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Illocutionary Meaning in a Knowledge Base: The Case of Requests

El significado ilocutivo en una base de conocimiento: El caso de las peticiones

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This paper focuses on conventionalized requests such as *Can you X?*, which are here considered to be constructions or entrenched parings of form and function. We first offer a concise account of how such illocutionary constructions have been approached from the point of view of Construction Grammar, to then provide the reader with their computational treatment within the knowledge base for Natural Language Processing systems known as FunGramKB. In so doing, four constructional domains are formalized in the COREL metalanguage. The overall aim of this paper is to contribute further evidence that the construction-based approach, which lies at the basis of the FunGramKB Grammaticon, is relevant for the investigation of language processing.

Keywords: *illocutionary constructions; requests; FunGramKB; COREL*

Este artículo se centra en peticiones convencionalizadas como *Can you X*? (*Puedes…?*), que aquí se entienden como construcciones o pares de forma y significado. En primer lugar ofrecemos una descripción concisa de dichas construcciones ilocutivas desde el punto de vista de la Gramática de Construcciones, para después presentar un tratamiento computacional de las mismas dentro de la base de conocimiento para el Procesamiento del Lenguaje Natural denominada FunGramKB. Al hacerlo, proponemos la formalización de cuatro dominios construccionales a través del metalenguaje COREL. El objetivo general de este artículo es aportar evidencias de que el enfoque construccionista, en el que se basa el Gramaticón de FunGramKB, es relevante para la investigación del procesamiento del lenguaje.

Palabras clave: *construcciones ilocutivas; peticiones; FunGramKB; COREL*

1. INTRODUCTION

It is widely known that the ultimate goal of Natural Language Processing (NLP) is to accomplish "human-like language processing for a range of tasks or applications" (Liddy, 2002: 2126). In other words, NLP tries to simulate how humans process language when they produce or comprehend a given text to later design and implement computational applications (e.g. information retrieval and extraction systems, machine translation (MT), etc.) that mirror human beings' cognitive abilities. To accomplish such a goal, NLP systems, and in particular, Natural Language Understanding (NLU) tasks, require a robust knowledge base that can store all the facts that are supposed to be true in a particular domain (Periñán, 2005). Thus, the development of knowledge bases has become one of the leading research topics in NLP, since the intelligence and usefulness of NLP applications will depend on the type, quality, and quantity of the data stored in the knowledge base. As Periñán (2005) notes, the type of knowledge a NLP program needs will depend on the type of application in which it will be implemented. For example, a spell checker does not need any type of knowledge, whereas an application that demands text understanding (e.g. MT) needs morphological, syntactic, semantic, and pragmatic information about the lexical units of the text, apart from non-linguistic knowledge, such as episodic and procedural knowledge. However, knowledge bases are not always designed using linguistic theories to handle the previously mentioned data, which, consequently, brings about "deceptively intelligent systems" (Periñán, 2012: 15) that do not understand the text.

In this context, the aim of this paper is to show how FunGramKB, a knowledge base designed to be implemented in NLU applications, which is grounded in constructionist and functional linguistic models like the *Lexical Constructional Model* (LCM) and *Role and Reference Grammar* (RRG), stores and represents illocutionary constructions such as requests employing a particular metalanguage known as COREL. In line with Trott and Bergen (2017), we sustain that theoretical linguistics, and in particular Construction Grammar (CxG), can contribute to the computational treatment of the thorny aspect of capturing human intention. Therefore, although our proposal takes a theoretical stance, it provides clear evidence that construction-based linguistic theories (e.g. the LCM), which lie at the heart of FunGramKB, can be of great benefit to the computational account of illocutionary constructions, in particular, and to research on NLP, in general.

The organization of the paper is as follows. Section 2 justifies the constructionist view that indirect requests should be treated as constructions in their own right. Section 3 provides a brief description of the architecture of FunGramKB, i.e. the knowledge base in which illocutionary constructions, among other types of constructions, are stored. Section 4 succinctly reviews the most relevant constructionist approaches to requests, which are used to put forward our own generic structure for these constructions that will be later codified in the COREL metalanguage (Section 4.1). Furthermore, details on such formalization of the four constructional domains that capture coded requests are provided in Section 4.2. Finally, Section 5 offers some concluding remarks.

2. (INDIRECT) REQUESTS AS CONSTRUCTIONS

Communication is often indirect (Ervin-Tripp, 1976) and this fact poses an obvious challenge for NLU. *It is hot in here*, for example, may be uttered as an indirect form of request, or it may be intended as a complaint, to name two possible interpretations. Thus, since the inception of *Speech Act Theory* (Austin, 1962; cf. Searle, 1969, 1975, 1979), scholars from various persuasions have paid particular attention to the analysis of indirect speech acts (ISAs) (e.g. Holtgraves, 1994; Stefanowitsch, 2003; Pérez, 2013; Trott & Bergen, 2017, among others). ISAs form a continuum, with entrenched or conventionalized expressions (e.g. *Can you pass the salt (, please)?*) at one end, to largely unconventionalized, context-dependent utterances which require different degrees of inferencing, at the other (e.g. *This soup is tasteless*). Whereas in *Can you pass the salt?*, the use of textual cues like modal *can* and the second person pronoun trigger a request interpretation, nothing in the surface form of *This soup is tasteless* does. Instead, the cue for a request meaning in the latter realization is contextual.

As can be inferred from the label ISA, most of the literature devoted to the study of speech acts has assumed a distinction between the direct/literal meaning of a speech act, on the one hand, and its indirect or intended interpretation, on the other. Such a dichotomy originated in Searle (1975), who considered that the literal meaning of a speech act is determined by the sentence-type in which it is realized, namely, declarative, interrogative, and imperative (Ruytenbeek, 2017). On this view, *Could you open the window?* is an *indirect request*, since it is performed by means of another direct speech act, i.e. a question. A mismatch would thus be said to exist between the literal illocutionary point of the utterance (i.e. a question about the hearer's ability to perform a given action) and its intended illocutionary point, i.e. a request.

In linguistics, various approaches have been put forward to account for the way in which indirect requests are comprehended. According to Searle's (1975) *Standard Pragmatic Model*, for example, the comprehension of indirect requests requires various stages. In *Could you open the window?* the language user would first compute the literal meaning of the utterance (e.g. a question about the hearer's ability to do X). In a second stage, s/he would assess the appropriateness of the literal meaning in the context in which is uttered. Finally, if such a literal meaning were to be deemed contextually inappropriate, the language user would generate a reasonable interpretation that made sense in the communicative situation (i.e. the speaker is requesting something). This initial proposal has been later challenged by empirical evidence (cf. Gibbs, 1979, 1983, 1987, 1989, 1994; Coulson & Lovett, 2010; see Holtgraves, 2002: 28-33). For example, according to the *Direct Access Model* speakers "do not necessarily analyze the literal interpretation of an indirect speech act during their immediate comprehension" (Gibbs, 2002: 473). In other words, given the appropriate context, it seems that language users can comprehend indirect requests *directly* without the need to compute the literal meaning first (Gibbs, 1986: 193). Additionally, Gibbs (2002) notes that the conventionality of an expression has a facilitatory influence in understanding what speakers imply and, in fact, speakers "find highly conventionalized uses of metaphors, idioms, indirect speech acts, etc., very easy to understand" (Gibbs, 2002: 479-480).

It may thus be argued that if idiomaticity or entrenchment of a surface form can provide direct access to what is traditionally assumed to be indirect requestive meaning, then such conventional forms are not indirect at all. In fact, with some CxG approaches (e.g. Stefanowitsch, 2003; Ruiz de Mendoza & Baicchi, 2007; Baicchi & Ruiz de Mendoza, 2010; Ruiz de Mendoza, 2013, 2015; Ruiz de Mendoza & Galera, 2014; Baicchi, 2017), we contend that traditional conventionalized ISAs (e.g. *Can/Could you X?, Will/Would you X?,* etc.) have constructional status, that is, they are parings of form and meaning/function (Goldberg, 1995, 2019). This, in other words, means that their illocutionary force is stably associated with their form. Although, clearly, utterances of this type capture meaning implications that were originally obtained pragmatically, the frequent co-occurrence of a given inference with particular formal configurations has eventually led to the inference becoming part of the meaning pole of the construction (cf. Bybee, 2013: 56).

With this in mind, in this paper we argue for two different, albeit related, ways of making meaning, namely *coded constructions* (e.g. *Can you X?*) and *inferred representations* (e.g. *This movie is boring*) (cf. Ruiz de Mendoza & Mairal, 2008; Ruiz de Mendoza, 2013; Ruiz de Mendoza & Galera, 2014). While coded or conventionalized constructions arise from lexicogrammar, inferred meaning implications are calculated by means of contextual factors and world knowledge. In the domain under scrutiny here, *illocutionary constructions*, which are the object of our attention here, are taken to be entrenched pairings of form and a given pragmatic meaning, which is now part of the semantics of the construction (Ruiz de Mendoza & Baicchi, 2007). Inference-based representations, by contrast, cover non-conventionalized expressions which may be constructions at other levels of analysis (e.g. at the level of argument-structure; Goldberg, 1995) but whose interpretation as requests is obtained on inferential grounds (e.g. *This soup is tasteless*). These, however, are outside the scope of the present paper (see Luzondo & Mairal (in prep.)).

We now turn to a description of the architecture of the knowledge base in which the computational treatment of coded illocution is carried out.

3. FUNGRAMKB: A BRIEF INTRODUCTION TO ITS ARCHITECTURE

FunGramKB is "a user-friendly online environment for the semiautomatic construction of a multipurpose lexico-conceptual knowledge base for NLP systems" (Periñán & Arcas, 2010: 2667; see www.fungramkb.com and the publications therein). FunGramKB has been originally designed to be reused in other NLP tasks and, more concretely, in those that focus on NLU (e.g. MT, dialogue based-systems). The knowledge base is a multilingual environment that currently supports various western languages (e.g. Spanish, English, Italian, etc.).

As shown in Figure 1, the architecture of FunGramKB displays three major knowledge levels. Whereas the lexical and grammatical levels are language-specific, the conceptual level is language-independent and is therefore shared by all the languages included in the knowledge base:

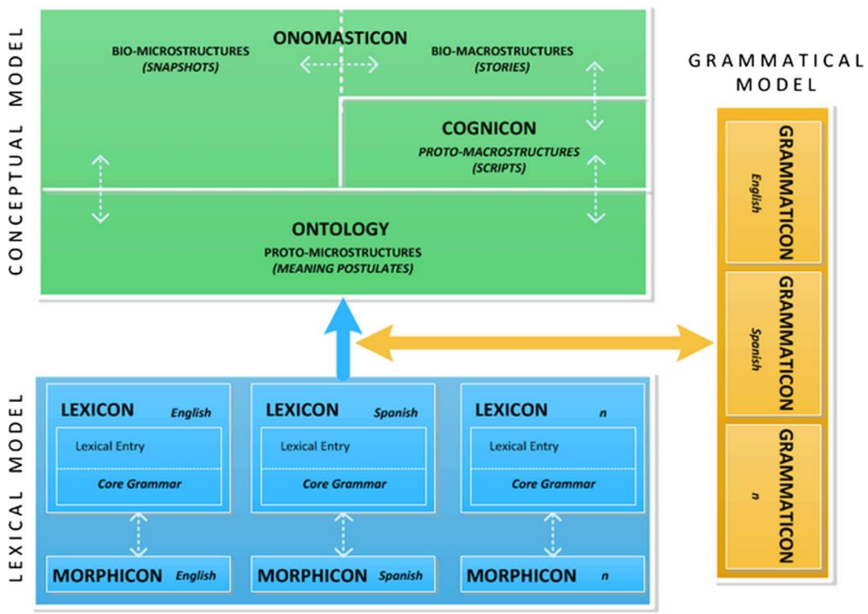

Figure 1: ***The architecture of FunGramKB*** (source: www.fungramkb.com)

What follows is a brief description of the knowledge levels specified in Figure 1. The lexical level comprises a *Lexicon*, which is based on the Aktionsart categories put forward within RRG (Van Valin & LaPolla, 1997; Van Valin, 2005), and a Morphicon. While the former stores morphosyntactic and collocational information about lexical units, the latter deals with inflectional morphology. This level is described in detail in Mairal and Periñán (2009).

The grammatical level, or *Grammaticon* (Periñán, 2013; Luzondo & Ruiz de Mendoza, 2015, 2017), which is the focus of our attention here (cf. Section 4), is the repository of *constructional schemata* or machine-tractable representations of linguistic constructions of a varied nature and complexity (e.g. argument-structure constructions (Goldberg, 1995), illocutionary constructions like *Can you X?* (Stefanowitsch, 2003), etc.). As shown in Figure 2, the Grammaticon is divided into several *Constructicons*, which computationally implement the four construction-types put forward in the usage-based constructionist model known as the LCM (Ruiz de Mendoza, 2013, 2014; Ruiz de Mendoza & Galera, 2014):

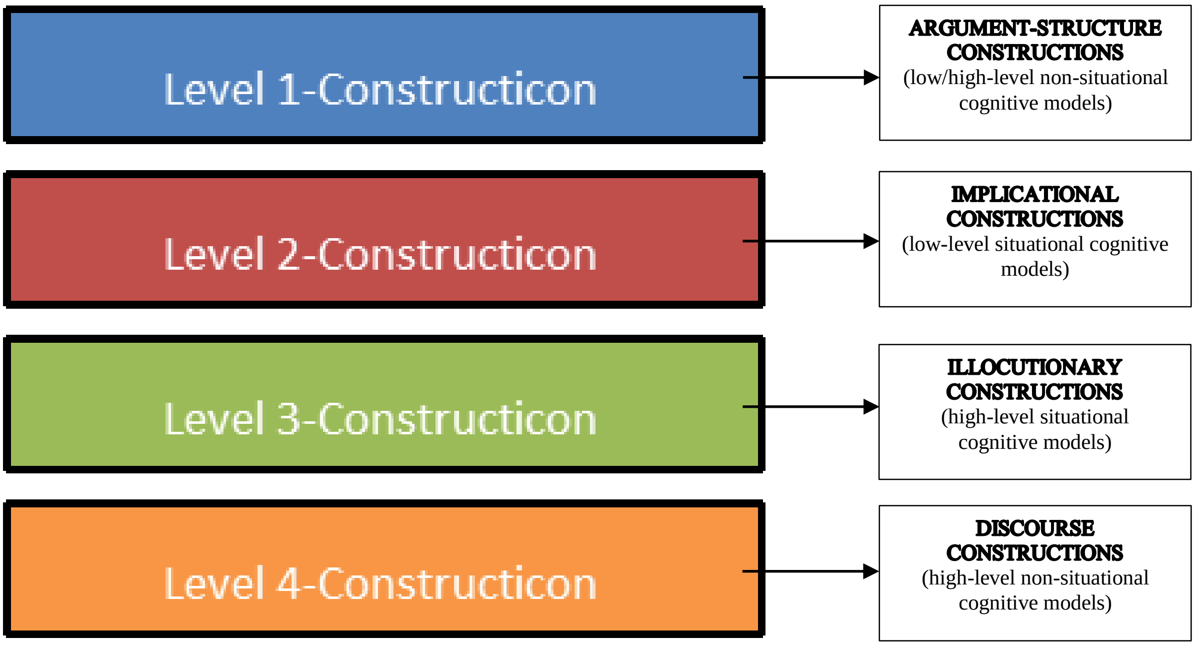

Figure 2: ***The Grammaticon and its four Constructicons***

As can be seen in Figure 2, each layer in the architecture of the LCM rests on a different idealized cognitive model (ICM(s); Lakoff, 1987). As such, the LCM postulates four basic types of ICMs: *low-level*, *high-level*, *non-situational* or *propositional*, and *situational* (cf. Ruiz de Mendoza, 2007). Low-level ICMs are defined as "non-generic semantic structures that result from the principled linkage of elements that belong to our encyclopedic knowledge store" (Ruiz de Mendoza & Galera, 2014: 64). Concepts like *house*, *dog*, or scenarios such as *going to a restaurant*, fall within this category. In turn, high-level ICMs arise from processes of generalization. For example, if we abstract away common material shared by low-level ICMs like *kicking* or *walking*, we arrive at the higher-level notion of *action*. Non-situational/propositional ICMs designate entities, their properties, and their relations in non-situational contexts. Finally, situational ICMs capture scripted sequences of events (Ruiz de Mendoza, 2013: 245). Note that this classification finds its place in the architecture of FunGramKB. Thus, the L1 or level-1 Constructicon of FunGramKB corresponds to the argument-structure layer of the LCM, which makes use of low-level and high-level non-situational ICMs. Lexical structure, which is integrated into higher-order syntactic structures like argument-structure constructions, is grounded in low-level propositional ICMs. By contrast, argument-structure configurations (e.g. the caused-motion construction in *He kicked the ball into* *the net*; Goldberg, 1995), which emerge from the abstraction of properties common to various lexical predicates, are grounded in high-level non-situational models. The L2-Constructicon, which deals with level-2 or implicational constructions in the LCM (e.g. *What's X Doing Y?*; Kay & Fillmore, 1999), exploits low-level situational models. The L3-Constructicon of FunGramKB, whose interface is shown in Section 4.2, handles illocutionary or level-3 constructions. These are similar to level-2 structures, except for the fact that illocutionary configurations are based on high-level situational models (e.g. *requesting*, *apologizing*, etc.). Illocutionary constructions, like their level-2 counterparts, contain fixed (e.g. *Can*) and variable elements (e.g. *you X?*). Lastly, relations of the type *cause-effect*, *action-result*, etc., which hold among non-situational high-level ICMs, are treated in the LCM at its discourse layer or level 4. This discourse layer is addressed in the L4-Constructicon of FunGramKB (e.g. *X Let Alone Y*; Fillmore, Kay & O'Connor, 1988).

Finally, the conceptual level is also made up of several sub-modules. The *Onomasticon* handles episodic knowledge and thus stores information about instances of entities and events (e.g. World War II, W. Churchill). The *Cognicon* contains procedural or situated knowledge in the form of scripts (Schank & Abelson, 1977; e.g. 'going to a restaurant'). Finally, the *Ontology*, in which semantic knowledge is stored, is as a hierarchical or IS-A structured catalogue of the concepts that a person has in mind. In line with the tripartite distinction between entities, properties, and events established by most current ontologies (cf. Pustejovsky & Batiukova, 2019: 189), the FunGramKB Ontology is divided into three subontologies: #EVENT (for verbal predicates), #ENTITY (for nous), and #QUALITY (which covers adjectives and adverbs). The modules that together make up the conceptual level of FunGramKB employ the same expressive conceptual representation language, i.e. COREL, for the formal codification of different kinds of knowledge. The metalanguage, in turn, serves as input to a reasoning engine.[1]

To illustrate the grammar of this formal language, let us consider the conceptual unit +NEED_00, which is defined in COREL as follows:

(1) Conceptual unit: +NEED_00 (subordinate of +WANT_00)
a. Thematic Frame (TF): (x1: +HUMAN_00)Theme (x2)Referent
b. Meaning Postulate (MP): +(e1: +WANT_00 (x1)Theme (x2)Referent (f1: +MUCH_00)Quantity (f2: (e2: +BE_01 (x2)Theme (x3: m +IMPORTANT_00)Attribute (f3: x1)Goal))Reason)

As a subordinate concept of +WANT_00, +NEED_00 inherits part of its structure. The TF of any conceptual unit specifies the number and type of participants involved in an event, which in the case of +NEED_00 would read as "a human (x1) needs an unspecified entity (x2: referent)". In turn, MPs are sets of one or more logically connected predications (i.e. *e1*, *e2*, *e3*, etc.) through which concepts are characterized. +NEED_00 is thus defined in COREL as "a human (x1) wants something (x2) much because (x2) is very important to him/her". Semantic distinctions between concepts (e.g. +WANT_00 and +NEED_00) are codified through satellites (e.g. Reason in (1b)), which are introduced by an *f* followed, in this case, by another predication (*e2*, in (1b)). The definition of lexical items like *want, necesitar* (in Spanish), Italian *essere necessario*, etc.,

[1] Through COREL, FunGramKB can be transduced into different computational formalisms in order to simulate human reasoning (e.g. logic, production rules, conceptual graphs, etc.). FunGramKB proponents are working on an automated cognizer with human-like defeasible reasoning abilities, which will be in charge of making inferences and draw conclusions from the information stored in the different conceptual modules.

which are linked to the conceptual unit +NEED_00, is thus provided at the conceptual level. Lexical units are in turn connected to the grammatical constructions in which they may occur, such as the English and Spanish *subject-manipulative construction* (e.g. *I need you by my side/Te necesito a mi lado*; Gonzálvez-García, 2011).

4. CODED ILLOCUTION IN THE GRAMMATICON

After introducing requests like *Can you X?* as constructions and briefly describing the knowledge base where they are going to be codified, we now discuss the computational treatment of illocutionary constructions through COREL.

Before delving into how coded requests are approached in FunGramKB (Section 4.2), we first provide a concise account of how requestive structures have been linguistically approached as constructions or entrenched form-function pairings. The purpose of such a review is to grasp their distinct linguistic properties which are essential for any NLP application intended to understand the nuances of human intention.

4.1 *A succinct linguistic review of illocutionary constructions: The case of requests*

Illocutionary meaning is associated with the activation of high-level situational knowledge. Thus, within Cognitive Linguistics, Thornburg and Panther (1997) and Panther and Thornburg (1998) have argued for the existence of illocutionary scenarios, i.e. conceptual constructs of generic knowledge that are shared by the members of a given linguistic community and stored in long-term memory. In their proposal, illocutionary scenarios consist of three components, i.e. *before*, *core* and *after*. Via the explicit activation of (one of) these components, speakers afford metonymic access to the whole scenario. For example, *Can you give me a hand?* exploits the before element of the request scenario, i.e. the hearer has the capacity to carry out the action and the speaker wants the hearer to do it. This component functions as the source domain of a metonymy whose target is the entire speech act category of requesting. Below is their illocutionary scenario for requests (Panther & Thornburg, 1998: 759)

(2) The BEFORE: (i) The hearer (H) can do the action (A);
(ii) The speaker (S) wants H to do A
The CORE: S puts H under a (more or less strong) obligation to do A
The RESULT: H is under an obligation to do A (H must/should/ought to do A)
The AFTER: H will do A

Ruiz de Mendoza and Baicchi (2007: 8-12) offer a refined version of illocutionary activity in which they make room for features such as the power relationship between the speaker and the hearer or the degree of politeness and optionality, which were not included in Panther and Thornburg's original proposals. For these authors, structures like *Can you X?, It is hot in here, Will you X?*, etc. are profiled against the base of a socio-cultural model called the *Cost-Benefit* ICM, which contains stipulations that capture high-level situational meaning at a more generic level than illocutionary scenarios. Whether the structures above have constructional status (i.e. are stable form-meaning associations like *Can you X?*) or require different degrees of inferencing (e.g. *It is hot in here*), they all share a common conceptual structure, i.e. the high-level scenario of requesting. Such a scenario is structured as follows:

(3) - The speaker needs or wants something that s/he is either unable or unwilling to satisfy by him/herself.
- The speaker assumes that the addressee has the ability and willingness to satisfy his/her needs and/or desires.
- The speaker makes the hearer aware of his/her needs/desires, while being aware that the hearer may refuse to provide them.

Thus, coded constructions and inferred representations such as the ones discussed in this section profile different aspects of the conceptual base in (4), which is part of the Cost-Benefit Model:

(4) a. If it is manifest to A that a particular state of affairs is not beneficial to B, and if A has the capacity to change that state of affairs, then A should do it.
b. If it is manifest to A that a potential state of affairs is not beneficial to B, then A is not expected to bring it about.

Pérez (2013) delves into this conception of speech acts as ICMs, and drawing on Lakoff (1987), presents an illocutionary ICM for the act of requesting which comprises the following simplified ontology:

(5) - The agent is the addressee and is capable of performing the requested action.
- The agent's willingness to perform the requested action is either low or unknown.
- If there is a request for an object, the addressee needs to possess it.
- The speaker performing a request prototypically needs the addressee to provide him/her with an object or to carry out an action in his/her benefit.
- The speaker wishes the requested action to be performed by the addressee.
- Requests prototypically involve a cost to the addressee and a benefit to the speaker but prototypically allow a certain degree of freedom to the addressee to decide upon his/her course of action.
- Requests are prototypically mitigated (e.g. *Could you please X?*).
- No specific power relationship or social distance binds the speakers.

Based on these linguistic analyses, and with a view to codifying through COREL the distinct linguistic properties of requests that are essential for any NLP system whose goal is to understand requestive meaning, we propose our own generic structure for coded requests with the following basic features:

(6) (a) A (speaker) is in need of or wants something.
(b) A makes B (hearer) aware of what s/he needs or wants.
(c) A makes B aware of his/her ability to provide for his/her need.
(d) A appeals to B's willingness to help.
(e) A increases B's optionality by being polite.
(f) B may be persuaded to help or not.

The selection of these features is the result of first factoring in those semantic components shared by the distinct scenarios proposed by Panther and Thornburg (1998), Ruiz de Mendoza and Baicchi (2007), and Pérez (2013), such as features (a)-(c) in (6). Second, against the backdrop of Mendoza and Baicchi's (2007) Cost-Benefit Model, features (d)-(f) were also considered crucial in the characterization of requests and, accordingly, included in (6).

Let us now devote our attention to the actual computational codification of the features in (6) in the English Grammaticon of FunGramKB.

4.2 *Codifying illocutionary constructions in the Grammaticon*

As stated in Section 3, the sub-modules that make up the conceptual level of FunGramKB use the same metalanguage, i.e. COREL (*Conceptual Representation Language*), to record the different types meaning supported by the Onomasticon, the Cognicon, and the Ontology. Besides this, the construction types stored in the four constructional levels of the Grammaticon must also employ COREL so that information is successfully shared among the distinct modules of the knowledge base. In other words, if we want the machine to understand a text in which the English or Spanish subject-manipulative construction appears, that construction must have been previously defined by the knowledge engineer via COREL. As a glimpse at (1) may suggest, the task of codifying illocutionary meaning has been a challenge because, in general, the expressive power of formal languages is fairly limited and, in many cases, it does not allow to express all the shades of meaning as natural languages do. In particular, COREL imposes a specific system of formalization and notation, as well as the usage of a closed set of conceptual units, functions, variables and operators of all kinds, to build meaningful and well-formed descriptions.[2]

In this context, to computationally account for illocutionary meaning in FunGramKB, we first drew on Del Campo's (2012) twelve speech acts, that is, advising, apologizing, boasting, condoling, congratulating, offering, ordering, pardoning, promising, requesting, thanking, and threatening, paying special attention to the formal configurations that realize them. As expounded in Jiménez-Briones (2016: 53), to meet the constraints imposed by the metalanguage and avoid the proliferation of COREL descriptions in the Grammaticon, we grouped various illocutionary configurations under the same COREL schema, labeling them 'constructional domains'.[3] Such grouping was not carried out randomly, but following the methodological principles in (7):

(7) a. The identification of key distinctive semantic features within each speech act, supported by a relevant number of constructions;
b. The possibility of codifying these distinctive features through COREL.

As for the case of requesting, the challenging task was, on the one hand, to "translate" the basic features of our generic structure for coded requests into COREL (cf. (6)) and, on the other hand, to match those features with the formal configurations that

[2] The interested reader is referred to Periñán and Mairal (2010) and Jiménez-Briones and Luzondo (2011) for a detailed account of the syntax and semantics of COREL.

[3] As of yet, thirty-four constructional domains have been identified and formalized in the Level-3 Constructicon. This number, however, is by no means exhaustive and new domains will need to be included as a result of constructional research in controlled natural languages such as ASD-STE100, the Aerospace and Defense Industries Association of Europe Simplified Technical English (see Cortés, 2019; Fumero & Díaz, 2019).

convey them. By way of illustration, Table 1 displays, on the left, some of the constructions that express requestive meaning (Del Campo, 2012; Pérez, 2013, among others) and their syntactic realizations, and, on the right, the attributes of our generic structure for requests:

Table 1. ***Configurations and semantic features for coded requests***

Some formal configurations for requests	Semantic features of the generic structure for requests
1. CAN/COULD YOU X (PLEASE)? *Could you collect this loan?* (Corpus of Contemporary American English, COCA, 1990) 2. I WANT X *I want a baby* (COCA, 2010) 3. I WOULD APPRECIATE IF YOU X *I would appreciate if you didn't interrupt me* (COCA, 2010) 4. DO/WOULD YOU MIND X? *Do you mind taking a picture of us?* (COCA, 2003) …	(a) A (speaker) is in need of or wants something. (b) A makes B (hearer) aware of what s/he needs or wants. (c) A makes B aware of his/her ability to provide for his/her need. (d) A appeals to B's willingness to help. (e) A increases B's optionality by being polite. (f) B may be persuaded to help or not.

Following the first methodological principle in (7), that is, accounting only for the key distinctive features that are well supported by a significant number of configurations, we were able to formalize, in COREL, the following four constructional domains:

(8) Requesting-type 1:

+(e1: +REQUEST_01 (x1: <SPEAKER>)Theme (x2: (e2: +DO_00 (x3: <HEARER>)Theme (x4: (e3: +WANT_00 (x1)Theme (x4)Referent))Referent))Referent (x3)Goal (f1: (e4: pos +HELP_00 (x3)Theme (x1)Referent) | (e5: pos n +HELP_00 (x3)Theme (x1)Referent))Result)

(9) Requesting-type 2:

+(e1: +REQUEST_01 (x1: <SPEAKER>)Theme (x2: (e2: +DO_00 (x3: <HEARER>)Theme (x4: (e3: +WANT_00 (x1)Theme (x4)Referent))Referent)Referent (x3)Goal (f1: +POLITE_00)Manner (f2: (e4: pos +HELP_00 (x3)Theme (x1)Referent) | (e5: pos n +HELP_00 (x3)Theme (x1)Referent))Result)

(10) Requesting-type 3:

+(e1: +SAY_00 (x1: <SPEAKER>)Theme (x2: (e2: +DESIRE_01 (x1)Theme (x3: (e3: +DO_00 (x4: <HEARER>)Theme (x5)Referent))Referent))Referent (x4)Goal (f1: +POLITE_00)Manner (f2: (e4: pos +HELP_00 (x4)Theme (x1)Referent) | (e5: pos n +HELP_00 (x4)Theme (x1)Referent))Result)

(11) Requesting-type 4:

+(e1: +SAY_00 (x1: <SPEAKER>)Theme (x2: (e2: +NEED_00 (x1)Theme (x3: (e3: +DO_00 (x4: <HEARER>)Theme (x5)Referent))Referent))Referent (x4)Goal (f1: (e4: pos +HELP_00 (x4)Theme (x1)Referent) | (e5: pos n +HELP_00 (x4)Theme (x1)Referent))Result)

The COREL scheme for the Requesting-type 1 domain in (8), which is realized by illocutionary constructions such as *Can/Could you X?* (*Could you collect this loan?*), codifies the following information: there is a speaker that requests something from the hearer (i.e. +(e1: +REQUEST_01 (x1: <SPEAKER>)Theme) and what s/he requests is for the hearer to do what the speaker wants. This is expressed in the following predications: ((x2: (e2: +DO_00 (x3: <HEARER>)Theme (x4: (e3: +WANT_00 (x1)Theme (x4)Referent))Referent))Referent (x3)Goal). As a result of this, the hearer may help the speaker or not, as specified in the Result satellite or (f1: (e4: pos +HELP_00 (x3)Theme (x1)Referent) | (e5: pos n +HELP_00 (x3)Theme (x1)Referent))Result).

The Requesting-type 2 domain in (9) accounts for the same information as the Requesting-type 1, except for the inclusion of the manner satellite (f1: +POLITE_00) to codify the fact that the hearer makes the request politely: *I wonder if you could X?*.[4]

The COREL scheme in (10) for the Requesting-type 3 domain, which unifies illocutionary expressions such as *Will you X?, Would you X?, Won't you X?*, etc., codifies the hearer's willingness to carry out the desired action: *Will you please come home*? (COCA, 1996). This is done by introducing a second predication (i.e. e2) with the basic concept +DESIRE_01.

Finally, the scheme for the Requesting-type 4 domain in (11) stresses the fact that the speaker makes the hearer aware that he is in need of something, using, this time, the basic concept +NEED_00. Constructions such as *I need a ride home* (COCA, 2010) or *I want a baby* (COCA 2010) exemplify this fourth domain.

In sum, we contend that the above-mentioned domains, which comprise several illocutionary constructions grouped under the four distinct, yet related, COREL schemata in (8)-(11), can convey all the necessary and sufficient information that the machine will need to perform any NLU task which involves coded requests. Figure 3 shows the interface of the English Level-3 Constructicon, that is, the FunGramKB editor where knowledge about requests has been stored. By way of example, we shall only comment on how the Requesting-type 2 domain has been implemented.

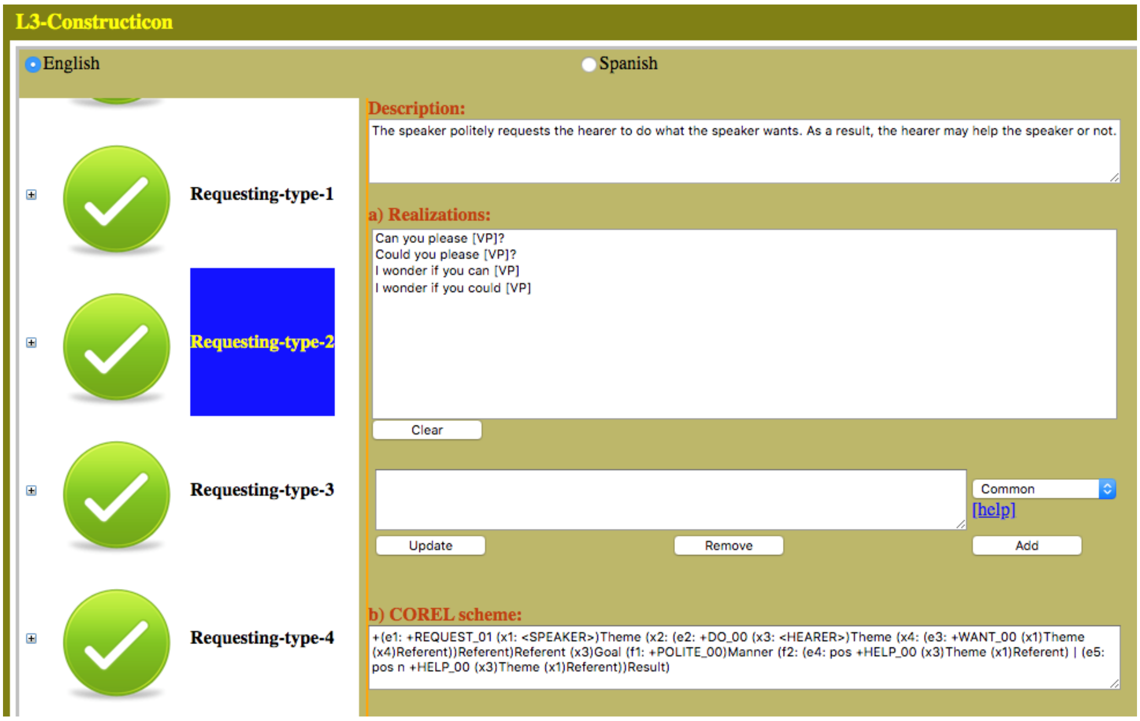

Figure 3. ***Requesting-type 2 in the L-3 Constructicon***

[4] It is worth noticing that the degree of politeness that the cognitive literature establishes for this speech act (i.e. *Pass the salt* > *Can you pass the salt?* > *Could you pass the salt?* > *Could you please pass the salt?*, etc.) is very difficult to account for using COREL. We thus decided to generalize and make room only for the distinction between requests vs polite realizations of requests.

The first type of information displayed in the editor, at the left-hand side of Figure 3, is the list of the thirty-four constructional domains identified to date. When double-clicking on one of the domains, i.e. Requesting-type 2, the sufficient and necessary information for that domain must be appropriately filled in in the right-hand boxes. For instance, in the description box, a short explanation of the constructional domain under analysis is provided, whereas the box "Realizations" includes a list of all the configurations that realize the Requesting-type 2 structure: *Can you please VP? Could you please VP?*, etc. Finally, at the bottom of the editor, we find the COREL scheme by means of which the semantics of each constructional domain is codified, in this particular case, the COREL scheme (9) previously explained.

5. CONCLUDING REMARKS

A constructionist approach to illocution allows us to view traditional, conventionalized ISAs like indirect requests as constructions in their own right, that is, as pairings of form and meaning. In this context, this paper has put forward two ways of making meaning, i.e. coded constructions and inferred representations (e.g. *This movie is boring*). In coded constructions such as *Can you X?*, *Will you X?*, etc., which have been the focus of our attention here, illocutionary force has been argued to be stably associated with their form (cf. Ruiz de Mendoza & Baicchi, 2007; Ruiz de Mendoza & Galera, 2014). After discussing how such configurations have been analyzed in Thornburg and Panther (1997), Panther and Thornburg (1998), Ruiz de Mendoza and Baicchi (2007) and Pérez (2013), we have proposed a simplified generic structure for coded requestive constructions on the basis of which four constructional domains have been codified via COREL in the Grammaticon of FunGramKB, which, in its turn, is based on the constructionist model known as the LCM.

We hope that this programmatic discussion provides additional evidence that Construction Grammar is a fruitful avenue for NLU, and more particularly, for the complex issue of the codification and recognition of human intention.

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