbs. The only difference between them is the fact that (18a) and (18b) are instances of the *WXDY* construction and (18c) is not.

### 5.1.3. Do

The verb *do* is also a fixed element and it is the only lexical verb that can appear in the construction, but, unlike the auxiliary *be*, which varies according to present or past tense, this verb can only appear in its progressive form, as is exemplified with the following instances:

- (19) a. What are Obsidian doing on the surface? (NOW)  
b. \*What have Obsidian done on the surface?

(19b) is ungrammatical because it does not display the progressive aspect, which has to be used in order for the construction to have its incongruity meaning. However, although the verb takes the progressive form, it is not referring to an actual action taking place at the moment of speaking or writing.

Moreover, there is also a possibility for some words to appear between the elements of the WXDY construction:

- (20) What are Yamaha doing still using only a spark-cut system? (GloWbE)

The fact that the word *still* appears between *doing* and the *Y* element does not change the semantic and morphosyntactic properties of the construction.

Besides, like the verb *be*, *do* cannot be negated; the use of negation in one of the two verbs leads to an ungrammatical sentence:

- (21) a. What were people doing on the roads at that hour? (GloWbE)  
b. \*What were people not doing on the roads at that hour?  
c. \*What were not people doing on the roads at that hour?

These utterances demonstrate that if one of these two verbs is negated, the instance of the WXDY construction would be ungrammatical. However, the *Y* element of the construction can be negated, as I will show later.

#### 5.1.4. X

The *X* element is one of the two variable elements of the *What's X doing Y?* construction. The gap of this element is usually filled by a noun phrase, which functions as the subject of the sentence.

- (22) a. What are kids doing watching a 10pm show? (GloWbE)  
b. What are bees doing with cell phones, anyhow? (GloWbE)

These two examples show that the nominal phrase that fills the gap of the *X* element does not have to be necessarily a nominal phrase that represents a human being, it can also represent animals, or even inanimate objects:

- (23) a. What's Vista doing with all that RAM? (COCA)

Out of the 144 instances found in the different corpora analysed, 87.5% of them have a human subject. Moreover, most of the subject gaps of the sentences are filled by the name of a person or institution:

- (24) a. What was Charlie doing making a movie in the first place? (COHA)  
b. What's Hollywood doing knocking off Japanese horror films? (COHA)

The prototypical subject of a sentence in the *What's X doing Y?* construction is a human being, such as the one in (24a).

Besides, this element contributes to the incongruity meaning of the construction since, if its gap is filled by a noun phrase that makes reference to an inanimate subject, it reinforces the idea that *do* does not have its action meaning in this construction, since a non-volitional agent cannot perform an action volitionally, for instance:

- (25) What is potassium doing here? (Strathy)

It is clear that the meaning of the verb *do* does not imply action in this sentence because the noun phrase *potassium* cannot perform any action volitionally. Moreover, when the subject of the sentence is inanimate, it erases the ambiguity of the construction, while animate subjects can increase it:

- (26) a. What's Stanley doing with that kind of person? (COHA)

- b. What are chipmunks doing in here? (COHA)
- c. What was iron doing in cold space many million miles away from the nearest star? (COHA)

If these three sentences are compared, it can be seen that the less ambiguous one is (26c) because the gap of the *X* element is filled by an inanimate subject. The three of them are instances of the *WXY* construction, but (26a) and (26b) may be also understood as ordinary questions in which the speaker asks the listener about the actions that the subjects of the sentences are performing. Despite the fact that animate subjects may increase the ambiguity of the structure, they are the type of subject most frequently used.

#### 5.1.5. *Y*

The *Y* element is the second variable element of the *What's X doing Y?* construction. According to Kay and Fillmore (1999), the gap of the *Y* element can be filled by a wide range of phrases. Nevertheless, four types of phrases have been found in the corpora analysed: prepositional phrases, adverbial phrases, *-ing* phrases and *-ed* phrases, or the combination of two of them:

- (27) a. What's Richard doing on the TV? (COCA) (prepositional phrase)
- b. What is m'lady doing here? (COHA) (adverbial phrase)
- c. What are Arsenal doing thinking about letting Walcott go? (GloWbE) (*-ing* phrase)
- d. What is Carter doing using a lawyer in Colorado? (COCA) (*-ing* and prepositional phrases)
- e. What's Geoffrey doing buried here? (COHA) (*-ed* and adverbial phrases)

Prepositional phrases are more frequently used than the other types of phrases: 48.6% of the instances of the *WXY* construction found in the different corpora have a prepositional phrase filling the gap of the *Y* element while, for instance, only 19.4% of the sentences

contain an *-ing* phrase. Besides, prepositional phrases denoting location are the most commonly used.

Another morphosyntactic feature of the *Y* element is that it is the only one that can be negated without making the instances of the WXDY construction ungrammatical:

- (28) a. What are men doing rating other men's bodies!? (GloWbE)  
b. \*What are not men doing rating other men's bodies!?  
c. \*What are men not doing rating other men's bodies!?  
d. What are men doing not rating other men's bodies!?

While the examples in (28b) and (28c) are ungrammatical because the verbs *be* and *doing* are negated, the example in (28d) is acceptable even though the *Y* element is negated. These examples demonstrate that the *Y* element of the construction is the only one that can be negated. Therefore, the negation in the WXDY construction is also a special feature of this construction.

## 5.2. The semantics of the construction

The idiosyncratic meaning of the *What's X doing Y?* construction is maybe its most relevant and defining feature. The meaning of this construction is what makes it special and different from other similar structures in English. This expression represents a situation that someone considers incongruous, that is, in every instance of the WXDY construction there is a speaker that judges a situation that he/she considers unexpected and surprising. Moreover, the speaker may also judge an event that he/she disapproves, as Cappelle (2017) shows with the following example:

- (29) a. What are your children doing in my garden?  
b. Look what your children are doing in my garden.

The sentence in (29a) represents disapproval, since the speaker describes a situation that is considered to be unexpected in a certain way. The meaning of the structure is attached to

the construction itself, since the sentence in (29b) does not necessarily imply disapproval, although it is similar to the previous one.(Cappelle, 2017, p.117).

The instances of the *What's X doing Y?* construction, in spite of their form, are more similar to *why*-questions than to *what*-questions. The pronoun *what* in the WXDY construction is not referential as it does not ask for actual information. The construction itself is the one which gives meaning to the sentence, and the meaning involves a request for an explanation of an incongruous situation.

An important feature of The *What's X doing Y?* construction is that it can be paraphrased with a *How come* question, since their meanings are quite similar. Although both structures are different, their semantic features are similar, since both of them resemble *why* questions:

- (30) a. What's Ellie doing all dressed up in Mother's clothes? (BNC)  
b. How come Ellie is all dressed up in Mother's clothes?  
c. Why is Ellie dressed up in Mother's clothes?

The examples above show that the instances of both the WXDY construction and the *How come* questions have an incongruity meaning. Since the meaning of the two sentences requires an explanation, both structures are similar to *why*-questions.

In addition, the construction may sometimes need a context in order to be understood as an incongruous event because some instances of the WXDY construction can be ambiguous: they can be interpreted literally or metaphorically, and, without a context, identifying the exact reading can be problematic, as the following examples show:

- (31) a. What is Binky doing in Latin 26? (COCA)  
b. What is Binky doing in Latin 26? She is in a graduate program, somewhere. (COCA)  
c. What was Martin doing in that neighborhood? (GloWbE)  
d. What was Martin doing in that neighborhood? Was he visiting someone there? (GloWbE)

The example in (31a) can be interpreted as a question in which the speaker simply asks about the activities that *Binky* is performing in *Latin 26*; however, the example in (31b) may be interpreted as an instance of the WXDY construction because the context in which the utterance is produced makes the situation described incongruous. Nevertheless, when the example in (31d) adds the context of the example in (31c), it can be seen that these two examples are not instances of the WXDY construction because the speaker is actually asking about the activities that *Martin* is performing. Therefore, a context is needed in many cases in order to determine whether the utterance is an instance of the *What's X doing Y?* construction or not.

The use of some expressions at the end of the construction can emphasize the idea that its meaning requests an explanation and the sentence can therefore be regarded as a true instance of the WXDY structure:

(32) What was Erdle doing in the woods, I'd like to know? (BNC)

The use of “I'd like to know” in (32) highlights the request for an explanation because it specifies that the speaker wants an answer or explanation of the situation described.

To sum up, the meaning of the *What's X doing Y?* construction involves a disapproving judgement caused by an incongruous situation. The speaker requests an explanation of the event described in the sentence because he/she considers it to be unexpected. In other words, the speaker asks for a clarification of a situation that he/she disapproves.

### 5.3. Argument structure

Goldberg (1995) proposes the application of argument structure to this model of grammar, and she also provides the argument structure analysis of some grammatical constructions, such as the caused-motion and the ditransitive constructions, among others. According to Evans (2007), argument structure is “...the number of arguments, that is, participants or entities, that a word-level relational predication such as a verb may be

combined with” (p.6). However, in the case of grammatical constructions, the argument structure of some verbs varies depending on the structure in which they appear, and it can also be possible for the arguments to be combined with a grammatical construction instead of with a verb. Kay and Fillmore (1999) analyse the *What’s X doing Y?* construction thoroughly, but they do not propose an argument structure analysis of this expression. This section of the work will provide a possible formalisation of the argument structure of the WXDY construction together with the linking pattern of arguments to syntactic function staking into account the works of Goldberg (1995, 2006).

According to Goldberg (1995), part of the semantics of a verb is constituted by its participant roles. However, some of these roles must appear in the sentence in a compulsory way while other roles need not be present. Those participant roles that are obligatory expressed are also called *profiled participant roles*, and they receive a syntactic function. In addition, a grammatical construction itself also requires its own roles, which are called *argument roles* and can be profiled or non-profiled, too. The argument roles of the construction are profiled when they are syntactically encoded as subject or object.

When a verb is used in a specific grammatical construction, its participant roles must be fused with the argument roles of the structure. This process is controlled by the principles of Semantic Coherence and Correspondence. The principle of Semantic Coherence states that only semantically compatible roles can be fused while the principle of Correspondence claims that a participant role can only be fused with one argument role (Goldberg 1995, p. 50).

Regarding the formalisation of the argument structure of the WXDY construction, one of its complexities is the fact that the main verb does not have its usual meaning. Since the main verb *do* lacks a real meaning, the number and type of the arguments required depend on the construction itself and not on the main verb. The main verb of the construction is the lexical verb *do*, whose meaning in an ordinary utterance usually involves action performed by an entity. The minimum valency of the verb *do* in its basic use is two. Therefore, it can be said that the verb *do* is transitive or divalent, since it requires at least two arguments that correspond to the subject and an object of the sentence. However, this

verb can take more than two arguments; it can also be ditransitive (or trivalent), since it can take three arguments that correspond to the subject and two objects of the sentence:

- (33) a. I still had to do homework when I got back home. (BNC)  
b. Have I done you any harm? (BNC)

The verb *do* can be seen as a divalent verb in (33a), since it requires only two arguments, the subject *I* and the object *homework*. But, in the example (33b), the verb *do* is trivalent due to the fact that it requires three arguments, the subject *I* and the objects *you* and *any harm*.

Although *do* is the main verb of the structure, there are only argument roles in the construction. Participant roles cannot be provided because the lexical verb *do* lacks a real meaning. Therefore, only the roles required by the construction itself are to appear in its instances. In this way, I propose that the WXDY construction will require two arguments, corresponding to the *X* and *Y* elements, which can be argued to receive the roles *theme* and *location* respectively.

Jackendoff (1972) defines the role *theme* as “...either an NP which undergoes physical motion, or as the NP whose location is being asserted” (p.29-30). In this sense, the *X* element of the WXDY construction can be seen as the *theme* of the sentence, since it is the noun phrase whose location is being stated. Regarding the *Y* element, it can be understood as the *location* role because it indicates the place where something is situated or takes place, as Jackendoff (1972) claims.

It has been mentioned above that the *Y* element may take different types of phrases to fill its gap, and most of them can be classified as clear examples of real physical locations, as the following examples show:

- (34) a. What are elephants doing in the middle of town? (COCA) (locative prepositional phrase)  
b. What was Newcombe doing out of the house at three o'clock in the morning? (Strathy) (locative prepositional phrase)

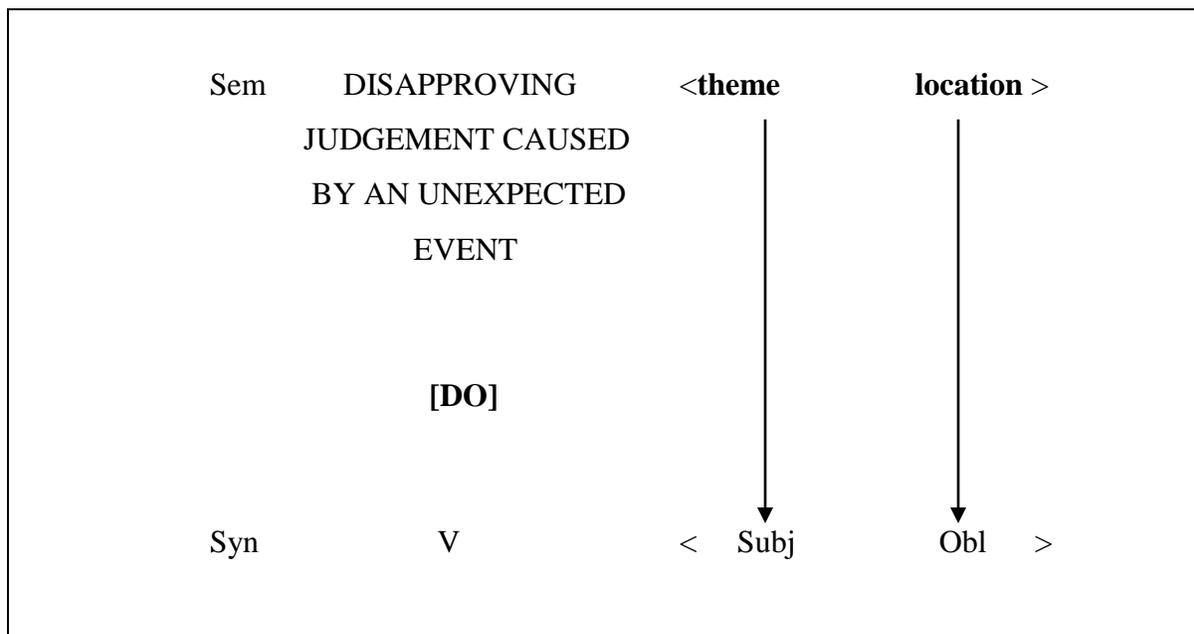
- c. What's Emma doing here? (COCA) (locative adverb phrase)
- d. What's Geoffrey doing buried here? (COHA) (-ed phrase + locative adverb phrase)

Instances from (34a) to (34d) show that the noun phrases that fill the gap of the *X* element can be argued to receive the *theme* argument role because their location is being asserted. Moreover, the phrases that fill the gap of the *Y* element indicate the location where the *theme* is placed, so they would receive the *location* role.

However, the *location* role might be also assigned to the *Y* element in a figurative way, as can be seen in the following sentence:

(35) What are priests doing practicing astronomy? (-ing phrase) (COCA)

*Practicing astronomy* may be understood as a location in the sense of *in the field of astronomy*, in other words, the *Y* element in (35) may be interpreted as a figurative location. With this in mind, the basic representation of the argument structure of the WXDY construction may be depicted as follows:



The meaning of the construction is indicated in the first line of this schema. However, it cannot be attributed to the verb, since the semantics of the structure is contributed by the construction itself. The argument roles (*theme* and *location*) required by the construction appear also in the first line. The second line belongs to the lexical verb and its participant roles, but, as already mentioned above, the verb does not contribute any participant role in this grammatical construction. Finally, the last line of the schema shows the syntactic function assigned to the arguments of the construction: the *theme* (*X* element) functions as the subject of the sentence while the *location* (*Y* element) is an oblique object.

To sum up, the argument roles required by the construction are *theme* and *location*, and they correspond to the *X* and *Y* elements. Nevertheless, I recognize that the discussion of the argument structure of the WXDY construction, especially of the *Y* element, deserves further investigation in view of sentences such as the following one:

(36) What was Hartmann doing calling the police? (GloWbE)

As can be seen in (36), *calling the police* (the *Y* element) may not receive the *location* role in some instances because it does not represent a real or figurative place.

#### 5.4. Frequency

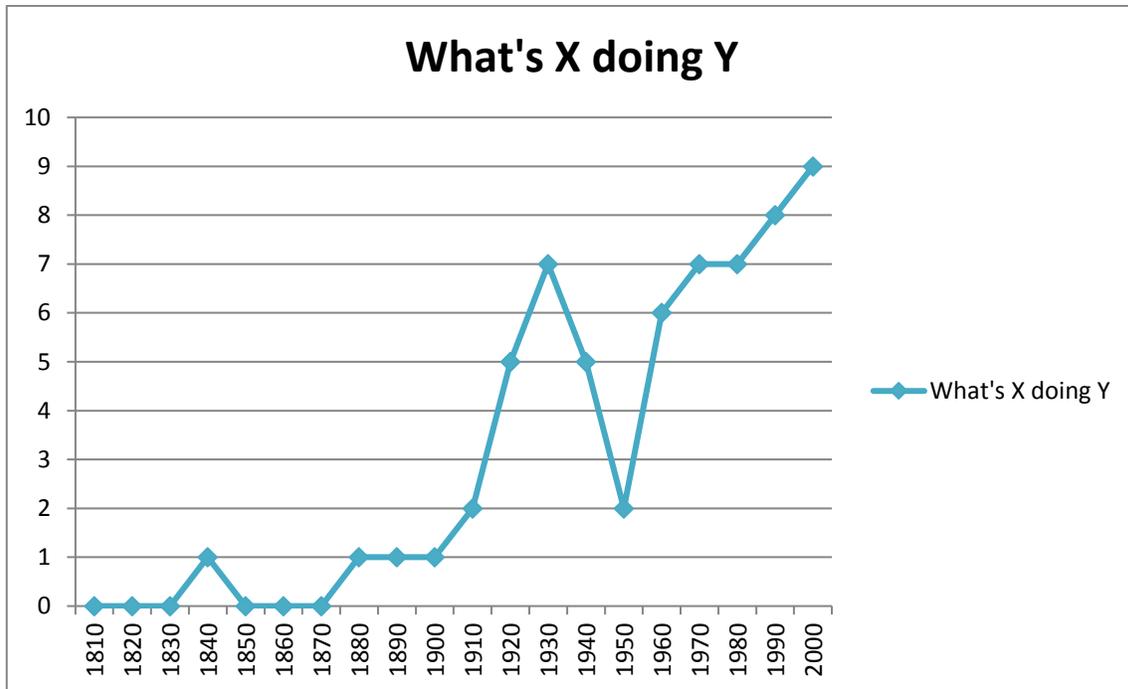
In this section, the frequency of use of the *What's X doing Y?* construction will be analysed. The use of different corpora has been very helpful in the analysis of the *What's X doing Y?* construction and its frequency of use since the number of instances collected is extremely low and the examples extracted from one single corpus are not enough to gather accurate results. The following chart shows the results of the corpora:

Corpus	Words	<i>what _vb* _n* doing</i> frequency	Instances of the WXDY construction
<b>GloWbE</b>	1.9 billion	334	25
<b>COHA</b>	400 million	161	62
<b>COCA</b>	520 million	134	39
<b>BNC</b>	100 million	53	11
<b>NOW</b>	4.4 billion	26	3
<b>Strathy</b>	50 million	7	4
<b>Total</b>			144

This chart shows that the frequency of use of the *What's X doing Y?* construction is low. For instance, there are 520 million of words in the Corpus of Contemporary American English (COCA), however, only 134 results are related to the “*what \_vb\* \_n\* doing*” pattern, and only 39 of them are instances of the WXDY construction. This chart demonstrates that it is quite difficult to find examples of this construction in any corpus. Therefore, the complexity of the analysis of this grammatical construction is reflected on the lack of instances that can be found in a linguistic corpus.

The *What's X doing Y?* construction is mainly used in informal language. This grammatical construction is highly frequent in written language, but it is also used in spoken language. 90.97% of the instances are found in non-academic texts, among which, 63.19% of the sentences belong to fiction books or texts. 9.03% of the instances appear in spoken language. However, it may be argued that the WXDY construction is mostly used in spoken language, since dialogues can be considered spoken language inside written language.

An interesting feature of the *What's X doing Y?* construction is the fact that its use has increased during the last 100 years. The COHA corpus, which includes records from the 1810s to the 2000s, shows how the use of the WXDY construction has significantly increased since the beginning of the 20<sup>th</sup> century.



The chart above shows the number of instances of the WXDY construction that appear each decade from the 1810s to the 2000s in the COHA corpus. Although there are more instances of the construction in the 1930s than in the 1950s, it can be seen that there are more instances of the construction in the 1990s and 2000s than in the first decades from which there are records in the corpus.

The 19<sup>th</sup> and the 20<sup>th</sup> centuries should not be compared because there is a huge difference in the number of words that are present in the corpus between 1810 and 1900 and the number of words between 1900 and 2000. Therefore, a comparison between centuries may not provide accurate results. Nevertheless, the decades of the 20<sup>th</sup> century might be contrasted because they have approximately the same number of words, as can be seen in the following chart extracted from the COHA corpus:

DECADE	NUMBER OF WORDS	DECADE	NUMBER OF WORDS
1810s	1,181,022	1900s	22,541,232
1820s	6,927,005	1910s	22,655,252
1830s	13,773,987	1920s	25,632,411
1840s	16,046,854	1930s	24,413,247
1850s	16,493,826	1940s	24,144,478
1860s	17,125,102	1950s	24,398,180
1870s	18,610,160	1960s	23,927,982
1880s	20,872,855	1970s	23,769,305
1890s	21,183,383	1980s	25,178,952
		1990s	27,877,340
		2000s	29,479,451
<b>TOTAL</b>	<b>406,232,024</b>		

To sum up, the *What's X doing Y?* construction is a complex grammatical construction that is used in both spoken and written language, but it is considered to belong to informal language. Besides, its use has increased as time goes by, as has been just mentioned.

## 6. Conclusion

The *What's X doing Y?* construction is a grammatical structure difficult to analyse due to its idiosyncratic properties and the difficulty to find instances in the linguistic corpora employed in this project. The study carried out has shown, however, that it is mostly used in informal and spoken language, but this does not mean that it cannot be found in formal or academic contexts. This construction has a fixed structure which can be exemplified with the following sentence:

(37) What's Swann doing in the balcony? (COHA)

The prototypical form of the WXDY construction consists of the interrogative non-referential pronoun *what*, the progressive aspect of the verb *do*, a subject representing a human being, and a locative prepositional phrase. Nevertheless, the noun phrase that fills the gap of the subject may also be a non-human being, and the phrase that occupies the position of the *Y* element can be other than a prepositional phrase.

Regarding the argument structure of the *What's X doing Y?* construction, it can be said that it has only two argument roles corresponding to the *X* and *Y* elements. The *X* element is always fused with the argument role *theme* while the prototypical role of *Y* is *location*, since most of the phrases that fill its gap designate a place, either literally or metaphorically. It should be also mentioned that there could be instances of the WXDY construction in which the argument role that the *Y* element receives is difficult to specify. Therefore, this aspect of the *Y* element should be investigated in further studies about the construction. The overall meaning of the structure would be the following one: someone makes a judgement about an unexpected or surprising situation because he/she disapproves it.

To conclude, the analysis of the *What's X doing Y?* and similar constructions has progressed recently due to the rise of studies related to Construction Grammar. Moreover, nowadays the use of this grammatical construction seems to have increased, since more instances of this structure have been found at the end of the 20<sup>th</sup> century than at the end of the 19<sup>th</sup> century. However, a further investigation should be carried out in order to achieve accurate results about the increase in the use of the construction.

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