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Multilingual Electronic Dictionary of Motion Verbs (DICEMTO): overall structure and the case of andar

Abstract: This chapter presents the research project “Multilingual Electronic Dictionary of Motion Verbs (DICEMTO)”, focused on the meaning alternations displayed by predicates with motion verbs. The basic assumption underlying DICEMTO is that the semantic variation that these verbs show in context is determined by the sub-lexical features encoded in their lexical entry and the lexical entries of their arguments. We explore in detail the lexical entry of the Spanish verb andar, composed of the minimal definition, the argument structure, the event structure, and the qualia structure, and show how the different meaning components belonging to these levels interact dynamically and generate different senses depending on the context.

Keywords: Generative Lexicon, qualia, motion verbs, event structure

1 Introduction

This paper presents the research project “Multilingual Electronic Dictionary of Motion Verbs (DICEMTO)”¹, which has been developed by the research group UPSTAIRS (Unit for the Word Study: Internal Structure and Syntactic Relationships) at the Department of Spanish Language and Literature, Autonomous University of Madrid².

This project is focused on motion verbs, and its main goal is to register in a systematic and consistent way the different senses that these verbs display in context

1 The research project presented in this paper has been financed by the Ministry of Economy and Competitiveness of Spain under research grants FFI2009-12191 and FFI-2012-33807 (Principal Investigator: Elena de Miguel). The website of the research group UPSTAIRS can be accessed at [<https://www.uam.es/gruposinv/upstairs/diccionario.html>].

2 A full list of the researchers involved in this project, including collaborators from other Spanish and foreign universities, can be found at [<https://www.uam.es/gruposinv/upstairs/upstairs2/agentivo.html>].

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as a result of their combination with other components of the predicate. Motion verbs were chosen of all the semantic groups of verbs due to their capacity of lightening and extending their basic spatial meaning when forming verbal periphrases and idiomatic expressions in different natural languages, independently of their typological ascription. DICEMTO is a theoretical dictionary rather than a conventional one: in looking into the combinatorial potential of motion verbs, we align ourselves with the frameworks that seek to identify the lexical features that determine the syntactic behavior of words and that ultimately license certain meaning alterations in the form of derived verb senses, idiomatic expressions, and verbal periphrases.

2 Theoretical foundations and general design of the dictionary

DICEMTO was conceived as a theoretical linguistic project. It is our belief that, in order to effectively fulfill their main function (i.e., explaining word meaning), the dictionaries must acknowledge the advances in lexical semantics and lexicon-syntax interface that allow accounting for the syntactic and semantic behavior of lexical units (cf. Batiukova 2009b). Lexicographical and computational projects WordNet, VerbNet, FrameNet, Redes and ADESSE³ are some of the most representative initiatives following this approach.

We assume the existence of a set of grammatically-relevant lexical features and generative mechanisms that determine in what contexts a word can appear and what meaning extensions (both literal and apparently figurative) it can display depending on the context. In terms of Generative Lexicon theory (henceforth GL), some of these lexical-semantic features make up specific sublexical structures. As will be shown in sections 3.2.1–3.2.3, the Event Structure and the Qualia Structure, among others, provide bits of information that ultimately license different word combinations, both apparently free and apparently constrained. We also make use of concepts routinely adopted in other influential linguistic models (generative grammar, frame semantics, etc.), such as argument structure, thematic structure and semantic roles (see section 3 for details).

³ WordNet = [<https://wordnet.princeton.edu/>].

VerbNet = [<https://verbs.colorado.edu/~mpalmer/projects/verbnet.html>].

FrameNet = [<https://framenet.icsi.berkeley.edu/fndrupal/>].

ADESSE = [<http://adesse.uvigo.es/data/>].

All the links were accessed online on July 15, 2016.

One of the main achievements of this project is the design of a linguistic meta-entry, which serves as a template for the lexical entries of concrete motion verbs and which can be easily adapted to other groups of verbs. This meta-entry is an abstract model based on a detailed study of particular motion verbs, and it serves, in turn, to systematize and improve the lexicographic representation of concrete verbs.

At this point DICEMTO has ten full lexical entries for the verbs *andar*, *bajar*, *caer*, *entrar*, *ir*, *llegar*, *salir*, *subir*, *venir*, and *volver*. The main language of the dictionary is European Spanish: all the lexical entries are written in Spanish and the primary examples are provided in Spanish. These examples are further translated into fourteen other languages: Arabic, Armenian, Chinese, English, Finnish, French, German, Italian, Japanese, Portuguese, Rumanian, Russian, Slovene and Slovak. As of now, a total of 1407 translated and glossed sentences are included in the lexical entries. The dictionary is freely available for consultation at [<https://www.uam.es/gruposinv/upstairs/v31/index.htm>].

The design of the dictionary seeks to reconcile theoretical exhaustiveness and user-friendliness by distributing different kinds of information between the three main modules ('Minimal definition', 'Lexical entry', and 'Phraseology') and also by offering flexible search options, which allow each user to choose the kind of data he wants to visualize⁴. The 'Minimal definition' module contains a basic definition of the verb and an example of its basic spatial use (see section 3.1). 'Lexical entry' provides a formal definition in terms of lexical structures (the argument structure, the event structure, the thematic structure, and the qualia structure) and also analyzes verbal periphrases and other sense modulations where the verb loses or changes a part of its meaning. Finally, 'Phraseology' registers phraseological units and syntagmatic combinations wherein each verb appears.

DICEMTO is mainly aimed at users with a linguistic background: it was conceived as a theoretical tool for linguists interested in the semantics and the syntax of motion, and in their cross-linguistic manifestations. However, some of its contents can also be dealt with by non-expert users (although no effort has been made so far to specifically adapt it to this group of users, and we are not going to elaborate on this here any further). For instance, the informal definitions in the modules 'Minimal definition' and 'Phraseology' do not require linguistic knowledge and are illustrated with examples and glossed translations for a better understanding. One of the groups of users that might potentially benefit from consulting the dictionary are second language teachers and learners, since the latter are known to have difficulty interpreting and producing idiomatic expressions. Their meaning cannot be interpreted compositionally, and it is rarely accounted for by generic rules taught in class, in handbooks, and in learner dictionaries.

⁴ A series of tutorials on the use of the dictionary are available at [<https://www.uam.es/gruposinv/appupstairs/upstairs2/tutoriales.html>]; last access: July 15, 2016].

In what follows we present the first two modules of the lexical entry⁵ of the verb *andar* ‘to walk’ (‘Minimal definition’ and ‘Lexical entry’)⁶. We will show how its senses can be integrated into a unique meta-entry structured in different levels of representation and how the meaning components belonging to these levels interact dynamically and generate different senses depending on the context.

3 Andar ‘to walk’ in DICEMTO

3.1 Minimal definition of *andar*

Definitions of motion verbs usually take up many lines in traditional dictionaries. *Andar*, for example, has twenty senses according to the *Diccionario de la lengua española* (DLE). The decision of including multiple senses for the same lexical item is frequently motivated by the vast combinatorial potential of these verbs. We believe that this proliferation of senses is undesirable from both the theoretical and the applied perspectives. It can be avoided or at least reduced substantially if the entries are underspecified, i.e., if they include a limited number of minimal lexical-semantic features which are constant across contexts and which determine how words can be combined (cf. Faber/Mairal 1999, Levin/Rappaport Hovav 2011, Bosque/Mairal 2012, De Miguel 2013). The assumptions underlying the GL model of the lexicon make this kind of definition possible: they license the combination of underspecified lexical features and structures by means of compositional mechanisms, which are triggered in context and yield the different interpretations of the word (cf. Pustejovsky 1995, De Miguel 2009).

As will be shown in the following sections, the definitions in DICEMTO account for the basic or central meaning of the verb and allow distinguishing the lexical entry from others at a purely linguistic level. We thus avoid one of the shortcomings of other models of definition, which quite often fail to differentiate between linguis-

tically relevant and extralinguistic information, thus incurring lexicographical as well as lexicological inconsistencies⁷.

We propose the following definition for *andar*:

- (1) {Desplazarse/moverse} {a pie/dando pasos}
Lit.: ‘To move {on foot/by taking steps}’

In this definition we captured the most important lexical features of *andar*: the motion component (‘to move’) and the manner-of-motion component (‘on foot/by taking steps’). These will be analyzed in the following sections as a part of different lexical structures.

3.2 Lexical entry of *andar*

3.2.1 Argument Structure (AS) and Thematic Structure (TS)

Recent theoretical lexicographical projects account for the combinatorial properties of lexical items by including specifications and structures related to what is known in theoretical linguistics as subcategorization, selection or valence (see FrameNet, VerbNet and CPA, among others).

Our entries distribute this information among three structures:

- a) the Argument Structure specifies the number of arguments required by the verb and their syntactic category;
- b) the Thematic Structure encodes the semantic function of arguments in the predicate;
- c) the Qualia Structure encodes inherent semantic features of the arguments, such as [PHYS_OBJ], [INFO], [EVENT], etc. These features are related to the properties of the real-world entities denoted by words (see section 3.2.3 for details).

The AS and TS of *andar* are represented in (2a) and (2b), respectively. The example in (2c) instantiates all the AS and TS components.

⁵ A terminological note is in order before we proceed. We use the term *lexical entry* to refer to:

- one of the modules of the dictionary
- the *lexicographic article*: all the information pertaining to a given verb and included in the three modules.

Unfortunately, this ambiguity is unavoidable in the context of this project.

⁶ The content and structure of the module ‘Phraseology’ is exhaustively described in González Cobas/Serradilla Castaño (2013). De Miguel (2015b) lays out the theoretical foundations of DICEMTO in connection with the GL framework.

⁷ Different perspectives on the ‘linguistic vs. encyclopedic’ dichotomy are discussed in Wotjak (1992), Busa et al. (2001) and Bosque (2000), among others. De Miguel (2009) presents a GL-framed approach to this issue.

- (2) a. AS: N1 (por 'via' N2) (hacia 'toward'⁸ / hasta / a 'to' N3) (de/desde 'from' N4) (N5) (Adv/Adj/etc.)
 b. TS: AgentPath/Medium Direction/Goal Source Distance Manner
 c. Juan[Agent] anduvo cojeando[Manner] tres kilómetros[Distance] por el monte[Medium] desde la Charca de la Olla[Source] al Pino Aprisquillo[Goal].
 Lit: 'Juan[Agent] walked limping[Manner] three kilometers[Distance] through the hills[Medium] from Charca de la Olla[Source] to Pino Aprisquillo[Goal]'
 'Juan hobbled around the hill for three kilometers, starting at Charca de la Olla and ending at Pino Aprisquillo.'

This kind of notation might seem unconventional because we do not label the prepositional phrases (in line with DDL, for example) and single out the noun phrases instead (N1-N5 in the example above). This decision is motivated by the fact that nominal features are more relevant as far as the composition of the predicate meaning is concerned. Labels and indexes attached to the noun phrases create a cross-reference system shared by the different structures. This is one of the main properties of the lexical model we make use of and it also underlies the design of relational databases, which we adopted as the organizational model for our dictionary.

Not all the predicate members listed in the AS of motion verbs are equally important, which usually translates into different frequency counts. We do not include data on frequency in our dictionary (unlike FrameNet, among other recent projects), but we do take it into account when defining the AS. High frequency elements are almost always the "canonical" arguments, in syntactic terms. The less frequent ones are usually the optional modifiers (adjuncts), which we also include in the AS (in parentheses, to mark optionality). Very low frequency constituents are not included in the AS, for instance the beneficiary adjunct. The example in (3) is taken from ADESSE⁹:

- (3) Una cosa es que le[Beneficiary] anduvieras detrás cuando eras una cría, como todas, porque era el mayor [...].
 Lit.: 'One thing is that you him[Beneficiary] walked behind when you were a child, like everyone, because he was the oldest [...].'
 'It is one thing for you to have been after him when you were a child, like all the other girls, because he was the oldest [...].'

⁸ *Hacia* 'toward' typically introduces a Direction argument or adjunct, but here we assume that Direction is derived compositionally, as a combination of the preposition with a noun encoding the Goal.

⁹ This example and all the others were translated by one of the co-authors of this paper (OB).

3.2.2 Event Structure (ES)

The notion of event structure (ES) is widely used in grammatical studies nowadays. In GL, this level of representation encodes the aspectual features of predicates in terms of subevents, temporally and hierarchically ordered parts of events. When combined, the subevents yield different types of events: states, processes, and transitions. The resulting event types are included as semantic types in lexical and conceptual ontologies (cf. Cruse 2004), and in lexicographical and computational works (for instance, in the SIMPLE ontology, cf. Lenci et al. 2000). DICEMTO adopts the event classification put forward in Fernández Lagunilla/De Miguel (1999), who derived eight event types for Spanish based on the GL event typology.

Andar denotes a process: a dynamic, durative and atelic event (see the ES representation in (4)). One of the defining features of processes is that they are homogeneous: any part of the walking event has the same properties as the whole event, so that it is always true that a person walking has already walked.

- (4) ES of *andar*: P[e1, e2, ..., en]

Although *andar* is atelic, its beginning and endpoints can be explicitly referred to. The beginning is usually related to the Source constituent, introduced by the preposition *desde* in (5a) (where the reference to the starting point is reinforced by the inchoative periphrasis <echar a + infinitive> 'to start to + infinitive') and also in (5e,f). The endpoint is related to the Goal constituent, introduced by the preposition *hasta* 'to' (in (5d,e)) and *hacia* 'toward' (in (5f)). Thus, the Goal and Source constituents mark the beginning and the end of a homogeneous event without necessarily making it telic: 'to be walking from somewhere {to/toward} somewhere' does not entail '{to have reached/to have walked all the way to} somewhere'¹⁰. The predicate components referring to Path, Medium, Direction (in (5a,b,c,f)) and Manner (in (5g)) are associated to the main phase of the event, the process:

¹⁰ It must be noted that the presence of *hasta* 'to' does make the event telic when it contributes to creating a complex event (i.e., a transition) composed of two phases: a process and a resultant state. This is what happens in (i), where *Juan anduvo hasta la valla* 'Juan walked to the fence' is compatible with the durative adverbial *durante dos horas* 'for two hours' (which focuses on the process subevent) and with the time-frame adverbial *en dos minutos* 'in two minutes' (which focuses on the transition as a whole).

(i) *Juan anduvo hasta la valla* {durante dos horas / en dos minutos}.
 'Juan walked to the fence {for two hours / in two minutes}.'

- (5) a. Echamos a andar desde el refugio de la Perdiz[Source] camino arriba [Direction].
'We began walking from the shelter La Perdiz[Source] uphill[Direction].'
b. ¿Qué sentirá cuando sus pies anden por ese césped[Medium] tantas veces recorrido?
'What will it feel like when his feet walk on this lawn[Medium], which he went through so many times?'
c. Me encanta andar por el campo[Medium].
'I love walking in the countryside[Medium].'
d. Con los pies descalzos, anduvo hasta la orilla del mar[Goal].
'He walked to the seashore[Goal] barefoot.'
e. En cuanto se levanta y anda desde la cama[Source] hasta el sofá[Goal], ve las estrellas.
'Every time he gets up and walks from the bed[Source] to the sofa[Goal], he writhes in pain.'
f. Por la calle 155[Path] anduvimos desde Broadway[Source] hacia el este [Direction].
We walked from Broadway[Source] eastward[Direction] along the 155th Street[Path].'
g. [...] ande rápidamente[Manner] o corra algunos minutos.
'[...] walk fast[Manner] or run for a few minutes.'

In addition to the Goal constituent introduced by *hasta* 'to' (see footnote 10), the boundedness of the Path can be reinforced by the aspectual clitic *se*, which (as claimed in De Miguel/Fernández Lagunilla 2000) can only be added when the event has a culmination phase followed by a change of state, as in (6).

- (6) [...] 5.600 personas los que nos anduvimos desde la Plaza de Santo Domingo hasta la Delegación del Gobierno¹¹.
Lit.: '(we) 5600 people walked to ourselves from Plaza de Santo Domingo to the regional Government Office.'
'There were 5600 of us that walked all the way from Plaza de Santo Domingo to the regional Government Office.'

¹¹ The clitic *nos* in (6) has a benefactive meaning in addition to the aspectual delimitative value. It might very well be possible that this is an evaluative benefactive clitic rather than an aspectual clitic, as argued in Armstrong (2013). Be it as it may, it does exert an impact on the aspectual makeup of the predicate.

3.2.3 Qualia Structure (QS)

The qualia structure (QS) is the most ground-breaking and also the most controversial component of the GL theory. It is novel because it extends the domain of linguistically relevant information to semantic features usually considered as extralinguistic, i.e., pertaining to real-world knowledge rather than to linguistic knowledge.

In GL, these features are encoded in the lexical entry whenever they are linguistically relevant, i.e., if they can be shown to determine the syntactic behavior of the word. For instance, the [+dynamic] feature allows explaining the different meanings of the verb *llegar* 'to come, to reach' in (7) (examples taken from De Miguel 2004b):

- (7) a. El atleta llega a la meta.
'The athlete is reaching the finishing line.'
b. El niño llega al botón del ascensor.
'The boy {reaches / is reaching} the lift button.'
c. La carretera llega hasta el valle.
'The road goes all the way to the valley.'

When combined with *atleta* 'athlete', which is [+dynamic], *llegar* denotes a motion event but with *carretera* 'road', which is [-dynamic], it does not: since *carretera* refers to a static object, which cannot move, the event loses the dynamic motion phase and turns into a mere state (of the road having a certain extension). (7b) is ambiguous between a dynamic and a static interpretation because *el niño* 'the boy' can be conceptualized as a moving dynamic entity or as a static entity endowed with spatial extension. In the former case *el botón del ascensor* 'the lift button' is the Goal of a motion event and in the latter it is the upper limit of the subject's vertical extension.

The [+dynamic] feature crucially affects the syntactic behaviour of the predicate: the [+dynamic] predicate in (8a, a') is compatible with the progressive form and rejects the adverbial *desde hace años* 'for years', and the [-dynamic] predicate in (8b, b') rejects the former and accepts the latter:

- (8) a. El atleta está llegando a la meta en este momento.
 'The athlete is reaching the finishing line at this moment.'
- a'. El atleta llega a la meta desde hace años.
 Lit.: 'The athlete reaches the finishing line for years.'
- b. *La carretera está llegando hasta el valle en este momento.
 The road is reaching the valley at this moment.'
- b'. La carretera llega hasta el valle desde hace años.
 Lit.: 'The road reaches the valley for years.'
 'The road reached the valley years ago.'

Since the [\pm dynamic] feature determines the syntactic behavior of the verbal predicates, it must be included in the QS of *atleta* and *carretera*¹². However, this is only one part of the story. The new meaning of the verb cannot be derived compositionally if it is not encoded in the lexicon, and one of the basic premises of DICEMTO is that the underspecified verbal definition must accommodate it.

The qualia roles refer to the meaning parameters that define events, objects and properties from the point of view of their origin (agentive role); their physical characteristics (size, shape, etc.) and ontological classification (formal role); their internal constitution (constitutive role); and their purpose (telic role). As pointed out above, their appropriateness in a grammatical analysis might seem debatable (cf. De Miguel 2009 and the references therein). In lexicography, on the other hand, their relevance is generally taken for granted. Thus, the Spanish lexicographer Julio Casares makes use in his renowned *Introducción a la lexicografía moderna* (1950) of the real definitions, which "aim at discovering the nature, the essence of the denoted thing", nominal definitions, which "merely explain the word meaning", genetic definitions, which "account for the defined concept as an effect of the action", teleological definitions, which "inform us about the nature of things as determined by their function", and descriptive definitions, which "combine the description of the form and other relevant properties with teleological or functional specifications, and also with the cause or origin of the defined thing". There is an obvious similarity between the genetic definition and the values encoded in the agentive role of the QS, between the teleological definition and the telic role, and between the descriptive definition and the formal role (cf. Batiukova 2009a, §3.1.).

It seems clear that the qualia are very well suited to describe nouns, especially the concrete ones. The formal role values are similar to the semantic selection features of the generative grammar and to the top-level nodes of lexical-conceptual

¹² The semantics of motion verbs is discussed in De Miguel (2004b, 2012) and Batiukova (2008: ch. 4-5), and the syntactic consequences of certain QS values are dealt with in De Miguel (2004a, 2009, 2011, 2015a).

ontologies (e.g., WordNet). In the following definition of *cocoa*, taken from the Merriam-Webster Online Dictionary¹³, we can easily detect pieces of information corresponding to the four qualia:

cocoa noun

- a. [powdered ground roasted]_{Agentive/Constitutive} [cacao beans]_{Formal} from which a portion of the [fat]_{Constitutive} has been removed and which [is used to make chocolate]_{Telic}
- b. a [beverage]_{Formal} [prepared by heating cocoa with water or milk]_{Agentive/Constitutive}
-

The lexical entries of DICEMTO specify the formal role values of all the nouns included in the AS and the ES of the verbs.

The Agent argument (N1) of *andar* is a dynamic entity that covers a certain distance (N5) and follows a path (N2, a location with spatial extension) between two locations: the Source (N4) and the Goal (N3). The adverbial or adjectival component encoding manner of motion is associated to the syntactic subject through its agentive role, because the Agent of *andar* is usually the internal dynamic cause of the motion event (cf. Levin/Rappaport Hovav 1992, Pustejovsky/Busa 1995, and Batiukova 2008):

- (9) QS of *andar*
- N1: [F = dynamic entity]
 N2: [F = location \wedge spatial extension]
 N3: [F = location]
 N4: [F = location]
 N5: [F = linear measure]
 Adv/adj/etc.: [A = manner of the Agent or dynamic entity]

The semantic features represented in (9) are the canonical ones, they define the spatial dynamic uses of *andar*. However, it quite often exhibits apparently non-literal meanings when combined with arguments whose semantic type is different from the ones stipulated in the canonical QS. For instance, (10a) encodes a spatial non-dynamic event and (10b) encodes a non-spatial dynamic event.

- (10) a. El libro que busca Juan anda por algún lugar de tu casa.
 Lit.: 'The book that Juan is looking for walks around some place in your house.'
 'The book Juan is looking for is somewhere in your house.'

¹³ [<https://www.merriam-webster.com/>]; last access: July 9, 2016].

- b. Juan anda preguntando desde hace días por su libro.
 Lit.: 'Juan walks around asking for days for his book.'
 'Juan has been asking for his book for days.'

The challenge consists in integrating these cases into our lexical entry and accounting for the semantic and grammatical alterations yielded by the combination of *andar* with different semantic types of arguments.

3.3 Modifications: the canonical definition of *andar* and its alterations

A quick look at the Word Sketch of *andar*¹⁴ suffices to realize that, on the one hand, the dynamic entities are but a small subset of the syntactic subjects of this verb and, on the other hand, that in many cases the verb loses its spatial meaning.

Table (11) classifies the uses of *andar* based on the QS of its subjects. The first two columns list the subjects of the verb and their absolute frequency. The next five columns show the interpretation that the verbal predicate acquires when combined with each subject in terms of the possible combinations of the features [\pm spatial] and [\pm dynamic].

(11) *Andar*, esTenTen11 (European, TreeTagger)

Head N of the subject	Overall frequency	[+spatial +dynamic]	[+spatial -dynamic]	[-spatial, +dynamic]		[-spatial -dynamic]
				"Metaphoric" and periphrastic uses	andar +{adv/adj/PP/participle}	
<i>cosa</i> 'thing'	236		X	X	X	
<i>gente</i> 'people'	128	X	X	X	X	
<i>chico</i> 'boy, guy'	92	X		X	X	
<i>cojos</i> 'lame people'	32	X				

¹⁴ Word Sketch is an automatically generated summary of the sentential elements that a given lexical item is combined with in a corpus (Kilgariff et al. 2008). We used the esTenTen web corpus integrated into the Sketch Engine corpus query system.

Head N of the subject	Overall frequency	[+spatial +dynamic]	[+spatial -dynamic]	[-spatial, +dynamic]		[-spatial -dynamic]
				"Metaphoric" and periphrastic uses	andar +{adv/adj/PP/participle}	
<i>PP</i> 'PP (Popular Party)'	37			X	X	
<i>político</i> 'politician'	24	X		X	X	
<i>moto</i> 'motorcycle'	20	X		X	X	
<i>Barça</i> [a football club]	18			X	X	
<i>diablo</i> 'devil'	17				X	
<i>burro</i> 'donkey'	12	X				
<i>Beti[s]</i> [a football club]	11			X	X	
<i>Ferrari</i>	10	X		X	X	
<i>francés</i> 'French'	9		X	X	X	
<i>muchacho</i> 'kid, boy'	9			X	X	
<i>chaval</i> 'kid, buddy'	9	X		X	X	
<i>gallina</i> 'hen'	8	X		X	X	
<i>peña</i> 'group, club'	8	X		X	X	
<i>torero</i> 'bullfighter'	8			X	X	
<i>militar</i> 'military man'	8	X		X	X	
<i>republicano</i> 'republican'	8		X	X	X	
<i>fantasma</i> 'ghost'	6	X		X	X	
<i>hyenas</i> 'hyenas'	6			X	X	

Head N of the subject	Overall frequency	[+spatial +dynamic]	[+spatial -dynamic]	[-spatial, +dynamic]		[-spatial -dynamic]
				"Metaphoric" and periphrastic uses	andar +{adv/adj/PP/participle}	
<i>ibex</i>	6			X	X	
<i>cazador</i> 'hunter'	6			X	X	
<i>paralíticos</i> 'paralytic (pl.)'	5	X				
<i>lobo</i> 'wolf'	5		X	X	X	
<i>ladrón</i> 'thief'	5	X	X	X		
<i>Sporting</i> [a football club]	5				X	
<i>economía</i> 'economy'	5			X	X	
<i>CIA</i>	5			X	X	
<i>Vaticano</i> 'the Vatican'	5			X	X	
<i>sevillano</i> 'Sevillian'	5				X	
<i>vasco</i> 'Basque'	4	X		X	X	
<i>andaluz</i> 'Andalusian'	4	X			X	
<i>chorizo</i> 'thief'	4			X	X	
<i>parejita</i> 'couple'	3	X			X	
<i>Cid</i>	3	X			X	
<i>Juventus</i> [a football club]	3			X	X	
<i>granadinos</i> 'of Granada (pl.)'	3			X	X	

Head N of the subject	Overall frequency	[+spatial +dynamic]	[+spatial -dynamic]	[-spatial, +dynamic]		[-spatial -dynamic]
				"Metaphoric" and periphrastic uses	andar +{adv/adj/PP/participle}	
<i>demonios</i> 'demons'	3				X	
<i>Cope</i> [radio station]	3				X	
<i>maya</i> 'Maya/Mayan'	3				X	
<i>FARC</i> 'Revolutionary Armed Forces of Colombia'	3				X	
<i>Bayern</i> [a football club]	3				X	
<i>duende</i> 'goblin'	3				X	
<i>Arsenal</i> [a football club]	3				X	
<i>paraplégicos</i> 'paraplegic (pl.)'	2	X				
<i>Mossad</i>	2				X	
<i>pendejos</i> 'nerds'	2				X	
<i>pederasta</i> 'pedophile'	2				X	

3.3.1 Andar in [+spatial, +dynamic] contexts

Most dynamic entities that participate in [+spatial, +dynamic] events headed by *andar* are represented by animate human nouns, both individual and collective (chico 'boy, guy', chaval 'kid, buddy', pareja 'couple', republicano 'republican', político 'politician', militar 'military man', vasco 'Basque', andaluz 'Andalusian', Cid, paralíticos 'paralytic (pl.)', paraplégicos 'paraplegic (pl.)', gente 'people', Peña

'group, club'), names of animals (burro 'donkey', gallina 'hen'), and also names of artifacts designed to generate motion (moto 'motorcycle', Ferrari).

As mentioned in section 3.2.3, the manner-of-motion component of the predicates headed by *andar* is encoded in the agentive role of the Agent subject. This component can refer to either the manner in which the event unfolds or the state of the subject while performing the action, and it can be expressed as an adverb, an adjective, a participle or a prepositional phrase. In addition, as all manner-of-motion verbs, *andar* lexicalizes a specific way of moving, which we captured as 'on foot/by taking steps' in the definition (cf. section 3.1).

Studies framed within the Generative Lexicon model (Pustejovsky/Busa 1995, Batiukova 2008) have proposed that the manner-of-motion component is encoded in the formal role of the QS of the verb and that this feature must be compatible with the information encoded in the formal role of the noun referring to the moving Agent. The feature 'on foot/by taking steps' is compatible with the meaning of human nouns and some names of animals, because these have extremities that end in feet or paws and therefore are able to move 'on foot/by taking steps': chico 'boy, guy', chaval 'kid, buddy', pareja 'couple', republicano 'republican', político 'politician', militar 'military man', vasco 'Basque', andaluz 'Andalusian', burro 'donkey', gallina 'hen', etc.

The same analysis cannot be applied to Ferrari or moto 'motorcycle' because the features encoded in the formal role of the verb and of these two nouns apparently do not match. Even so, we can easily find expressions such as (12a) and (12b) in the corpus, and the speakers have no difficulty interpreting them.

- (12) a. El Ferrari anduvo como una bala.
Lit.: 'The Ferrari walked like a bullet.'
'The Ferrari was as fast as a bullet.'
- b. La moto anda menos.
Lit.: 'The motorcycle walks less.'
'The motorcycle is going slower.'

We believe that these expressions are acceptable because the meaning of *andar* undergoes an adjustment process called co-composition (Pustejovsky 1995, De Miguel/Batiukova 2017), whereby the argument imposes its selectional requirements on the verb. In this particular case, the manner of motion expressed by the predicate as a whole is imposed by the lexical entry of the Agent instead of the verb: a Ferrari or a motorcycle move when their wheels spin, and not 'by taking steps'.

3.3.2 Andar in [+spatial, -dynamic] contexts

The meaning alterations discussed in the following three sections differ to a lesser or greater extent from the basic motion meaning encoded in the minimal definition 'to move on foot/by taking steps'.

As shown in Table (11), the motion component is absent in many of the retrieved sentences. In some cases the event keeps being spatial but becomes non-dynamic, as in (13), where *andar* means 'be located somewhere':

- (13) a. El sol se ha puesto, y los lobos *andan* cerca. (= 'están cerca')
Lit.: 'The sun set and the wolves *walk* nearby.' (= 'are nearby')
- b. Sabemos que los ladrones *andan* en los estacionamientos, esperando que el dueño se aleje de su vehículo. (= 'están en los estacionamientos')
Lit.: 'We know that the thieves *walk* around the parking lots, waiting for the car owner to leave his vehicle.' (= 'are in the parking lots')

The events in (13) are stative. If we change the verbal form for progressive, the expression remains acceptable but acquires a spatial dynamic interpretation:

- (14) a. Los lobos *están andando* cerca.
Lit.: 'The wolves *are walking* nearby.' (= 'are prowling nearby')
- b. Los ladrones *están andando* en los estacionamientos.
Lit.: 'The thieves *are walking* around the parking lots.' (= 'are prowling around the parking lots')

De Miguel (2012) argues that the static uses of *andar* can be accounted for if we assume that any event can be decomposed into a sequence of states and transitions between these states (this claim is implicit in Pustejovsky 1991 and 1995, and it is further elaborated in Moreno Cabrera 2003 and Mani/Pustejovsky 2012, among others). When the [+dynamic] feature is lost, as in (13), and there is no transition from one state to another, the process is reduced to a state and the Path constituent comes to denote the spatial location of the subject.

However, even in these static uses of *andar* there is a residue of dynamicity, which is why it is not completely synonymous with the spatial meaning of *estar* 'be located somewhere'. The predicates with *andar* imply a sequence of spatial or temporal states, as in (15). In (15a), en Lima 'in Lima' is the spatial frame wherein the iteration of states takes place (meaning roughly 'happening {over there / over and over again}'). In (15b), the spatial frame within which multiple states of 'being in the Internet' occur is por ahí 'over there / around'.

- (15) a. Las cosas en Lima andan complicadas y debo regresar allá.
Lit.: 'The things in Lima walk complicated and I must go back there.'
'The things in Lima have been complicated and I must go back there.'
- b. [...] desde luego no es normal que la gente ande por ahí navegando con un navegador de hace 20 años.
Lit.: '[...] of course it is not normal that the people walk navigating over there with a 20-year-old browser.'
'Of course it is not normal that some people are using a 20-year-old browser to navigate.'

The examples in (14) and (15) illustrate the possibility of splitting the features [\pm spatial] and [\pm dynamic] in the meaning of *andar*. When both are positively valued, the predicate has the basic motion meaning. When there is no dynamicity but the spatial feature is preserved, a stative locative meaning emerges, as in (14). The iteration of a state or location sometimes reveals a residue of dynamicity (as argued above for the sentences in (15)), which is absent in the spatial use of *estar* 'be located somewhere'.

As will be shown right away, we can also focus on the change of state in time instead of space, and derive predicates with *andar* defined as [$-$ spatial, $+$ dynamic].

3.3.3 *Andar* in [$-$ spatial, $+$ dynamic] contexts

3.3.3.1 *Andar* denoting motion in time

In the cases discussed in this section, the predicates with *andar* are dynamic and they present their arguments syntactically as a moving Agent, Goal or Path. However, they do not express motion in space. This section focuses on constructions with adjectives, adverbs, participles and prepositional phrases (as in (16))¹⁵, and the next section discusses verbal periphrases with *andar*.

In (16a), the Agent subject *los granadinos Eskorzo* 'the band from Granada Eskorzo' cannot physically move along the Path denoted by the constituent *por el camino de la evolución musical* 'down the road of musical evolution'. In (16b), the Agent *los cazadores* 'the hunters' cannot literally go after the prey because the noun

liebre 'hare' refers to an unexpected event (or previously unknown information) rather than to a moving animal (*ha saltado la liebre* means 'something unexpected happened'). The subjects in (16c) and (16d) show the same behavior: *la economía* 'economy' and *la cosa* 'the thing' are not capable of moving, and there are no other elements in the predicate that can yield a different interpretation (like *Lima* or *por ahí* 'over there' in (15)). One of the possibilities that is left is to switch the interpretation from the spatial domain to the temporal domain: the state denoted by the predicate is iterated in time (with more or less significant changes) either explicitly (*hace trece años* 'for thirteen years' in (16a), *poco a poco* 'little by little' in (16b)) or implicitly, as in (16c) and (16d), which are compatible with the specification 'lately / over and over again' and 'back then, during that period', respectively. The verbal tense – present simple in (16c) and simple perfect in (16d) – renders this interpretation possible¹⁶.

- (16) a. Hace ya casi trece años que los granadinos Eskorzo[moving Agent] andan constantemente por el camino de la evolución musical[Path].
Lit.: 'The Eskorzo band from Granada have been constantly walking down the road of musical evolution for thirteen years.'
- b. La liebre ha saltado en el Ayuntamiento de Murcia, y los cazadores[moving Agent] andan tras su presa[Goal], a la que van cercando poco a poco y en lógica capturarán.
Lit.: 'The hare has jumped in the city hall of Murcia and the hunters walk after their prey, which they are surrounding little by little and which they will most certainly capture.'
- c. La economía anda muy mal.
Lit.: 'The economy walks very badly.'
'The economy is in bad shape.'
- d.. [...] la cosa anduvo más repartida.
Lit.: '[...] the thing walked more (evenly) distributed.'
'Things used to be distributed more evenly.'

¹⁵ Following Camus Bergareche (2006), we assume that these constructions are attributive, since the verb merely contributes the continuative or iterative meaning to the state description encoded by the adjective, adverb, participle or PP. For this reason, the sentence in (i) can be paraphrased as 'Juan has been concerned about his health', with the copula *estar* in Spanish:

(i) Juan anda preocupado por su salud. (= 'Juan está preocupado por su salud')
Lit.: 'Juan walks concerned about his health.'
'Juan has been concerned about his health.'

¹⁶ Here we deal with the same iterative meaning of the simple perfect as in (i) and (ii). One of the sources of the iterative interpretation of (i) is the non-referential nature of the determinerless direct object *coche* 'car': the speaker always had an object of the kind 'car', but it most likely was a different instance of this object (a different car) on each occasion, which renders the state of 'having a car' iterative.

(i) Siempre tuvo coche.
'He always had a car / He used to always have a car.'

(ii) Nunca estuvo enfermo.
'He never got sick.'

Examples like (16) are usually analyzed as metaphorical, but we believe them to be the outcome of the lexical agreement processes between the minimal definition of the verb and the QS features of its nominal arguments.

3.3.3.2 Verbal periphrases with *andar*

Andar also loses its spatial meaning and retains the [+dynamic] feature in the aspectual periphrasis <andar + gerund>. The periphrasis can usually be replaced with the main verb but there are some subtle aspectual differences.

Verbs appearing in periphrastic constructions as auxiliaries undergo semantic bleaching: they lose their lexical content to a lesser or greater extent, and merely express very general grammatical meanings (temporal, aspectual and modal). Yet the bleaching is never complete: the auxiliary usually retains a part of the meaning encoded by the verb in its lexical uses. The more general and polysemic the verb meaning is, the higher its capacity of losing lexical content. *Venir* 'to come', for instance, participates as auxiliary in four periphrases (see Batiukova/De Miguel 2013a). By contrast, rich and specific semantic content correlates with inability to form periphrases. This would be the case of *volver* 'to return, to come back' and *andar* 'to walk': the former lexicalizes a very specific kind of path, the latter encodes a peculiar manner of motion, and they only form one periphrasis each (<volver a + infinitive> and <andar + gerund>).

This part of the lexical entry of *andar* is based on the description in Martínez-Atienza (2006) and Nueva gramática de la lengua española (2009), which we redefined in terms of the event structure typology put forward in De Miguel/Fernández Lagunilla (2000, 2004, 2007).

We argue that the periphrasis <andar + gerund> has a continuative meaning, similar to <estar + gerund>: it focuses on the intermediate phase of the event without referring to its endpoint. In other words, this periphrasis encodes processes (P) and it has the same event type as *andar*. However, unlike *andar*, <andar + gerund> can express frequentative meaning when it denotes situations that unfold with interruptions or intermittently (we will elaborate on this when analyzing the main verbs compatible with this periphrasis).

Verbal periphrases generally impose aspectual constraints on their main verb, and our dictionary accounts for these constraints¹⁷. Since <andar + gerund> encodes processes, it is compatible with durative events not oriented towards a telos (see Martínez-Atienza 2006: 87): processes (as in (17a,b)), iterative achievements (17c,d), iterative accomplishments (17e), detelicized accomplishments (17f), and non-permanent states (17g). Permanent states are usually incompatible with continua-

tive and progressive periphrases because these involve dynamicity which the permanent states lack: their course is independent from the temporal variable.

- (17) a. Pero cómo te vas a ir si es ya de noche y los chacales y las hienas andan merodeando por ahí. [PROCESS]
'You cannot possibly leave now: it is dark already, and the jackals and hyenas are walking and lurking around.' / 'You cannot possibly leave now: it is dark already, and the jackals and hyenas are lurking around.'
- b. [...] el Ibex andaba luchando por no perder los 9.800 puntos. [PROCESS]
'Ibex has been struggling to hold on to the 9,800-point level.' [lit.: 'walked struggling']
- c. Estos días el PP anda proclamando que pueden bajar impuestos a muerte y a saco. [ITERATIVE ACHIEVEMENT]
'The Popular Party has been claiming these days that they are determined to cut taxes across the board.' [lit.: 'walks proclaiming that']
- d. La gente andaba golpeando un bloque de hielo. [ITERATIVE ACHIEVEMENT]
'The people were pounding at an iceblock.' [lit.: 'walked pounding']
- e. Ya sé que con cuarenta y tres años soy algo mayor ya para andar escribiendo cartas de estas. [ITERATIVE ACCOMPLISHMENT]
'I know that at forty-three years old I'm a little too old for writing this kind of letters.' [lit.: 'walk writing']
- f. [...] de momento ando esculpiendo mi nueva criatura [DETELICIZED ACCOMPLISHMENT]
'[...] for now I'm working on my new sculpture.' [lit.: 'walk sculpting my new creature']
- g. Las chicas andan disfrutando de un baño de burbujas. [NON-PERMANENT STATE]
'The girls are enjoying a bubble bath.' [lit.: 'walk enjoying']

In (17b-g) *andar* heads non-spatial predicates. (17a) can have three different interpretations: (a) *andar* as a lexical verb ([+spatial, +dynamic]) with predicative gerund ('the jackals and hyenas walk around and lurk'); (b) *andar* as an attributive verb (close in meaning to the spatial non-dynamic use of *estar* 'be located') with an adverbial gerund; (c) *andar* as auxiliary of continuative periphrasis, i.e., [-spatial, +dynamic], as in all the other predicates in (17).

The iterative examples preserve the dynamicity component lexicalized by *andar*: the examples (17b,c) can be paraphrased as 'to do something over and over again'. *Andar* also seems to be determining the continuative-intermittent meaning of (17a,b,d) ('to be lurking intermittently, while doing other things', 'engage in sev-

¹⁷ For simplicity's sake, we use the traditional Vendlerian terminology here instead of the more structured proposals by Pustejovsky (1995) and De Miguel/Fernández Lagunilla (2000, 2004, 2007). The latter are used in DICEMTO to define the overall event type expressed by the periphrasis.

eral episodes of struggle', 'be sculpting something in parallel with other activities'): since the main verbs *merodear* 'lurk, prowl', *luchar* 'struggle' and *esculpir* 'sculpt' do not denote intermittent events, the continuative-intermittent meaning must be contributed by *andar*, whose residual dynamicity emphasizes the transitions between the states within the macroevent and thus favors a fragmented vision thereof. To sum up, the main contribution of *andar* to the meaning of the sentences in (17) consists in focusing on the subject's passing through the different temporal states that make up the event denoted by the predicate.

3.3.4 Andar in [-spatial, -dynamic] contexts

As shown in (11), we detected no non-spatial and non-dynamic predicates. Section 3.3.2 discussed examples (recall (15)) that can in principle be paraphrased with a stative verb but still retain a residue of dynamicity.

Truly stative non-spatial cases are very rare, the sentence in (18) being one of them: here *andar* means 'be functional' when applied to an artifact (a watch). One of the sentential elements contributing to the stative interpretation is the negation.

- (18) El reloj no anda.
Lit.: 'The watch does not walk.'
'The watch is broken.'

This seems to prove that the original meaning of the lexical verb cannot be totally cancelled no matter what context it is surrounded by. In the case of *andar*, the meaning component that persists even in the non-spatial uses is dynamicity.

4 Conclusion

This paper presented the research project "Multilingual Electronic Dictionary of Motion Verbs". We have outlined its theoretical foundations and the basic tenets of the analysis we have been applying to both spatial and non-spatial uses of motion verbs, including the so-called metaphorical extensions and idiomatic expressions. We believe to have proven that this kind of research can make important contributions to the theoretical study of motion verbs and to their lexicographic representation.

5 Literature

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