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**A NETWORK OF SPANISH CONSECUTIVE DISCOURSE MARKERS
FROM A USAGE-BASED PERSPECTIVE: CORPUS AND
EXPERIMENTAL EVIDENCES**

**UNA RED DE MARCADORES CONSECUTIVOS DEL ESPAÑOL
DESDE UNA PERSPECTIVA BASADA EN EL USO: PRUEBAS DE
CORPUS Y EXPERIMENTALES**

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List of abbreviations

AOI	Area of Interest
Cxn	Construction
Corpes XXI	Corpus del Español del Siglo XXI
CREA	Corpus de Referencia del Español Actual
DM	Discourse marker
DPDE	Diccionario de Partículas Discursivas del Español
DS1	Discourse Segment 1
DS2	Discourse Segment 2
FRT	First Reading Time
GE	Grammaticalization as expansion
GR	Grammaticalization as reduction
NGLE	Nueva Gramática de la Lengua Española
PP	Prepositional Phrase
RRT	Re-Reading Time
Top.	Topicalized
TRT	Total reading Time

Introduction

This thesis tries to shed more light on the relationship between the developmental paths of discourse markers (henceforth DMs)¹ and the varying properties they show, given the *impasse* at which frameworks and methods have left the question. Many of the difficulties have come from a closer examination of the Grammaticalization Theory.

Although this framework and its applications have undergone a huge development in the last decades, a wide range of theoretical and methodological problems have also arisen throughout this spread and remain without clear and unanimous response. For the sake of brevity, I would like to outline here the ones I consider more relevant to the field and to some extent more related to my overall goals and particular object of study.

In the highest level of scientific enquiries, some authors have even cast some doubts about the very existence of grammaticalization. Joseph's article "Is there such a thing as grammaticalization?" constitutes a great exemplar (and summary) of the most skeptical view,² by highlighting the lack of agreement in the definition of the ontological essence of grammaticalization:

there is disagreement on the nature of this phenomenon. Especially important here is the ambivalence evident in the literature as to whether grammaticalization is a single process or instead is several processes or instead is a result of other developments, and as to what its relationship is to other mechanisms of language change. In particular, the same authors sometimes refer to grammaticalization as a process and sometimes as several processes, but also as something that results from other mechanisms. (Joseph, 2001: 164)

This discussion has mainly to do with the motivations and mechanisms of change involved in grammaticalization, their specificity compared to other kind of linguistic changes and the extent to which they can be holistically regarded as a response to an identifiable force that triggers them, i.e., grammaticalization itself (Fischer, 2011). It seems, however, that this issue can be somehow addressed by the question of whether there is any identifiable cognitive reflection of grammaticalization taking place, which is one of our main research questions.

Far from this epistemological debate, and even among those authors that with no doubt recognize the self-status of grammaticalization, we can find another important problem in the theory regarding the extension to which it can be applied; in other words, which phenomena of language change fall into the category of grammaticalization. In this sense, historical processes involving the rise of DMs have become an unavoidable challenge for the Grammaticalization Theory, inasmuch as they contradict some of the earliest assumptions of such framework. This is actually the central topic of the thesis. Therefore, for the purposes of this introduction, let us briefly mention the two most prominent issues underlying this controversy.

¹ It is used here as a hyperonym covering all the terms proposed in the literature so far: pragmatic markers, discourse markers, connectives, discursive operator, discourse particles and so on.

² The most critical view is mainly found in Newmeyer (2001).

First of all, there is a longstanding discussion on what is grammar, which are its boundaries or (in a simple and empirical point of view) what qualifies an expression to be considered as grammatical (rather than lexical). Now, from the point of view of traditional grammar, it is assumed that DMs do not belong to grammar, as they do not constitute a (traditional) grammatical class. On the other hand, Lehmann's parameters (Lehmann, 2002[1982]) have been widely accepted as a tool to determine the degree of "grammaticity" in synchrony, and the direction of the changes that take place in grammaticalization processes, which are characterized as unidirectional in the theory. Taking this perspective into account, the problem lies on the fact that the evolution undergone by DMs does not meet the directions posited (loss of morphosyntactic autonomy and structural scope), unlike the standard or classical cases. Therefore, the emergence of DMs has been seen by many scholars as something different and even contrary to grammaticalization, something that does not lead to grammar, but to the discourse or pragmatic pole (Ocampo, 2006). It is also thought of as denying the unidirectionality attested in grammaticalization. It seems, however, that this debate concerns the grammatical properties of DMs, the conception of grammar and, only indirectly, the nature of grammaticalization. Furthermore, these problems seem to lose consistency when applying new approaches to grammar as those presented by Construction grammar, as will be shown below, since they do not assume the sentence as the maximal level of analysis and include pragmatic and discursive aspects as part of the coded meaning of constructions.

The other issue worth mentioning is intrinsically concerned with grammaticalization as a process. Here, the question is whether the process of formation of DMs behaves equally as the one undergone by other "traditional" grammatical categories, regardless of the final, resulting category. Traugott (1995a) tried to set up the basis for a unitary consideration of grammaticalization, as the processes and mechanisms of change (subjectification, reanalysis, decategorialization, etc.) seem to be the same. Nevertheless, case studies undertaken have given rise to problems that call for further insights and methods. This has been revealed in the literature as a two-faced problem, depending on the author who deals with it: a methodological limitation to show the complete path followed by DMs, on the one hand, and a theoretical questioning of the real evolution of structures into DMs, on the other.

Some authors point out the methodological difficulties that historical research on DMs faces, which are tightly tied to the available methods. For instance, tracing back the rise and development of a DM requires large historical corpora which are not always at our disposal. In addition, the characteristics of these corpora are often incompatible with the research needs: the inexistence of purely oral testimonies,³ the lack or scarceness of colloquial samples, the low reliability offered by punctuation as a clue for the syntactic features and, above all, the fact that the analysts have to draw on their own introspection as present-day speakers to interpret structures belonging to another diachronic layer of a language. For those researchers, fuzziness

³ For an empirical treatment of the lack of reliability offered by indirect sources of colloquial registers, see Enghels and Azofra (2018).

and inconsistencies at drawing the presupposed stages of evolution of some DMs are due to these endogen limitations of historical research with corpora (e.g., Pons Rodríguez, 2010).

In what can be considered a current debate, the real evolutionary path followed by DMs has been put into question in theoretical terms. The fact that corpora studies do not reflect Traugott's (1995a) cline (intrapropositional adverb > sentence adverb > discourse marker) suggests the idea of a different process of formation, rather than a bias (Fischer, 2007, 2011; Heine, 2013), so this would be a question that deserves further empirical support (beyond traditional corpus linguistics studies) to be accepted (or rejected).

Much of the abovementioned *problematique* can be seen in a set of Spanish causal-consecutive DM or DM-alike constructions: *por tanto*, *por eso*, *por ello* and *por esto*. Then, this sub-set of DMs formed by the preposition *por* 'for' and a phoric pronoun (*tanto* 'so much', *eso* 'that', *esto* 'this', *ello* 'it') represents such difficulties and becomes our particular object of study.

First, some authors have emphasized methodological hurdles related to the semantic nature of the deictic elements that these constructions contain:

Caso ilustrativo es el de los marcadores discursivos que incluyen demostrativos o elementos específicamente capacitados para trabajar fóricamente; formas como “por esto” o “por ende” pasan de ser solo intraoracionales a funcionar también, simultáneamente, de manera, supraoracional; pero, ¿cómo discernir los papeles durante el proceso intermedio? Son la posición y, en menor medida, la invalidación para funcionar saturando un argumento de la principal los únicos índices, pero no dejan de ser pistas escurridizas. (Pons Rodríguez, 2010: 549)

The most relevant problem here is the fact that such forms are enabled to yield connective meanings by their very compositional meanings, so intermediate stages (if they ever existed) are indistinguishable. In technical terms, there is almost no potential context incompatible with the source meaning, as they can refer to any abstract situation previously described. Thus, such methodological tool is not valid for this case.

As a result, no critical test can be applied to know whether an intermediate stage remains opaque because of methodological barriers or it does not actually take place in such an evolution. Moreover, it should be noted that most of these deictic-based markers are found from early documentations of Spanish at least in an advanced stage of the evolution, following the path proposed for DM, since they seem to display connective properties, based on syntactic position, which is one of the few objective, but still slippery (Cano, 2003; Pons Rodríguez, 2010: 549), criteria⁴ on which the analysis can be drawn. The question, thus, should be expanded as to whether there is any development in the use of these forms as connective devices.

In this particular set of DMs, many researchers have addressed the question synchronically by drawing on formal differences. Here, the point is that in Present-Day Spanish *por tanto* meets most of formal properties of DM, while *por ello*, *por eso* and *por esto* do not. Such difference has been recognized by different authors as the one opposing connectives or DMs to lexical connective cues (Recio et al., 2018), lexical cue phrases (Pander Maat and Sanders, 2001;

⁴ See Bolly et al. (2017) for the weight of the parameter of position in predicting DM status.

Sanders, 2005), lexical signaling devices (Sanders and Noordman, 2000), secondary connectives (Rysová and Rysová, 2015, 2018; Danlos et al., 2018), intra-clausal prepositional phrases (Degand, 2000), lexical connectives (Cuenca, 2017). Studying our paradigm of markers from a historical point of view, Narbona (1978: 331, *our translation*) specifically opposes “*grammatical device available for the anaphoric reproduction*” to “*illative-consecutive locutions*”.

The problem of arguing in this vein is that DM is a category recognized by its prominent functional properties, those guiding the inferences in the communication, in which constructions with different structural properties converge. That is to say, it has been emphasized that DM is a functional category with members organized along a prototypical/peripheral continuum depending on how many formal/structural properties they meet (Pons Bordería, 1998a, 2006). Disagreement present in the literature with regard to the acceptance of *por ello*, *por eso* and *por esto* as DMs represents the particular preferences of authors at drawing only on functional or also on formal properties for delimiting the category.

Formal evidences mentioned by the authors that highlight such differences can be grouped under three general properties of DMs: formal fixation or invariability (1), extrapropositional scope (2) and lack of syntactic integration (3):

- (1) A. Por todo ello/ eso / esto / *tanto, dimitió.
B. Por ello /eso / esto / *tanto mismo, dimitió.
- (2) A. Precisamente por ello / eso / esto *tanto dimitió.
B. Solo por ello / eso / esto / * tanto dimitió.
- (3) A. Es por ello / por eso / esto / *tanto por lo que dimitió.
B. No por ello / por eso / por esto / *por tanto dimitió.

There are different problems associated with this way of proceeding. As a consequence of relying on indirect proofs, which are based on introspective judgments, the differences are treated as dichotomic: such sentences are possible or not (for a critique of discrete grammaticality judgments, see Ford and Bresnan, 2010). However, pervasive evidences on the nature of language change point to gradualness, which results in synchronic gradience —e.g., prototypical or peripheral members of categories, fuzziness at the boundaries of categories, radial categories, family resemblance— (Hopper, 1987; Heine, 1992; Rosenbach, 2010). The approaches based on introspective judgments are, therefore, oversimplistic in that they overshadow the gradual nature of ongoing changes. In this sense, it would be more interesting to know not only if such constructions are possible, but how often they occur, since changes in frequency are informative of ongoing language change (however, see Mair, 2004). As stated by Hoffmann (2005: 36-37) for an analysis of English complex prepositions, “a quantitative data analysis can offer many important additional insights; far more than can be gained through the evaluation of purely constructed data.”

Likewise, some of the enabling constructions exemplified in (1)-(3) seem to depend upon the concrete usage-pattern we are using for making the judgment. For example, while the capacity

to be focused in cleft or pseudo-cleft sentences is arguably possible in 3), it is not so clear in 4), which is an actual utterance extracted from a corpus:

(4) A. Pero la defensa de Salamanca [de mantener en la ciudad el Archivo de la Guerra Civil] no se basa sólo en razones históricas: se basa en sentimientos en agravio y de expolio a una ciudad, y de favoritismo a otra comunidad autónoma. Estamos, por tanto, ante una situación muy delicada, de las que afectan a la cohesión nacional. Permítaseme, **por ello**, expresar mi perplejidad por la desastrosa gestión gubernamental de este asunto.

B. (...)?Es **por ello** por lo que permítaseme expresar mi perplejidad por la desastrosa gestión gubernamental de este asunto.

(*La voz de Galicia*, 29/12/2004 [Retrieved from CREA])

These examples raise the question of whether such forms have developed new meanings while the construction they come from is still available —a phenomenon referred to as *layering* (Hopper, 1991) in the literature— and we are not able to set apart the two constructions. In other words, it could be the case that both intrasentential prepositional phrase and extrapositional DM coexist in these forms.

Moreover, it is not clear the extent to which the impossibility of *por tanto* in such constructions is the result of a historical development, since it seems that some of these possibilities are constrained by the very meaning of *tanto*. As a way of illustration let us point out that some of the constructions that are found at any time with *por ello*, *por eso*, *por esto* do not even take place in *por tanto* at the time it was supposed to be non-fully grammaticalized (e.g. **por todo tanto*, **por tanto mismo*, **solo por tanto*; however, it is documented *no por tanto*).

Hence, all these factors converge in the need of a renewal in the approaches to the study of the development of DMs. From a theoretical point of view, many advances have been reached within the new framework of constructionalization, built up by several authors (Noël, 2007; Bybee, 2010; Gisborne, 2011; Gisborne and Patten, 2011; Hilpert, 2013) and shaped by Traugott and Trousdale (2013). It has the advantages of blurring the limits between lexicon and grammar, and widening the concept of grammar so it can encompass pragmatic functions (pragmatic meaning and constraints are coded in constructions), avoiding the above-mentioned problems with directionality. It also allows to account for changes taking place only at one level, either semantic or formal (morphosyntactic), which could explain some anomalies found in the studies, used as arguments against the notion of grammaticalization (Joseph, 2001, 2011). Usage-based approaches also allow to shed more light on the status of the different forms, which is not always addressable by introspective judgements at first sight, but has to do many times with frequencies, which reveal the degree of entrenchment of a form in a specific function.

At a methodological level, the seek for methods and approaches that overcome the problems involved in the tracing with written corpora has begun recently and constitutes one of the most promising areas of future investigation.

This thesis can be framed within this direction of research. By taking into account new insights and frameworks and undertaking some new empirical methods, it tries to shed some light on the following main question:

I. Is there any cognitive reflection of the development of DMs?

There are already some approaches that have raised a similar question. For example, Fischer (2011) asks how grammaticalization manifests itself in terms of synchronic processing. More specifically, Degand (2000: 692), addressing structures very similar to the ones studied in this thesis, pose a question in the following terms:

In this context it is interesting to raise the issue of the cognitive status of prepositional phrases compared to the inter-clausal discourse markers such as connectives. Do prepositional phrases play an equally important role in text processing or does their intra-clausal status imply that they are less important in terms of processing?

Recently, Recio et al. (2018) have undertaken an eye-tracking study to examine the processing strategies triggered by *por tanto*, *por ello* and *por eso*. The results allow to attribute a connective pattern to all of them but some special characteristics to *por tanto* related to its higher degree of grammaticalization. There are also some differences between *por ello* and *por eso* that the authors treat as reflecting the morphosyntactic particular properties of *ello* and *eso*. However, from our point of view, it is worth asking whether the approach can only reflect grammaticalized vs non-grammaticalized connective devices or also degrees of grammaticalization across these markers. In order to answer such question we have carried out an eye-tracking experiment with *por tanto*, *por eso*, *por ello* and *por esto* that tries to shed light on the issue by drawing on two assumptions:

- At the methodological level, a paradigmatic design where all the DMs are read by all the participants is required, since only this way direct comparisons between all the markers can reliably be made.
- At the theoretical level, it should be questioned if grammaticalization alone can account for the results obtained in the experiment or rather the description of the nature of these markers would benefit from the contributions of usage-based construction grammar and constructionalization. The former is a branch of construction grammar that exploits the idea that grammar is built on the generalization of speakers over usage-events (§2.1.1). Since in construction grammar the basic unit of grammar is the construction —a form-meaning pairing of varying complexity and schematicity—, language use impacts on the mental representation of constructions and the relations between them, which are often referred to as constructional networks (§2.3.1). Constructionalization framework (§2.2) can be regarded as a diachronic consequence of this insight and focuses on how extant constructions change and new constructions come into being in language use.

A working hypothesis in this sense is that connective token uses of all these forms model their constructional status and the relations between them, so they are to be studied as constructions with certain specifications provided by their use. The hypothesis comes partly from the

attestation that *por eso*, *por tanto* and *por esto* are documented in initial position fulfilling connective functions in earlier periods of Spanish, while, at that time, *por ello* was not traced with this function (Eberenz, 2000; Herrero Ruiz de Loizaga, 2003a; c.f. Garrido Sepúlveda, 2017) or showed a lower percentage of initial position than it did in final position. In Present-Day Spanish, *por tanto* seems to have undergone some movements toward DM construction and *por ello* has been leveled to *por eso* and *por esto* in its connective function. It follows that, although the structure of all of them is prone to fulfill connective function, there are historical changes in the entrenchment of each form to this function, which can result in the linkage to the DM construction by formal or functional resemblances or the definitive constructionalization.

Accordingly, we have also carried out a corpus study in order to find eventual formal and functional differences in usage across our markers. The main aim is to draw the constructional status of each marker and the way they relate in a constructional network with regard to the categories of DM and intrapropositional adverb. A final task is to check whether such picture can be put in relation with the results obtained in the eye-tracking study.

In dealing with the main question, we try to solve the following particular research questions that are also relevant issues for the fields of grammaticalization/constructionalization:

- A. Can all these markers be regarded as a paradigm or group from a functional point of view?
- B. Are the differences between them reflected in processing patterns?
- C. Can their similarities and differences be modeled in a constructional network?

Along the pages of this thesis we will contextualize all these questions. The first two chapters are devoted to the state of the art and the frameworks that can be helpful to address the development of these markers with the methods proposed: in the first one we present the way discourse DMs have been seen from a diachronic point of view and the problems this view involves; chapter 2 will address the new framework of constructionalization by firstly focusing on the most important tenets of construction grammar and the most suitable streams to deal with our object of study, namely, usage-based construction grammar and Radical Construction Grammar.

After presenting all the theoretical issues related to the diachronic dimension of DMs, in chapter 3 we introduce the set of markers that constitute our object of study, by addressing the domain of causality and the different resources to relate discourse segments causally. We will describe morphosyntactic and semantic properties of *por tanto*, *por eso*, *por ello* and *por esto* from a synchronic point of view. Brief notes on the diachrony of these markers will also be provided.

Chapter 4 involves the whole eye-tracking experiment. A brief state of the art of individual and comparative eye-tracking studies with DMs opens the chapter. After this contextualization, the methodology of the study will be explained: it will be focused on independent variables and conditions, study design, materials, participants and statistical treatment. Then, the results will be presented by, first, analyzing the commonalities displayed by their patterns in terms of principles of DMs processing and, secondly, signaling some differences between them.

The goal of chapter 5 is to obtain a picture of the constructional status of the DMs by means of a corpus study aimed at describing their usage properties. In this chapter we describe the selected corpus and the parameters that describe their position with regard to the categories at issue. Afterwards, we present and discuss the results.

Chapter 6 is devoted to the discussion of correlations between the results of the eye-tracking and the corpus study. The thesis closes with the extracted conclusions, those obtained through the studies and those involving relevant future research.

Introducción

Esta tesis trata de arrojar luz sobre las relaciones que existen entre el proceso evolutivo que recorren los marcadores del discurso y la variación en las propiedades que pueden distinguirse en ellos, habida cuenta del estado de estancamiento al que han conducido los métodos y marcos teóricos predominantes hasta la fecha. Muchas de las dificultades que se constatan en dicha investigación provienen de un riguroso examen de la Teoría de la Gramaticalización.

En efecto, la eclosión y el enorme desarrollo que ha experimentado este marco teórico y sus aplicaciones en las últimas décadas han traído aparejado también un amplio abanico de problemas teóricos y metodológicos cuya solución permanece en disputa. Por motivos de espacio nos gustaría mencionar aquí aquellos que devienen especialmente relevantes para el campo y que se hallan en cierta medida vinculados a nuestro objeto de estudio y propósitos generales.

En un nivel elevado de discusión científica, algunos autores cuestionan la existencia misma de la gramaticalización. El artículo de Brian D. Joseph (2001) “Is there such a thing as grammaticalization?”, constituye un claro ejemplo de la visión más escéptica sobre el fenómeno, ya que señala la falta de consenso que existe en torno a la definición de la esencia ontológica de la gramaticalización.

there is disagreement on the nature of this phenomenon. Especially important here is the ambivalence evident in the literature as to whether grammaticalization is a single process or instead is several processes or instead is a result of other developments, and as to what its relationship is to other mechanisms of language change. In particular, the same authors sometimes refer to grammaticalization as a process and sometimes as several processes, but also as something that results from other mechanisms. (Joseph, 2001: 164)

Este debate en realidad se articula sobre las motivaciones y mecanismos de cambio lingüístico que explican la gramaticalización, su especificidad con respecto a otros tipos de cambio lingüístico y la medida en que pueden considerarse holísticamente como una respuesta a un factor que los desencadena, es decir, la gramaticalización (Fischer, 2011). Parece, sin embargo, que esta discusión puede abordarse a partir de una de nuestras principales preguntas de investigación: ¿puede identificarse algún reflejo cognitivo de un proceso de gramaticalización en desarrollo?

Alejándonos de estas disquisiciones epistemológicas y adentrándonos en las corrientes más comunes que sí reconocen el estatuto propio de la gramaticalización como cambio lingüístico, podemos mencionar otro problema importante en la teoría que afecta a la extensión que el fenómeno puede abarcar; es decir, qué procesos de cambio lingüístico pueden incluirse bajo la categoría de gramaticalización. En este sentido, los procesos históricos de desarrollo de marcadores del discurso han supuesto un enorme e insoslayable desafío para la Teoría de la Gramaticalización, en la medida en que contravienen algunas de las premisas fundacionales de esta. En tanto que este constituye el tema central de la tesis, desgranamos brevemente a continuación las cuestiones más importantes que subyacen a esta controversia.

En primer lugar, existe un debate tradicional sobre la definición y delimitación de la gramática, o, en otras palabras, sobre qué determina la consideración de una palabra como gramatical o léxica. Desde el punto de vista tradicional, se asume que los marcadores del discurso no pertenecen a la gramática, ya que no constituyen ninguna clase de palabra (categoría gramatical). Por otro lado, los parámetros de Lehmann (2002[1982]) han devenido en herramienta canónica para determinar el grado de “gramaticidad” en sincronía y la dirección de los cambios que se producen en los procesos de gramaticalización, caracterizados comúnmente como unidireccionales. De acuerdo con esta perspectiva, el problema radica en que la evolución que experimentan los marcadores del discurso no se corresponde con la dirección que postulan los parámetros de Lehmann (por ejemplo, pérdida de autonomía morfosintáctica y alcance estructural), al contrario de lo que sucede con las categorías gramaticales tradicionales. Así pues, el surgimiento de marcadores del discurso se ha considerado en ocasiones diferente e incluso contrario a la gramaticalización, como un proceso que no conduce al polo gramatical, sino discursivo (Ocampo, 2006) y que viola, por tanto, la unidireccionalidad atestiguada en los procesos de gramaticalización tradicionalmente estudiados.

Se podría decir que, en realidad, este debate se centra en las propiedades gramaticales (morfosintácticas) de los marcadores del discurso, la concepción de la gramática y, solo indirectamente, la naturaleza de la gramaticalización. Además, estos problemas parecen perder consistencia cuando se aplican nuevos enfoques de gramática como los que presenta la gramática de construcciones, como se verá posteriormente, ya que estos no asumen la oración como límite de análisis e incluyen aspectos pragmáticos y discursivos como parte del significado codificado de las construcciones.

El otro aspecto que debe tratarse en relación con el desarrollo de marcadores discursivos está intrínsecamente relacionado con la gramaticalización como proceso. En este sentido, se debate si el proceso de formación de marcadores del discurso presenta el mismo desarrollo que el que se observa en otras categorías gramaticales “tradicionales”, independientemente de la categoría resultante de este. Traugott (1995a) ha tratado de sentar las bases para una visión integradora de la gramaticalización, en tanto que los procesos y mecanismos que actúan en ambos cambios (subjektivización, reanálisis, descategorización, etc.) parecen ser idénticos. Sin embargo, ciertos estudios que se han llevado a cabo bajo este prisma han dado lugar a problemas que exigen nuevas perspectivas y métodos. Estas dificultades pueden dividirse en dos grandes tipos, dependiendo de los autores que las abordan: por un lado, se constatan limitaciones metodológicas para dar cuenta del proceso íntegro que siguen los marcadores del discurso hasta su formación; por otro lado, ha surgido también un cuestionamiento teórico de la evolución real que se produce en el paso de ciertas estructuras a la categoría de marcadores del discurso.

Respecto al primer punto, algunos autores señalan las dificultades metodológicas a las que se enfrenta la investigación histórica sobre marcadores del discurso. Por ejemplo, rastrear el surgimiento y desarrollo de un marcador del discurso requiere extensos corpus históricos de los

que no disponemos a menudo. Además, las características de estos son muchas veces incompatibles con las necesidades de la investigación: la inexistencia de testimonios orales puros, la falta o escasez de muestras coloquiales,⁵ o la insuficiente fiabilidad que ofrecen los signos de puntuación como indicadores de características sintácticas; y, sobre todo, el hecho de que el analista tiene que recurrir a su introspección como hablante actual de una lengua para interpretar estructuras que pertenecen a un estrato diacrónico diferente (variante diacrónica). Para los autores que se centran en esta dificultad, las inconsistencias y la falta de claridad en el establecimiento de los estadios presupuestos para la evolución de ciertos marcadores se deben a dichas limitaciones intrínsecas de la investigación histórica con corpus (e.g. Pons Rodríguez, 2010).

En cuanto al segundo punto, en un debate que podemos considerar actual, se ha cuestionado la evolución que siguen los marcadores del discurso en términos teóricos. El hecho de que los estudios de corpus no reflejen el *cline* de Traugott (1995a) (adverbio intraproposicional > adverbio oracional > marcador del discurso) sugiere la idea de un proceso de formación diferente, en lugar de un sesgo metodológico (Fischer, 2007, 2011; Heine, 2013). Así pues, esta cuestión merecería mayor consideración y apoyo empírico (más allá de los estudios de corpus tradicionales) para aceptarse o rechazarse.

Gran parte de la problemática planteada puede observarse en un grupo de marcadores de causa-consecuencia del español: *por tanto*, *por eso*, *por ello* y *por esto*. Así, este subconjunto de marcadores formados por la preposición *por* y un pronombre fórico (*tanto*, *eso*, *esto*, *ello*) refleja tales dificultades y deviene en nuestro objeto de estudio particular.

En primer lugar, algunos autores enfatizan las dificultades metodológicas que provienen de la naturaleza semántica de los elementos deícticos que contienen estas construcciones:

Caso ilustrativo es el de los marcadores discursivos que incluyen demostrativos o elementos específicamente capacitados para trabajar fóricamente; formas como “por esto” o “por ende” pasan de ser solo intraoracionales a funcionar también, simultáneamente, de manera, supraoracional; pero, ¿cómo discernir los papeles durante el proceso intermedio? Son la posición y, en menor medida, la invalidación para funcionar saturando un argumento de la principal los únicos índices, pero no dejan de ser pistas escurridizas. (Pons Rodríguez, 2010: 549)

El problema que se vislumbra aquí radica en que estas formas están habilitadas para la conexión por su significado composicional, de modo que los estadios intermedios (si han llegado a existir) son indistinguibles. En otras palabras, no existen apenas potenciales contextos incompatibles con el significado de origen que nos garanticen un cambio, ya que todos estos elementos anafóricos pueden referirse a cualquier situación abstracta descrita previamente. Por tanto, dicha herramienta metodológica (búsqueda de contextos aislantes) queda invalidada para estos casos. En consecuencia, no puede aplicarse ninguna prueba mínima y suficiente para determinar

⁵ Para un tratamiento empírico de la escasa fiabilidad que ofrecen las muestras indirectas del registro colloquial, véase Enghels y Azofra (2018).

si los estadios intermedios permanecen opacos a causa de las barreras metodológicas o simplemente no tienen lugar en dicha evolución.

Además, la mayoría de estos marcadores basados en deícticos se encuentran desde documentaciones tempranas del español al menos en un segundo estadio de la evolución propuesta para los marcadores del discurso, puesto que parecen exhibir propiedades conectivas, si nos fijamos en la posición sintáctica que ocupan, que es una de los pocos criterios objetivos, aunque ciertamente resbaladizo (Cano, 2003; Pons Rodríguez, 2010),⁶ en que el análisis se puede apoyar. La cuestión, por tanto, debe ampliarse a si existe realmente algún desarrollo en el uso de estas formas como mecanismos conectivos.

En este conjunto específico de marcadores del discurso, muchos investigadores han abordado la cuestión desde un punto de vista sincrónico recurriendo a diferencias formales. El argumento consiste en que, actualmente, *por tanto* cumple la mayoría de las características formales de la categoría de marcador del discurso, mientras que *por ello*, *por eso* y *por esto* no. Diferencias como las que se han alegado para estos marcadores han sido previamente analizadas en otras unidades y han dado lugar a diferentes etiquetas que se oponen parcialmente a la de marcador del discurso: *lexical connective cues* (Recio et al., 2018), *lexical cue phrases* (Pander Maat and Sanders, 2001; Sanders, 2005), *lexical signalling devices* (Sanders and Noordman, 2000), *secondary connectives* (Rysová and Rysová, 2015, 2018 Danlos et al., 2018), *intraclausal prepositional phrase* (Degand, 2000), conectores léxicos (Cuenca, 2017). En su estudio histórico sobre el paradigma que nos ocupa, Narbona (1978) explícitamente opone “útil gramatical disponible para la reproducción anafórica”, que aplica a *por eso* y *por esto*, a “locuciones ilativas-consecutivas”, donde incluye a *por tanto*.

El problema de argumentar de este modo radica en que la de marcador del discurso es una categoría reconocida por la propiedad funcional fundamental de guiar las inferencias en la comunicación, en la que convergen construcciones con características estructurales diferentes. Es decir, se ha destacado que los marcadores del discurso constituyen una categoría funcional con miembros organizados a lo largo de un continuo de prototipicidad, en función del número de propiedades formales o estructurales que cumplen (Pons Bordería, 1998a, 2006). La falta de consenso que se refleja en la bibliografía con respecto a la aceptación de *por ello*, *por eso* y *por esto* como marcadores del discurso representa las preferencias particulares de los autores por basarse más en propiedades formales o funcionales para delimitar la categoría.

Las diferencias formales que mencionan los autores que subrayan tales divergencias pueden agruparse en tres propiedades fundamentales de los marcadores del discurso: fijación formal o invariabilidad (1), alcance extraproposicional (2) y falta de integración sintáctica (3):

(1) A. Por todo ello/ eso / esto / *tanto, dimitió.

B. Por ello /eso / esto / *tanto mismo, dimitió.

⁶ Véase Bolly et al. (2017) para un análisis más exacto del peso del parámetro “posición” para predecir el estatus de MD.

(2) A. Precisamente por ello / eso / esto *tanto dimitió.

B. Solo por ello / eso / esto / * tanto dimitió.

(3) A. Es por ello / por eso / esto / *tanto por lo que dimitió.

B. No por ello / por eso / por esto / *por tanto dimitió.

Existen diferentes problemas asociados a este análisis. Como consecuencia de recurrir a pruebas indirectas basadas en criterios introspectivos, las diferencias se consideran desde un punto de vista dicotómico: las oraciones son gramaticales o no (para una crítica de los juicios de gramaticalidad discretos, véase Ford y Bresnan, 2010). Sin embargo, las pruebas que arrojan los estudios del cambio lingüístico apuntan a la existencia de gradualidad en el cambio, que resulta en un gradiente sincrónico —por ejemplo, miembros prototípicos o periféricos de las categorías, límites difusos entre categorías, categorías radiales, relaciones de parecido de familia— (Hopper, 1987; Heine, 1992; Rosenbach, 2010). Los enfoques que se basan en juicios introspectivos son, por tanto, demasiado simplistas, en tanto que descuidan la naturaleza gradual de los cambios en desarrollo. En este sentido, sería más interesante conocer no solo si dichas construcciones son posibles o no, sino con qué frecuencia ocurren, puesto que los cambios en la frecuencia informan sobre la existencia de un cambio lingüístico en desarrollo (sin embargo, véase Mair, 2004). Como afirma Hoffmann (2005: 36-37) en un análisis de las preposiciones complejas del inglés, “a quantitative data analysis can offer many important additional insights; far more than can be gained through the evaluation of purely constructed data”.

Asimismo, algunas de las construcciones que permiten dichas paráfrasis dependen del patrón de uso concreto que usamos para hacer el juicio. Por ejemplo, mientras que la capacidad de ser focalizado es a priori posible en (3), no resulta tan claro en un ejemplo real de corpus como (4):

(4) A. Pero la defensa de Salamanca [de mantener en la ciudad el Archivo de la Guerra Civil] no se basa sólo en razones históricas: se basa en sentimientos en agravio y de expolio a una ciudad, y de favoritismo a otra comunidad autónoma. Estamos, por tanto, ante una situación muy delicada, de las que afectan a la cohesión nacional. Permítaseme, por ello, expresar mi perplejidad por la desastrosa gestión gubernamental de este asunto.

B. (...) ¿Es por ello por lo que permítaseme expresar mi perplejidad por la desastrosa gestión gubernamental de este asunto.

La voz de Galicia, 29/12/2004 [extraído de CREA]

Estos ejemplos dan lugar a la pregunta de si estas formas han desarrollado significado nuevos, mientras que las construcciones de las que provienen están todavía presentes en la lengua —un fenómeno conocido como *layering* (Hopper, 1991) en la bibliografía— y no somos capaces de distinguir ambas construcciones. En otras palabras, podría darse el caso de que tanto el sintagma preposicional con alcance intraproposicional y el marcador del discurso extraproposicional coexistieran sin diferencias formales superficiales.

Además, no está claro en qué grado la imposibilidad de que *por tanto* concorra en dichas construcciones es el resultado de un desarrollo histórico, ya que parece que algunas de estas

posibilidades están limitadas por el significado mismo de *tanto*. A modo de ilustración podemos mencionar que algunas de las construcciones que se encuentran con *por ello*, *por eso* y *por esto* no tienen lugar en *por tanto* en las etapas en las que aparentemente no estaba gramaticalizado (por ejemplo, **por todo tanto*, **por tanto mismo*, **solo por tanto*; sin embargo, sí existía *no por tanto*).

Así pues, todos estos factores convergen en la necesidad de una renovación en las aproximaciones al estudio del desarrollo de los marcadores del discurso. Desde un punto de vista teórico, se han alcanzado muchos avances en el seno del nuevo marco teórico de la construccionalización, construido por diversos autores (Noël, 2007; Bybee, 2010; Gisborne, 2011; Gisborne and Patten, 2011; Hilpert, 2013, entre otros) y modelado por Traugott y Trousdale (2013).

Dicha perspectiva posee la ventaja de difuminar los límites entre el léxico y la gramática, y de ampliar el concepto de gramática, de modo que pueda abarcar funciones pragmáticas (los significados y las restricciones pragmáticas se hallan codificadas en las construcciones), soslayando así los problemas previamente mencionados con la direccionalidad de los cambios. Además, también permite dar cuenta de cambios que solo afectan a un nivel, ya sea semántico o formal, lo que podría explicar algunas anomalías encontradas en algunos casos y usadas como argumentos contra la noción tradicional de gramaticalización (Joseph, 2001, 2011)

Por otro lado, los enfoques basados en el uso pueden arrojar luz sobre el estatus de diferentes formas que no puede abordarse a priori a través de juicios introspectivos, sino que tiene que ver muchas veces con frecuencias de uso, que revelan el grado de afianzamiento (*entrenchment*) de una forma en una función específica.

En un nivel metodológico, la búsqueda de métodos y aproximaciones que superen los problemas propios del rastreo histórico con corpus históricos ha comenzado recientemente y constituye una de las áreas de futura investigación más prometedoras.

Esta tesis se puede enmarcar en esa dirección de investigación. Teniendo en cuenta las nuevas perspectivas y marcos y recurriendo a nuevos métodos empíricos, el trabajo trata de arrojar luz sobre la siguiente pregunta principal, anticipada anteriormente:

I. ¿Existe algún reflejo cognitivo de una formación de marcadores del discurso en curso?

De hecho, algunos trabajos ya han sugerido esta pregunta. Por ejemplo, Fischer (2011) se cuestiona si la gramaticalización se manifiesta en términos de procesamiento sincrónico. Más específicamente, Degand (2000: 692), estudiando estructuras similares a las nuestras, plantea la cuestión en los siguientes términos:

In this context it is interesting to raise the issue of the cognitive status of prepositional phrases compared to the inter-clausal discourse markers such as connectives. Do prepositional phrases play an equally important role in text processing or does their intra-clausal status imply that they are less important in terms of processing?

Recientemente, Recio *et al.* (2018) han llevado a cabo un estudio de *eye-tracker* para examinar las estrategias de procesamiento desencadenadas por las formas *por tanto*, *por ello* y *por eso*.

Los resultados permiten atribuir un patrón conectivo a todos ellos, pero también vislumbrar algunas características especiales en *por tanto* que se relacionan con su mayor grado de gramaticalización. Existen también diferencias entre *por ello* y *por eso* que los autores atribuyen a las propiedades morfosintácticas particulares de *ello* y *eso*. Sin embargo, en nuestra opinión, cabe preguntarse si este enfoque refleja solo las diferencias entre conectores gramaticalizados y no gramaticalizados o pueden apreciarse también diferencias entre grados de gramaticalización. Para responder a esta pregunta, en esta tesis llevamos a cabo un experimento de *eye-tracker* con *por tanto*, *por eso*, *por ello* y *por esto* que trata de arrojar luz sobre esta cuestión asumiendo dos premisas:

- En el nivel metodológico, se requiere un diseño paradigmático en el que todos los participantes lean enunciados con cada marcador, de manera que se puedan realizar comparaciones directas entre ellos.
- En el nivel teórico, debe cuestionarse si el marco de la gramaticalización puede dar cuenta íntegramente de los resultados obtenidos en el experimento o la descripción de la naturaleza de estos marcadores podría beneficiarse de las contribuciones de la gramática de construcciones basada en el uso y la construccionalización. La primera es una rama de la gramática de construcciones que explota la idea de que la gramática se construye sobre la generalización que los hablantes hacen a partir de eventos de uso reales (§2.1.1). En la medida en que en estas perspectivas la unidad básica de la gramática es la construcción —par mínimo de forma y función con diferentes grados de complejidad y esquematicidad— se argumenta que el uso de la lengua impacta en la representación mental de las construcciones y las relaciones que se establecen entre ellas, de las que se da cuenta mediante una red de construcciones (§2.3.1). El marco de la construccionalización (§2.2.), por su parte, puede considerarse como el plano diacrónico de este enfoque y se focaliza en estudiar cómo las construcciones existentes cambian y emergen nuevas construcciones en el uso de la lengua.

Una hipótesis operativa en este sentido es que los usos conectivos de estas formas modelan su estatus construccional y las relaciones entre ellos, de modo que deben estudiarse como construcciones con ciertas especificaciones proporcionadas por su uso. La hipótesis se apoya parcialmente en la constatación de que *por eso*, *por tanto* y *por esto* se documentan en posición inicial desempeñando funciones conectivas en los primeros periodos del español, mientras que, en esta etapa, no se rastrean usos de *por ello* en esta función (Eberenz, 2000; Herrero Ruiz de Loizaga, 2003a; cf. Garrido Sepúlveda, 2017) o muestran un porcentaje menor de posición inicial en comparación con la final. En español actual, *por tanto* parece haber experimentado ciertos desarrollos hacia la construcción de marcador del discurso y *por ello* se ha nivelado con *por eso* y *por esto* en su función conectiva. Se desprende de ello que, aunque la estructura de todos ellos es susceptible de ser empleada con fines conectivos, hay cambios históricos en el afianzamiento de cada forma a esta función que pueden desembocar en ciertos vínculos con la construcción de marcador del discurso a través de semejanzas formales o funcionales, o incluso una definitiva

construccionalización (formación de un nuevo nodo dependiente de la categoría de marcador del discurso).

En consecuencia, en esta tesis también llevamos a cabo un estudio de corpus para encontrar posibles diferencias formales y funcionales entre nuestros marcadores. El objetivo principal es representar el estatus categorial de cada marcador y la forma en la que se relacionan todos ellos en una red de construcciones con respecto a las categorías de marcador del discurso y adverbio intraproposicional. Por último, tratamos de comprobar si dicho esquema puede ponerse en relación con los resultados obtenidos en el estudio de *eye tracker*.

Por lo tanto, la pregunta de investigación principal se concreta en otras cuestiones particulares que pueden resultar importantes en el campo de la gramaticalización/construccionalización, como las siguientes:

- A. ¿Pueden todos estos marcadores ser considerados como un paradigma o grupo desde un punto de vista funcional?
- B. ¿Existen diferencias entre ellos que se reflejan en patrones de procesamiento?
- C. ¿Pueden modelarse sus semejanzas y diferencias en una red de construcciones?

A lo largo de las páginas de esta tesis se contextualizarán todas estas cuestiones. Los primeros dos capítulos se dedican al estado de la cuestión y los marcos que pueden ser de ayuda en la determinación del desarrollo de los marcadores con los métodos propuestos: en el primero presentamos la manera en que se han estudiado los marcadores del discurso desde un punto de vista diacrónico y los problemas que esta visión lleva aparejados; el capítulo 2 aborda el nuevo marco de la construccionalización, centrándose en primer lugar en las características más importantes de la gramática de construcciones y las vertientes de esta más adecuadas para tratar nuestro objeto de estudio, a saber, los enfoques de gramática de construcciones basada en el uso y la Gramática de Construcciones Radical.

A continuación, en el capítulo 3, presentamos el conjunto de marcadores que constituye nuestro objeto de estudio, estudiando el campo de la causalidad y los diferentes recursos para relacionar causalmente segmentos discursivos. Describimos las propiedades semánticas y morfosintácticas de *por tanto*, *por eso*, *por ello* y *por esto* desde un punto de vista sincrónico y también se aportan algunas notas sobre la diacronía de estos marcadores.

El capítulo 4 incluye todo el experimento de *eye-tracker*. El capítulo abre con un breve estado de la cuestión sobre estudios de *eye-tracker* individuales y comparativos sobre marcadores del discurso. Tras esta contextualización, se explica la metodología del estudio: se focaliza en las variables independientes y las condiciones, el diseño del estudio, los participantes, el procedimiento y el tratamiento de los datos. A continuación, se presentan los resultados, analizando, primero, los puntos en común que muestran los patrones de procesamiento de acuerdo con los principios de procesamiento de la marcación del discurso para, en segundo lugar, señalar algunas diferencias entre ellos.

El objetivo del capítulo 5 es obtener un cuadro general del estatus construccional de estos marcadores del discurso a través de un estudio de corpus dirigido a la descripción de sus propiedades de uso. En este capítulo describimos el corpus seleccionado y los parámetros que pueden describir su posición con respecto a las categorías en cuestión (adverbio intraproposicional y marcador del discurso). Finalmente presentamos y discutimos los resultados.

El capítulo 6 se centra en la discusión sobre las correlaciones existentes entre los resultados de los estudios de *eye-tracking* y de corpus. La tesis cierra con las conclusiones que pueden extraerse, tanto aquellas que se obtienen de los estudios como las que se refieren a la investigación futura relevante.

*Any theory of grammaticalization
that does not presuppose a notion of
grammar is a stronger theory in that
it will also be able to handle the
problem of how grammar arose in the
first place. (Himmelmann, 1992)*

Chapter 1. How to become a discourse marker? The problem of describing the development of discourse markers

One legitimate —and allegedly important— question that researchers pose when analyzing DMs is which framework is more suitable to deal with the development of coded discursive meaning. The issue has been extensively developed in accounting for the rise and evolution of DMs (Erman and Kotsinas, 1993; Traugott, 1995a; Brinton, 1996, 2008, 2017; Aijmer, 1997; Wischer, 2000; Traugott and Dasher, 2002; Günthner and Mütz, 2004; Company, 2004a; Diewald, 2011a, 2011b; Heine, 2013, 2018 Degand and Evers-Vermeul, 2015): should we draw on a grammaticalization framework or should we design an alternative framework that better fits the specificities of such category?

The question emerges when we consider a set of functionally-similar DMs, such as the one conforming the Spanish *por tanto* lit. ‘for so much’, *por ello* lit. ‘for it’, *por eso* lit. ‘for that’ and *por esto* ‘for this’. They are linguistic forms specialized in linking or binding two discourse segments in a wide cause-consequence relation, as in the following example:

- (5) Los problemas de la columna vertebral comienzan, en la mayoría de los casos, por la adopción continuada desde la infancia de posturas inadecuadas, tanto durante el descanso como en el trabajo.

Por ello, se hace preciso incluir en nuestras programaciones ciertos contenidos que permitan a los alumnos de E.S.O y Bachillerato tener los suficientes recursos que les capaciten para prevenir e incluso subsanar tales dolencias.

*(Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte, nº1, 11/2000
[Extracted from CREA])*

Most of them (see §3.3.1) are attested in connective uses from early documentations of Spanish, with only *por tanto* having changed in its formal properties (§3.3.2). It is, therefore, worth studying the scope of such changes and the extent to which they end up bringing these markers into different categories or what relation they hold in a speaker’s grammar. It is also important to explore whether grammaticalization properly accounts for the setting of these units or, on the contrary, it overshadows their functioning as DMs. If grammaticalization implies a gradual acquisition of grammatical meaning and form (cf. Heine et al., 1991: 65-69; Lichtenberck, 1991; Heine, 1992; Bybee et al., 1994: 24; Lehmann, 2002[1982]: 11; Hopper and Traugott, 2003

[1993]: 232; Traugott and Brinton, 2005: 26-27; Traugott and Trousdale, 2010), how do we deal with connective functions that do not show a clear previous development?

Therefore, it is necessary to explore the relation between DMs and grammaticalization theory.

The increasing popularization of DMs as worthy objects of study in linguistics coincided with the remarkable spread of the Grammaticalization Theory. Efforts to analyze DMs from an integral insight (diachronic perspective included) concurred with the expectations of Grammaticalization Theory to find out if the development of such new discovered (functional) class could be explained by the theoretical tools and assumptions of the theory. Therefore, the theoretical gaps of both fields acted as magnets attracting endeavors and spawned prodigious research.

In a preempirical stage, grammaticalization was accepted as the process through which the rise and development of DMs could be described, but such statements were not supported by empirical diachronic studies. In fact, this led to a circular argument, where DMs are considered products of grammaticalization and the proof to know whether they have undergone grammaticalization or not is that they are DMs.

But despite the momentum gained by the theory, the accommodation of DMs into the theory of grammaticalization gave rise to many problems. Some of them were inherited from the same hurdles that were found when attempting to fit DMs into classical grammatical theories: namely, the non-ascription of DMs to any grammatical or syntactic class, given their heterogeneous origins, and their extrasentential scope. Other problems were the result of divergences found in the process of formation of DMs compared to those undergone by other classical grammatical words. All in all, both arguments appear intertwined (and are inextricable) in the most quoted proposal of directional processes in grammaticalization, i.e., Lehmann's (2002[1982]), since his parameters are intended to determine both the degree of grammaticalization (from a diachronic perspective) and the grammaticality⁷ (from a synchronic perspective).

Several authors have identified such problems as the main questions to answer in order to characterize the historical process giving rise to DMs. Thus, Himmelmann (2004) calls the first issue *the box metaphor* and the second one, *the process metaphor*, while Diewald (2011a) splits her survey on the questions of the target and the process. Similarly, Degand and Evers-Vermeul (2015) reduce the problem to two specific research questions:

1. Are DMs grammatical expressions?
2. Are the processes of linguistic change involved the same as those of grammaticalization?

Regarding the solutions to these questions, Traugott (2010a) and Traugott and Trousdale (2013) have categorized grammaticalization into two views, each leading to a different result:

⁷ *Grammaticality* is a polysemic term in the field of linguistics. It is often used in the generative tradition as the well-formedness of a sequence according to the internal grammar of speakers. Following Lehmann (2002[1982]: 8), however, it is used here to mean the degree to which a word is to be considered grammatical (function word, procedural unit) rather than lexical (content word, conceptual word).

grammaticalization as reduction and grammaticalization as expansion.⁸ The former insight focuses on the loss of autonomy and increasing dependency of the grammaticalizing forms. The latter is much more concerned with the acquisition by a certain form of a meaning arising out of a restricted context and how such meaning expands over contexts and syntactic classes; put differently, it concentrates on increasing productivity and schematicity of the grammaticalizing structure. While grammaticalization as expansion can afford to deal with the criticisms posed in a traditional view, a new question that exceeds the most representative proposal within this model (i.e., Traugott's, 1995a) has arisen: the real evolutive path of DMs is called into question, as far as a greater role of synchronic factors and instantaneous mechanisms of change is suggested (Fischer, 2007, 2011; Kaltenböck et al., 2011; Heine, 2013, 2018; Heine et al., 2013).

As a result, different labels have been proposed to describe the change undergone by lexical items or constructions that evolve into DMs. In what follows we will first briefly outline the problems related to the accommodation of DMs in the realm of grammar (§1.1). We will then elaborate on the difficulties that addressing the “process question” involves (§1.2). Finally, we will examine a new proposal of evolution for DMs (§1.3).

1.1 Discourse markers inside or outside the grammar

Grammatical status is at the basis of most conceptions of grammaticalization so it becomes necessary to draw a definition of “grammatical” to decide whether or not we are faced with examples of a process of grammaticalization.⁹ But consensus on this matter is far from being reached amongst scholars; rather, this issue remains disputed and differently approached (Harder and Boye, 2011; Diewald, 2010, 2011a, Boye and Harder, 2012). Moreover, the adjective *grammatical* encloses a polysemy that is not always made explicit and whose meanings are even considered related and inextricable (Himmelmann, 1992; Harder and Boye, 2011).¹⁰ In the first sense, *grammatical* opposes to *pragmatic*; in the second, the opposition stands between grammatical and lexical classes of words or grammar and lexicon. DMs seem to challenge both

⁸ For a critique of such a division, see Heine (2018).

⁹ Note that this is only the consequence of applying a transparent use of the term *grammaticalization* to be bound to a specific notion of grammar, but this is in fact not necessary. In this sense, Himmelmann (1992: 1) mentions different possibilities:

- a) Both areas are only loosely related, i.e., grammaticalization is essentially a kind of historical morphology while grammar is concerned with the synchronic functioning of the language system.
- b) Both areas are related in that grammaticalization theory (GT) presupposes some concept of grammar. In order to investigate grammaticalizational phenomena we have to know what grammar is.
- c) Both areas are related, but their interrelation is reversed. GT itself may be conceived as a theory of grammar (or, somewhat less ambitiously, as contributing substantially to a theory of grammar)

¹⁰ For example, Boye and Harder (2009: 10) state that “[o]ften, however, the notion of linguistic category seems to be bound up with grammatical status, i.e., the property of being part of the grammar rather than the lexicon: linguistic categories are equated with grammatical categories.”

oppositions, and the fact that both *lexicalization* and *pragmaticalization* have been considered alternative labels to grammaticalization in the development of DMs is a clear proof thereof.

In traditional accounts of language, DMs have been excluded from the grammar on the basis of two facts. First of all, they cannot be regarded as a grammatical/syntactic category of any type, since they show heterogeneous origins and different formal properties (Hansen, 1998: 36; Martín Zorraquino, 1998; Pons Bordería, 1998a; Portolés, 1998; Fraser, 1999: 944). Secondly, given that the maximal level of grammatical analysis is the sentence and the connection they yield overcomes such level, they are considered extra-grammatical.

As a consequence of the lack of a clear structural criterion to define them, many authors have classified them as a functional category: “it is fairly clear that the category of DMs cannot be described in morpho-syntactic terms, but is rather of a functional-pragmatic nature” (Hansen, 1998: 236).

However, their functions fall out of the domain of traditional grammar and require the incorporation of new descriptive tools: argumentative orientation, focus, mitigation, intensification, turn management and so on, all of them non-truth conditional. Since non-truth conditional meaning is traditionally assessed as pragmatic or within the study of pragmatics, these units are also outside grammar in that they contribute to pragmatics and not to semantics.

It follows for some authors that, since these units contribute to the discursive level and pragmatics, they cannot be formed by a process that inserts units into the grammar box (following the metaphor of Himmelmann), assuming a narrow conception of grammar that only includes morphology, syntax and semantics. However, there is no reason to assume such a notion of grammar, since it is based on the biases of the traditional understanding as pointed out by Diewald (2011a: 455):

This short survey of different suggestions on how to classify the diachronic development of discourse functions points to the fact that pragmatic meaning is generally not regarded to be part of grammar. The frontier line in this debate seems to run between ‘true’ grammatical function and ‘merely’ pragmatic function. It nicely illustrates the tendency of linguistics in general, and grammaticalization studies in particular, to regard the traditional set of familiar grammatical categories as the semantic-functional benchmark for judging grammatical categories on semantic-functional terms.

This is one of the bases of the proliferation of alternative accounts for the process of formation of DMs, among which *pragmaticalization* has been the most successful and widely discussed one.¹¹ In its first formulation, Erman and Kotsinas (1993) already set the basis for the wide meaning of this kind of change, which across different studies has come to mean “formation of

¹¹ However, other labels are worthy to be included. The most encompassing one, degrammaticalization (Heine, 2003; Norde, 2009) include all the processes that seem to contravene the directionality of grammaticalization and has been applied to the evolution of DMs by Company (2004a). Lexicalization is also seen as a process undergone by the structures that become DMs, although it does not preclude the working of a grammaticalization process together (Wischer, 2000). The label used in Ocampo (2006) to refer to the process of formation of DMs is *discursivization*.

DMs". This is an undisputable issue, since such a definition does not question what the specificities of this formation are, but rather what the target of the process is.

For example, the most critical feature of pragmaticalization, according to Aijmer (1997) is the non-obligatoriness of the outcome, which is, in fact, a paradigmatic property of DMs. This problem is addressed by Diewald (2010: 25-27, 2011b) and Diewald and Smirnova (2010), who have proposed the notion of communicative obligatoriness to account for the grammaticality of non-traditional categories such as modal particles or DMs. The other authors that use the term pragmaticalization take into account only the target of the process: that is to say, the status of DMs.

Yet, the very existence of the term *pragmaticalization* for the development of DMs does not entail its independence as a linguistic change, but, rather that, the status of this kind of change with regard to grammaticalization varies according to the position of the researchers. Heine (2013) identifies three basic positions with regard to the development of DMs: pragmaticalization as a different process from grammaticalization (Erman and Kotsinas, 1993; Aijmer, 1997) pragmaticalization as a subprocess of grammaticalization or as a non-typical process of grammaticalization (Wischer, 2000; Company, 2004a; Günthner and Mutz, 2004; cf. Barth and Couper-Kuhlen, 2002) and pragmaticalization being the same as grammaticalization —i.e., pragmaticalization does not exist— (Traugott, 1995a; Traugott and Dasher, 2002; Brinton and Traugott, 2005; Diewald, 2011a, 2011b).

The first position lies on the narrow notion of grammar we have mentioned before. The assumptions made within this conception can even induce to misleading conceptions of the directionality in grammaticalization, if we do not clarify the notions. For example, some authors (like Ocampo, 2006) have suggested that the creation of DMs implies movement towards the discursive pole and, therefore, that such evolution seems to move up the cline, according to Givon's famous cline (discourse > syntax > morphology > morphophonology > zero). It is important to note that *discourse level* here opposes to grammar in a narrow and specific sense. The concept of grammar sketched in this view is constrained to the sentence level, and those units overcoming such level belong to the "discourse level". However, since the endeavor of text linguistics to systematize all the units fulfilling a textual function, a proper grammar of text has been designed (Halliday and Hasan, 1976; Van Dijk, 1977; Casado, 1997[1993]). Therefore, even within structural positions, grammar, taken as the structured system of signs that contract relations between them, is accepted to act in this textual/discursive dimension.

There is another wider sense of the *discourse level* that seems to be the proper one for understanding the aforementioned cline, which is that of language use, the one that corresponds to the *parole* (Saussure, 1987[1916]) or *performance*. Here the point is that changes take place in language use and what begins as a meaning arisen in the context of the utterance can become part of the conventional structuration of a language. This is the very sense in which the directionality of grammaticalization cannot be denied: grammaticalization understood as the conventionalization of conversational implicatures (Traugott, 1988; Hopper and Traugott,

2003 [1993]; Traugott and Dasher, 2002) is the mechanism underlying the formation of DMs and other categories.

This important distinction is clarified in Loureda (2013) by drawing on the three dimensions of language described by Coseriu (1985) and elaborating on the levels within it: language is universal (as a cognitive activity common to human beings), but takes place always in historically structured systems of signs (traditional dimension), which are used individually in particular occasions with particular purposes (individual dimension). Moreover, within the traditional structuration of speech, three levels should be recognized: the level of words (morphology), the level of sentence (syntax) and the level of text. Therefore, following Loureda (2013: §1) two notions of *text* (or discourse) must be distinguished:

el texto como nivel autónomo de lo lingüístico (texto-unidad) y el texto como nivel de estructuración idiomática superior a la oración, a la cláusula, al sintagma, a la palabra y a los elementos mínimos portadores de significado (texto-nivel).

According to this view, grammaticalization always implies the passing of a unit from the traditional or historical level to the particular dimension (text-unit) and the return to the traditional level as a new unit. The idiosyncrasy of emergence of DMs would be that it is inserted in the text level of the traditional dimension. The process is sketched in figure 1, taken from Loureda (2013) for the Spanish DM *por lo visto* ('seemingly').

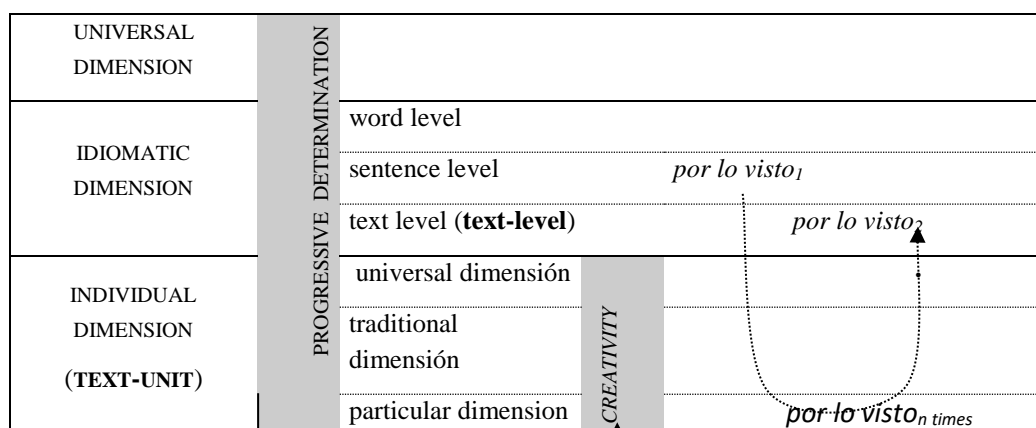


Figure 1. Scheme of the development of *por lo visto* as a DM (Loureda, 2013)

This view shows a theoretical widening of the notion of grammar and helps to understand the formation of DMs as grammaticalization, as long as the insertion within the whole idiomatic/traditional dimension is recognized. The proposal can be subsumed within the second position on the formation of DMs, since it explicitly signals and separates the level where DMs work (textual); it is in fact coincident with the characterization made by Company (2004a) of grammaticalization of DMs that implies “ascenso en el nivel de lengua”, as opposed to the more classical one that leads to “descenso en el nivel de lengua”.

Note that the theoretical perspective of Loureda (2013) highlights the role of the individual use of language at the genesis of the change. This is in fact a cornerstone of the Grammaticalization Theory, which has come to adopt a very prominent functional approach where the use of language becomes essential in the study of language change: “change does not originate within

language (grammars do not change by themselves), but in language use, i.e., in factors external to language structure” (Traugott and Dasher, 2002: 35-36).

The focus of the functional orientation has been fundamentally put on the role of context as the locus of change (see §2.2.1.1.1). In this sense, pragmaticalization seems to be misleading as well, since the formation of DMs also shows that what at some point is context-dependent becomes the inherent meaning of the form. However, few attempts have been made to solve the problem of the definition of grammaticality and degree of grammaticalization in a pure and systematic functional fashion. One of them is Boye and Harder’s (2012), who, in an important shift from structural to functional arguments, try to define grammaticalization and grammatical status by exclusively drawing on functional grounds.

According to this perspective, in every utterance there are units that fulfill different discursive roles, in terms of the discursive saliency they show: units that constitute the essential part of the message are said to display a primary discursive status; those parts of the utterance that cannot be considered the focus of the message show an ancillary discursive secondary status (Harder and Boye, 2011; Boye and Harder, 2012). Grammatical status is defined as the secondary discursive status fulfilled by the items or constructions in the actual utterance. It is worth noting that here grammaticality of a sign is a relative and communicative notion which depends always on the item or construction that has the primary status in the actual utterance. DMs are, in this sense, equated to other grammatical categories in that they are secondary with regard to other units that play a primary communicative role.

In this view, grammaticalization takes place when a unit that can be used with a secondary status in a certain context acquires the default ability to function as secondary in every utterance, i.e., when it is coded as discursively secondary. This gives rise to a complete functional definition of grammaticalization: “Grammaticalization is the diachronic change which gives rise to linguistic expressions which are coded as discursively secondary” (Harder and Boye, 2011: 63).

Thus, this is a wider definition of grammatical nature (and, subsequently grammaticalization) that includes DMs and does not entail differences between core grammar and peripheral categories. However, it remains to be clarified how exactly a secondary status is assessed beyond the intuitive criterion provided above: that is to say, how can this lack of discursive prominence that comes from their not being the main point of the message be operationalized? For this purpose, some tests such as “focalizability” or “addressability” are proposed (Boye and Harder, 2012: 14). As we will see, some of these tests would justify the separation of *por tanto*, as a grammatical form, from *por eso*, *por ello* and *por esto*. The former fails to admit modification by a focus particle (such as *solo* ‘only, just’) and rejects being highlighted in cleft or pseudo-cleft questions or even being addressed and recovered as the main question of a message (by referring to it with a WH-question).

The problems with such an empirical validation of the grammatical or lexical status of a form are even recognized by Boye and Harder (2012: 18): “There is an extra dimension of the problem of identification, which would be present no matter what criterion was involved: identification depends on the individuation of conventionalized expressions.” This leads to the simplification

of the gradience present in all categories: we may be excluding some usages of the expression by constructing *ad hoc* introspective judgements of the form and therefore invisibilizing steps in a continuum. It does not help either to the diachronic clarification of the historical point at which a specific form has to be regarded as grammatical rather than lexical (Harder and Boye, 2011: 18).

On the other hand, as we will see (§4.1), the definition provided does not have a straightforward connection with the cognitive nature of the meaning of DMs, since a wide range of online processing experiments on DMs attests their special status within the sentence: DMs become the guide and the axis of the utterance processing. Then, if the functional claims of Boye and Harder (2011) are accepted and their secondary status includes DMs, an evident paradox arises: what is functionally (or communicatively) not prominent is cognitively salient. A bridging solution to this apparent clash will be provided by drawing on the framework of Thetical Grammar (§1.3; §2.3).

In any case, the definition of grammatical status posed by these authors constitutes an important widening of the concept of grammar that avoids differentiation of DMs from other grammatical categories. It avoids prejudices associated with structural criteria for defining what is grammatical or the biases in a narrow definition of the proper meaning of grammatical expressions. The approach elaborates on functional definitions, such as the one by Hopper and Traugott (2003[1993]), that have previously gotten away from structural positions where grammatical categories show a sorted scale (Kuryłowicz, 1965; Lehmann, 2002[1982]). Such definitions consider grammaticalization as the acquisition of a grammatical function by a lexical item or a new grammatical function by an already grammatical item (compare it with “from a grammatical to a more grammatical” in Kuryłowicz, 1965)

Yet, there are other definitions of grammatical meaning that are also aimed at overcoming such difficulties and help to include DMs within the grammar of languages. For example, Diewald (2011a, 2011b) tries to unify the meaning of grammatical expressions by reducing it to their deictic component. Following Bühler and Jakobson, Diewald identifies relational indexical meaning as one of the main and distinctive features of grammatical categories:

A grammatical sign modifies another (lexical) sign by relating it to some other element, i.e., to some reference point lying outside both of them. That is, a grammatical sign establishes a link between the linguistic element it modifies and some other entity. (Diewald, 2011a: 459)

By taking on this assumption, Diewald argues for the inclusion of pragmatics within the nucleus of grammar, since deixis implies the connection of a linguistic segment to the communicative situation by means of a coded unit. The argument allows her to blur the line between pragmatics and grammar in terms of meaning: if grammar is pragmatic in nature, categories such as DMs or modal particles cannot be set off from grammar. They are deictic, as far as they link the segment hosting them to a previous discourse string of different length or to the discursive context by drawing a relation based on the speaker subjective stance. To illustrate the kind of relational meaning that DMs yield, it is useful to see the example provided by Diewald (2011b: 370) with regard to the conjunction *but*:

A paraphrase of this type of realization of the relational structure is: ‘Go back to the (derived) origo, which is a proposition (proposition1); from there interpret proposition 2 as being in a particular semantic relation to proposition 1 (according to the semantic features of the conjunction)’.

This could be applied to describe the deictic meaning of *por tanto* as follows: go to the derived origo, which is a proposition or set of propositions, i.e., a discourse segment; from there interpret proposition 2, i.e., the second discourse segment, as being causally and inferentially related to proposition 1, in such a way that the second discourse segment is to be read as the inferred consequence of the first one.

The deictic nature of DMs has been previously drawn by some authors in a more general way (Portolés, 2000), but note that such a general characterization makes a distinction between our markers impossible, since they all are deictic by nature.

This way of seeing DMs as essentially not distinct from traditional grammatical pieces is framed in a broad conception of grammar where pragmatic meaning is not considered alien to grammar: a strong argument in this sense is made through the statement that very traditional categories such as tense and aspect very often carry pragmatic meaning (Traugott, 1995a: 5) or the fact that the meaning relevant to the category of voice is non-truth conditional. Such a view is strongly argued by Traugott in her seminal article, which gives a theoretical background for the grammaticalization-as-expansion view:

The view of grammar adopted here is that it structures cognitive and communicative aspects of language. It encompasses not only phonology, morphosyntax and semantics but also inferences that arise out of linguistic form, in other words, linguistic pragmatics such as topicalization, deixis. (Traugott, 1995a: 5)

This view has more recently drawn on a distinction of kinds of meanings coming from the pragmatic framework of Relevance Theory. Relevance-Theory’s claim (Blakemore, 1987, 2002) that not all linguistic units contribute to the utterance interpretation in the same way has provoked a great impact in linguistics. It has opened the way to a semantic distinction of linguistic forms that has even spread beyond the boundaries of the pragmatic framework and been widely accepted as a reassessment of the traditional distinction between lexical or content words and grammatical or function words.

Languages work with —or display— two different kinds of meaning: conceptual meaning, the one prototypically conveyed by lexical units, as contributing to conceptual representations, and procedural meaning, the one prototypically conveyed by grammatical items, as guiding and instructing how to work with these representations. DMs display this latter kind of meaning, since they constrain the inferences that the speakers have to make in the conversation.

This distinction has been extracted from the theory to explain the phenomenon of grammaticalization as the change whereby units with conceptual meaning acquire procedural meaning (Leonetti and Escandell, 2004). However, a clash between the postulates of Grammaticalization Theory and Relevance Theory has been noticed in that, according to the classical claims of the latter, words can only contain either conceptual or procedural meaning, while, following the assumptions of the former, words gradually acquire such procedural

meaning, which would necessarily render units with both conceptual and procedural meaning in a synchronic state.

Some modulations within Relevance Theory have been proposed to accept that words often carry a conceptual and a procedural component (Nicolle, 1998; Saussure, 2011; Wilson, 2011, 2016: 13-15) and their presence is a matter of degree. The progressive foregrounding of such procedural meaning is also an object of controversy (Clark, 2016: 141), since the theory is designed against the pragmatic notion of general conversational implicature (Grice, 1975[1968]; Horn, 1984; Levinson, 2000) that underlies the descriptions of the change in grammaticalization for many authors (Diewald, 2002; Heine, 2002; Traugott and Dasher, 2002).

If conceptual and procedural meaning are always somehow present in the words, a description such as the one by Boye and Harder where all the units can be used as communicatively secondary pieces seems to be not so far. From this point of view, the change can consist of a reanalysis through the foregrounding of the procedural function in a communicative strategy, as held by Waltereit (2006). Moreover, it paves the way to consider procedural meaning as a meaning attached to some functions, in such a way that all units can display it when used in such function (see thetical grammar in §1.3)

As a corollary, we have seen that the formation of DMs is seen as grammaticalization or not depending on the conception of grammar taken by the authors. Traditional accounts inherit an *a priori* exclusivist view on the set of units that works within grammar that, however, does not appear to be justified from structural or semantic criteria of grammaticality. There are many theoretical insights that overcome such a view, from the identification of the textual domain as a level coded in languages to the drawing of a functional consideration of grammatical meaning. In addition, the definition of the meaning conveyed by grammatical units has been reassessed in a way that includes DMs without displacing them as peripheral categories. Indexicality and procedural meaning give account of the kind of meaning common to all the instructional units of a language.

1.2 Processes involved in the development of discourse markers

In the previous section, we have seen that some problems in accepting the category of DMs come from its heterogeneous origins, as put forward by many authors (Hansen, 1998; Portolés, 1998; Fraser, 1999, to name a few). However, such a critique lacks power when we consider sentences as the following:

- (6) Las luces están apagadas. **Por tanto**, están durmiendo.
- (7) Las luces están apagadas. **Por lo visto**, tienen muchos problemas para pagar la factura.
- (8) **Visto que** las luces están siempre apagadas, deben de tener muchos problemas económicos

In sentence (6), *por tanto* is a DM that fulfills an argumentative connective function, namely: presenting “están durmiendo” as a reasoned conclusion and “las luces están apagadas” as the premise from which it is derived. This means that it is a two-place element (Fraser, 1999), since

it affects or has scope over two discourse segments. Syntactically it is originally a prepositional phrase consisting of the preposition *por* and a quantitative neuter pronoun as the head, from which the deictic nature comes. The same original syntactic structure can be found in *por lo visto* in the sentence (7), with the preposition *por* and a participle substantivized by a neuter article. However, although it occupies the same position in the utterance, it does not fulfill a connective function but, rather, it only affects the upcoming discourse segment by presenting “*tienen muchos problemas para pagar la factura*” as a “fact known from an indirect source, so the speaker is not responsible for or attenuate what is said” (Ruiz Gurillo, 2009, our translation).¹² The evidential feature, in this case, comes from the lexical meaning of the verb *ver* ‘to see’, which is often a prominent source of knowledge speakers rely on. Yet, such lexical origin in the same morphological category (past participle) is used in sentence (8) as a conjunctive phrase (*visto que*) introducing the logical cause or the premise of the conclusion that follows. That is to say, it participates in the same argumentative relation as the one presented in sentence (6), but in this case it introduces the premise and not the conclusion.

This intricate set of form and meaning original similarities and final divergences leads us to argue that the relation between the source meaning and the resulting functions of DMs is mediated by complex semantic and formal processes of change where multiple factors are involved in such a way that the connection becomes explainable but not fully predictable.¹³ This is a strong

¹² It might be argued that, in this context, a connective meaning arises as well, since *por lo visto* introduces a conclusion that can be derived from what has been seen. However, in this analysis we should also study what exactly the conventional (core) meaning conveyed by *por lo visto* is: that is to say, to what degree this sense comes from the conventional meaning of the marker or arises as a conversational implicature based on the particular context. In this sense, from examples like (3') below it can be concluded that at least some of the connective features are cancellable with *por lo visto*:

- (7') a. Las luces están apagadas. Por lo visto, tienen problemas económicos, aunque no sé si será por eso.
- b. Las luces están apagadas. *Por tanto, tienen problemas económicos, aunque no sé si será por eso

¹³ For more distant relations between the source structure and the outcome in DMs, see Estellés (2009a; 2009b) on *por cierto*. A radical perspective on factors intervening and conditioning the development of grammatical markers can be seen in De Smet and Fischer (2017), where “supporting constructions” are held responsible or catalyst for a change to take place. While it mainly applies to the fact that a potential change must be enabled by existing constructions, the role of such constructions can be suspected to condition the direction of the changes:

From this it follows that the course of change is highly contingent. Because every (potential) new expression has a unique set of supporting constructions, as determined by its specific form, syntax and function, the chances for an item to extend its range of use vary from item to item, and from grammatical context to grammatical context. Indeed, where the grammaticalization literature has initially revealed recurrent pathways of change (e.g., Heine & Kuteva 2002), more recently attention has moved to the ways in which each specific grammaticalization is also uniquely conditioned by the form and function of the source item and by similarity relations to other constructions (e.g., Fischer 2007; Breban 2010; Ghesquière 2014).

argument to see DMs as a class, independent of their formal origins, since, as pointed out by Briz (2011a: 85), many of them are grammatically something they were not before. Therefore, that former different structural constructions undergo a process of change providing them new form and meaning is an undeniable reality for most of DMs, and what becomes necessary is to clarify the kind of process involved and the similarity to other kinds of language change. Another problem, which will be dealt with in §1.3, is to examine the nature of the processes and what is the specific weight of synchronic and diachronic processes in the division of labor. This problem also particularly affects some of our markers.

This consideration of diachrony as an explanatory base for synchronic structures and meanings has been strengthened by Grammaticalization Theory as to making it the most powerful theoretical claim, so it reveals itself as an *a priori* relevant theory for the observed case. In fact, grammaticalization can be seen from a diachronic (changes occurring across time) and synchronic point of view (how categories are organized along the continuum lexical-grammatical (Lehmann, 1985), which grammatical categories are covered by means of a coded expression in a language (Hopper and Traugott, 2003[1993], etc.). In both dimensions, the definition of the concept varies greatly, ranging from specific clines where multiple properties have to be met (Lehmann, 2002[1982]), to the widest conception where grammaticalization equals creation of grammar (Hopper, 1987; Croft, 2006: 366), as we will see.

Especially in the view of Lehmann (2002[1982]), the synchronic and diachronic points of view appear intertwined by means of his parameters (see table 1 below). The parameters reinforce the definition of Meillet (1982 [1912]) and Kuryłowicz (1965) of grammaticalization as loss of autonomy: “consequently, if we want to measure the degree to which a sign is grammaticalized, we will determine its degree of autonomy” (Lehmann, 1985: 3). The system conceived by Lehmann is a more sophisticated and linked way of sorting some properties prototypically attributed to grammatical or lexical words, such as open or close inventories, meaningfulness (full or empty words), syntactic ranges (Jespersen, 1975), major or minor categories (Lyons, 1968) and so on. The advantage of the model is that it lays out the relevant features along a continuum, which symbolizes the way (from lexical to grammatical) a functional domain is fulfilled in a stage of language (synchronically) and the direction the items go through when affected by grammaticalization (diachronically). It, therefore, highlights the processual and gradual nature of grammaticalization, which is one of its most quoted features, giving place to many argued semantic and morphosyntactic clines.

The process is therefore characterized as a reduction process where loss of morphosyntactic freedom goes hand in hand with what has been called *semantic bleaching*, *weakening*, *reduction*, *loss of semantic features* or *desemantization*. It is the paradigm of what Traugott has more recently called *grammaticalization-as-reduction* view. The relevant changes in this model of grammaticalization are the following:

- At the syntagmatic axis: scope decrease, loss of syntactic mobility and bondedness;
- At the paradigmatic axis: semantic and phonological attrition, integration into a paradigm and obligatorification.

Parameter	Weak grammaticalization	—process →	Strong grammaticalization
Integrity	Bundle of semantic features; possibly polysyllabic	— <i>attrition</i> →	Few semantic features: oligo- or monosegmental
paradigmaticity	Item participates loosely in semantic field	— <i>paradigmaticization</i> →	Small, tightly integrated paradigm
paradigmatic variability	Free choice of items according to communicative intentions	— <i>obligatorification</i> →	Choice systematically constrained, use largely obligatory
Scope	Item relates to constituent of arbitrary complexity	— <i>condensation</i> →	Item modifies word or stem
bondedness	Item is independently juxtaposed	— <i>coalescence</i> →	Item is affix or even phonological feature of carrier
syntagmatic variability	Item can be shifted around freely	— <i>fixation</i> →	Item occupies fixed slot

Table 1. Lehmann's (1985: 5) parameters and processes of grammaticalization

Lehmann's parameters are very useful –and probably thought of– to deal with widely known examples of grammaticalization, let us say, the classical ones.¹⁴ Yet, other kind of recursive linguistic changes do not readily fit into this schema,¹⁵ so Lehmann's notion of grammaticalization becomes a narrower one.

DMs pose important problems to the model since they do not undergo loss of morphosyntactic autonomy, but, contrarily, show lack of syntactic integration (which is reflected in syntagmatic mobility) and scope increase. The positions with regard to this fact are the same as those mentioned in §1.1. For those authors who accept that directionality in grammaticalization constitutes a robust principle for the theory and involves all the parameters of Lehmann the development of DMs is seen as something different to grammaticalization; others admit that development of DMs belongs to a subtype of grammaticalization or a non-prototypical case (since it does not meet all the parameters). However, there is another position that tries to

¹⁴ Among them, for example, the following clines:

- a. Relational noun > Secondary adposition > Primary adposition > Affix > Case inflexive (Lehmann, 1985; Heine et al., 1991, etc.)
- b. Main verb > auxiliary verb > clitic > affix (Lehmann, 1985; Heine et al., 1991; Hopper and Traugott, 2003 [1993], etc.)

¹⁵ We could discuss about particular properties in cases of development of grammatical material. For instance, some authors cast doubts about the decrease of scope (and reduction of phonological substance) in the path from demonstrative to conjunction (Eng. That > that, Germ. Das > dass). The same goes for the change from a demonstrative to an article (Eng. That > the; Lat. Ille, illa > Sp. el, la.). It also raises the question whether we could treat the famous Jespersen's cycle, where a lexical word becomes a negative marker, as a case of grammaticalization, since the negation particle widen its scope to reach the modality of the whole sentence.

reconcile the development of DMs with the process of grammaticalization, by reassessing the framework.

The main grounds for this view are all the approaches to grammaticalization that focus on semantic change (and not in formal evolution) and in one way or another have overcome the traditional way of looking at the semantic side in grammaticalization as a loss process. Concepts such as *metaphorical mapping* (Sweetser, 1988) or *pragmatic strengthening* (Traugott, 1988, 1989, Traugott and König, 1991) give account of such trends that imply a semantic evolution of the type “loss-gain” and assume a pragmatic enrichment in the earlier stages of grammaticalization (primary grammaticalization). Moreover, pragmatic strengthening is many times guided by a clear tendency, which has been considered typical in the evolution of DMs: subjectification and intersubjectification (Traugott, 1989, 1995b, 2010b), understood as the “mechanism whereby meanings are recruited by speakers to code attitudes and beliefs (subjectification) and once subjectified may be recruited to encode meanings centered on the addressee (intersubjectification)” (Traugott, 2010b: 35).

Therefore, the approaches to grammaticalization that concentrate on the *semantization of pragmatics* (Traugott, 2012) are very familiar with the expansion undergone during the process. Some of them have claimed that scope decrease and loss of positional freedom are not critical criteria for grammaticalization and, subsequently, formation of DMs is truly consistent with grammaticalization, since it clearly shows decategorialization, generalization of meaning, pragmatic strengthening and subjectification as processes of change, and reanalysis and analogy, as relevant mechanisms.

Under these considerations, a cline for the development of DMs has been proposed beside other well-attested morphosyntactic changes as a proper case of grammaticalization (Traugott, 1995a). The cline is particularly based in the scope increase as one of the natural characteristics:

Intrapositional adverbial > sentence adverbial > discourse marker

The formation of DMs, therefore, fits into a view of grammaticalization as expansion. The most systematic (and general) proposal on this insight is made by Himmelmann (2004), who identifies grammaticalization with three types of context expansion. This insight elaborates on what has traditionally been called generalization of meaning and correlates with the theory of kinds of context in grammaticalization (Heine, 2002; Diewald, 2002), and especially with the release from the enabling context posed in the stage of semantization in Diewald (2002) (which is different from the isolating context recognized by both authors¹⁶):

- Host-class expansion: the item undergoing grammaticalization can appear together with a class of element it could not before.

¹⁶ The difference lies on the fact that for Heine the finding of an isolating context (that is to say, a context that is not compatible with the original meaning of the form) suffices to argue that a new semantic meaning has been coded. For Diewald, it is necessary an expansion of the type described by Himmelmann. The difference could be due to the fact that Heine focuses more on typical processes, as the reanalysis of the concrete item, while Diewald is drawing somehow a more constructional perspective.

- Syntagmatic expansion: the item or construction can appear in syntactic context where it was impossible before.
- Semantic-pragmatic expansion: the grammaticalized construction can appear for fulfilling functions that were not available for the source category.

While this picture describes the kind of changes that would enable scope expansion to be included in cases of grammaticalization, an open question is how this class of context expansion applies to the development of DMs. Himmelmann even raises the same question with regard to conjunctions:

And while in some standard instances of grammaticization the identification of the relevant construction is relatively straightforward (for articles is the noun phrase, for auxiliaries it is the verbal complex), in other instances it is much less so. [...] And the proper analysis of the grammaticization of conjunction probably would have to take into account the two clauses linked by the conjunction, and hence issues of sentence and/ or paragraph structure. The fact that hardly any proposals are available dealing with these fairly standard grammaticization phenomena is their proper syntactic context shows that despite the fact that occasionally lip-service is paid to the assertion that grammaticization pertains to constructions and not to individual elements, most work in grammaticization has not yet begun to take the implications of this view seriously. (Himmelmann, 2004: 32)

In any case, this view of grammaticalization as context expansion precludes a constructional approach to linguistic change that will be the topic of the chapter 2. There, the notions of productivity, schematicity and compositionality would be brought into play for describing the language change we are dealing with.

1.3. Some in-depth exploration of the process question. A new framework to deal with the rise of discourse markers: cooptation

The proposal of Traugott has been very useful to introduce the evolution of DMs as a grammaticalization process of their own right and the cline has helped to describe several trajectories of DMs crosslinguistically¹⁷ (Brinton, 1996; Traugott and Dasher, 2002; Company, 2004a; cf. Onodera, 2004; Estellés, 2009a, 2009b; Fanego, 2010, Azofra, 2012, to name a few). However, not all the authors agree that this is the actual path all the DMs go along, but some emphasis has recently been put on historical processes giving rise to DMs that do not completely fit within such an evolution, since they do not show a gradual development through the cline (Fischer, 2007; Kaltenböck et al., 2011; Heine, 2013; Heine et al., 2013; Kleinknecht, 2013; Cuello, 2014).

¹⁷ A summary of literature on the development of English DMs that confirm the path posited by Traugott can be found in Brinton (2008: 31-35). Pons Rodríguez (2010) undertakes a comprehensive survey on the diachronic studies of Spanish DMs. Pons Bordería (2018) carries out a metanalysis of the evolution of different types of Spanish DMs, reinterpreting the path from the point of view of the Val.Es.Co conversation units' system; in this approach the so-called *leftward movements* include the scope increase from internal adverb to DM described by Traugott (1995a).

The issue can be framed, in my opinion, as an overarching underlying question, which remains open: how long does it take for a grammaticalization process to occur? The question has been formulated several times (Narrog and Heine, 2011: 8), but no approach has, to my knowledge, gotten close to convincingly answer it. Despite the theoretical and methodological problems that make impossible an absolute answer to this question, what would be interesting is to compare the lapse of time needed in different well-attested clines. For example, does the cline of Traugott take the same time as the most classical clines to be accomplished? An analysis of this kind would provide important claims to the question of the nature of grammaticalization that get further (and disregard) the problem of the target of the process. Although no exploration has been carried out, one could guess that differences can be found, based on the fact that changes that affect the paradigm of the so-called traditional grammatical classes (prepositions, conjunctions, inflectives) occur less often than the rise of DMs, which seem to be open-ended.

Thus, it is unclear that all the changes along the cline described by Traugott take place in the continuous gradualness and slowness attributed to grammaticalization, as noted by Pons Rodríguez (2010: 553):

la gradualidad del cambio que experimentan los marcadores discursivos que pasan por procesos de gramaticalización no siempre implica lentitud, ya que no es raro (como ocurre en *por lo visto*) que de los ciclos medios del cambio no quede constancia documental. Ello puede producirse porque el cambio se precipita de forma *catastrófica* en unas pocas décadas hacia sentidos propios de un marcador del discurso; por una cuestión puramente técnica: muchos de esos cambios se fraguan en la conversación.

Such difficulties can be extended to the initial stages of the change, since, in some markers, especially those that come out of an already extrapositional category, intrapositional initial stages are impossible to find. A case in point is the development of the Spanish *hombre* out of a vocative. Cuello (2014) disregarded a typical process of grammaticalization for the development of the Spanish DM *hombre*, after analyzing over 500 examples from the 18th and 19th centuries. The results point to the preeminence of synchronic factors over historical evolution in its functioning as a DM. All the pragmatic functions (mitigation, intensification and expressivity) that *hombre* fulfills nowadays were already present in the 18th century together with the purely appellative function, since they are actually proper or common pragmatic functions of the category (Real Academia Española, 1973; Haverkate, 1978, 1979; Fraser, 1990, 1999; Bañón, 1993; Shiina, 2007). Moreover, most distinctive syntactic properties of DMs, such as extrapositional scope, parentheticality, syntactic mobility and positioning at the left and right peripheries, are shared by vocatives. In a nutshell, there is no historical process in the development of functions, neither in scope increase nor in loss of syntactic integration.

Then, what is left as a historical change? *Hombre* has lost its appellative feature through a process of foregrounding and subsequently specialization of pragmatic functions. Consequently, *hombre* is no longer used in Present-Day Spanish as an attention-call device to address a stranger (where other vocatives such as *señor* or *caballero* are still used). Such loss is morphologically reflected in the lack of inflection (*hombre* is used when holding a conversation with a woman or

a plural addressee, even in some monological contexts) and syntactically in a specific discursive constrain: *hombre* cannot occupy the absolute initial position described by Estellés and Pons Bordería (2014) or even the beginning of an initiative intervention¹⁸ (Cuello, in preparation).

The loss of inflection capacities is the feature that most of times is quoted as the major sign to give account of the grammaticalization undergone by *hombre*, since it is an evidence of semantic bleaching (loss of semantic referential meaning) and decategorialization (loss of morphological properties of the category of noun). This is probably why *hombre* is considered one of the most conspicuous DMs in Peninsular Spanish, mainly in the category of alterity focalizers (Portolés, 1998; Martín Zorraquino y Portolés, 1999) or metadiscursive control markers (Briz, 2001). However, does this mean that other vocatives that are not so formally-fixed as *hombre* or still retain some of the appellatives feature (or its use) are not to be considered DMs? Besides *hombre*, a wide range of vocatives specialized in some DM function amounts in Present-day Spanish,¹⁹ which leaves open the question about where the boundaries are supposed to be: is formal fixation the critical criterion? How do we account for formal fixation? Is it absolute or a matter of degree?

The difficulties are not only associated to this special source for DMs. In order to shed light on the generality of the problem, let us show some parallels with our object of study, which departs from the category posed by Traugott (1995a). *Por tanto* belongs historically to a set of prepositional phrases that, because of the causal and anaphoric meaning of their component parts, are found as cause-consequence connective devices roughly from the first documentations of Spanish (§3.3.1). In this use, a wider scope than at least intrapositional adverb seems to be at work, thus, in the first centuries (Medieval Spanish), there are examples that are hard or impossible to set apart from the sentential adverbial stage. At some point in the course of time *por tanto* has become formally fixed, while the other markers are supposed to retain some degree of compositionality. This is analyzed as a decrease in compositionality, which is bounded to the loss of the anaphorical feature in *por tanto*. Then, *por tanto* is no longer

¹⁸ Some frequent and well-known expressive uses of *hombre* do appear in initiative interventions. However, from our point of view, they can be set apart categorically from the other discourse marking uses on the basis of their functional and structural properties. In these cases, according to its interjective expressive nature, *hombre* can stand alone in an intervention, since it bears its own illocutionary force. It follows from this that an analysis in terms of Val.Es.Co conversation units's system (Grupo Val.Es.Co., 2014) allows distinguishing two different kinds of units: *hombre* as an adjacent modal subact, modifying the illocutionary force of the upcoming discourse segment, where it can only be placed in a reactive intervention (unlike the vocative construction it comes out of), and *hombre* constituting an act, with pragmatic and communicative independence.

¹⁹ *Mujer* is treated as a different marker by Briz (2013). *Tío/tía* is one of the most studied vocatives with DM functions for Peninsular Spanish (Jørgensen, 2008; Fuentes Rodríguez, 2009); *chico/a* is included as a discourse particle in Fuentes Rodríguez (2009) and Santos Ríos (2003). The use of *huevo* as a DM in Chile is analyzed by Rojas (2012) and described in the DPDE (Briz et al., 2008). The different values of Mexican *güey* has deserved a diachronic explanation (Kleinknecht, 2013) in order to find out which functions were inherited from the vocative use and which ones are the result of a process of change.

available in some uses where the anaphoric nature is highlighted.²⁰ Thus, like in the case of vocatives, the connective function was presumably available for such markers and *por tanto* has undergone changes leading to formal fixation and loss of an original semantic feature. In other words, some stages in the cline are lost in all the markers and the difference between *por tanto* and the others remains more subtle than predicted by the theory of grammaticalization. The parallelism is depicted in figure 2. In a theoretical sense, one could suggest that vocative is as central a category for the procedural meaning of metadiscursive control as are deictic terms preceded by preposition to connective meaning. An elaboration of these relations will be provided in §2.3.1.

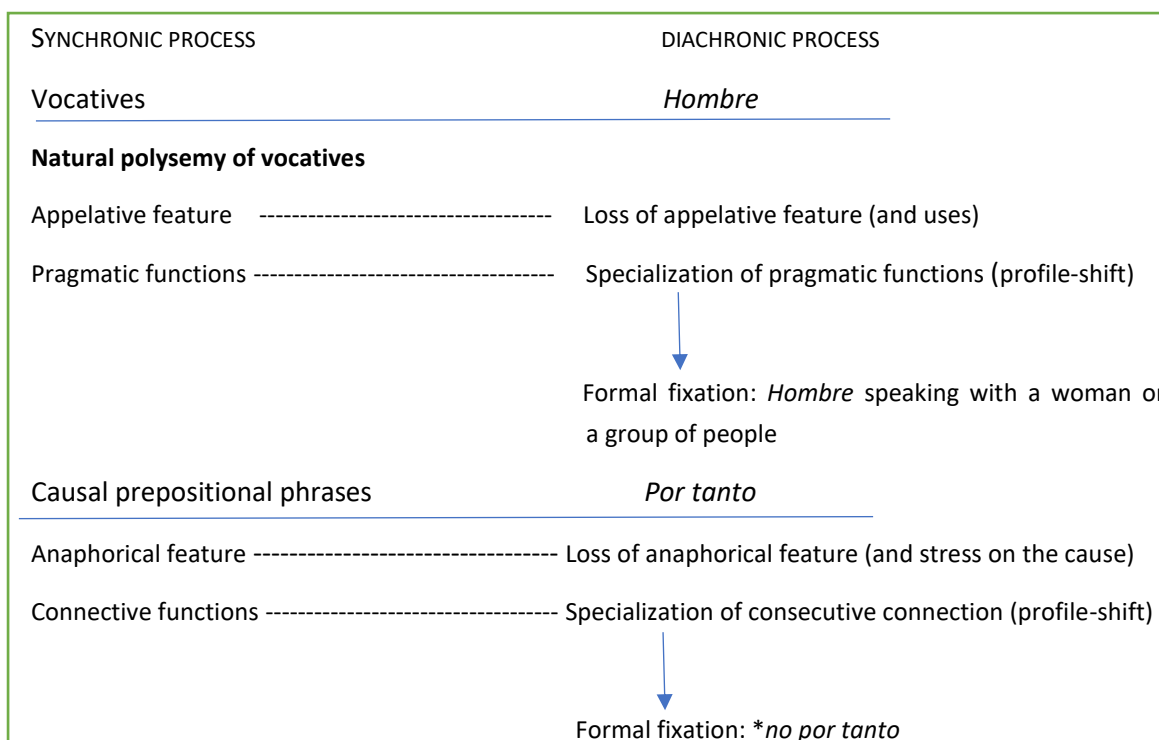


Figure 2. Synchronic and diachronic processes in *por tanto* and *hombre*

In the quotation of Pons Rodríguez (2010: 553) above, a doubt about what underlies such observed *catastrophic* changes is raised: is it opacity in the corpus or real abrupt evolution? In what follows, we will introduce some arguments for a non-gradual account of the development of DMs, with a special emphasis on discourse grammar (as the framework) and cooptation (as the kind of synchronic change enabling DM functions). These approaches follow a what-you-see-is-what-you-get explanation of the findings of historical corpus studies.

²⁰ While this is true for the use as a connective, let us note that recently it has been an increase of the intrapropositional uses of *por tanto* in very specific constructions such as *gracias por tanto*. This is not striking according to a theory where linguistic context is taken into account in the grammaticalization process, which is best shown by construction grammar and constructionalization. Moreover, it gives account of the property known as *divergence* (Hopper, 1991) and the renewal cycle typical of linguistic change (Hansen, 2018).

A group of authors (Kaltenböck et al., 2011; Heine, 2013; Heine et al., 2015) has reassessed the processes leading to the rise and evolution of DMs by drawing on a new view on language that recognizes two basic domains in its structure, interacting in what is called *discourse grammar*. The first, sentence grammar, includes all the mechanisms, syntactic categories and relations described by what has been repeatedly referred to here as traditional grammar. The second, thetical grammar, includes many linguistic structures, external to the syntax of the sentence and serving metacommunicative needs of various types: text organization, source of evidence, speaker attitude, speaker-hearer interaction and world knowledge.

The thetical domain is composed by different kinds of units (called theticals) that are external to the sentence syntax in that they show the following properties:

- a. They are syntactically independent from their environment.
- b. They tend to be set off prosodically from the rest of the utterance.
- c. Their meaning is non-restrictive.
- d. They tend to be prosodically mobile.
- e. Their internal structure is built on principles of SG [Sentence Grammar] but can be elliptic.

(Heine et al., 2013: 159)

The advantage of setting this domain is that it encompasses many different categories that have been addressed separately and —although many times led to some comparison— whose relationship has not entirely been drawn out. From the shared features sketched above, we can conclude that their syntactic and semantic similarities lead them to a common function: their externality to the syntax and their non-restrictive meaning make them prone/able to yield not propositional meaning but discourse-related meaning. This includes what is known as comment clauses, parenthetical clauses, tag questions, apposition markers, discourse and pragmatic markers, vocatives, interjections, non-restrictive appositive modifiers and so on. In a reconfiguration of these structures within the theory, the following theticals have been recognized: conceptual theticals, formulae of social exchange, vocatives and interjections. The list is not complete but other phenomena should be analyzed in light of the theory.

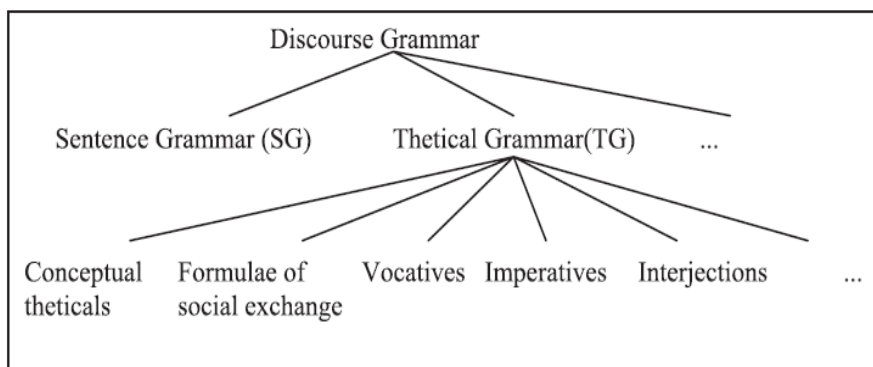


Figure 3. Architecture of Discourse Grammar according to Heine (2013: 1217)

DMs are considered *conceptual theticals*, more specifically, a subtype of these, because they are “largely or entirely formulaic”. The explicitation of this subtype has to do with the distinctions that, according to Heine et al. (2015), can be made between all the theticals in terms of degree of fixation. Under this parameter, three kinds of theticals can be found:

- **instantaneous theticals**, that are completely compositional;
- **constructional theticals**, or “recurrent patterns or constructions of theticals, being compositional but having some schematic structure and function” (Heine et al., 2015);
- and **formulaic theticals**, which are non-compositional invariable chunks with a great mobility.

The emergence of theticals takes place by an operation called *cooptation*, which consists of the instantaneous recruitment of any structure from sentence grammar to work within discourse grammar: “(c)ooptation is a ubiquitous operation whereby a chunk of SG, such as a clause, a phrase, a word, or any other unit is deployed for use as a thetical” (Heine, 2013: 1221). It follows that this operation is instantaneous and individual, which makes a difference with most of descriptions of grammaticalization.

According to such a view, it could be said that the formation of DMs takes place via cooptation and not grammaticalization, but it would be more precise to argue for a division of labor: while the emergence or the first scope expansion and the pragmatic related meaning is covered by cooptation, subsequent formal fixation or semantic change is explained through mechanisms consistent with grammaticalization, as recognized by Heine (2013: 1223). Therefore, in the terms presented before, instantaneous conceptual theticals are coopted from sentence grammar sporadically and may subsequently undergo formal fixation to become a formulaic thetical; there is an intermediate stage with some structural variation provided by a schema with open slots but a relatively stable meaning.

In sum, cooptation explains abrupt acquisition of an extrapositional scope and pragmatic meaning, which is exactly what Fischer (2007) claims and what is found in *hombre* and *por ello*, *por eso*, *por esto* and *por tanto*. However, the question remains whether or not this latter group of markers clearly fit into the schema of theticals and cooptation or not. One possibility emerges from the explanation of Fischer that takes originally prepositional phrases as *in fact* for her demonstration of abrupt scope increase. Another theoretical position that enables such explanation could be the one by Garachana about some DMs as proconcessive:

Ahora bien, en los ejemplos propuestos en Cuenca (1991) no cabe hablar de conectores adversativos, o adversativo-concesivos, sino más bien de partículas proconcesivas. Es decir, estos conectores y sus equivalentes castellanos –*no obstante*, *con todo*, *a pesar de todo*, *aun así*, *así y todo* y, en muchos de sus empleos, *sin embargo*–, son proformas que aparecen en lugar de una prótasis concesiva ecoica. Esto significa que tales conectores tienen valor discursivo, pues la información expuesta en el enunciado o en los enunciados anteriores es recuperada por el valor fórico de la partícula. (Garachana, 1997: 252)

This quotation opens up the possibility to equate such DMs (original prepositional phrases) to reduced conceptual theticals in origin (cooptation would have to do with subjectification and syntactic deprivation), in such a way that they recover a full string of previous discourse. However, it seems that they cover a slightly different phenomena and their relationship with the category of thetical should be clarified in §2.3.1.

All in all, thetical grammar and cooptation are very useful for explaining different discursive structures that are placed at the edge or periphery of the category of DMs and are difficult to account for within a standard grammaticalization theory. For example, Domínguez García (2019; 2020) focuses on *¿me entiendes lo que te quiero decir?* ('do you understand what I mean') as a metadiscursive resource for managing the interaction in different ways. She asks whether such a structure can be categorized as a DM, since, on the one hand, it is used with a clear procedural meaning of managing the interaction (turn-giving, turn retaining), but, on the other, it shows great formal variability and can still be used with its clear conceptual meaning (that is to say, seeking an answer about the understanding of the speech act). She goes on to suggest that such long tag question could be the elaboration on an already grammaticalized DM *¿me entiendes?* lit. *do you understand me?*, 'you know?'.

Thetical grammar provides a wider view on these phenomena and, in this case, a simpler explanation (according to the Occam's razor) to the presented data. *¿Me entiendes lo que te quiero decir?* is a conceptual thetical, coopted directly from sentence grammar and not through a process of grammaticalization. The fact that it is felt by Spanish speakers as an expression overused by some people, as signaled by Domínguez García (2020), points to the possible ongoing formal fixation. However, since the same speakers report different variants of the expression when talking about it, it is reasonable to place it within the category of constructional conceptual theticals, a compositional pattern with some open slots that fulfills a specific function.

In this sense, thetical grammar can benefit from the notions and assumptions of construction grammar and constructionalization in order to fine-tune the analysis of the development of different theticals.

For example, Heine (2013) points out that some semantic and formal changes can occur before and after cooptation has taken place. While a view that treats formal and semantic change as a parallel evolution has been privileged from a grammaticalization point of view, constructionalization allows for the existence of constructional changes in the formal or semantic pole before and after constructionalization. Moreover, when arguing for a change where a schematic pattern with a fixed meaning arises, Kaltenböck et al. (2011) are describing the nature of constructions as meaningful units —and therefore signs— with a different degree of schematicty or phonological specification.

In the next chapter, we explore the nature of construction grammar and constructionalization for a better understanding of the development of DMs and their setting in a constructional network.

Chapter 2. A new perspective on language change: constructionalization

In the chapter 1 we have surveyed the difficulties posed by the development of linguistic structures into DMs. Specifically, we have analyzed how, according to some authors, Grammaticalization Theory fails to account for the development of DMs. In the next chapter we will introduce some approaches to grammar that share several theoretical claims with Grammaticalization Theory to show whether a better picture of the change undergone by DMs can be captured by embedding it within a wider perspective of linguistic change: constructionalization.

Constructionalization can be defined as the theory about how constructions arise and change over time. It draws on the same principles assumed by synchronic constructionist approaches (Traugott and Trousdale, 2013) and shapes the constructional accounts of language change that are included under the label of Diachronic Construction Grammar (Israel, 1996; Noël, 2007). By doing so, the authors reassess different historical linguistic changes, such as grammaticalization and lexicalization, in a broader and more explanatory theory of language change.

It is important to recall that some advantages of constructionist approaches over traditional accounts have been mentioned in passing when dealing with the problems of Grammaticalization Theory evinced by the development of DMs. Before proceeding, let us summarize the contributions of construction grammar that help overcome some of the problems outlined in the chapter 1:

- **Problems in establishing the limits between lexicon and grammar.** Construction grammar approaches inhibit such problems, since the opposition fades away inasmuch as the ubiquitous presence of constructions is highlighted. Constructions are composed many times by lexical and grammatical words and it is such concrete combination what acts as a sign and provides a meaning, which many times carries grammatical features. The distinction has to be directed to whether the specific construction has a procedural or a contentful meaning, assuming at the same time that some constructions can be placed halfway between such poles (Traugott and Trousdale, 2013; Trousdale, 2014: 561). Thus, closed inventories as a critical criterion to define grammatical items becomes a weaker argument,²¹ since procedural meaning has been demonstrated to be attached to a large amount of constructions of different length and degree of schematicity. Moreover, in the case of DMs, the fact that they are often composed by more than one word, which are nonetheless invariable and fixed, has led to the idea of a process of lexicalization

²¹ In the European tradition there are some reluctances to accept this wider conception of grammatical words. For example, Diewald (2020) considers paradigmaticity —understood *a la* Lehmann (1985)— as a critical feature to identify grammatical classes of words. The procedural meaning is not sufficient to characterize this kind of words. For example, according to her, both the adverb *yesterday* and the past tense affixes convey a procedural meaning in terms of their relational (deictic) nature; however, only *past tenses* do it in a grammatical way, due to the obligatory nature of this grammatical category and its paradigmatic organization.

working within the grammaticalization process (Wischer, 2000; Lehmann, 2002 [1982]). In usage-based construction grammar, chunking is a pervasive phenomenon taking place in all kind of constructions, compositional and non-compositional, lexical and grammatical.

- **Problems in admitting coded discursive meaning as part of the grammar.** One of the most important contributions of construction grammar lies on its assumption that discursive and pragmatic functions are part of the conventional meaning of constructions.

La asociación entre formas lingüísticas y valores pragmáticos ha sido señalada ampliamente en los estudios de Pragmática a propósito de los marcadores del discurso. La novedad que introduce la Gramática de Construcciones consiste en el reconocimiento de que la información pragmática también puede estar asociada a patrones morfosintácticos. Existen semejanzas funcionales entre los marcadores del discurso y ciertas construcciones gramaticales. Así, por ejemplo, la construcción de tópico reduplicado posee un significado no alejado del de los marcadores discursivos, como pone de relieve el hecho de que la traducción más natural al inglés de ejemplos como (28) sea mediante el uso de la expresión *really*. (Gras, 2011: 101)

This assumption is preempted by the kind of “peripheral” cases that began to be analyzed as constructions (Finkbeiner, 2019), such as *let alone*, *him be a doctor?* (Fillmore et al., 1988), *there-constructions* (Lackoff, 1987) or “what is the X doing in Y” (Kay and Fillmore, 1999), which are confined to specific pragmatic situations, and has been reinforced in the so-called usage-based construction grammar approaches (Goldberg, 1995; Bybee, 2006, 2010).

Moreover, other authors have gone a step further to find discursive structural properties of some constructions in the formal pole or in the external syntax (Linell, 2009; Gras, 2011), in what can be considered the base to fine tune the study of DMs from a constructional perspective (Lewis, 2011; Fischer and Alm, 2013; Enghels, 2018; Fuentes Rodríguez, 2019; Salameh, 2020; Fischer and Pons Bordería, in preparation).

- **Problems in accepting peripheral categories as a worthy object of study.** Construction grammar tries to provide a principled and unified model to account for language phenomena. This means that all the constructions of a language must be studied under the same principles and, thus, they must be given the same status at a general level. Therefore, DMs are as “grammatical” as other linguistic categories, since they are also conventional constructions with a specified formal and semantic pole.

- **There has been an extensive discussion on the role of reanalysis and analogy in grammaticalization. In recent years, the preeminence of reanalysis has been called into question by some authors that claim for a major role of analogy (Fischer, 2007, 2011; Noël, 2016).** In particular, diachronic studies on DMs bring up this issue and take on a paradigmatic influence as a mechanism of change (Estellés, 2009a, 2009b). Analogy and reanalysis can be reconciled in a constructional view that assumes that constructions are

organized in networks with multiple interacting links that allow for changes (Traugott and Trousdale, 2013; Traugott, 2014; 2018a; Zehentner and Traugott, 2020).

Finally, it is well known that the notion of context has become a key factor in grammaticalization research (Hopper and Traugott, 2003[1993]; Diewald, 2002, 2006; Heine, 2002; Bybee, 2003; Traugott, 2003) and connects with the concept of construction as a complex linguistic unit. Thinking of contexts as symbolic learned pairs of form and meaning helps to describe the process of creation of grammatical forms.

In this chapter, we will deal with all these issues by showing the most important tenets of construction grammar and their advantages over other linguistic theories in accounting for a number of linguistic phenomena. The first two problems are addressed in the first section of the chapter (§2.1), where we sum up the general assumptions and claims of constructional approaches, in general, and usage-based approaches (§2.1.1) and Radical Construction Grammar (§2.1.2), in particular. A special emphasis on the relationship between grammaticalization and construction grammar is made in §2.2, in which the notions of constructionalization and grammatical constructionalization are introduced. Finally, the role of analogy and reanalysis is dealt within the constructionalization of DMs (§2.3) as a reassessment of the traditional notion of paradigm (§2.3.1).

2.1 Construction grammar: general assumptions

The endeavors of cognitive and functional schools to overcome the exclusive formal study of grammar and to incorporate semantics as part of grammar have given rise in recent decades to a set of approaches that focus on *constructions* as the main units of languages. By doing so, such perspectives return to some of the main points of structuralism and generative grammar (Goldberg, 2006; Gras, 2011) and elaborate on them to get a uniform and explanative view of grammar. As to the shared departing point with generative approaches, construction grammar approaches focus on the cognitive dimension of language and the necessity to account for a system that enables individuals to produce novel sentences (never heard before); within such cognitive dimension, both schools acknowledge the importance of a powerful theory of language acquisition and language production (Goldberg, 2003, 2006). Regarding the common grounds with structuralism, construction grammar retrieves the concept of sign, a conventional form-meaning pairing shared by a community of speakers, to place it at the center of the theory, and describes languages by means of the relations between signs; that is to say, language is thought of as a *structured inventory of constructions*. Therefore, individual and social aspects of language are well represented in such constructionist theories.

Beyond these overall commonalities, construction grammar approaches get away from such theories, since they provide new insights into language that allow to account for phenomena that were overshadowed or disregarded by the previous dominant linguistic theories. Although

the approaches differ in many regards, all of them share several tenets that allow to group them in a constructionist paradigm,²² with different branches:

Central and defining to the constructionist approaches is the notion of construction as the basic and pervasive unit of language. Constructions have been explicitly conceptualized by the following canonical definition in Goldberg (1995: 4):

C is a CONSTRUCTION iff_{Def} 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 established constructions.

Certainly, this symbolic relation that lacks predictability has long been held to explain the nature of morphemes and words, since Saussure's definition of sign;²³ e.g., in the prefix *pre* there is nothing in the form of the phonemes /p/, /r/ and /e/, i.e., in the sound, nor in their combination /pre/, that resembles the meaning of anteriority, but only the conventional association of this fixed combination of sounds (or formal pattern) with such meaning. The constructionist perspective is characterized by assuming that conventional association between a formal and a semantic pole works at higher levels than the morphology, i.e., those that imply combination of words. According to Croft (2001, 2005), all constructionist approaches share the assumption that constructions exist at all the levels of language, or, in the eloquent words of Goldberg (2003: 223), "it's constructions all the way down"

Such a phenomenon has long been acknowledged for specific fixed combinations of words that, as in the definition of Goldberg, lack predictability, often called *idioms*. These combinations have been studied as peripheral and conspicuous cases that fall under the domain of phraseology, a subdiscipline of lexicology. Specific instances of phraseological units in Spanish are the verbal phrase *ir al grano* or the proverb *vísteme despacio, que tengo prisa*. The constructionist approaches try to prove that these units are not as odd as previously thought, but reflect the same principle all the units of language can be reduced to. In order to do so, they focus on structural patterns that, unlike most idioms, are schematic instead of phonologically specified, but show a stable meaning regardless of the items they are filled with. Therefore, even the most abstract structures found in syntactic combinations of words can be thought of as symbolic units (constructions).

It follows from these two basic principles of construction grammar that the concept of construction embraces large kinds of linguistic structures that vary with regard to two properties, each of them forming a continuum between two extremes: the one of substantivity-schematicity and the one of atomicity-complexity. Since syntactic rules of combination fades

²² Different classifications have been proposed and lack of consensus on the inclusion of some approaches as constructional is present in the literature. In the Oxford Handbook of Construction Grammar (Hoffmann and Trousdale, 2013), the following streams are analyzed: Berkeley Construction Grammar, Sign-based Construction Grammar, Fluid Construction Grammar, Cognitive Grammar, Cognitive Construction Grammar, Embodied Construction Grammar and Radical Construction Grammar.

²³ In order to recognize this, Diessel (2015: 299) proposes using the label *construction* for complex conventional signs that overcome the level of the word and preserve *sign* for the atomic conventional pair described by Saussure, that is, words or lexemes.

away when syntactic patterns are conceived as learned pairs of form and meaning, the above-mentioned variation of constructions across schematicity and complexity constitutes the lexicon-syntax continuum principle (Langacker, 1987: 25-6, 36-7; Croft, 2001: 17; Broccias, 2012). Table 2, taken from Croft (2001) reclassifies the traditional levels of language description according to these properties of constructions.

<i>Construction type</i>	<i>Traditional name</i>	<i>Examples</i>
Complex and (mostly) schematic	syntax	[SBJ <i>be</i> -TNS VERB- <i>en</i> by OBL]
Complex and (mostly) substantive	idiom	[<i>kick-TNS the bucket</i>]
Complex but bound	morphology	[NOUN-s], [VERB-TNS]
Atomic and schematic	syntactic category	[DEM], [ADJ]
Atomic and substantive	word/lexicon	[<i>this</i>], [<i>green</i>]

Table 2. Different kind of constructions according to the lexicon-syntax continuum (Croft, 2001)

Since syntactic rules are disregarded as a meaningless and independent module of language, the different levels of language should be incorporated in the constructions. This leads to another shared assumption of constructionist approaches, according to Croft (2001: 18); namely, the kind of information coded in the component parts of a construction: the formal pole of a construction consists of phonological, morphological and syntactic features, while the meaning pole includes semantic, pragmatic and discourse function aspects, as shown in the following representation of a sign.

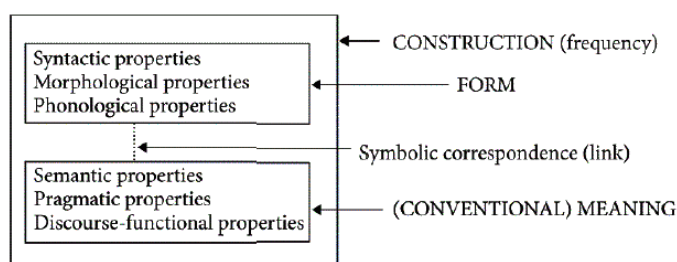


Figure 4. Representation of construction as symbolic units (Croft, 2001: 18)

The inclusion of pragmatic aspects as conventional meaning of constructions comes across as a particular features of construction grammar, since one of the most extended definitions relegates pragmatics to the remaining part of communicative meaning after coded meaning is subtracted.²⁴ This claim of construction grammar is well shown by common speech acts which

²⁴ An interesting discussion on the different conceptions of pragmatics and their relationship to construction grammar can be found in Finkbeiner (2019). He distinguishes between the “inferential pragmatics paradigm”, focused on those aspects of meaning that are not coded by linguistic expressions but grasped from the context (i.e., conversational implicatures) and the “grammatical pragmatics” paradigm, which is concerned with those context-related meanings that are part of the conventional meaning of units and structures. As Finkbeiner (2019: 175) poses, the two approaches differ in their focus and interpretation of language: grammatical pragmatics “tends to maximize speakers’ grammatical knowledge and to minimize inferential reasoning”, while inferential pragmatics tends “to minimize speakers’ grammatical knowledge and to maximize inferential reasoning”. Construction grammar is oriented towards the grammatical pragmatics approaches and in general has neglected the relationship between constructions and inferential processes. A notable exception to this lack of concern is Leclercq (2019), who draws relationships between Construction Grammar and Relevance Theory.

are highly idiomatic, as the Spanish reduplicated topic construction (Valenzuela et al., 2005), which licenses a lot of particular uttered constructions (constructs):

- (9) Comer comer no come, pero bebe como un cosaco.
- (10) Hijos hijos no tengo, pero sí muchos sobrinos.
- (11) Despacio despacio no iba, pero tampoco iba hecho un loco. (Examples taken from Valenzuela, et al., 2005: 203)

The approach, thus, paves the way for the total introduction of DMs as part of grammar, since the basic unit that grammar is composed of includes pragmatic specification as a conventional part of it. Despite this, few attempts to fully describe DMs in a constructional account have been made, but some directions in such enterprise can be glimpsed in different works.

There are two essential ways of extending the scope of construction grammar to include the analysis of DMs (Gras, p.c.). The first one analyzes DMs as pieces occurring in a set of defined constructions that overcome the sentence level (Fried and Östman, 2005; Fried, 2009; Lewis, 2011; Fischer and Alm, 2013; Kanetani, 2019; etc.): that is to say, DMs are embedded in some particular contexts that allow them to work by virtue of their meaning (for instance [DS1 (DM) DS2]); the meaning of the markers would, therefore, be specified by the kind of context they can occur in. This development is in line with the influential work of Goldberg (1995) on argument structure, but assumes that conventional structuration of a language reaches the discursive level. It is also in line with some of the Croft's (2001) claims (see §2.1.2), since constructions can be only defined with regard to the constructions that enable them; nor the category of DM (categories do not exist as psychological units of language) nor particular DMs could be described without reference to the constructions in which they are hosted.

The second one emphasizes the status of DM category as a schematic construction (with certain formal and functional properties) that sanctions a wide range of substantive constructions (particular DMs); this is the perspective taken in Imo (2005), Traugott (2018a, 2019) and Enghels (2018). In our work, we mainly focus on this second approach, while still acknowledging that an integral perspective of the functioning of DMs should take into account how the two perspectives fit together: that is to say, how different DMs constructions interact with the complex constructions they are embedded in. In addition, the first perspective is also covered by the analysis of types of context as the constructions that enable and determine the change (Traugott, 2003; Diewald, 2006; for a theoretical perspective, Fried, 2009, as an application to a modal particle)

In 2.3.1 we draw a partial picture of how consecutive DMs could be organized in a constructionist scenario, by looking at the last strong principle shared by all construction grammar approaches: the speaker's knowledge about language consists of an organized network of constructions. As it is the goal of that section to elaborate on such principle as a suitable perspective of the modern conceptualization of paradigms, here we only sum up its claim. Since removing syntax rules diminishes the productivity of language and would demand a very powerful storing capacity, a complex storing system is proposed in order to account for the relations between

constructions in a very efficient way (Bybee, 2010); as it has been proposed for the acquisition and storing of the lexicon, the language system would consist of this whole network of interrelated constructions, often called *constructicon*: therefore, abstract schemas stored by speakers sanction more specific constructions which inherit properties from the former by means of taxonomic —vertical— links (Goldberg, 1995, 2003, 2006; Traugott and Trousdale, 2013; Diessel, 2015). The taxonomic links, therefore, represent degrees of schematicity: constructions at the bottom of this network, which are called micro-constructions by Traugott (2014, 2018a, etc.), are phonetically specified (e.g.: *por tanto Cxn*), while constructions at the top, which receive the name of *schemas*, are phonetically non-specified (e.g.: DM Cxn). By combining constructions and filling them in different ways (according to some part-wholes relations) speakers manage to produce novel sentences, which are manifested in the so-called *constructs* (particular constructions actually uttered by speakers at a specific spatio-temporal point).

There is still a basic gap that should be filled and, indeed, connect with the main objective of this thesis. Since constructions show idiosyncrasies in form or meaning, ultimately described as arbitrary and conventional, they cannot be fully explained by metaphorical mapping (otherwise they would be predictable), as several cognitive theories posit, but some kind of development must play a role in the arbitrariness of the construction (Diessel, 2015). In the words of Bybee (2010: 10): “Since all patterns of linguistic structure have an evolutionary history, part of the explanation for why languages have particular structures must involve reference to how these structures arose.”

For example, we deal with a set of DMs that show an original nearly exact formal composition but display divergent formal behavior nowadays. The goal of the thesis is, therefore, to analyze the pathways of change that affect the Spanish consecutive DMs *por ello*, *por eso*, *por esto* and *por tanto*. The enterprise is not straightforward, since all of them share discursive contexts by virtue of the common connective function they fulfill, but they nevertheless differ in some formal properties which are constrained in *por tanto*. We need tools to explain how these differences occur and whether the same forces are working in the rest of markers (*por ello*, *por eso* and *por esto*)

Hence, before analyzing how the consecutive DMs would be located in a constructional network, we need to explain the motivations and mechanisms of change and how this comes to happen in constructions. The most suited framework to deal with the interaction between synchrony and diachrony is usage-based construction grammar, so in the next section we will outline the main claims of these perspectives before getting into the diachronic changes that occur in constructions.

2.1.1 Usage-based Construction Grammar

Coseriu (1978) noted that neither the distinction between *langue* and *parole*, nor the one between *competence* and *performance* were sufficient to characterize the reality of language when observed through actual utterances. Despite the fact that in the *parole* many of the possibilities enabled by the system are available for speakers, a normal realization is performed

within a speech community by default. Therefore, the level of *norm* should be recognized between the language system and the *parole*: through the repetition of structures in language use speakers recognize forms as the non-marked way of expressing specific situations, but such forms cannot be said to be constrained by the language system in a structuralist sense. However, if we think of languages not as independent and self-contained systems, but as the result of more general (high order) cognitive processes, ritualization of such structures cannot be seen as something totally different from the language (*langue*). More than 50 years after this, some of these observations seem to underpin the claims of usage-based construction grammar, which tries to challenge such sharp distinction.

When attention is drawn to the variation in use, some tendencies are recognized. A broadly accepted functional principle holds to the fact that these tendencies are informative of changes in grammatical structure. These are the functional roots that favor a look to language use as the motivation for changes in Grammaticalization Theory, against the backgrounds of Generative Grammar, constrained to the reanalysis across generations of speakers. A differential claim by radical usage-based approaches would be that such tendencies are evidences not of language change but of continuous language shaping, since grammar does not preempt discourse, as suggested by the concept of *emergent grammar* (Hopper, 1987). Interestingly, the article that most clearly claim for such a picture has very often been quoted as a radical perspective of Grammaticalization Theory, as well as a foundational work of usage-based construction grammar, so Emergent Grammar can be recognized as a hinge of both theories.

In Grammaticalization Theory the analysis of language change hinges on both cognitive and functional grounds: context is recognized as the locus of change, while the mechanism responsible for the change (through context) is anchored in cognitive inferential processes such as metonymy. Usage-based construction grammar best integrates both aspects in the account of how constructions come into being and change through language use. The main point of the proposal lies on the description of language as the cognitive organization of speaker's experience with language (Bybee, 2006: 711). Since speakers' experience with language occur in specific utterances (in language use), it is required that speakers retain specific features of the forms uttered (situational and linguistic context included) and incorporate them as part of the linguistic knowledge of such forms through cognitive processes of generalization and categorization, among others. The representation of such knowledge is depicted through an exemplar model (Bybee, 2006, 2010, 2013; Diessel, 2015, 2017), where particular realizations of forms are stored together and displayed across a space with prototype and peripheries depending on the multiple formal and functional resemblances of the uttered form with previous realizations. In other words, usage events affect the cognitive representation of categories, since the grammar of speakers is defined by the categorization and generalization of tokens of use.

It is clear that, from this point of view, language and use cannot be considered as independent and hermetic dimensions of language; instead, we have to rely on use of forms to elucidate their categorial or constructional nature. Not only does this picture distort the sharp distinction

between language and use, but also that of synchrony and diachrony, since variation in use usually exhibits gradience, which, in turn, is reflected in the gradualness that is witnessed in historical changes. In this picture, frequency is held as one of the main factors of change in constructions (emergence, constructional changes, growths, declines), and in our analysis it will be particularly relevant for the entrenchment of constructions and for the links that micro-constructions develop towards more schematic constructions (see 2.3.1).

The influence of frequency in language change has been enhanced in different theories but the specific role of it remains subject to debate. Delving into such discussions exceeds the dimension of this thesis, so for the present purposes we sum up some key notions of how frequency can be used to analyze language change and on which measures we should rely. Frequency has been held either as the prerequisite, the cause (Bybee and Hopper, 2001; Bybee, 2003) or the consequence of language changes²⁵ such as grammaticalization. Some of the branches that focus on frequency as the main cause of grammaticalization processes (Bybee and Hopper, 2001; Bybee, 2003) have resulted in —or converged with— usage-based construction grammar approaches. According to usage-based theories, frequency is a pervasive factor in a myriad of language phenomena. Firstly, let us note that it is within usage-based approaches where the notion of construction is expanded to frequent combinations of words, regardless of their regularity and compositionality (Goldberg, 2006; Bybee, 2010). Apart from this general consideration, in these branches, frequency is held responsible for the decline and even the fading, as well as the growth or entrenchment of constructions. It can also lead to changes in constructions such as form reduction (through routinization, chunking, coalescence) and loss of semantic compositionality, which eventually results in one of the main grammaticalization processes: decategorialization. Lastly, frequency determines the level of schematicity at which a construction is entrenched in the speakers' mind (Croft, 2001; Barðdal, 2008).

For this last issue, a nuanced distinction in the concept of frequency is important. On the one hand, token-frequency refers to the total number of occurrences of a specific construction in a text, corpus, etc.; on the other, type-frequency is applied to the number of different micro-constructions licensed by a construction. For example, the prepositional phrase formed by the preposition *por* and the neuter pronoun *esto* as the head shows in Corpes XXI a token-frequency of 292 in Spain for the lapse between 2010-2015. However, its type-frequency is 13, since these are the different types or variants in which such 292 examples are distributed (*por esto*, *por todo esto*, *por todo esto que...*, *por esto último*, *precisamente por esto*, *quizá por esto*, *tal vez por esto*, *precisamente por esto último*, *principalmente por esto último*, *por esto otro*, *por esto de que*).

²⁵ Here consequence serves as an umbrella term for diverse explanations about the frequency increase. For example, some authors relate such increase to the generalization of the meaning and the expansion to new contexts; others (Mair, 2004) restrict this effect to the spreading of the innovation across speakers, genres and registers.

Increase in token-frequency is associated to changes such as attrition, coalescence, loss of compositionality, etc. Increase in type-frequency is often related to higher productivity (Traugott and Trousdale, 2013).

Both notions are relevant for determining the degree of entrenchment of constructions. Entrenchment, although a widely used notion, refers mainly to the storage of constructions in the grammar of speaker. Frequency here plays a great role. Echoing Blumenthal-Dramé (2010), we can say that it is hardly likely that a speaker (excluding linguists) entirely stores the following sentence (12) in its substantive form or level. Instead, it is more plausible that speakers draw on a more schematic complex stored pattern and fill it with other substantive stored constructions for producing or processing the sentence. In the example (13), however, one would rather agree that speakers do not freely fill in an abstract pattern but retrieve directly the substantive construction which they have stored as part of his/her language knowledge. Finally, different constructions are retrieved from varying degrees of schematicity when producing sentence (14): [*como x, y*], [VER-TNS *el pelo a* alguien].

(12) Las ideas verdes incoloras duermen furiosamente.

(13) Quien tenga la lengua larga, que tenga el lomo duro.

(14) Como corra demasiado, no le vamos a ver el pelo. (Taken from García-Miguel, 2005)

Regarding the consecutive DMs, although it is hard to hold that some degree of compositionality is lost in *por eso* or *por ello*, their high frequency of use raises the question of whether they can be accessed together as a unit or, in other words, if they are entrenched at the level of the microconstruction. Moreover, the preeminence of connective uses in their apparitions begs the question of whether they are entrenched in this connective meaning or at least they show some (stronger or less strong) links to the DM category (§5.2.2.5 and §5.2.2.6).

2.1.2 Radical Construction Grammar

As stated above, Coseriu (1978) was concerned with the specific material realization that speakers of a community of speech perform among all the possibilities that the system enables, for positing an in-between level in language description. The rationale behind the addition of this level is that the actual variant does not display a property that works as a distinctive feature in the particular language subsystem (phonological, morphological, syntactic...). For example, even when openness of vowel does not constitute a distinctive feature between [e] and [è] in Spanish phonology, phoneme /e/ is normally pronounced more open in *papel* than in *queso* (Coseriu, 1978: 54).

Radical Construction Grammar, a constructional usage-based approach ideated by Croft (2001, 2005), rejects the idea that categories can be established by means of distributive proofs for a language system as a whole. Instead, constructions are language-specific and specific of the complex construction they are inserted in. What for a specific category is possible in several constructions it is not in others.

For example, one could agree that *Esta noche voy a lavarme el pelo* is an instantiation of a microconstruction that inherits the properties of the transitive and the reflexive schematic

constructions. The reflexive construction has the particularity that the agent and the patient are the same. However, in Spanish the action of going to the hairdresser to get a haircut is usually conveyed (we can say it is the normal realization) by the same construction, as in the example below, although, interestingly, the subject of this reflexive sentence does not fulfill the role of the agent. There is, therefore, a mismatch between syntax and semantics in this kind of sentences.

(15) *La semana pasada me corté el pelo.*

The construction is also available for other beauty-related actions, such as manicure or pedicure.²⁶ From the perspective of Coseriu this could be explained as one of the expressive possibilities that the speaker chooses within the system, specifically within syntax in this case, assuming also that what is not totally explained by the syntax is retrieved by pragmatics²⁷ so it counts as a fact of *parole*. Nonetheless, it is not solved the problem of why, if it is a possibility offered by the system, it does not work with other verbs or actions with the same strength: for instance, if one says *La semana pasada me hice un masaje*, addressees could understand this sentence as involving a reflexive meaning; the hearer could wonder how did the speaker manage to massage himself or think that the massage was applied in a part of the body easily accessible for the person. Obviously, the same meaning as in the sentence (15) can be retrieved by drawing on the context, but the inference is less generalized than in the case of (8). In the view of Radical Construction Grammar, this would be explained by taking on *verb-class constructions* and *verb-specific constructions* (Croft, 2003).²⁸

Examples like the one put forward make the distinction drawn by Coseriu to lose strength: it does not mind that the particular feature found in language production is not distinctive in all the language system, since it is particularly conventional in that construction. It has a particular feature that does not extend to all the constructions.

The same has been exposed with regard to diverging phonetic details in constructions. Bybee (2010) has strongly claimed that the pronunciation of words varies as to the construction they instantiate. For example, the auxiliary *don't* results phonetically more reduced in very frequent constructions such as *I don't know*, where it carries a pragmatic function, than in other less frequent constructions (Bybee and Scheibman, 1999); Berkenfield (2001) manages to differentiate between the categories which the English *that* instantiates (demonstrative pronoun, demonstrative adjective, complementizer and relative clause marker) by means of

²⁶ It is obviously affected by cultural aspects and world knowledge, since there are some actions that are typically done by others so everyone can retrieve that the subject is not the one doing the action.

²⁷ In this case, world knowledge would lead to the inference that someone else has done the action. That is to say, a factitive interpretation (Real Academia Española, 2010: §34.6j) —the subject makes someone to do something for him/her— is particularly enabled by the world knowledge.

²⁸ In fact, the phenomenon can be explained by assuming the network of middle constructions drawn by Maldonado (2009, 2019). This construction is attracted by a subschema of reflexive-middle constructions that include grooming actions. This schema would be becoming more schematic and productive.

phonetic properties such as vowel duration or first formant (centrality of [a]) and correlates them with their position in the diachronic path and their token-frequency.

What is particularly relevant for our study is that specifications can be made at different levels of schematicity, reaching the one of micro-constructions, as well as the fact that such idiosyncrasies come from language use. It allows specific micro-constructions to undergo changes and, finally, to be generalized as being licensed by other more schematic constructions. This is precisely the mechanism described by the framework of constructionalization argued by Traugott and Trousdale (2013).

2.2 Constructionalization

We have preliminarily pointed out three important interrelated aspects:

- language, as a network of constructions, is subject to change;
- constructions emerge, change, and decline over time;
- language use is the driving force modelling language through changes that are conditioned by domain-general cognitive processes.

Now is time to connect them in the task of explaining the changes that the *constructicon* is subjected to (2.2.1) and more specifically the creation of grammatical constructions through these changes.

We are concerned with two types of changes in constructions, according to the distinction proposed by Traugott and Trousdale (2013), Traugott (2014) and Trousdale (2014). Very often constructions undergo changes in meaning, pragmatic implications, discourse functions and so on; these are changes that affect the functional pole. It has also largely been accounted that changes in the formal pole are very frequent, the most evident and visible affecting the phonology, but also others related to the syntactic combination or the morphological inflective capacities, for mentioning just a few of the transformations witnessed in language change. When changes either in the formal or the semantic pole take place, a constructional change has occurred: that is to say, a change in the properties of the construction. A qualitative distinction is made when both kind of changes occur in a construction; in this case, a *constructionalization* is said to take place, that is to say, a new construction has arisen or come into being, in the sense that a new form-meaning pair is available in the language. Therefore, constructional changes are changes within constructions, while constructionalizations are changes within the network of constructions (or in the system, in the words of Traugott and Trousdale, 2013: 22), in the sense that a new node is created.

Both constructional changes and constructionalization are related to changes in some important general properties of linguistic units identified in both grammaticalization theory and synchronic constructional approaches, and remarked by Traugott and Trousdale (2013): namely, schematicity, productivity, compositionality (and analyzability) and grammaticality.

All these properties that help define the nature of constructions are a matter of degree (Traugott and Trousdale, 2013: 11). Schematicity is generally associated to the degree of abstraction over

phonologically filled (or specified) patterns that a construction represents; as highlighted by Traugott and Trousdale (2013: 13) the abstraction is based on the categorization across sets of constructions according to their resemblances.²⁹ For illustration, we can say that ADV construction is more schematic than ADJ-*mente*, and the latter is, in turn, more schematic than *religiosamente*, which is completely specified in phonological terms.

Schematicity can also determine the productivity of a construction, as to the point that many times the latter term has been directly assumed as a synonym of the former (Kay and Fillmore, 1999: 31, as quoted in Barðdal, 2008: 14). However, productivity deserves an autonomous status (see Perek, 2020 for a differentiated treatment of both concepts), since schematic constructions can display different degrees of productivity. Productivity can be said to be shown by the type-frequency of a construction, that is to say, by the number of different microconstructions (or more specific constructions) it sanctions. In a traditional sense, it is assumed that it refers to the range of applicability of a certain rule in language, but also to its liveness: whether the rule can be applied to new items or not, or, in constructional terms, whether the construction can attract new items or existing items that were not used in the construction, a quality known as *extensibility* (Barðdal, 2008). According to Barðdal (2008: 35-55), however, the definition is more complex and involves generality of the construction according to type-frequency, as well as semantic coherence of the elements that enlarge the type-frequency; in fact, productivity would be determined by the inverse function between both factors.

Another important factor that is involved in processes of formation of constructions is the compositionality they show. It mainly refers to the possibility of reaching the meaning of the construction by totally drawing on the meaning of its different components. At a formal level, compositionality relates to whether the morphological inflections and syntactic capacities that are allowed by the regular functioning of the categories embedded in the construction work in the construction at issue. In a general sense, Traugott and Trousdale (2014: 261) characterize compositionality as the degree of match or mismatch between form and meaning in a construction.

In constructionalization and in constructional changes a decrease in both semantic and formal compositionality takes place; the former is well known for processes such as semantic generalization or loss of referential meaning in changes under the scope of grammaticalization; the latter has also been dealt under the label of decategorialization (Hopper, 1991).

A subtle distinction is highlighted by Bybee (2010: 44-45) by setting off analyzability from compositionality; according to her, there is a mismatch in the relation between parts and wholes

²⁹ In some works, the categorization in schemas and subschemas is taken as reflecting actual psychological categories (Croft, 2001); however, some authors explicitly point out that schemas and subschemas used in their investigations are categorizations made by the linguist which may coincide or not with those stored in the *constructicon* of speakers:

In our view schemas and subschemas are the subparts of the linguistic system that the linguist picks out for discussion and analysis. They are not meant to be mental representations, though nothing prevents there being an overlap between such representations and linguists' categories. (Traugott and Trousdale, 2013:14)

in terms of compositionality and in terms of transparency to the speakers: thus, the prefix *pre* is more identifiable as a part of the construction in *premeditar* than in *presencia*; likewise, the preposition *a* is more recognizable in a phrase like *a cantar* than in the DM *a ver* or the construction *a ver si*. This last loss of analyzability has led to the hesitation of speakers between *a ver*, *aver* and *haber* when writing the construction. Lastly, one could adventure to think that varying degrees of analyzability by speakers are working in the Spanish consecutive DMs, even when most of them show a high degree of compositionality in many contexts (see §3.2.1.1).

Finally, another factor that defines the nature of constructions is the grammatical or lexical content they encode. In this case, a long tradition that culminates in Grammaticalization Theory has evinced the historical transitions between both poles (Traugott and Trousdale, 2013: 12; Noël, 2016), usually in a marked directional trend toward grammatical meaning. In the framework of constructionalization this feature has been retained to differentiate between lexical or contentful constructionalization and grammatical or procedural constructionalization.

This framework advocates a semantic criterion to define grammatical or lexical nature of constructions. The reason is that grammatical function/meaning can be found in many linguistic forms whose size and schematicity (and therefore whose structural properties) vary significantly: from morphemes (atomic and substantive grammatical constructions) to syntactic structure (complex and schematic constructions). To illustrate this argument, let us recall that the same kind of “grammatical” meaning is expressed by the verbal voice morpheme *-or* (*-ris*, *-tur*, *-mur*, *-mini-*, *-ntur*) in Latin and the schematic complex construction [verb SER + PARTICIPLE] in Spanish. This way, structural criteria become a weaker argument to defend the “grammaticality” of a sign; rather, constructions can encode grammatical meaning at different levels of schematicity; moreover, according to different views, a high degree of schematicity implies a more grammatical meaning, while the lexical meaning is confined to the substantive lexical constructions that can be embedded in larger constructions.³⁰

The description of the grammatical meaning is associated to the difference made in Relevance Theory between conceptual and procedural meaning, beside the indexical feature observed by Diewald (2011a: 358-359; see §1.2):

‘Contentful’ material can be used referentially; on the formal dimension it is associated with the schematic categories N, V, and ADJ. ‘Procedural’ material has abstract meaning that **signals linguistic relations, perspectives and deictic orientation** [...]. In Terkourafi’s words, linguistic expressions encode procedural meaning when they **contribute information about how to**

³⁰ At this point it is important to recall that Meillet (1982[1912]) already included as cases of grammaticalization the acquisition of grammatical meaning in word order (which is a phonologically non-specified schema); subsequent grammaticalization research along the history has left these phenomena as peripheral, included in some conceptions but outside the core of the theory, since they do not fit in the narrow classical conception of grammaticalization (Hopper and Traugott, 2003[1993]: 60). Constructionalization, therefore, becomes a perfect framework to explain and describe all these phenomena in a unified fashion.

combine [. . .] concepts into a conceptual representation' (2011a: 358–359). (Traugott and Trousdale, 2013: 12 [emphasis added])

According to the view presented above, not only grammatical morphemes (grammatical substantive simple constructions) but also the overarching schematic construction would determine how to work with the conceptual meaning provided by lexical substantive constructions to build the mental representations.

Since this kind of meaning is the one attached to DMs, it is necessary to delve further into the subtype of constructionalization leading to new grammatical/procedural constructions.

2.2.1 Grammatical/procedural constructionalization

2.2.1.1 *From grammaticalization to procedural constructionalization*

For sake of clarity we consider it more suitable to adopt the term *procedural constructionalization*, since *grammatical* is reserved in many traditional schools to grammatical dependent morphemes or independent ones, such as prepositions and conjunctions, and can be misleading. Moreover, it is the adjective *procedural* that has managed to embrace and involve all the classical grammatical classes of words together with other categories disregarded by the tradition, such as modal particles, DMs, etc.

For explaining the creation of procedural constructions, we consider it important to examine how the most important theory of the rise of grammatical structures (Grammaticalization Theory) meets construction grammar and how some of the principles of that theory are mapped into the constructionist perspective of language change. One of the hinge assumptions between both theories is the role of context in the creation of procedural constructions; thus, we will now examine it.

2.2.1.1.1 *Functionalism and the locus of change: the role of context*

Context has attracted a rising interest in linguistics, mainly within pragmatics and functional linguistics, where the attention devoted and the role transferred to it have been of particular importance. Yet, the notion carries a polysemy, which is important to clarify in order to address the role of context in grammaticalization and constructionalization research. By context, authors refer mainly to two different concepts, which bring us to a twofold implication for grammatical changes: a definition implication and a motivation implication.

On the one hand, context refers to the linguistic environment in which items are embedded. For some authors this would equal to *cotext*; from another perspective it falls under the widely and loosely used label of *construction*, with a meaning ranging from *syntactic string of any kind to form and meaning pairing of different complexity*. Hence, this kind of context carries a twofold implication: in the conception of what grammaticalization is (definition implications), but also in some mechanisms or motivations for grammatical change (motivations implications). The fact that these two aspects are mixed can be seen in the following stages, with an increasingly pervasive role of context:

1. Linguistic environment is assumed to condition the meaning acquired by the grammaticalizing item (Hopper, 1991; Bybee et al., 1994, Garachana, 1997) thus accounting for a mechanism of change: routinization.

>

2. Grammaticalization affects not only independent pieces, but also larger units or syntactic strings (Hopper and Traugott, 2003[1993]), thus widening the scope of grammaticalization and modifying the definition.

>

3. Grammaticalization takes place with context expansion, which is a mechanism or a result of the process of change (Himmelmann, 2004); the process can be explained and described as a succession of different kind of contexts (Heine, 2002; Diewald, 2002, 2006)

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4. Grammaticalization must be subsumed in a more pervasive, general and explanatory framework of language change, namely, constructionalization, where the surrounding context is assumed to be inextricably tied to the grammaticalizing item. The change takes place in this larger unit of representation called *construction*, thus widening the scope of the paradigm of changes.

The first two perspectives are developed within the framework of grammaticalization; the last two imply, from our point of view, a change of paradigm: from “traditional” functional approaches to grammar to construction grammar approaches, and then from Grammaticalization Theory to Constructionalization. In what follows, we review the claims made in the first framework and integrate them in a view where context is determined by the construction.

To begin with the first surveys into the relevance of context in language change, one of the consequences of enhancing the role of context in grammaticalization is that definitions such as the classical ones of Meillet (1912) and Kuryłowicz (1965), describing it as a process that affects words (*mots*) become insufficient to explain the change, since in many cases, phrases and larger structures undergo grammaticalization (Bybee et al., 1994). Furthermore, even when apparently only one word is grammaticalized, the unit cannot be loosen from the structure it took part in, as it conditions the grammatical function acquired by the affected piece (Lehmann, 2002[1982]; Himmelmann, 2004).

One of the most adduced mechanisms for this change is routinization (Garachana, 1997; Bybee and Hopper, 2001; Bybee, 2003). According to Garachana (1997:91), “la reiterada presencia de una partícula en un contexto permite que esta acabe adquiriendo el significado del conjunto de la construcción”. One of the changes that better reflects this meaning absorption from the linguistic context is the classical Jespersen’s cycle, which is clearly represented by the French negation particle *pas*. The noun *pas* acquired this sense in negative constructions through a process of reanalysis where, in specific context it is conceived as a purely grammatical mark to

negate. The evolution goes on with a process of generalization by analogy, in which *pas* spreads to previously improper contexts until becoming an obligatory morpheme to produce negative modality in French sentences.

Routinization is clearly compatible with the usage-based account of constructional change. However, a difference is to be made between routinization as the progressive individual storage and access of a former combination of words and the kind of mechanism involved in the evolution of the French *pas*. The exemplar representation of categories is particularly relevant to this case, as the speakers have to retain characteristics of the linguistic context in which the noun *pas* was produced to finally associate them with this word.

Similarly to the case of *pas*, the Spanish adversative conjunction *pero* ‘but’ has come to conventionalize this meaning out of a negated causal construction. The presence of the adverbial phrase *per hoc* (‘for this’) in contexts where the expected consequence appears under the scope of negation leads to the absorption of this meaning by *per hoc*, which finally can introduce by itself facts that happen against the expected consequences.

However, this case forces us to bring context into a scenario better anchored in pragmatics, since the counterexpectation (counterargumentative) meaning was not coded by the linguistic structure but arisen out of an inference based on context.

2.2.1.1.2. Context as a locus of change: invited inferring theory of semantic change and types of contexts.

The other sense that the word *context* has been used in linguistics implies extralinguistic conditions that determines the communicative exchange. This notion has led to regard language use and actual utterances as the basic unit to operate with in linguistics. From this, we can reach a broad definition of context that encompasses all the factors that the hearer is concerned about when trying to grasp the intended meaning of an utterance.

Specifically, the role that context plays in the processes of creation of grammatical structures can be described as “locus of change” and directly relates to one of the most important mechanisms of language change, namely, metonymy (understood as an inferential process of the human cognition), which has displaced metaphor as the main explanation of the kind of semantic change taking place in historical changes leading to grammatical structures. This change has its counterpart in the greater importance conceded to reanalysis over analogy in syntactic change. However, in the last years and due to the influence of constructional views, analogy has gained ground in the explanation of changes. A reassessment of the interaction between these mechanisms in grammaticalization will be done in §2.3.1

Enhancement of metonymy has provoked that grammaticalization processes are complementarily characterized as the conventionalization of conversational implicatures arising in concrete contexts (Traugott and Dasher, 2002), that is to say, the main mechanism behind grammaticalization would be the semantization of pragmatics.

Although we can consider that this explanation is preempted by Heine et al. (1991) and the hypothesis is somehow present in other previous works or even generally introduced, we find

the first development of the model in Traugott and Dasher (2002), where the *invited inferencing theory of semantic change* (IITSC) is formulated. According to the IITSC, the change would begin when a speaker uses an already invited inference (IIN) in an innovative way in a new context. For the change to take place this innovative use must be adopted by other speakers. If the spread change acquires a special importance in a community of speech, the new meaning is generalized; that is to say, it becomes a generalized invited inference (GIIN), implying a pragmatic strengthening of the form at issue. Note that the IIN resembles the particularized conversational implicatures of Grice (1975) and utterance-token meaning of Levinson (2000); in turn, GIIN is equivalent to generalized conversational implicatures or utterance-type meaning. Therefore, the following scale can be posited for a better understanding of the well-known discourse to syntax cline posited by Givón: particularized conversational implicature > generalized conversational implicature > conventional implicature.

Attempts at explaining the change from a constructional view have cast some doubts about the compatibility of the IITSC or the metonymic change. For example, Traugott (2008: 35) poses the question of whether or not the new meaning arising in contexts can be accounted for in a constructional perspective, where the previous constructions must be the attracting forces leading the change and imposing the meaning. In more recent approaches (Traugott and Trousdale, 2013), a possible reconciling explanation has been pointed to by drawing on the notion of *spreading activation*, as the cognitive implied mechanism. Just as occurs with other domains of cognition, use of language activates different parts of the network that are related to the relevant portion of discourse uttered. What has been known as priming effects is here taken to encompass a broader range of phenomena: cognitive activation of a partial network can be influenced by the specific context in which the utterances are performed; when such activation turns out to be prominent or sufficiently replicated it may become stronger and by default: these are previous and necessary steps for the speaker's new matching of the structures at issue with such part of the network, i.e., with other schema. This is an interesting insight to better explain the interaction between reanalysis and analogy in the creation of grammatical structures: change is guided both by contextual implicatures and existing constructions, since the latter are activated by the former and make them a prominent candidate for the speaker's new matchings, i.e., reanalysis. The issue of the division of labor between analogy and reanalysis is better explored in section §2.3.

However, according to these insights, the new meaning cannot be said to become coded until it spreads through new context(s) incompatible with the original meaning. Here, the theory connects with a complementary account of grammaticalization based on types of contexts, as catalysts of the micro-changes (Diewald, 2002, 2006; Heine, 2002). According to such a view, processes of change can be described as a succession of stages, each fully determined by the linguistic context that operates in it.

The starting point of the change is the *bridging context*, where some properties of the surrounding context enable the rise of an implicature. This stage encompasses two different types of context in Diewald's model (2002): in *untypical contexts*, an expansion of the linguistic

unit through unseen contexts takes place; afterwards, a specific context characterized by “multiple semantic and structural ambiguities”, called *critical context*, gives rise to the concrete implicature. At this stage, even when the new meaning could be foregrounded by the context, becoming the preferred interpretation, it remains cancelable.

In a second stage, the linguistic unit occurs in a *switch or isolated context*, which is completely incompatible with the old meaning. At this point, there is a divergence between the two models. In Diewald’s account, this context suffices to guarantee that the change has taken place and the new meaning is already coded in the linguistic unit. Heine, however, considers that at this stage the new meaning stays tied to this context and depends completely on it; for the change to occur, the new meaning has to release from this context, by spreading to multiple incompatible contexts, thus becoming absolutely independent from specific contexts and inherent to the form. The clearest proof for the change is that the old form can occur alongside the new one: eg., *Voy a ir* ‘I am going to go’, or *Por tanto, vino por eso*.

This difference between models could be due to the (direct or indirect) adoption of different approaches, with Diewald’s closer to constructionalization and Heine’s closer to the more traditional one: as seen, Heine’s model requires the form to separate from specific contexts for considering it to have conventionalized the meaning; but from some constructional viewpoints, the form is always supported (licensed) by the (larger) construction in which it is embedded; or, at least, the form. Therefore, the difference between these stages would be one of productivity of the schematic construction or the level at which the constructions are entrenched: substantive or schematic.

In further developments, Diewald (2006) has explicitly drawn the connections between context-types in grammaticalization and constructions, putting forward how isolating context can be conceived of as constructions, particularly, as abstract idiosyncratic constructions. In any case, what becomes interesting from the constructional point of view is the fact that the change can be characterized as the entering of a linguistic structure which formerly belonged to a specific construction into another schema which provides grammatical meaning; in the words of Traugott and Trousdale (2013), the change takes place when an expression that has undergone some modifications comes to be sanctioned by a new schema. Thus, the theory of contexts and the other mechanisms and *loci* of change above explained can be integrated in a view of change that explains constructionalization as the concurrence of formal and semantic constructional changes.

2.2.1.2 Constructional changes and constructionalization

One of the advantages of the constructional account of grammatical change espoused in Traugott and Trousdale (2013) over traditional views of grammaticalization is that it allows to account for changes either in the formal or the semantic pole, before and after constructionalization takes place.³¹ It solves some critiques posited by skeptical views on

³¹ While the distinction between constructional changes and constructionalization proposed by Traugott and Trousdale (2013) is very insightful and many authors have adopted it, it does not lack criticism.

grammaticalization such as the one of Joseph (2001, 2011) or challenges posed by grammatical changes in some languages. It is suggested, for example, that no semantic change occurs in the so-called secondary grammaticalization, e.g., in the passing from clitic to affix. Conversely, Bisang (2004) demonstrates that the formal pole undergoes no change in languages that lack formal exponents of grammatical categories. This strongly contravenes the “parallel reduction hypothesis” (Bybee et al., 1994; Rhee, 2003).

Most changes that have been studied within the framework of grammaticalization can be said to begin with a pragmatic enrichment that takes place in language use. The replicated use of the structure to convey such pragmatic implications constitutes the first semantic constructional change; since it occurs with no constructionalization, it is referred to as a preconstructionalization constructional change (Pre-Cxzn CCs). In this case, this notion is roughly coincident with that of primary grammaticalization, in the spirit of Traugott (2002, 2010b).³² The emergence of the pragmatic inference is always tied to specific constructions. Although semantic constructional changes are privileged as the trigger of the constructionalization, it is necessary to note that constructional changes driven by formal resemblance to other constructions have been pointed out as a motivation for constructionalizations (Octavio de Toledo y Huerta, 2018).

According to several authors (Traugott and Trousdale, 2013; Traugott, 2014), the first constructional change results in a mismatch between form and meaning,³³ which is finally solved by the speaker through a change in the opposite pole that best fits with the first innovation. By doing so, speakers create a new micro-construction that can be licensed by other schematic construction. After this has occurred, constructions are prone to more semantic and formal changes, called post-constructionalization constructional changes (PostCxzn CCs). For instance, at the formal side, frequency of use can lead to univerbation and phonological reduction as a consequence of automatization. On the other hand, the new construction can appear with other

Recently, some scholars have drawn attention on the lack of definitional accuracy and empirical evidence to draw the line between both concepts (Smirnova and Lotterer, 2020: 12-18). The issue is analyzed by Flach (2020) as an example of the *Sorites paradox* by analyzing the emergence of the *into-causative* construction. Applied to this domain, the question arises as to “how many changes constitute the coming into being of constructionalization? Where does constructionalization start and where does it end?” (Flach, 2020: 46).

³² Although the term was introduced by Givón (1991, as quoted in Smirnova, 2015), the conceptualization is quite different. In Givon, it refers to a grammaticalization that affects already grammaticalized items. In Traugott (2002) it is assumed that grammaticalization clines can be split into a change where the functional meaning is acquired (primary grammaticalization) and a change where morphosyntactic reduction takes place (secondary grammaticalization). This reflects Kurłowicz’s (1965) definition. In sum, in Givon’s conceptualization a chain of grammaticalization with bifurcations is assumed, while in Traugott’s model an only grammaticalization process is taken into account but with different stages. For a clarification of the term, see Smirnova (2015).

³³ This notion is, however, criticized by authors who ascribed to a usage-based perspective, since the mismatch is not realistic in terms of the speaker’s system, but of the analyst’s; i.e., from an external perspective. In the speaker’s mind, there is always a parsing according to his/her knowledge of language (Noël, 2017; Fischer, 2010)

class of words or contexts before impossible (Himmelmann's context expansion).³⁴ This is due to the schematization of the construction, which finally leads to higher productivity.

Therefore, this constructional view of language change can reconcile the two main views on grammaticalization: GR and GE (see §1). As Traugott and Trousdale (2013: 123-124) point out, GR is concerned with the internal constituent relations of the construction, while GE focuses on the external relations, but they are intertwined: as a result of the pragmatic expansion in PreCxzn CC and some chunking, the link between components is lost (loss of compositionality); after constructionalization, links between old constituents of the construction are not recovered (since the whole construction is sanctioned by a schema), which leads to the entrenchment of the construction and subsequently to its formal reduction. Interestingly, the entrenchment of the construction also gives place to a productivity and schematicity increase, since it sanctions more micro-constructions.

Thus, loss of compositionality is the other side of the coin of pragmatic expansion. Entrenchment of the construction leads to formal reduction as well as increase in productivity and schematicity (obligatorification).

2.3. Constructionalization of discourse markers

In recent years, the theory of constructionalization has explored how these mechanisms of change can describe the change undergone by DMs (Traugott, 2018a).

The description of the changes undergone by grammatical categories as consisting of small micro-steps involving formal and semantic shifts separately aids at getting a more realistic and fine-grained evolutionary picture, which can be applied to the come-into-being of particular DMs from a semasiological point of view. But it also sheds light on another theoretical question that has evaded a completely understanding of researchers for a long time: the issue about the boundaries of categories and the relations between different constructions that share some discursive functions but differ in their formal properties.

For our research goals, it is interesting to investigate if, by virtue of their common functional properties, the set of constructions we are studying should be treated as members of a same class, being other formal differences distinctive features opposing them. Usage-based approaches can fine-tune the classical notion of paradigm to account for how language use models relations between items and schemas according to existing networks and links. Such existing networks complement the syntagmatic metonymic view of change: through language use links between constructions emerge and become stronger (or weaker).

³⁴ This split between pre and post-Cxzn CCs is claimed to justify some cases in which the burst of the construction does not take place until time after it shows grammatical meaning, like in the case of *be going to* (Mair, 2004), according to Traugott (2014).

2.3.1 A reassessment of the concept of paradigm: networks and links

Linguistic elements cannot be analyzed in isolation. The value of a sign only emerges in relation with other signs. This is the prerequisite of any *system* and the basis of the definition of the language as a structured system of signs, which has been posed by structuralism and has determined the way the grammar of languages has been studied for a long time. For this linguistic approach, one of the most important concepts has been that of *paradigm*. They are abstract sets of elements that can fulfill a specific slot by virtue of a common property, but oppose themselves by a distinctive feature, so the specific slot should be filled by only one of them.

Paradigms have been successfully applied to the study of phonology and morphology. The concept, however, has undergone a huge spread across different fields and linguistic levels that even reached lexical semantics, the level traditionally regarded as more unsystematic. For syntax, some concepts arisen within the theory of paradigms, like *markedness*, have been considered, and, similarly, in the grammaticalization framework a specific role and a concrete mechanism of change was conceded to markedness by Company (2002), among others.

The expansion, however, has not come about without problems, but some paradoxes inherited from the local and particular domain in which the theory is rooted have risen up. For example, as pointed out before, lexical items have been traditionally considered as less systematic than grammatical words. Even within structural lexical semantics, it is claimed that lexicon is organized into categories, but not in the same fashion as phonemes or morphemes are within paradigms: “Nevertheless, paradigmaticity is an inevitable feature of grammatical categories. It is the very feature that distinguishes grammatical items from lexical items which may conjoin into word field (loosely organized, open classes) but not into paradigms” (Diewald and Smirnova, 2012: 127). This presupposes an important difference between lexical and grammatical units in terms of storage and psychological access, which gives place to the concepts of *lexicon* and *grammar*. Therefore, assuming a categorical continuum (as a synchronic account of grammaticalization theory poses) it seems difficult to decide where a *paradigm (stricto sensu)* applies clearly. As a matter of fact, there is a complex and longstanding discussion on the paradigmaticity of some important categories such as auxiliaries (Lehmann, 2002[1982]; Diewald and Smirnova, 2010), let alone auxiliary constructions of categories not traditionally studied, such as evidentiality markers in European languages (Diewald and Smirnova, 2010).

An important nuance can be added to this line of reasoning: the categorial continuum does not concern lexical and grammatical words, but syntactic constructions involving (more) lexical words (in the sense of syntactic strings made up following the rules of the grammar) and grammatical morphemes, thus depicting the general cline claimed by Givón: *syntax* > *morphology*. At this level, the same problem arises, as syntax has not been operationalized in paradigmatic terms; instead, it is taken as the other main axis of the functioning of linguistic items (the one of combination).

This is actually the continuum envisaged by Lehmann (2002 [1982]) in his parameters of grammaticalization (see §1.2). In fact, one of the parameters specifies the paradigmaticity of a

sign: that is to say, the degree to which they belong to a paradigm, and the size of the paradigm at issue. Again, this implies an asymmetry: forms or combination of forms that cannot be clearly organized in a structure gradually enter into increasingly closer paradigms. But how can this be synchronically represented? Even when the scale of grammaticalization built up by the quantification of the parameters intends to apply synchronically, it provides no further clues on how this overall picture is represented in the minds of speakers or even how the relations take place.

Although from the structural point of view taken by Lehmann the notion of paradigm is a narrow one, it raises the question whether items located at different points of this continuum (grammaticalization scale) can be part of a same functional paradigm, as Lehmann recognizes that speakers are always able to choose one form along the continuum in order to express themselves in a particular way. Appealing to the notion of functional paradigm has been one of the most important developments of the thoughts on paradigms, and has led to apply a systematic perspective to other levels of language analysis.³⁵ For example, in the field of pragmatics, Estellés (2009a) sets up the basis of a functional paradigm of DMs with a clear structure: Spanish DMs of the so-called *digressive paradigm* differ as to their distribution and contextual restrictions by virtue of their degree of *markedness*. Moreover, she demonstrates the real power of the relations these forms entail, as to the point that it conditions how they arise, work and develop: in other words, it reinforces the role of paradigms as ‘motivation for change’ in grammaticalization, which had been only weakly pointed and generally disregarded (recall the role of analogy) hitherto, opening the way to recent similar approaches (Fischer, 2007, 2011; Diewald and Smirnova, 2012; Octavio de Toledo y Huerta, 2018). This is the starting point that encourages us to prove that linguistic forms with a varying degree of grammaticalization must be organized in some way that allows them to interact by virtue of some relations they maintain.

Yet, we are still aware that the traditional notion of paradigm carried by structuralism and that of functional paradigm are far away and should be reconciled in order to properly account for the way in which structurally different signs are related in a language and how this conditions language change. This would mean a huge step in the onomasiological study of language. In what follows I will try to show that a construction grammar approach with networks and different kind of links, as the one posited by Van de Velde (2014), Traugott (2018a), Zehentner and Traugott (2020) and others, is a suitable insight for solving the aforementioned problems.

³⁵ Confining to a high degree to a classical concept of paradigms, Diewald intends to demonstrate that some German constructions conform a clear paradigm of evidentials, facing different problems that the notion of paradigm traditionally drags. First, the evidentials in German, unlike other languages, are not grammatically obligatory; in order to solve this problem, Diewald draws on the notion of *communicatively obligatory*: when any functional content is to be communicated without foregrounding the evidentiality, an evidential marker becomes obligatory. Secondly, Diewald throws the very interesting assessment that structural difference of constructions should not be held as an argument against their paradigmaticity, since some classical paradigms, as tense, are built in many languages by synthetic and analytic mechanisms at the same time.

Construction grammar provides a homogenous account of language by drawing on the notion of construction as a basic unit, which is ubiquitous in the language system. As mentioned before, constructions are form-meaning pairings of a different size, so they have value of a sign and, in this sense, they contract relations with each other. All the constructions are related by means of a huge network of constructions, the so-called *constructicon*, thus deleting the difference between lexicon and grammar (and accordingly the differences in the organization of each of these components of language). As seen, constructions differ only with respect to the degree of complexity and schematicity but are all bearers of meaning by themselves, which means that a sharp distinction between syntax and lexicon is also disregarded. Hence, studying the network of these constructions would let us capture “our grammatical knowledge *in toto*” (Goldberg, 2006: 18), alleviating the asymmetry between levels and the way we storage and organize the units. In a nutshell, construction grammar retrieves the structuralist notion of sign but here such a symbolic unit is taken to encompass larger constructions, so the paradigmatic axis becomes fully relevant to relate and systematize a wider range of linguistic structures, not only grammatical morphemes.

There are different models to account for how networks of constructions are organized. The hierarchical inheritance relations are the most argued links between constructions (Goldberg, 1995, 2003, 2006; Diessel, 2015). This implies a vertical axis along which schematic constructions sanction more substantive constructions that inherit from the former the properties to a different degree, depending on the construction grammar approach;³⁶ in between there are constructions with a varying degree of schematicity, which can be multiplied depending on the degree of exhaustiveness required (Traugott and Trousdale, 2013; Traugott, 2018a). For the sake of clarity, it will suffice to consider here, as Traugott does, three levels of schematicity (as depicted in figure 5): schemas, subschemas and micro-constructions.

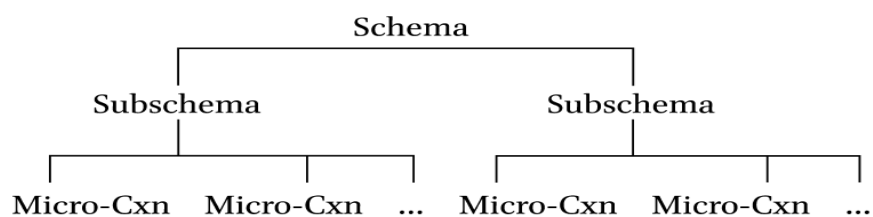


Figure 5. Representation of inheritance hierarchy (Traugott, 2018a)

This overview might be seen as comprising the notion of paradigm: schemas and subschemas would act as the categories and subcategories, and microconstructions as the members within

³⁶ There are approaches that draw on a complete inheritance hypothesis (for instance Kay and Fillmore, 1999), being reductionist models up to a point, whereas others consider the application of a specific redundant inheritance system, allowing for holistic meaning at the level of micro-constructions (default inheritance model and full-entry model). Usage-based approaches espouse the latter view, while formalist streams take rather the former model.

it.³⁷ This is doubtless the approach partly undertaken in Traugott (2018a). It is worth noting that the paradigmatic relations involve elements located at the same level and, therefore, are horizontal in nature. Horizontal relations, thus, accounts for the paradigm built by micro-constructions inherited from a subschema, but the question arises as to whether they can reach further to relate micro-constructions of different subschemas? A better picture for this fact can be obtained by showing a more complex drawing.

Within the previous inheritance linkages there could be micro-constructions sanctioned by more than one schema that display properties inherited from these different nodes. Such complex “system”, coined as multiple inheritance (Goldberg, 1995: 97), provides us with a finer representation of how this schema could be applied to paradigms of any class. Let us retrieve the figure from van de Velde (2014) to show how it would be with phonology.

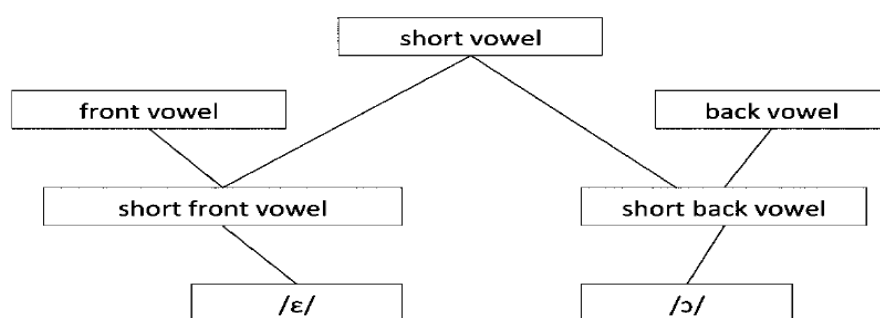


Figure 6. Partial hierarchical network of Dutch phonology (Van de Velde, 2012)

The most important conclusion that we can reach from this figure is that the final phonemes are specifications of subschemas inheriting properties from more than one schema, so the final micro-constructions do not instantiate the same subschema but are related by virtue of a higher common schema. It is obvious that some kind of relation involves them, as they share the [+short] feature and differ in the [front/back] opposition, and, therefore, they function in this horizontal axis. The horizontal relation also applies to the other abstract/schematic levels. Obviously, the relation in this example completely represents a very close paradigm, but they can reach further. In fact, Traugott (2018a) adds the symbolism of a continue line for a strong horizontal relation and a discontinuous line for a weaker horizontal relation.

Thus, horizontal links are taken by these authors as evidences of relationships between a construction and its neighbors. Taken together, such horizontal links can be summed up as the representation of some relations posited by cognitive approaches such as family resemblance

³⁷ This is a slightly confusing comparison. More abstract (schematic) constructions are not only categorical abstractions made by the analyst, but they try to represent psychological extant patterns built by speakers across generalization of tokens of use. The claim is taken to the highest level in Radical Construction Grammar (Croft, 2001), whose major difference with other constructional branches lies on the claim that abstract atomic constructions –that is to say, grammatical categories– do not *really* exist; they are theoretical abstractions made across different constructions that, however, do not hold for any objective common criterion.

or radial category. Family resemblance has already been proposed as the principle governing the “paradigm” of a set of DMs:

In sum, Spanish DMs with *bien* form a rather coherent group, though not, strictly speaking, a paradigm, if by such we understand a set governed by the constant and symmetric opposition of a few functional features. Rather, these DMs bear more of a family resemblance to each other, with each member sharing at least some semantic, distributional, syntactic or formal properties with at least one other member of the group, though no one particular property seems to be common to all of them. (Octavio de Toledo y Huerta, 2018:164)

Apart from this one, it can also explain further relations. This combination of horizontal and vertical links should shed some light on how macro and micro-structure relate. It could blur the dilemma whether changes take place within or across domains.

If we return to the problem of the emergence of DMs, we can note that an approach such as the one outlined here is very useful to appreciate their nature. For example, their origins trace back to free combination of words and they gradually become formally fixed and acquire a common function, but they do not properly fit into the distinction open/close class: “Even if they do not form an open class, DMs are not a closed set of elements; on the contrary, their limits are open and subject to debate.” (Pons Bordería, 2008a: 1413)

To illustrate the benefits of the wider approach provided by construction grammar, let us look at the Spanish construction *por si (pronominal subject) fuera poco*. It has been included only in some repertoires of discourse particles (Fuentes Rodríguez, 2009). A quick look at its properties reveals an interesting overlapping in both formal and functional sides with DMs. On the one hand, it conveys a procedural non-truthconditional meaning, namely adding information argumentatively cooriented to what has been said before, many times with a strong nuance of disagreement, as in (16).

(16) Según el Ine, los hogares españoles son los más deficientes y peor equipados de la Unión Europea. Más de la mitad de familias carece de medios para tener una calefacción adecuada. **Por si fuera poco**, somos los que más sufrimos la contaminación acústica, los que hablamos a grito pelado o con dos pelucas, los que más tocamos el claxon y a los que menos nos molesta el ruido guerrero de los tubos de escape de las motos.

(*El Norte de Castilla*, “Dulce hogar, o no”, 12/01/2001 [retrieved from CREA])

On the other hand, it shows a lack of syntactic integration within the sentence (parenthetical use), most of times it occurs in utterance initial position (contrary to what is expected in adverbial phrases) and it follows other markers reinforcing the connective meaning, such as *y* ‘and’. The strongest argument against its consideration as a DM is its formal variability: it can be expressed with many formal variants in which such a construction can occur. However, construction grammar is able to manage such problems readily; within this framework it is conceivable that the aforementioned procedural meaning is located in a schematic construction, not in the substantive filled construction. Such a schematic construction could for the sake of illustration (we are aware that the nature of such construction is much more abstract and schematic) be called “*por si* VERB_{SUBJUNCTIVE} QUANTIFIER”.

Now, regardless of the question of whether it is a DM in nature or not, we can agree that this construction may hold “resemblance” relations with some DMs, such as *encima* by virtue of their partial functional overlapping. Therefore, in a constructional network it would be located not far from these schemas. Indeed, going to an upper level, DM category only differs with parenthetical spontaneous constructions involving conceptual items in the formal invariability of the former. The approach of discourse grammar (§1.3) captures this fact very well: there are some categories acting within *thetical grammar*, in which we find *vocatives*, *conceptual theticals* and *discourse markers*.³⁸ Then, in a constructional fashion, they can be said to belong to the *thetical* category and so they are neighbors taking relations from their shared (non-truth conditionality, extrasentential scope, procedural meaning) and distinctive (formal invariability) features.³⁹

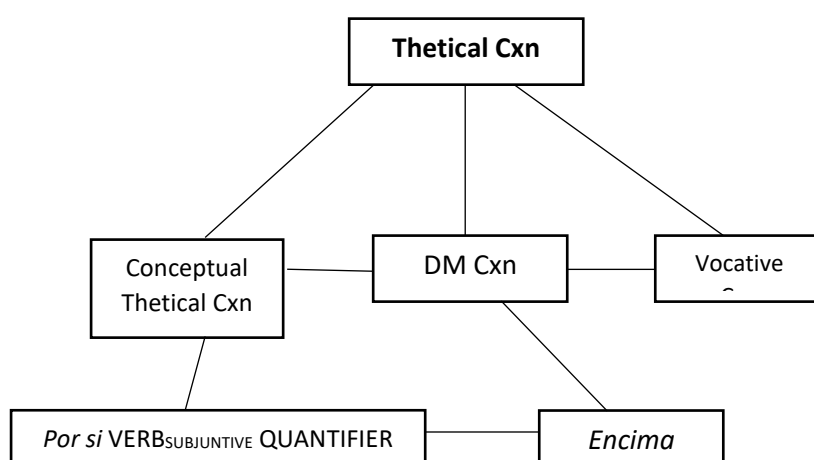


Figure 7. Some neighboring relations of discourse markers in a partial network

Such synchronic horizontal relations imply diachronic tendency of evolution between categories. Gradience is ensured by multiple constructions (usually micro-constructions) laid out in between the categories by means of varying number of common features. In a diachronic sense, displacement towards a category is accomplished by constructional micro-changes provoked by particular uses of a construction (constructs). Thus, such a view preserves syntagmatic (metonymic) reanalysis while assuming the attracting role of extant patterns, that is to say, analogic change, which has recovered some attention recently (Fischer, 2007, 2011, 2020; Noël, 2016; De Smet and Fischer, 2017; Octavio de Toledo y Huerta, 2018).

Now, this source is not the only (or even the most quoted) one considered for the rise of a DM, but, instead, it has opened a new stream in the research by coining a new kind of process for the formation of DMs called cooptation (Heine, 2013). The main cline for the development of

³⁸ We regard here DMs as formulaic theticals and conceptual theticals as instantaneous theticals or constructional theticals and therefore we treat them as different constructions.

³⁹ The common schema to which DM Cxn and Conceptual Thetical Cxn belong is supported in languages with verb second position by the fact that both constructions yield SV order. In a radical construction grammar, this category exists because it is sanctioned by a larger or complex construction: [X SV Y] (in contrast to [X VS Y]). This is the formal representation that Fischer (2007) uses.

DMs was described by Traugott and begins with intrapositional adverbs (Traugott, 1995a; 2018a; Traugott and Dasher, 2002). This is the cline where we can place our object of study: forms occupying a space between prepositional phrases and DMs.

For the adverbs to widen the scope it is necessary that they occur in initial position. This requisite coincides with the second general source of inference recently recognized by Traugott (2018b), the so-called discourse-structuring inferences, related to profile-shift.⁴⁰ Initial position privileges metatextual readings guided by the typical behavior of such kind of metatextual devices (connectives). Therefore, we can predict that prepositional phrase is another neighboring category of DMs, but the strong connections take place at the level of constructs, tokens of use of a micro-construction where the prepositional phrase occurs in initial position of utterance.

Another solution is to take an intermediate schematic construction sanctioning the initial use of prepositional phrases: the topicalized construction. In this case, a great neighboring relation would exist at the level of the “mixed” micro-construction (that construction with multiple inheritance). The role of constructs in this hypothesis would be restricted to the entrenchment of the micro-construction.

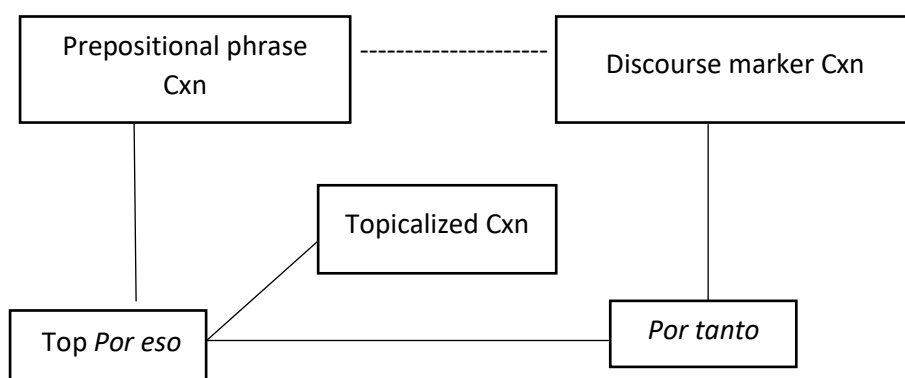


Figure 8. Relations between topicalized prepositional phrase and discourse marker category

But how could we operationalize such a view to organize our markers? As predicted by some formal differences in introspection judgements, *por eso*, *por ello* and *por esto* do not properly instantiate the schema of DM as *por tanto* does. However, in specific positions they are able to convey a similar procedural meaning, namely, relating two discourse members in a wide cause-consequence relation. Therefore, there is a functional overlapping that enables some relations between them and make the speakers build a functional slot where all of them fit. The fitness in a functional slot of a specific size (we refer to a partial overlapping) is a clear picture of the form-function mismatch, which becomes prominent when a specific sub-construction becomes entrenched in such concrete use. That is to say, all the prepositional phrases headed by *por* used in initial position could virtually fulfill such function and maintain relations with the discourse marker category, but the relation stands in a higher and more schematic level and is, therefore,

⁴⁰ However, Traugott (2018b) explicitly argues against autonomous and sufficient capacity of initial position to trigger such profile-shift, contrary to what is proposed in Fischer (2007).

weaker than the relation entailed at the level of an entrenched micro-construction. This could be represented by elaborating the previous figure 8. Note that no hypothesis is made on the status of our object of study in this figure, but every representation is made for the sake of symbolic illustration.

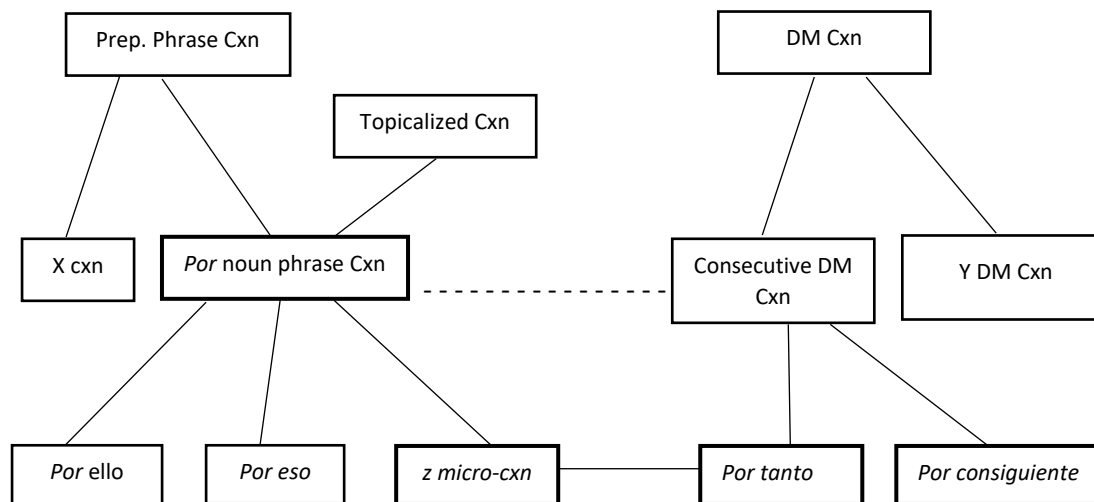


Figure 9. Illustrative partial network with horizontal relations in both schematic and substantive levels

This figure tries to represent the following fact: when the form is not entrenched at the level of micro-construction (in this case, but without any hypothesis operating here, *por eso* and *por ello*), relations are confined to the more schematic construction they instantiate and are weaker (discontinuous line) than those between an entrenched micro-construction (*z micro-cxn*) and a substantive DM construction (regular line).

It would be more interesting if these two kinds of sources for the development of DMs were not independent and non-related phenomena, but interacted allowing for a near-unitary account of DMs rise. If we combine both kinds of changes in one network, we obtain an overall picture of the influence each part of the network plays in the setting up of DMs. Fischer (2007: 275), in the pursuit of a basically analogical change that avoids the gradual widening of scope proposed by Tabor and Traugott (1998), Traugott (1995a) and Traugott and Dasher (2002), espouses a similar view:

I propose (this will be worked out further in §6.2.2) that the verbal adjunct (stage i in Figure 6.1) on its way to becoming a sentence adverbial (stage iii) developed via an intermediate stage (stage ii), in which it first appeared in a topic position at the front of the clause, without a change in scope. When some of these sentence adverbials came to be used as a pragmatic marker at an even later stage (stage iv), they did so by filling a position that had already been created by other pragmatic markers, which themselves had often developed from ellipted clausal phrases (reduced modal clauses) that were used as a separate or independent phrase in front of the main proposition and with scope over this proposition. (...) My suggestion is that the use of sentence adverbials as pragmatic markers in initial position took place by analogy rather than by an internal semantic-pragmatic development of the adverbials themselves. The analogy was possible due to semantic and structural properties that the sentence adverbials and pragmatic markers shared with the reduced (modal) clauses.

According to Fischer (2007), Traugott’s proposal (1995a) is less faithful to the actual development of DMs for two reasons: on the one hand, it would have overlooked or foreshadowed the stage II (which we have called topicalized prepositional phrase construction) and, also, disregarded a distinction in the stage III, where sentence adverbials can have clausal or utterance scope; on the other hand, it misleads the change from stage III to IV as being gradual and metonymical, instead of analogically-driven. Extant attracting patterns save the gaps between stages which are not proved to be gradual according to the data available. The schema presented is very insightful to understand the complete process:

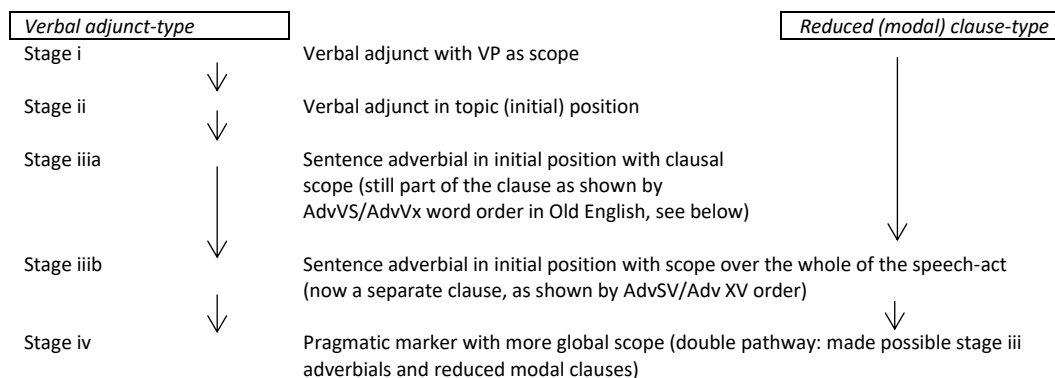


Figure 10: Stages from intrapositional adverbial to discourse marker according to Fischer (2007)

We would like to highlight some important commonalities between Fischer’s proposal and the draw we have put forward:

- a. Initial position plays an important role for the scope increase. We have hypothesized that the critical construction is a topicalized prepositional phrase, which in Fischer’s proposal is referred to as “verbal adjunct in topical position”.
- b. We have signaled that frequency of use of the topicalized micro-construction exerts significant influence, in our case, to the entrenchment of the micro-construction, which, consequently, makes the analogical links stronger. Such importance of the frequency of use of initial position is also present in the words of Fischer:

My suggestion is, with respect to the stages from verbal adjunct to sentence adverbial (stages (ii–iii) in Figure 6.1), that the development is linked to a more general semantic (i.e., metaphorical) change combined with the possibility for adjuncts to appear in a topic position (more about this below), while for stages (iiib–iv), its parallel use as a reduced clause and **its frequent initial position** play a role.

- c. DMs and conceptual thetical are related because of some shared properties and so they can be said to belong to the thetical category (Heine et al., 2013). Therefore, horizontal relations with the category of DMs are strong. Conceptual theticals –and theticals– are referred to by Fischer as “reduced (modal) clauses”. The parallels of reduced clauses and sentence adverbials/pragmatic markers are highlighted by Fischer as to the point that the existence of the former enables some intrapositional adverbs to behave as the latter. It seems that, according to the syntactic behavior, pragmatic markers, sentential

adverbials and reduced modal clauses behave as a class, which reinforces the relevance of Thetical Grammar (where other similar categories as vocatives are included).

Moreover, we have provided further clues on how analogical influence can take place in these cases. We have claimed that entrenchment at the level of the micro-construction seems to be a more enabling factor for analogical force to act: analogical relations at more substantive levels are stronger. This could explain why, according to Fischer, the development of *in fact*, which takes place after *indeed*, shows “suddenness”, compared to the emergence of *indeed*: when *in fact* began to be used there was a substantive construction such as *indeed* available to the speaker; on the contrary *in fact* had to draw on more schematic patterns (and maybe farther in the network) to acquire the new status. Similarly, Estellés (2009a: 240 and ff.) has demonstrated that analogy based on particular DMs constructions influences or accelerates the evolution of functional similar DMs: while the scope increase of *por cierto* is both explainable through the regular evolution of DMs and through analogical levelling based on other digressive markers (*a propósito* and *a todo esto*), later scope reduction undergone by *a propósito* can only be accounted for by the attraction exerted by *por cierto* (which retains some distributional properties of its older intensifier features). Moreover, the most modern semigrammaticalized digressive markers raised with all the properties that the older members of the paradigm showed.

In chapters 4 and 5 we will prove the relevance of such an overview. In §4.3, speakers’ processing of discourse relations marked by these forms will reveal us the degree to which neighboring relations trigger a similar cognitive pattern. Moreover, it will give us clues about whether all the “non-grammaticalized” markers show the same neighboring relations to the DM category; in other words, if their links are equally strong. Afterwards, the corpus study (chapter 5) will prove if the degree of closeness deduced by the similarity of processing patterns is derived by usage-patterns, and if the entrenchment of a construction affects such relations. The combination of the studies will provide a picture about what kind of relations in the network are synchronically relevant to these markers.

Chapter 3. Consecutive discourse markers in Spanish

In the last chapter, we have looked at the constructional accounts of language and language change, since they provide insights to uncover several phenomena of language. To recall briefly, one of the most important contributions of the approach is that it does not assume the sentence as the maximal level of analysis, as classical structuralist and generativist theories do. In so doing, they somehow continue the endeavors of different schools to overcome the constraint on sentence analysis, and incorporate the discourse level as part of language analysis.

The linguistic forms we are dealing with in this thesis (*por tanto*, *por ello*, *por esto*, *por eso*) have to be studied by taking into account this level, since, as connectives, they signal relations between different parts of the text (phrases, clauses, sentences, etc.). The relations all of them mark can be said to fall into the wide category of *causality* (Montolío, 2001),⁴¹ so a brief look at this kind of relation is to be taken, before analyzing them specifically. By doing so, we proceed as follows: first we draw on an onomasiological analysis, which is useful in order to look at the general features of the category which are cross-linguistically proved; afterwards we turn to a specific analysis of the relevant forms from a semasiological point of view, which will be the perspective we will adopt in order to get a fine-tuned description of the markers in the corpus study (chapter 5).

Therefore, in the first section we shall outline the linguistic patterns in which causality, as a cognitive category, is manifested in languages: general tenets (section 3.1), directions of causality (section 3.1.1) and type of causality (section 3.1.2). Following that, an analysis of the shared and divergent properties of these markers will be carried out and we will undertake a brief historical account on their evolution, which is important from a usage-based point of view.

3.1 Causality as a linguistic category

Causality has been revealed as an important field of study in cognitive linguistics, psycholinguistics, text linguistics, pragmatics and other disciplines. All of them intend to define this kind of relation by taking a different insight and highlighting different features of it.

The type of devices that languages display to convey causality range from verbs (*hacer*, *causar*, *provocar*, and inherent causative verbs), prepositions (*por*, *a causa de*, *debido a*, *gracias a*) and conjunctions (*pues*, *porque*, *ya que*, *puesto que*, *debido a que*, etc.) at the clause level to connectives (*por tanto*, *por consiguiente*, etc.) at the textual level. In this section, we focus on causal relations which manifest in the connection between different parts of the text.

Causal relations take place in the connection between two discourse segments in such a way that one of them is understood as the cause (in a wide sense) of the other. However, this kind of relationship, which has been suggested to be basic in conceptual representation (Sanders,

⁴¹ Although this is the main assumption in different cognitive approaches, Bermúdez (2003) does not consider causality as the conceptual metaphor underlying the meaning of the different DMs. According to this proposal, their meaning would be the result of a specific mapping onto a schematic metaphora depicting a trajectory.

2005) and in human communication (Sanders and Sweetser, 2009), can be expressed by different schemes in languages, depending on different factors (for a classification of coherence relations according to different parameters, see Sanders et al., 1992): hence, the wide definition of causal relations above provided is able to cover existing relationships between discourse members in (17)-(20).

(17) Decidió callarse durante el resto del día. (porque) Su madre estaba muy enfadada.

(18) El despertador no sonó aquel día. (por tanto) Juan llegó tarde al trabajo.

(19) Se ha visto al jugador negociando con otros equipos. (por tanto) No quiere continuar en el club.

(20) ¿Tienes hambre? (porque) Me ha sobrado un plato de la comida.

3.1.1 Forward and backward causality

The first difference we should remark in accounting for the causal relations has to do with the direction of the argumentative relation or the disposition of the members that define the relation; in general discourse relations terms, this criterion has been signaled as the *order of the members* (Sanders et al., 1992).⁴²

In examples like (17), the first part of the relation introduces the consecutive member, while the second part conveys the cause which triggers this consequence. This is the order known as *consequens*, *antecedens* in the rhetorical tradition; despite being a non-iconic order according to the temporal sequence, it is the most frequent causal order in languages (Moeschler, 2014). By contrast, in examples like (18), the reversal arrangement of members is laid out: *El despertador no sonó aquel día* acts as the cause or reason to Juan's delay, which remains as the consecutive member, showing the order *antecedens*, *consequens*, an iconic order. These two kinds of relations, which have come to be called *forward* and *backward* causal relation (Degand and Pander Maat, 2003) or *forward and backward causality* (Sanders, 2005), can be covered by their own linguistic devices or signs: markers that signal the first relation are many times called *forward causal markers*; markers which function in the other direction have been coined *backward causal (discourse) markers*. Nevertheless, in order to follow the traditional Spanish terminology, along these pages we will call them *causal* and *consecutive* connective devices or DMs (Portolés, 1998; Martín Zorraquino and Portolés, 1999; Montolío, 2001; Fuentes Rodríguez, 2009), which seems to differentiate both more clearly. Whereas in this tradition causal and consecutive markers remain dealt as distinct categories,⁴³ it is widely posited that they are

⁴² It is, however, a definition based on the observation of implicit causal relations. In explicit (marked) causal relations it should be nuanced, since there are, in fact, causal marked clauses that precede the consequence, such as the focalized *because* clauses or causal clauses with *since* in the first discourse segment, for mentioning the functioning of English causal constructions.

⁴³ In the field of DMs, most known classifications (Portolés, 1998; Martín Zorraquino y Portolés, 1999; Briz, 2001; Briz et al., 2008; Fuentes Rodríguez, 2009) only recognize consecutive DMs, as causal relations are covered by conjunctions and conjunctive phrases, which yield syntactic dependence between clauses. Under the label of "connectives", Montolío (2001) includes both kind of units, though differentiating two

related in such a way that each one is conceived as the mechanism which functions in the reversal schema of the other:

- (21) a. Decidió callarse durante el resto del día, porque su madre estaba muy enfadada.
 b. Su madre estaba muy enfadada. Por tanto, decidió callarse.

According to Montolío (2001), although the same relation holds in both linguistic arrangements, the difference lies on the part of the relationship that turns out to be focalized, highlighted or emphasized. Therefore, we can relate the choice of speakers to particular construals of the event (Langacker, 1987: 110). These differences in schema can also be accounted for in different ways:

- a. In terms of the information structure they involve. In backward (marked) causality (cause-marked relations), the marked discourse segment, that is to say, the cause, covers the rhema of the utterance while the thema is directly conveyed by the non-marked segment, i.e. the consequence (often the second discourse segment). In forward causality, the thema coincides with the cause and the rhema is accounted for by the consequence.
- b. In terms of the cognitive salience of the members. Taking the causal relation as a unit, we can say that the discourse member introduced by the connective acts as the profile and the other discourse member remains as the base; that is to say, in backward marked causality (explicit causal relations) the cause is profiled by the connective *porque*, while in forward marked causality (explicit consecutive relations) it is the consequence what is foregrounded.

Spanish has a wide range of conventionalized signs that convey each one of these categories. The choices, however, differ in morphosyntactic nature. Forward causal relations (causal relations) can be marked by conjunctions like *porque* or *pues*, conjunctive phrases like *ya que*, *puesto que*, *dado que*, *en tanto que*, *debido a que*, *a causa de que*, etc. Backward causal relation markers (consecutive markers) are, in turn, the conjunctions *luego*, *conque*, *por lo que*, *así que*; and the DMs *por tanto*, *por eso*, *por ello*, *por esto*, *por consiguiente*, *por ende*, *pues*, *así pues*).⁴⁴ Table 3 sums up the Spanish markers of causality sorted by the direction of the relationship and the morphosyntactic category:

subtypes (see footnote 17). In the Spanish syntactic tradition of type of clauses, backward causality is studied within subordinate clauses, while forward causality oscillates between adverbial subordinate clauses (consecutive adverbial clauses) or coordinate clauses (illative clauses).

⁴⁴The distinction we refer does not lack terminological problems in the literature, since *DM* and *conjunction* are not considered as different categories by many authors, but as different dimensions (grammatical category vs textual function) of the same phenomenon. The relevant feature we are taking to set them apart is the prosodic integration in the second discourse segment they show or not. According to this difference, Montolío (2001:35) differentiates between “parenthetical” and “clause-integrated” connectives. Another way of differentiating has to do with the level at which they operate. For example, according to Briz (2011b: 151) *porque* would work as a conjunction when it introduces a subordinate clause, but it would fulfill a DM function when it connects two distinct speech acts. The same can be applied to the most basic conjunction *y*.

	Backward or causal markers	Forward or consecutive markers
Conjunctions	<i>Porque, pues, como</i>	<i>Luego, conque</i>
Conjunctive phrases	<i>Ya que, dado que, puesto que, en tanto que, debido a que, a causa de que...</i>	<i>Así que</i>
Discourse markers		<i>Por tanto, por eso, por ello, por esto, por consiguiente, por ende, así pues,</i>

Table 3. Spanish causal resources according to the direction of the relation and morphosyntactic nature

As we can see, *por tanto, por eso, por ello and por esto* are forward causal DMs or consecutive markers, so we henceforth will focus on this kind of relation. However, it seems important to keep in mind the general view on the causality schema, as far as we are dealing with historical linguistic issues, and changes often take place as movements within the same schema or category, i.e., from adversative markers to concessive markers in the contraargumentative category (Garachana, 1997: 367).

3.1.2 Different types of causality

Whereas (17) and (18) may differ in either the argumentative direction or the information structure, they both are different from (19) with regard to the kind of causality involved. (17) and (18) reflect a relation based on the “real world”: the fact of his/her mother being angry leads the subject to keep quiet the rest of the day; and the fact that the alarm does not sound causes Juan (did not wake up at the time expected) to arrive late at work.

In (19), however, it seems hard to hold that the player being caught dealing with other teams is what causes him/her not wanting to go on playing for his/her team; rather, this is the reason to suspect it. Hence, at this point we are dealing with a causal relation that works within the domain of reasoning. The same can be applied to (20), where the fact of having more food is the reason to ask if he/she is hungry.

This distinction is not only supposed to be built up logically, but, also, cognitively motivated, based on different findings:

- a) The stages in the development of children’s understanding of causality match (some aspects of) the distinction drawn by Sanders (2005). In terms of linguistic acquisition of causal relations, it is suggested that not all types of causality emerge at the same time, but some of them are more difficult to manage due to its complexity (Kyratzis et al., 1990; Evers-Vermeul, 2005; Zufferey, 2006; 2010; Evers-Vermeul and Sanders, 2011). The experiments carried out to prove the order of acquisition of these types of causality in children, however, do not completely converge.⁴⁵ Yet, in the light of these studies and

⁴⁵ Kyratzis et al. (1990) found out in experiments with children that speech-act relations are the only existing ones at the age of 2.5 and the prominent ones in all childhood. According to them, this domain preempts the content and the epistemic ones ontogenetically, at least in causality. Ever-Vermeuls and Sanders (2011) call into question the reliability of the results, since the preference of speech-act domain relations could be biased by the context of the experiment. They set up different experimental and corpus-

assuming that children do not acquire a full-fledged theory of mind until about the age of four (Baron-Cohen, 1995), it is plausible to posit that some epistemic causal relations arise later since they involve —and require— some specific metarepresentational skills (Zufferey, 2006, 2010).

- b) Some languages, like Dutch, German and French have different connectives for marking each of these causal relations, so these languages —and according to Sanders' intuitions (Sanders, 2005), most of languages— have lexicalized⁴⁶ this cognitive extant category. That is to say, the cognitive subcategories of causality have reflexes in language expressions.
- c) Phylogenetically, a diachronic path through the different types of causality can be held if we assume that they are characterized by an increasing intersubjectivity. Attempts at linking the notion of intersubjectification (Traugott, 2010b; Traugott and Dasher, 2002) to the development of causality markers have been explored by different authors (Evers-Vermeul, 2005; Degand and Fagard, 2012; He, 2014). Yet, the connections are not straightforward.
- d) Some psycholinguistic experiments demonstrate that different kinds of causality trigger different processing times (Traxler, Sandford, Aked and Moxey, 1997; Traxler, Bybee and Pickering, 1997; Canestrelli, 2013)

However, in order to account for this difference and to cut up the category accurately, multiple approaches and explanations have been presented. While in some cases the approaches do not apparently differ much more than in their labels, in other cases the resulting distribution of subcategories becomes relevant.⁴⁷ Furthermore, some theories have focused on the *coherence* relation between two segments (Sanders et al., 1992; Sanders, 1997), others on the meaning of certain connectives (Van Dijk, 1977; Halliday and Hassan, 1976; Zufferey, 2012, among others). Retrieving some syntactic arguments in favor of a twofold distinction, a constructionist approach has been put forward as well (Kanetani, 2005; 2019). In the next subsections, a brief summary of the different distinctions made so far will be presented.

based studies, reaching the conclusion that the three domains are acquired very early and that the epistemic one seems to be the most complex, agreeing in this point with Kyratzis et al. (1990).

⁴⁶ The term *lexicalize* here could result confusing. What all these authors claim is that there are connectives specialized in some kind of causal relations, so the cognitive subcategory or space within the category is covered by an expression in a certain language. In this sense, remind (chapter 1) that grammaticalization theory addresses from a synchronic point of view which categories are covered by means of a grammatical expression in languages and which are not. However, the relations between the theory of grammaticalization and the existence of the causal connectives in different domains has been so far only very weakly pointed. By taking this framework as the explanatory tool, we may rather say that in some languages certain items have undergone a grammaticalization process, acquiring the meaning of guiding the speaker through an “specific” causal inference relation. An attempt to shed some light on the evolutionary path of these connectives can be found in Degand and Fagard, 2012).

⁴⁷ For a discussion on the degree of overlap of distinct labels regarding the source of the relation, see Sanders (1997).

3.1.2.1 Classical threefold approach

Sweetser (1990) brought out the fact that linguistic meaning can be mapped into three basic cognitive domains, namely, content (real world), epistemic (mental) and speech act (interactive) domains. This threefold distinction shows significant resemblances with the one diachronically drawn by Traugott (1982, 2002, 2012), which posits a semantic evolution of linguistic items through the following cline: propositional > textual > subjective (which is relabeled afterwards as referential > subjective > intersubjective). Both insights seem to be rooted in the traditional classification of linguistic dimensions by Halliday and Hasan (1976): the ideational, textual and interpersonal levels of description. Moreover, the triple division, as pointed out by Redeker (1990), can be traced back even to Bühler's (1934) dimensions or components of language: representation of ideas, expression of the speaker and appeal to the listener.

When applied to the field of “connectives” (conjunctions in the terminology of the author), Sweetser (1990) points out that the meaning of different conjunctions in English works in these three domains of use.⁴⁸ In the case of causal conjunctions, the *content domain* refers to causal relations based on real world (although it can refer to thoughts).

(22) Volvió porque la quería. (Adapted from Sweetser, 1990)

Backward content causal relation

(23) LLueve mucho. Por eso, la gente lleva paraguas.

Forward content causal relation

The *epistemic domain* works in relationships made up within the mental space, where causes are conceptualized as premises or arguments and consequences as conclusions:

(24) La quería, porque volvió. (Adapted from Sweetser, 1990)

Backward epistemic causal relation

(25) La gente lleva paraguas. Por tanto, llueve mucho

Forward epistemic causal relation

Finally, speech act causal relations take place when the cause is the base for performing a speech act, for instance an interrogative speech act.

(26) ¿Qué haces esta noche? Porque hacen una película muy buena. (Adapted from Sweetser, 1990)

Backward speech-act causal relation

(27) Tengo entradas de sobra. Por tanto, ¿quieres venir conmigo?

Forward speech-act causal relation

⁴⁸ For Kanetani (2019) these connectives show *pragmatic ambiguity*, that is to say, they are underspecified with regard to the specific domain at which their relations should be matched, this specification being made through pragmatics.

Although the three levels are thought of as basic in language use and metaphorical mapping, it does not seem clear whether the distinction between the epistemic and the speech act specifically applied to causality has to be maintained or not (Sanders, 1997; Kanetani, 2019), since in epistemic relations the cause or consequence following the marker is also taken as a *justification* of the act of stating something.⁴⁹ Therefore, the triple distinction seems to be motivated by the general distribution abovementioned applied to other domains. This third *kind* of causality can only be differentiated from the epistemic by the presence of a specific kind of speech act (question, command), but the relation is in fact equal in nature. In words of Sanders (1997: 129):

both speech act and epistemic relations concern a non-content connection, that is, a level in which the speaker creates the coherence, either by reasoning or arguing, or by communicating on a meta-level.

With “communicating on a meta-level”, Sanders seems to mean that there are also other kind of causality that should be recognized in a classification like that of Sweetser, namely, metacommunicative causal sentences. This kind of sentences has been used in suggesting that the distinction of Sweetser can in fact be widened in the light of real examples (Kalokerinos, 2004; Kanetani, 2005, 2009; Kitis, 2006; Bardzokas, 2013, 2014, 2017). In addition, in the speech-act domain another specification can be made to include near-reformulation uses of the causal connectives (Pander Maat and Degand, 2001), as in the example (28); however, both metalinguistic (a sub-type of metacommunicative relations) and reformulative uses seem to be related and act as their counterparts, according to the direction of the relation, as the sentences (29) and (29’) suggest. They can be, thus, properly subsumed under the label of meta-discursive causal relations:

(28) A su tío Baltasar de Zúñiga (véase Apéndice II de este capítulo) —con quien compartió poder al principio, recibiendo su ayuda, y **por tanto** al menos "su par", "su igual"— no necesitó separarlo. Murió pronto (X-1622)».

(Otero Novas, José Manuel, *Fundamentalismos enmascarados. Los extremismos de hoy*, 2001 [retrieved from Corpes XXI])

(29) Este delito, porque se ha hecho totalmente de espaldas a la ley, arroja sombras sobre la gestión del gobierno.

(29’) La estratagema, ejecutada totalmente de espaldas a la ley, y, por tanto, el delito, arroja sombras sobre la gestión del gobierno.

To our understanding, the only way to elucidate the linguistic validity of the description is to demonstrate if there are connectives specialized in signaling this specific relationship (Sanders, 1997: 129): that is to say, connectives that specialize in the speech act and not in the epistemic

⁴⁹ However, see Zufferey (2006) for a justification of the distinction. Drawing on Relevance Theory, the author distinguishes between descriptive (content) and interpretative (epistemic and speech act) use of connectives, and a further distinction applies in the second group, namely, the meta-cognitive (epistemic) or meta-communicative type of meta-representation involved in the interpretative use of language.

relations or vice versa.⁵⁰ According to the perspective adopted by Sweetser, if this happens, it should be related to a diachronic process of intersubjectification, as the one posited by Traugott. However, the scarce diachronic analyses made so far in this vein (Degand and Fagar, 2012; He, 2014; Evers-Vermeul, 2005) are not conclusive.

Until further strong evidences from such analyses are available, we have to rely on formal arguments. In this sense, as several authors have pointed out, this kind of sentences show a homogeneous behavior when different kind of tests are applied (Kanetani, 2019). Some of these tests will be shown when accounting for differences between markers in §3.2.1.1.

This is probably why “these difference in meaning and use have mainly been accounted for in terms of dichotomies” (Degand and Pander Maat, 2003: 175).

3.1.2.2 *Dichotomist approaches*

A split into two major categories of causality is proposed in different traditions⁵¹ (Halliday and Hasan, 1976; Lapesa, 1978; Schiffrin, 1987; Van Dijk, 1987; Sanders, 1997; Kanetani, 2005, 2019; Briz, 2011b; Moeschler, 2011). An overarching argument for such a distinction stems from the difference between connecting the cause of what is said (*dictum*, “*enunciado*”) and linking the cause of the act of saying (*modus*, “*enunciación*”), which is to say, the difference between providing the cause of a proposition and providing the cause of a speech act.

According to this analysis, these kinds of causal relations operate at different levels of language: the first ones connect at the locutionary level, yielding an only speech act or event. For example, summing up the analysis of the French connective *parce que* by Groupe Lambda (1975), Stukker and Sanders (2012:171-172) argue in this vein: “‘*parce que* is an operateur ‘linking two propositions into one new proposition’ (1975:254). In other words, *parce que* signals that the causal relation is constructed on the level of the propositional content of the segments related (1975: 257)”.

The second ones connect at the illocutionary level rendering different speech acts (and events). As a consequence of their connecting clauses or speech acts, they yield different truth-conditions:

(30) Está lloviendo y por eso la gente lleva paraguas.

(31) Es inglés y, por tanto, es valiente. (Adapted from Grice, 1975)

In an utterance like (30) truth-conditions depend not only on the truth of the first (“Está lloviendo”) and second segments (“la gente lleva paraguas”), but on the truth of the first fact causing the second one. However, the truth of the utterance (31) only hinges on the truth of the

⁵⁰ According to Zufferey (2006) it is the case of French *donc*, which can only appear in epistemic causal relations, but evidences are far to elucidate this issue in different languages.

⁵¹ Multiple labels makes reference to this distinction: external vs internal (Halliday and Hasan, 1976); propositional vs non-propositional (Schiffrin, 1987); semantic vs pragmatic (Van Dijk, 1987; Briz, 2011b); objective vs subjective (Sanders, 2005); causales de la enunciación / causales del enunciado (Lapesa, 1978); causal vs inferential (Moeschler, 2011); cause vs reasoning construction (Kanetani, 2019)

two connected segments in isolation. That is to say, in the second utterance the connection falls out of the domain of truth conditions. It is in this sense in which the labels *semantic* and *pragmatic* (Van Dijk, 1987; Sanders, 1997; Briz, 2011b) for these two kinds of causality seem to be relevant or appropriate. In this vein, it has also been pointed out, especially for *because*-clauses, that the first connections work within the domain of grammar (in the sense of sentence-constrained), while the second ones are to be analyzed in the domain of pragmatics, since they overcome the sentence level (Briz, 2011b).

Another pragmatic related distinction is applied to the domains of causality, namely, conceptual and procedural encoding of causality (Bardzokas, 2013, 2017). Finally, and also from a Relevance Theory framework, it has been pointed out that the two types of causality differ in that the second ones require an interpretative use of language and code a metarepresentation, rather than a description of events (Zufferey, 2006, 2010): thus, in a sentence like “*Está lloviendo, porque la gente lleva paraguas*” the first segment is not uttered as a fact or event, but as the representation of a belief, i.e., a metarepresentation.

As a consequence of this fundamental distinction, several diverging properties have been put forth by various authors:

- The connection of the first kind of causality can fall under the scope of an interrogation (Briz, 2011b), as the intonation curve show (Kanetani, 2005; 2019):

A. La gente lleva paraguas porque está lloviendo

B. Está lloviendo porque la gente lleva paraguas

- Focalization of the marked segment is not possible in both kinds of causality, only in the content or propositional one.

A. Es porque llovía por lo que la gente llevaba paraguas.

B. *Es porque las luces estaban apagadas por lo que no estaban en casa.

A'. Es por eso por lo que la gente llevaba paraguas.

B'. *Es por tanto por lo que no estaban en casa.

- Likewise, epistemic/speech act relations cannot be paraphrased by *because of*. In Spanish, however, epistemic relations can be conveyed with *por*. It seems that paraphrasis with *debido a que* clearly distinguishes both uses.

(English)

A. He's not coming to class because he is sick.

B. He's not coming to class because of his sickness.

A' He's not coming to class, because he has just called from San Francisco.

B' * He's not coming to class, because of his calling from San Francisco. (Rutherford 1970:105, as quoted in Kanetani, 2009)

(Spanish)

- A. No viene a clase hoy porque está enfermo.
 B. No viene a clase hoy debido a que está enfermo.
 A'. No viene a clase hoy, porque acaba de llamar desde San Francisco.
 B'. *No viene a clase hoy, debido a que acaba de llamar desde San Francisco.

- Epistemic adverbial modification (Groupe Lambda, 1975, as quoted in Zufferey, 2012: 138). The causal relation does not fall under the scope of the adverbial modification in B and B'. The sentence B' is possible, as long as the adverb *quizás* 'perhaps' does not affect *por tanto* but the propositional content "llueve".

- A. Quizás la gente lleva paraguas porque llueve.
 B. Quizás llueve, porque la gente lleva paraguas.
 A'. Llueve, quizás por eso la gente lleva paraguas.
 B'. La gente lleva paraguas. *Quizás por tanto llueve.

According to these differences in formal behavior and in the meaning they convey, both kinds of causality for the backward relations have recently been described as schematic constructions (recall the description of constructions as form-meaning pairings): the causal construction and reasoning construction (Kanetani, 2005, 2006, 2019). The approach allows to account for the different micro-constructions licensed by the schemas. Thus, Causal Cxn licenses the following constructions in English: [x **because** y], [**because** y, x]; in turn, Reasoning Cxn is instantiated by [x, **because** y] [x, **since** y], [**since** y, x] and [x **for** y]. The following figure, taken from Kanetani (2006), depicts the configuration of these constructions:

Causal construction	Reasoning construction
Sem: P ₁ is a cause of P ₂	Sem: P ₁ is a premise from which to conclude that P ₂
Syn: [C ₂ because C ₁] [Because C ₁ , C ₂]	Syn: [C ₂ because C ₁] [Since C ₁ , C ₂] [C ₂ , since C ₁] [C ₂ , for C ₁]

Figure 11. English Causal and Reasoning constructions according to Kanetani (2006)

In our opinion, one of the advantages of this proposal is that the existence of the reasoning construction as an independent schematic construction enables the attraction of items from different domains (not only from the content causality domain) to act as reasoning connectives. This could explain why in English *since* is only used in the reasoning constructions, while *because* can participate in both constructions. According to Kanetani (2005, 2006, 2019), there are metaphorical links to the reasoning construction from both the causal construction and the temporal construction: reasoning *because* arises as a metaphorical extension of the causal construction, reasoning *since* arises out of a metaphorical use of the temporal construction. The *logical* consecutive (illative) conjunction *luego* also seems to have acquired the reasoning meaning from its temporal uses. Interaction of reanalysis through contextual inferences and analogy is of great importance here.

The impossibility of *since* to occur as a marker of plain content-world causality is hardly explainable through an account as Sweetser's (1990),⁵² where the different domains exist only as a metaphorical mapping of the basic meaning of connectives that occurs in language use.⁵³ Even if the explanation comes from the diachrony, as Sweetser (1990) suggests by drawing on Traugott's (1982) approach, it should be demonstrated that *since* first acted only as a content-domain causal connective, reaching the epistemic domain in use and specializing at this level, something that seems to be partially against the historical findings.⁵⁴ Degand and Fagard (2012), attempting at testing the theory of subjectification in the French causal connectives, find out that no evolution has taken place in the setting of *car* as an epistemic connective from the first documentations of French, while *parce que* has evolved from being only used in content-domain to act as an epistemic causal connective. Taking together these insights and results, it seems that both subjectification of the causal relation and recruitment from other domains (also addressable as subjectification) occur in the creation of reasoning connectives; this is also in line with a view of synchronic setting and dynamics of change as the one put forward in §2.3.1 (see also Traugott, 2018a for *after all*)

Finally, a different way of classifying causal relations is to consider whether the relation holds in a real-world event or it is built up in the speaker's mind. In the first case, they are called objective causal relations; in the second, they are subjective causal relations. Objective causal relation refers to Sweetser's content domain, while subjective causal relations cover epistemic and speech act domain. However, developments of this latter approach, based on the subjectivity, have given rise to scalar approaches, which we deal with in the next section.

3.1.2.3 Scalar approaches

As stated previously, the distinction by Sweetser (1990) has been simplified by several authors to fit into two major categories, objective and subjective causal relations (Canestrelli, 2013), subsuming epistemic and speech-act relations under the category of subjective connections. Subjectivity, therefore, becomes the main parameter for defining the relations.

Objective causal relations express causality between events in the real world (11a), whereas subjective causal relations express the relations between the speaker's conclusions on the basis of events in the world. (Canestrelli, 2013: 14)

However, other authors have come up with further distinctions that render subjectivity as a scalar notion, rather than a discrete one (Pander Maat and Degand, 2001; Degand and Pander Maat, 2003). The reason for such a change is to be found in the necessity to take more fine-

⁵² Sweetser (1990) does not explicitly accept this impossibility (in fact, she provides examples of *since* in the content domain) but recognizes the strong tendency of *since* to occur in epistemic or speech-act causal utterances.

⁵³ A similar critique can be found in Lewis (2006: 50): "It is not clear why there might be domain-independent senses that were blocked for use in one domain or another. In other words, the "single core sense" model does not explain why there is no apparent synchronic productivity"

⁵⁴ For instance, the first "indisputable" example of causal *since* recognized by Traugott and König (1991) involves non-content causality. However, it is not clear whether the authors only regard such kind of examples (epistemic) as pure causal because only they clearly block a temporal reading of *since*.

grained analyses for explaining preferences of connectives in different contexts within one domain.

A first split takes place in the domain of objective or content relation, where, according to these authors (Pander Maat and Degand, 2001; Degand and Pander Maat, 2003; Sanders, 2005) there is a category overlooked by Sweetser: non-volitional and volitional relations can be distinguished. In non-volitional causality —(32) and (33)— the consequence takes place without any conscious intervening agent; it is, in common terms, a cause-effect relation. Volitional content relations —(34)—, in turn, are driven by conscious-endowed agents and are, thus, characterized by showing intention or willingness; it can be called a reason-action relation. The main linguistic argument for considering such distinction comes from the alleged specialization of some English, Dutch and French connectives in each of these sub-domains, both in causal (backward) and consecutive (forward) discourse relations, but it has also been justified by cognitive arguments such as the centrality of intentionality in the development of children's cognition (Sanders, 2005).

- (32) Para colmo, en el primero no vive nadie, **por eso** precisamente habíamos tenido goteras, porque no se dieron ni cuenta de que había estallado una tubería.

(Ángeles González-Sinde, *El buen hijo*, 2013 [retrieved from Corpes XXI])

- (33) Los partidos cuentan cada vez más con potentes y más poderosos gabinetes de prensa, comunicación y de marketing, **por esto** tienen mayor capacidad para fabricar noticias que brindan a los medios de comunicación, enfocadas a dirigir el mensaje político deseado.

(Manuel A. Alonso y Ángel Adell, *Marketing político 2.0. Lo que todo candidato necesita saber para ganar las elecciones*, 2011 [retrieved from Corpes XXI])

- (34) Los empresarios saben que la Guardia Civil no puede hacer mucho más de lo que hace, porque con una única patrulla nocturna debe controlar varios municipios. **Por ello** se dirigen a sus responsables para que aumenten los efectivos y refuercen la seguridad.

(María Santalla, «Reportaje | Autodefensa ante la delincuencia en Arousa», *La Voz de Galicia.es. A Coruña: lavozdegalicia.es*, 2004-04-14. [retrieved from Corpes XXI])

Some relation seems to hold between volitional and epistemic relations according to the following insights made by several authors (Pander Maat and Degand, 2001)

- Many epistemic connectives can appear in a volitional relation, while they don't fit in non-volitional content relations:

(35) a. The sun came up. As a result /*so the temperature went up.

b. I felt tired. *As a result/ so I left. (Pander Maat and Degand, 2001)

- There seems to be connectives specialized in this domain, such as Eng. *that's why*, Fr. *c'est pourquoi* and Dut. *daarom*.

- While these connectives cannot appear in an epistemic or speech-act relation, the use of a matrix-verb or performative operator enables them. This could be understood as a bridging context:

- (36) a. The snow is melting. *That's why /*As a result, the temperature is above zero.
- b. The snow is melting. That's why /*As a result, I think the temperature is above zero. (Pander Maat and Degand, 2001)
- (37) a. You have been very impolite. *That's why /*As a result, leave the room immediately!
- b. You have been very impolite. That's why / *As a result, I demand that you leave the room immediately! (Pander Maat and Degand, 2001)

The relation is conceptually explained in the following terms: while in non-volitional relations there is no conscious agent involved, both volitional and epistemic relations show presence of subject of consciousness; however, in the former case, the source of the causality is not the speaker himself/herself, although (s)he is involved to a certain degree (by adopting the point of view of the protagonist); in the latter case, it is the speaker, in its communicative role of speaker, who is responsible for the relation, as a concluder (Pander Maat and Degand, 2001). Therefore, it seems that volitional relations occupy an intermediate space between non-volitional content relations and epistemic relations (Pander Maat and Degand, 2001: 214). From these facts, it follows for the authors “the need to apply a scalar perspective to the spectrum reaching from nonvolitional causality in the content domain to epistemic and speech-act causality.” (Pander Maat and Degand, 2001: 214). The scale is sorted by the speaker's involvement in the construction of causality, being lowest in the content relation and highest in the speech-act relation.

Another particular observation is made in the domain of epistemic causality. According to the authors, two different kinds of relations fall into this domain. In the example (38), the second segment is not presented as a fact, but as a conclusion drawn from a causal segment; the basis holding the relation, however, lies on real world causality (raining causes—in normal conditions—the courts to be wet). These relations are called *causality-based epistemic relations*.

- (38) It has rained continuously for two days. The tennis court will probably be unplayable.
(Pander Maat and Degand, 2001)

The epistemic causality of (39) is different, insofar the direction of the relation is reversed: “the real-world effect is taken as an argument supporting a conclusion concerning the real-world cause” (Pander Maat and Degand, 2001: 224). It could also be the case that the relations do not lay in facts related to real-world causality but in an abductive reasoning process, as in (40). These relations are *non-causally based epistemic relations*.

- (39) The snow is melting. The temperature must be above zero.
- (40) The lights are off. They are not at home. (Pander Maat and Degand, 2001)

This particular distinction has not been so extensively explored in terms of the markers that can cover each of the subcategories. However, in section §3.2.1.2 we briefly analyze how the insight can be applied to explain the use of *por tanto* in relation to other Spanish connectives.

In sum, causal relations can be sorted across a continuum of subjectivity (tables 4 and 5). In this context, causal and consecutive connectives or DMs has been also seen not only as marks of a certain type of relation, but as signals that encode by themselves a certain degree of subjectivity or speaker's involvement (Pander Maat and Degand, 2001), that is to say, as units provided with a specific procedural meaning (c.f. Sasamoto, 2008; c.f. Stukker et al., 2009; c.f. Stukker and Sanders, 2012; c.f. Canestrelli, 2013). According to Pander Maat and Degand (2001), DMs that encode a high degree of speaker's involvement do not fit into discourse segments that do not allow for such level of subjectivity, according to their strong objective reading. In a paradoxical way, they also state that high speaker's involvement connectives can turn objective relations into subjective ones. The insights are, in general, coincident with the rigidity of the procedural meaning: it leads to a clash when the context is hardly adjustable to the meaning imposed by the marker, which can yield pragmatic difficulties, but it can also force to change the set of assumptions to fit its meaning, transforming, then, the relation.

SUBJECTIVITY	-	Non-volitional content relation	No subject of consciousness
		Volitional content relation	Subject of consciousness: "protagonist", syntactic subject.
		Causally-based epistemic relation	Subject of consciousness: speaker
		Non-causally-based epistemic relation	Subject of consciousness: speaker
	+	Speech act relation	Subject of consciousness: speaker; coincidence of deictic coordinates with enunciation.

Table 4. Scale of subjectivity across causal relations according to Pander Maat and Degand (2001)

Coherence relation	Sweetser's domain	Subjectivity	Traditional twofold distinctions
Cause-consequence Reason-action	Content	Non-volitional Volitional	Semantic / Internal / external / Objective
Claim-argument	Epistemic	Causally-based epistemic Non causally-based epistemic	Pragmatic / internal / external / Subjective
Justification Request-reason Question-reason ...	Speech act	Speech act Reformulation	

Table 5. Distribution of causal categories in scalar subjectivity-based analysis

Stukker et al. (2009) espouse another view on the relationship between causal and consecutive DMs and their uses. In order to account for the problematic cases (uses that do not adjust to the alleged meaning of the markers), they assume a usage-based perspective and hypothesize that the schematic meaning of the markers allow for prototypical and non-prototypical usages, the latter being considered as subjective (alternative) construals of the speaker.

We have seen, therefore, that, although causal relation can emerge in discourse without explicit marks signaling them, DMs not only explicitly signal the cause-consequence relation, but also

impose a specific meaning over the relation: direction of causality⁵⁵ and type of causality. Inspecting the properties of specific DMs is the main aim of the thesis, so, in the next section, we go on to analyze the Spanish consecutive DMs *por tanto*, *por ello*, *por eso* and *por esto*.

3.2. Consecutive discourse markers in Spanish

In context such as the one in (18)—repeated here as (41)—many of the units above signaled (table 3) seem to be exchangeable, as can be seen in the following example.

(41) El despertador no sonó aquel día. **Por tanto / Así que / Por ello / Por eso / En consecuencia** / Juan llegó tarde al trabajo.

Between them, some share the structural property of being non-clause integrated. Moreover, the DMs *por tanto*, *por eso*, *por ello* and *por esto* constitute a group from the point of view of its original structure (syntactic pattern of formation) and so they are grouped in different publications from a historical point of view (Herrero Ruiz de Loizaga, 2003a, 2003b). In Present-Day Spanish, their formal properties appear to differentiate *por tanto* from the rest of markers according to some alluded tests. More recently, these differences, attributed to their varying degrees of grammaticalization (Portolés, 1998; Martín Zorraquino and Portolés, 1999; Fuentes Rodríguez, 2009), have been tested to be relevant from a processing point of view, through an eye-tracker experiment (Recio et al., 2018).

Contrast in their functional properties, in turn, has not been the focus of much research, although some differences are glimpsed in the definitions of the markers or in some brief notes in the literature (Martín Zorraquino y Portolés, 1999; Montolío, 2001; Briz et al, 2008; Fuentes Rodríguez, 2009; De la Fuente García et al., 2019).

It is the goal of this thesis investigate the properties of this group of markers and their differences and to test whether further distinctions are to be made within it, such that we may draw a picture of their categorical nature and how they are organized in a network of constructions. In this section, we sum up the characterization of these markers made so far and add some new considerations from the point of view of the function they fulfill.

3.2.1 Overall distinctions in the paradigm

3.2.1.1 Formal properties

While the connective function has been generally assumed as a common feature of all these units (for example, Montolío, 2001), phonological (however, see §3.2.2), morphological and syntactic features of DMs are only prototypically met in *por tanto* (Portolés, 1998; Martín Zorraquino and Portolés, 1999; Martín Zorraquino, 2010; Recio et al., 2018), since the other forms still show some degree of compositionality, syntactic restriction and/or intra-sentential scope. This leads to a disagreement in the inclusion of units such as *por ello*, *por eso* and *por*

⁵⁵ Moeschler (2016) explicitly recognizes the direction of the relation as the conventional procedural meaning conveyed by the markers, while the objective/subjective reading is retrieved either as an entailment or as an implicature, depending on the connective.

esto as instances of the category of DMs. Portolés (1998) and Martín Zorraquino and Portolés (1999) argue against their DM status, and Santos Ríos (2003) does not make reference to them; conversely, they are part of the repertory presented by Briz et al. (2008) and Fuentes Rodríguez (2009) and, in addition, many specific publications does not pay attention to these differences. The discussion, then, stems from the different definition of DM underpinning the authors' classifications.

While for many authors the category of DM covers all the units that “instruct the hearer on how to connect a segment with the previous discourse strings, the context or how to manage the interaction”, other scholars have considered that a distinction is to be made within the functional realm of connectives: those that show structural properties associated to the category of DMs and those that do not: grammaticalized and non-grammaticalized DMs. Several existing labels, from different linguistic schools, are reminiscent of the alluded distinction: lexical connective cues (Sanders, 2004; Recio et al., 2018), cue phrases, lexical connection (Cuenca, 2017), intrapropositional prepositional phrases (Degand, 2000) and secondary connectives (Rysovà and Rysovà, 2015; Danlos et al., 2018).

Some of the relevant properties that differ in this group of markers are the following⁵⁶:

A. **Syntactic compositionality.** *Por eso*, *por ello* and *por esto* still admit the class of modification they are prone to by virtue of the category of the pronoun they include. On the contrary, *por tanto* cannot be modified by the same adjectives:

- Por todo eso/ello/esto vs *Por todo tanto. Por eso/ello/esto mismo vs *Por tanto mismo.

While according to most of grammaticalization and constructionalization approaches this could be the reflection of a process of decategorialization—loss of pronominal combination capacities accompanying—, historical data does not allow to conclude this, since most of combinations that we find in the rest of markers are not documented in any period of Spanish for *por tanto*. Thus, this seems to reveal synchronic grounds behind the restriction, as, for instance, the meaning of *tanto* (Recio et al., 2018). Note that the combination is not only very strange in this unit but also in all the phrases governed by *tanto*. More significant seems to be the impossibility of relative clause complementation in *por tanto*, as the existence of *de tanto que* reveals; in fact, this is a compositional combination for conveying causal relations:

(42) Ella, una vez, me abrió llorando, **de tanto que** dije.

(Rafael Sánchez Mazas, *La vida nueva de Pedrito de Andía*, 1956)

B. **Possibility of being externally modified.** Unlike *por tanto*, the markers *por eso*, *por esto* and *por ello* can be modified by an adverb.

⁵⁶ The list is based on Recio et al. (2018) but does not completely coincide, since we have grouped some phenomena in a different way and added some tests.

(43) A. Quizás/tal vez/solo/también/incluso/No por eso/ por ello / por esto han venido.

B. *Quizás/Tal vez/Solo/También/Incluso/No por tanto han venido.

C. **Possibility of being negated or interrogated.** Only propositional content can fall under the scope of negation or interrogation. Thus, it is posited that *por tanto* cannot be negated while *por eso*, *por ello* and *por esto* do, as the difference between (44a) and (44b) reflects:

(44) A. Llegó a casa cansado. No por eso/por ello/por esto dejó de atender sus obligaciones domésticas.

B. Llegó a casa cansado. *No por tanto dejó de atender sus obligaciones.

D. **Capacity of constituting the rest of an ellipsis.** According to Portolés (1998), this distinguishes grammaticalized DMs from propositional phrases.

(45) A. Ana no podía venir. Juan no se pondrá triste por otras cosas, pero **por ello/por eso/por esto**, sí (se pondrá triste).

B. Ana no podía venir. Juan no se pondrá triste por otras cosas, pero ***por tanto**, sí (se pondrá triste). (Recio et al., 2018)

(46) A: —Ana no viene. ¿Y **por eso/por ello** Juan se va a poner triste?

—(Sí, precisamente) **por eso/por ello**.

B —Ana no viene ¿Y **por tanto** Juan se va a poner triste?

—(Sí, precisamente)***por tanto**.

It should be however noted that this test (in fact, the argument can be extended to all these tests, see test E.) compares *por tanto* with clearly intrapositional uses of *por eso*, *por ello* and *por esto*. However, according to Portolés (1998) and Martín Zorraquino and Portolés (1999), there are markers whose original structure or source category is still used, and this does not tell us anything about their degree of grammaticalization; it is in fact possible for every grammaticalized structure to be found together with the structure it comes out of, according to the principles of layering and divergence (Hopper, 1991). It is important to avoid misleading by distinguishing between degree of grammaticalization of a certain form and existence of layering (the new form-meaning pair coexist with the construction out of which it has evolved).

E. **Capacity of being focused by cleft or pseudo-cleft sentences.** According to its external or extracausal scope (Degand, 2000), sentences with *por tanto* cannot be paraphrased by a cleft sentence (40A). It is, according to some authors, possible in *por eso*, *por ello* and *por esto* (47B), which reveals their intrapositional scope.

(47) A. Es por eso/por ello/ por esto por lo que se marchó.

B. * Es por tanto por lo que se marchó.

This test actually reveals the domain in which the causality works, since such a paraphrasis is only suitable for changes of states that happen in the real world (and are, then,

propositionally marked), not for reasoning or epistemic stances, or, more clearly, speech act relations. Therefore, the absolute judgement about the possibility of these markers to participate in such construction could be biased by the usage we are analyzing and it would be interesting to think if these markers can be found in usages that reject the cleft paraphrasis. For instance, the following example is part of a famous Spanish dialogued song:

- (48) —Ya es tarde
 —¿Por qué?
 —Porque ahora soy yo la que quiere estar sin ti. **Por eso** vete, olvida mi nombre, mi cara, mi casa y pega la vuelta.

Here, the use of *por eso* seems inadequate in a paraphrasis such as the previous one:

- Ya es tarde
 —¿Por qué?
 —Porque ahora soy yo la que quiere estar sin ti. **#Es por eso por lo que** vete, olvida mi nombre, mi cara, mi casa y pega la vuelta

Examples like the one put forward bring up the need for a prototype structure of meaning of DMs, which can be better accounted for by a usage-based approach. It also reveals the importance of taking into account different kind of registers to make better descriptions of the markers. Indeed, the last example seems to be favored by an informal register (it represents an oral conversation between two known and familiar interlocutors about a non-technical topic) and similar examples are found in oral samples of corpora:

- (49) Desde el punto de vista teórico o sea usted no / eh ustedes no quieren la independencia de Cataluña // no quieren la secesión de Cataluña de España // cosa que a usted no se le escapa que en estos sí en vez de estar usted en esa silla estuviese el señor Ibarretxe o el señor Arzallus / quizás no diría eso / de una forma tan contundente // **por eso**// mm / ¿no cree usted que la opinión pública española / le cuesta entender // por qué ustedes después de toda la contribución que han hecho / al proyecto de España// n/ no dan ese paso? // que desde el punto de vista de la política usted sabe que los / los gestos / son muy importantes y que participar en un gobierno / ehh
- (50) El tiempo es oro. **Por eso** no lo pierdas // Toma diariamente dos cápsulas de Reviface y en cien días notarás los resultados / volverás a lucir una piel bonita y luminosa.

In more formal, written registers, this use is also found in *por ello*:

- (51) Pero la defensa de Salamanca [de mantener en la ciudad el Archivo de la Guerra Civil] no se basa sólo en razones históricas: se basa en sentimientos en agravio y de expolio a una ciudad, y de favoritismo a otra comunidad autónoma. Estamos, por tanto, ante una situación muy delicada, de las que afectan a la cohesión nacional. Permítaseme, por ello, expresar mi perplejidad por la desastrosa gestión gubernamental de este asunto.

(*La voz de Galicia*, 29/12/2004 [retrieved from CREA])

(51') #Es por ello por lo que permítaseme expresar mi perplejidad por la desastrosa gestión gubernamental de este asunto.

This reinforces our claim that the markers should be analyzed as micro-constructions with specific properties provided by their use and that inspecting real data reveals more than what can be concluded from prefabricated introspection judgments.

F. **Capacity of being coordinated with intrapositional adverbials.** This reveals that the function of *por tanto* is not an intrapositional prepositional phrase anymore.

(52) A. Por eso/ Por ello / Por esto y por otras cuestiones hemos escogido el vestido.

B. *Por tanto y por otras cuestiones hemos escogido el vestido.

The non-propositional status could also be tested by the classical grammaticalization argument that fully grammaticalized items can appear with their homonyms side by side. In this case, the presence of *por tanto* does not preclude the cause adverbial complement, as in the following sentence.

(53) El gobierno ha rebajado los requisitos para obtener las ayudas. Por tanto, tenemos posibilidades de que nos concedan la beca por nuestra situación económica.

G. **Prosodic integration.** *Por tanto* is prosodically detached from the rest of the sentence, that is to say, it shows an own prosodic contour, while *por ello*, *por eso* and *por esto* can be realized either prosodically integrated in the clause or set off from it. This reveals the higher integration of *por eso*, *por ello* and *por esto* in the sentence structure, compared to *por tanto*, which is external to the sentence.

H. **Positional mobility.** According to the different degree of sentence predication detachment or syntactic integration, varying degrees of propositional mobility are found in the markers, being *por tanto* the less syntactically restricted one (Recio et al., 2018): it can occur in initial, intermediate and final position.

3.2.1.2 Functional differences

Little attention has been paid to the differences present in the functional pole of these markers. Normally, authors assume that these markers can be engaged roughly in the same kind of contexts, although they can express pragmatic subtle differences. However, the overlap in use is not total. By virtue of these pragmatic differences several contexts have been signaled as constrained to some markers, but they have not been accounted for systematically. An exception to the neglected look at the meaning is Bermúdez (2003), where the context-selection of different consecutive markers is related to the metaphorical image they depict; however, in this study *por tanto* is not analyzed.

A broadly signaled pragmatic difference has to do with the information structure that these markers imply. According to Montolío (2001: 122), *por eso*, *por ello* and *por esto* “pueden usarse

cuando se subraya especialmente la relevancia de la causa en el momento de presentar la consecuencia”, while *por tanto* is grouped with the markers that “señalan de forma ostensiva que lo que viene a continuación constituye una consecuencia, sin remitir explícitamente a la información previa; esto es, sin hacer referencia a la lógica de la causa desencadenante” (Montolío, 2001: 124). This relates to the constraint on their required information structure; specifically, the given/new information each of these groups can present: *por tanto* is constrained to new information, while *por eso*, *por ello* and *por esto* introduce given information (Montolío, 2009); this explains the following different behaviors:

(54) A. Quizás ha pasado una mala época y por ello/por eso/por esto está así de cansado

B. Quizás ha pasado una mala época y por tanto está así de cansado.

In the example above, by using *así* the speaker presents the discourse member as a mutually manifest fact, given by the context (for a scale of types of givenness, see Ariel, 1988, 2001), which invalidates the use of *por tanto*. For it to be used, the segment should be presented as a fact inferable from the content of the first premise or cause.

The distinction can be treated as a case of different ground-profile configuration. According to Montolío (2001), *por ello*, *por eso* and *por esto* can occupy an intermediate space between the elements that focus on the cause and those that fully focus on the consequence, where *por tanto* is included.⁵⁷ Since *por tanto* arose out of the same structure and was used in a very similar way to the rest of markers at some point in the history (see §3.3.1), it strongly suggests that it underwent a prototypical metonymical change (part-to-whole —part-to-part according to Garachana—), resulting in presenting the consequence of what was previously uttered without profiling the cause. Reminiscences with the evolution from concessive to adversative markers are unavoidable: whereas concessives focalize the weak or insufficient argument of the counter-argumentative relations, adversatives do it with the strong argument that overcomes the expectative; in addition, concessives present a thematic segment, while adversatives introduce the rhema of the utterance:

Esta evolución hacia valores adversativos es especialmente visible en aquellas situaciones en las que la oración introducida por el conector aparece justo antes de que se cambie de tema. En estos casos, a no ser que la cláusula introducida por *aunque* rija subjuntivo, en la mayoría de las ocasiones no es posible distinguir el valor concesivo del adversativo. Posiblemente esto venga determinado bien por el carácter fuertemente remático de la posición final, bien por la imposibilidad de establecer cuál de los dos argumentos es el que guía la orientación del discurso, cuando se cambia de tema. Nos encontramos, pues, en un contexto en el que los valores concesivos y adversativos parecen neutralizarse, propiciando así la transición hacia los significados adversativos. (Garachana, 1997: 369)

El empleo con valor adversativo de un conector especializado en la expresión de la concesividad significa emplear una pieza especializada en la expresión de uno de los valores de la relación

⁵⁷ In fact, some authors classify *por eso*, *por esto* and *por ello* as causal markers (Gutiérrez Ordóñez, 2000: 83; Herrero Ingelmo, 2012, to name a few).

contraargumentativa –la concesividad– para referirse al otro valor propio de la contraargumentación –la adversatividad–. Por lo tanto, se trata, insistimos de una metonimia del tipo LA PARTE POR LA PARTE.” (Garachana, 1997: 375)

The following schema (figure 12) intends to represent the analogy between both categories according to the diachronic observation of Garachana (1997) on the counter-argumentative schema and the synchronic explanations of Montolío (2001) on the causal paradigm:

<p>CONCESSIVE</p> <p>-----</p> <p>CAUSAL</p> <p>-----</p> <p><i>Porque</i> <i>Pues</i> <i>Debido a que</i> <i>Dado que</i> <i>Puesto que</i></p>	<p><i>Por esto</i> <i>Por eso</i> <i>Por ello</i></p>	<p>ADVERSATIVE</p> <p>-----</p> <p>CONSECUTIVE</p> <p>-----</p> <p><i>Por tanto</i> <i>Por consiguiente</i> <i>Por ende</i></p>
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Figure 12. Parallels between the cline from concessive to adversatives and from causals to consecutives

The same basis is used by Montolío to explain the inadequate use of *por eso*, *por ello* and *por esto* in contexts where the consequence is not fully straightforward from the given premise or cause, as in the following examples:

(55) A. El hombre del tiempo ha dicho que el próximo fin de semana lucirá el sol; *por tanto*, será mejor que cojamos el paraguas.

B. # El hombre del tiempo ha dicho que el próximo fin de semana lucirá el sol; *por eso* será mejor que cojamos el paraguas. (Montolío, 2001)

This is one of the observations made in the literature about the difference of subjectivity that each of these markers conveys. Several authors have pointed out that a reasoning or inferential process of the speaker is implied by *por tanto* in the cause-consequence relation it builds (Portolés, 1998; Martín Zorraquino and Portolés, 1999; Briz et al., 2008). Others have emphasized that the causal relation signaled by *por tanto* rest on a *topos* shared by a community of speakers (De la Fuente García, et al., 2019: 151; cf. Gutiérrez Ordóñez, 2012), which is a prerequisite for subjective relations according to Pander Maat and Degand (2001). It seems, indeed, that only *por tanto* can appear in the most prototypical examples of epistemic use, that is to say, in non-causally-based epistemic relations:

(56) A. La calle está mojada. Por tanto, ha llovido

B. ?La calle está mojada. Por eso/ello/esto ha llovido.

3.3. Defining at the substantive level of constructions.

As we have seen, most of authors distribute these consecutive markers in two groups. Not many attempts have been made to differentiate further within the second group: *por ello*, *por eso* and *por esto*. However, Briz et al. (2008) present *por ello* and *por eso* in different entries: while the definition is the same, some differences are found in fields such as “register” or “position”; *por esto* remains treated as an infrequent variant of *por eso*. The presentation in Fuentes Rodríguez (2009) is analogue: *por esto* does not appear and *por ello* and *por eso* are presented in separate

entries. The reason is that they are thought of as variants of a same schema that still shows some degree of productivity in terms of formal variation and compositionality. However, we think that an individual, though brief, treatment is necessary due to the following arguments:

- A. Historical studies reflect that they have not fulfilled the same role in all the periods of Spanish, but some patterns of evolution can be recognized both from qualitative and quantitative points of view. A clear proof thereof is the fact that the form *por esto* is barely quoted in synchronic studies, regarded as an infrequent variant of *por eso*, while it is often taken into account in historical studies (e.g. Herrero Ruiz de Loizaga, 2003b; Garrido Sepúlveda, 2017), since it was the most used connective in several points in the history (Garrido Sepúlveda, 2017). From the point of view of Grammaticalization Theory, renovation and replacement has been a constant notion in explaining historical and cyclic phenomena. From the point of view of construction grammar, marginalization, declines and movement toward the periphery or the prototype of a construction have also been analyzed (Traugott and Trousdale, 2013: §2.5.1.3; cf. Sommerer, 2020). These perspectives suffice, in our opinion, to justify a closer look at the different markers.
- B. In a similar vein, if *por tanto* has undergone formal and functional changes that get it away from the rest of markers, and assuming that changes do not occur abruptly, we can wonder if the same forces are acting over the other markers and gradual micro-steps can be glimpsed. The role of *por tanto* as an analogical force is also worth considering. The work of Fuentes Rodríguez (2009) and Briz et al. (2008) in giving separate entries of *por eso* and *por ello* is a promising step in this direction, since they provide specificities in their positioning or prototypical register, which can be seen as constructional changes, or, at least, constructional specificities according to the following point.
- C. Even from a purely synchronic point of view, adopting a constructional perspective implies accepting the following maxim: if two different forms convey the same semantic meaning, they must differ in their pragmatic implications (Goldberg, 1995: 67, 2006: 95). The maxim is applicable to all the forms we analyze, but it is more evident in *por ello*, where the categorical distance between a personal pronoun and demonstrative pronouns is higher.

Privileging the historical argument above presented, we first make a brief summary of the diachronic evolution of this group of markers, according to different historical works. Afterwards, we describe every marker by examining their formal and functional components and relating them to their compositional semantics.

3.3.1 Historical evolution of the paradigm

A considerable body of research has been devoted to elucidate some issues that determine the history of the consecutive connective elements of Spanish, from different angles and approaches (Mendoza Abreu, 1992; Eberenz, 2000; Cano, 2003; Herrero Ruiz de Lozaiga, 2003a; 2003b; Garrido Sepúlveda, 2017). The perspectives range from synchronic studies that characterize a specific period of Spanish to diachronic approaches that focus on different stages; the methods, from purely descriptive analysis to explicative accounts that benefit from the

development of Grammaticalization Theory and other frameworks (e.g., discursive traditions); and the techniques, from qualitative corpus studies to quantitative ones. The aim of this subsection is to establish the degree of knowledge on the evolution of these markers that has been reached so far.

According to the authors that trace back longest in the study of these forms, the connective function of some of them (see below) is attested in early periods of Spanish (Herrero Ruiz de Loizaga, 2003a), which poses a first theoretical problem: how this fits with the Traugott's (1995a) cline (intrapropositional adverbial > sentence adverbial > discourse marker), since they show hints of being in a second stage very early, losing prototypical syntactic properties of the intrasentential adverbial (e.g., fronted position)

If the position they occupy indeed inform us about their evolutionary stage, it is necessary to consider two options. On the one hand, some kind of continuity in the use of these consecutive discursive devices from Latin is plausible. Against this hypothesis, however, stands their absence in grammars of Latin, where other units are often recognized.⁵⁸ On the other hand, as previously stated (§1.3), the connective meaning is straightforwardly connected to the phoric value of *esto*, *eso*, *ello* and *tanto* beside the prototypical causal preposition *por*. Thus, the existence of a free-combined syntactic construction available for speakers for the expression of causal connection can be posed and indeed this has already been explained in a constructional network perspective (§2.3.1).

In Medieval Spanish (12th, 13th, 14th 15th) *por tanto*, *por eso* and *por esto* occur in their causal connective function (Mendoza, 1992), though this function is not found for *por tanto* until the 13th century. Although Mendoza (1992) includes *por ello* in her study and claims for a neutralization of the pronoun in such configuration, this statement turns out to be doubtful in light of a distributional difference noted by several authors: unlike the other forms, in 13th, 14th and 15th centuries, *por ello* tends to the final position (Mendoza, 1992) and it does not fulfill a connective function (Eberenz, 2000), as it is proved by its absence in the translation of connective fragments in different versions of the Bible analyzed by Garrido Sepúlveda (2017). The claim can be taken up to the 16th century for dialogued texts (Herrero Ruiz de Loizaga, 2003a). Even when this datum can offer clues about varying degrees of grammaticalization or at least different predisposition of the forms to fulfill the connective function, it is necessary to broaden the study by means of examination of larger corpora.

It does exist agreement on the similar function fulfilled by the rest of forms in connective uses along these first centuries. In fact, all of them are documented in correlated clauses, introducing an apodosis of a causal protasis, as in the example (57). The pattern is even traceable for *por*

⁵⁸ According to Herrero Ingelmo (2012) the typical are *ergo*, *ergo igitur*, *itaque*, *inde*, *proinde*. Narbona (1978: 318) states that the prototypical conclusive particles *ergo*, *igitur*, *itaque*, *ita* and *denique* are lost in the transition from Latin to Spanish, but other adverbs that fulfilled such function in Latin survived in the first periods of Spanish: *inde*, *proinde* and *unde*. On the other hand, Garrido Sepúlveda (2017) considers the possibility of *por esta causa* having appeared as a direct translation of *propter hanc causam*.

tanto, the marker that eventually diminished in greater degree its anaphorical value. The construction is claimed by Narbona (1978) to be the syntactic origin of the connective *por tanto*:

(57) **Por quanto** es la uilla de tal uuelta poulada/ que los unos a los otros non se entendien nada/ **por tanto** es de nombre de confusion dada/ ca Babilon confusion es en letra llamada (Narbona, 1978)

This paradigmatic configuration or schema, in which all these forms could participate in, is best reflected in the following example, where a concatenation of these correlative structures can be noted:

(58) Ay otra manera, que es llamada obsecraçión. E ésta es tanto como conjunçión. Mas **por quanto** la conjunçión se faze del mayor al menor, **por esso** non se llama conjunçión, mas **porque** la conjunçión se faze del menor al mayor **por tanto** es dicha obsecraçión. E esta obsecraçión es dicha asignar rrazón por que le den lo que demanda. E este asignar ha de ser de parte de Dios, [37v] diziendo: - "Señor, pues tantas graçias me avedes fechas, por vuestra misericordia e piedat otorgatme aquésta".

(*Sermones*, San Vicente Ferrer, 1411-1412 [retrieved from CORDE])

In several studies, it has been suggested that some DMs act as echoic units that retrieve a previous discourse segment in a specific argumentative relation. We retrieve here the above quoted (see §1.3) statement by Garachana:

no cabe hablar de conectores adversativos, o adversativo-concesivos, sino más bien de partículas proconcesivas. Es decir, estos conectores y sus equivalentes castellanos *–no obstante, con todo, a pesar de todo, aun así, así y todo y*, en muchos de sus empleos, *sin embargo-*, son proformas que aparecen en lugar de una prótasis concesiva ecoica. (Garachana, 1997: 252)

The relation with the abovementioned discursive correlated construction or discontinuous conjunctive phrase (Narbona, 1978) is evident, since here such causal protasis are explicitly marked. Again, a mechanism of subjectification linked to the syntax deprivation (Company, 2004b) would be at stake. The following schema depicts the possible evolution of the markers, departing from such discursive structure:

[Causal protasis (*Porque/ como/ ca/ por quanto X*), causal apodosis (*por esso /por esto/ por tanto/ por ende Y*)]

>

[Non-marked causal segment (*X*), cause signaling (*por esso , por esto, por tanto, por ende*), consequence (*Y*)]

>

[Non-marked causal segment (*X*), consequence signaling (*por ende, por tanto*), consequence (*Y*)]

Figure 13. Possible cline followed by the consecutive markers

In both the correlative structure and the “stand alone” connective use, *por tanto*, *por esto* and *por eso* first highlighted or signaled the cause. In the 16th century, *por eso* sporadically occurs in usages where the connective “ostensibly signals the consequence” (Herrero Ruiz de Loizaga, 2003a, our translation), which finally were assumed by *por tanto*. Hence, a process of specialization (Hopper, 1991) can be argued to be acting here. Taking into account the original

syntactic pattern and the following specialization, Narbona (1978) describes the evolution of *por tanto* in the following way:

Por otro lado, *por tanto*, que comienza siendo un neutro reproductor en correlación con *por cuanto*, va especializándose en la orientación inversa de la relación: presentar como consecuencia o deducción de la anterior a la frase que introduce. Con ello se debilita, e incluso puede llegar a desaparecer, su capacidad de señalamiento anafórico. (Narbona, 1978: 342)

In the specialization of *por tanto* as a consecutive DM, it develops a formal variant, *por lo tanto*, whose origin and implication are disputable. Herrero Ruiz de Loizaga (2003a) attributes the coming into being of this combination to the analogy with other prepositional phrases with *por*, such as *por lo mismo* and *por lo dicho*, and takes it as a proof of the loss of pronominal values of *tanto*; otherwise, he argues, the combination would result impossible. However, the first examples of *por lo tanto* documented in Spanish show that the pronominal elements may act as the antecedent of a relative clause, preserving thus its original properties.

- (59) Assi bien scriuo, en creencia vuestra, a los reuerendissimos cardenales vicecancellor, Anges e Sancti Petri ad Vincula; pero si se podra scussar quel dicho vicecancellor, ni el obispo de Barcelona, no sientan el negocio, fagase secreto, porque quiça no recibiesse empacho alguno. Ca **por lo tanto** que importa a mi seruicio y stado, mucho lo desseo; y set cierto que vos lo terne en senyalado seruicio. Y de lo que se fiziere luego me auisat...

(Anonymous, *Fernando a sus procuradores en Roma...*, 1488 [retrieved from CORDE])

- (60) porque aquella se deue acordar que puede hauer dos anyos que, vaccando la dicha abadía y la de Sant Genis, que ambas son de muy poca renta, embio su auiso y suplicacion, por correo proprio, que por ello despacho, mi secretario, mossen Coloma, dende Rossellon, donde entonçes estaua, por mi mandado, y a su suplicacion, lo que mucho me plugo, **por lo tanto** que merece y me ha seruido, fue contenta Vuestra Santidat disponer dellas a su voluntat.

(Anonymous, *Fernando al papa, rogándole que, con arreglo a lo ofrecido, conceda la abadía de la Real, al arzobispo...*, 1495 [retrieved from CORDE])

Regarding the frequency of use of these markers, there are also diachronic movements in which some tendencies can be recognized. The movements are informative of the evolution of the forms (especially *por tanto*) but also show that the markers could be paradigmatically connected and so they influence each other in push-and-pull chains or through other attracting forces, something that has been demonstrated for a paradigm of digressive DMs in Spanish (Estellés, 2009a, 2009b). From a cognitive point of view, increase in frequency reflects a higher entrenchment and movement towards the prototype of the category/construction (Stukker et al., 2009; Traugott and Trousdale, 2013).

For exploring those tendencies, we analyze raw data (hits per form in each century) retrieved from CORDE and triangulate with studies that draw on several methods aimed at shedding light on different aspects.

Forma	12 th	13 th	14 th	15 th	16 th	17 th	18 th	19 th	20 th
Por tanto	1	108	168	2336	5625	1173	792	3580	8926
Por e(s)so	5	934	342	4301	8981	3844	1952	5773	10336
Por (aqu)esto	8	1143	3515	6270	7638	3267	1136	2128	2454
Por ello	41	1942	955	1918	2930	1011	234	555	2884

Table 6. Raw frequencies (total hits) in CORDE for *por tanto*, *por ello*, *por es(s)o* and *por (aqu)esto*

An overall view shows a low tendency of *por esto* and an increasing frequency tendency of *por eso* and *por tanto*. Discarding *por ello* for the reasons found in literature about its intrapropositional role, the data point to a preeminence of *por esto* as a connective over the rest of the forms for the first centuries of Medieval Spanish, something which is supported by many historical studies (Narbona, 1978; Eberenz, 2000; Herrero Ruiz de Loizaga, 2003a, 2003b; Garrido Sepúlveda, 2017). For instance, this is what can be extracted from the data of Bible translations by Garrido Sepúlveda (2017) if we remove his variable of discursive tradition or genre.⁵⁹

	13 th	15 th
Por tanto	0	20
Por esto	28	21
Por eso	6	14

Table 7. Frequency of consecutive discourse markers in Bible translations of the 13th and 15th centuries, according to Garrido Sepúlveda (2017)

From the same source, we can see the preeminence of *por esto* until the 16th century with regard to *por eso*, although *por tanto* is used similarly in terms of frequency. However, the preference is not static. An increasing tendency of *por eso* takes place beside a decline of *por esto* in such a way that they seem to be mutually determined. A reverse tendency for *por eso* and *por esto*, which can be analyzed as a case of markedness reversal (Company, 2002), is constant until Present-Day Spanish, where *por eso* is a much quoted and prototypical marker of cause-consequence and *por esto* remains treated as a marked variant.

Garrido Sepúlveda (2017) also suggests a replacement of *por esto* by *por tanto* in the 15th century, through the comparison of the connectives used in the same fragment in different versions of the Bible. He also posits that *por tanto* specializes in this century in the genres where *por esto* decreases. However, its constant increase along history does not seem to occur straightforwardly at the expense of *por eso* and, in fact, it does not get to surpass *por eso* in frequency, as *por eso* did with regard to *por esto*. Thus, and in accordance to the functional differences pointed out before, this opens up the possibility of establishing a micro-paradigm at some point, where *por tanto* began to compete with other markers (e.g., *por ende*).

As mentioned before, most of studies on these connectives concentrates on Medieval Spanish due to the importance attributed to this period for the elaboration and sophistication of the

⁵⁹ One of the methodological advantages of the study is that it allows to discriminate connective uses, since the corpus is based on passages of translated Bibles whose original (from Latin or Hebrew) contained a clear argumentative sequence, marked by a connective.

Spanish syntax, which includes, from a wide perspective, textual connective resources. As a result, there is an important gap in the literature from the 16th century onwards that cannot be filled by the raw data extracted from CORDE. Based on the actual setting, during this lapse of time, *por tanto* was consolidated as a consecutive reasoning marker, occupying a functional space in causality that was not typical for *por eso* and *por esto* and probably fulfilled by *por ende* and other resources. In turn, *por ello* acquired the connective function that was fulfilled by *por eso* and *por esto*, specializing in written or formal (i.e., communicative distance) genres.

3.3.2 Por tanto

The connective *por tanto* is one of the most frequent consecutive DMs in Present-Day Spanish (García Izquierdo, 1998; Fuentes Rodríguez, 2009). It has been analyzed as a connective form in different approaches. In the syntactic tradition, it is recognized as an *illative* coordinative conjunction (RAE, 2010), which marks some kind of continuity between the two conjoined clauses. In more recent approaches, it is described as a prototypical DM that marks cause-consequence argumentative relations (cf. Fuentes Rodríguez, 1987, 2009; Portolés, 1998; García Izquierdo, 1998; Martín Zorraquino and Portolés, 1999; Briz, 2001; Briz et al., 2008). By virtue of its frequency and generalized use a non-marked status is attributed to *por tanto* by some authors. For example, Fuentes Rodríguez (2009: 261) recognizes that it “puede establecer una relación causa-consecuencia en toda su diversidad. Puede introducir también una conclusión”. Its broader use compared to other markers is illustrated in the following examples:

(61) Está lloviendo, *por eso/por tanto* la gente lleva paraguas.

?Está lloviendo, *luego* la gente lleva paraguas.

(62) La gente lleva paraguas, *por tanto/luego* está lloviendo.

?La gente lleva paraguas, *por eso* está lloviendo

(63) Tengo entradas de sobra, *por tanto/así que* ¿quieres venir conmigo?

?Tengo entradas de sobra, *por ello/por eso/ luego* ¿quieres venir conmigo?

Despite its apparent versatility, the mechanism by which *por tanto* establishes the connection must be fine-tuned: it introduces a discourse segment as a consequence inferred from the previous segment, which is then integrated as a premise. This reasoning layer of meaning is specifically alluded in several definitions in one way or another (Portolés, 1998; Martín Zorraquino and Portolés, 1999; Briz et al, 2008), so it could be included under the category of inferential connectives (see Moeschler, 2011). Others emphasize that the basis of the relation must rest on a *topos* shared by a community (Fuentes Rodríguez, 2009; Gutiérrez Ordóñez, 2012; De la Fuente García et al., 2019). The marker, then, shows that the relation is mutually manifest in terms of previous world-knowledge and, in relevantistic terms, strengthens the assumptions that can be made from the first segment.

Since these aspects are inherent to its meaning, a clash occurs when the relation of cause-consequence is temporally and causally immediate (not mediated by a reasoning) (Martín Zorraquino and Portolés, 1999). The restriction can be paraphrased as such: when the relation

is construed as a cause-effect, *por tanto* does not fit, since, by virtue of its specific procedural meaning some inferential derivation is expected:

(64) #Sale el sol y por tanto canta el gallo. (Martín Zorraquino and Portolés, 1999: 4101)

Taken together the wide range of use it displays and the specific meaning conveyed, and taking into account the insights provided by Pander Maat and Degand (2001) about the use of epistemic markers in content-world domain, it seems that *por tanto* specifically provides causal epistemic meaning: either adding an inferential reading to causally related states of affairs (causally-based epistemic relation) or abductionally drawing conclusions from premises (non-causally-based epistemic relations).

Compositionally, the structure of the marker builds on the preposition *por* and the phoric indefinite quantitative pronoun *tanto*. This pronoun is also present in other causal conjunctive phrases such as *en tanto que* ‘inasmuch’, but it does not abound in other DMs. According to some authors, *tanto* displayed in Medieval Spanish an anaphorical use which enabled its entrance in the schema [*por* + anaphorical term], previously instantiated by *por esto*, *por eso* and *por ende*. However, it seems that it constitutes a more peripheral member of the anaphoric category (according to the quantitative and scalar inherent meaning it contains), which could favor its evolution to the consecutive DM category. In this sense, it appears that the formal fixation is built on the scarce syntagmatic combination it is allowed by its very meaning.

Notwithstanding this predisposition, some formal restrictions that come from its loss of compositionality are attested. For instance, the possibilities of being negated and interrogated are lost on its way to the DM status. In addition, its relative clause complementation is attested in other free-syntagmatic combinations, which are nowadays impossible.

3.3.3 Por eso

Although *por eso* is treated differently among authors regarding its DM status, it is often mentioned, due to its high frequency of occurrences, as a connective device (see 3.3.1).

It is composed by the preposition *por* and a medial neuter demonstrative pronoun, so the presence of an anaphorical pronoun in its structure makes it a good candidate for the DM function. In fact, other DMs contain the same deictic (*eso sí*, *a pesar de eso*). It is important to note that, unlike *ello* (see 3.3.5), the anaphorical and discourse deictic⁶⁰ function of the demonstrative is achieved in a metaphorical or derived way (Diessel, 1999: 93; Zulaica, 2009; De Cock, 2013),⁶¹ since the identification of the discourse member as the referent (endophoric deixis) can be seen as the metaphorical extension of signaling referents in the extralinguistic

⁶⁰ Diessel (1999), among endophorical uses, distinguishes anaphorical (substitution of previous uttered noun phrase) from discourse deictic (substitution of a discourse string) functions. The insight is useful in order to account for the deictic restrictions of the personal pronoun *ello*.

⁶¹ However, other authors claim for an equal status of all the pragmatic uses (e.g., Himmelmann, 1996) and some studies have revealed that endophoric uses are most frequently found in real texts.

context (exoforic deixis)⁶² (spatial deixis > discursive deixis). Unlike *esto*, on the other hand, it identifies the referent in a second degree of distance (medial demonstrative), which, discursively, could be related to the degree of accessibility of the referent (Ariel, 1988; Figueras, 2002), in this case, the proposition or set of propositions. Accessibility theory (Ariel, 1988; Figueras, 2002; cf. Prince, 1981) poses a scale of pragmatic accessibility of references, which influences the choice of the anaphoric term in the following way: the more accessible the referent is the less marked anaphoric expression will be chosen to retrieve it. According to such theory, personal pronouns are more accessible than demonstratives, and within demonstratives, *eso* would be more accessible than *esto*.

In this sense, the specialization of second degree of distance deictics in some discursive configuration or fixed patterns deserves some attention (*por eso, eso sí, eso es, a pesar de eso, de ahí (que), por ahí, eso es que...*) (however, *por si esto fuera poco, a todo esto, esto es*) and could explain the replacement of *por esto* by *por eso* as the most frequent form for conveying cause-consequence relations.⁶³ According to De Cock (2013), an intersubjective semantic feature remains active in all the uses of the medial neuter demonstrative *eso*, be they instances of free functioning of the demonstrative or fixed patterns such as DMs; the use of *esto*, on the contrary, does not appeal to the interlocutor to the same degree and, thus, it is less useful for establishing a “common ground” with the hearer (De Cock, 2013), which, again, can be related to the accessibility of the referent.

Regarding the meaning, *por eso* is generally described as a cause-consequence connective that explicitly focus in the cause, thus favoring relations between facts or states of affairs. However, other usages that do not fit into this typology of causality have been shown in section §3.2.⁶⁴

In conversations it also appears with verbs of saying to present the justification of an utterance (DPDE):

(65) G: ¡ay! he subió y no estabas.

L: hemos llegao a las- a las seis y media/// como tenía que dejar el trasto↑ hemos llegao a las siete o así↑ y tú has llegao mal↓ °(a las siete)° tú me dijiste que ibas a llegar tarde ¿no? a las ocho// **por eso te digo.**

Likewise, in some dialogical context, *por eso* even retrieves the illocutionary force of the act of saying and acts as a stand-alone unit, displaying pragmatic autonomy and filling by itself the intervention of the speaker. In this use, it ratifies the relevance of a previous utterance by the speaker in relation to the interlocutor’s answer.

⁶² Regarding this difference, Eberenz (2000: 120) asserts the following for the 15th century: “Esto y esso se distinguen, en primer lugar, por su significado señalativo, valor que conservan aún cuando en el discurso desempeñan una función fórica. Puede decirse que la anáfora expresada por *esto* y *esso* resulta más enfática, mientras que *ello* remite a su antecedente con mayor discreción.

⁶³ According to Diessel, there are several languages in which only the medial demonstrative is able to take endophorical uses, being the proximal restricted to exophorical uses, then.

⁶⁴ Fuentes Rodríguez (2009: 269) recognizes its possibility of acting between acts of saying, that is to say, illocutionary acts.

(66) A: —Ten cuidado con la vacuna de Pfizer, no me fío mucho.

B: —Pero ha pasado todos los controles sin ninguna incidencia, ¿no?

A:—No. Por eso.

It seems that this function is particularly constrained to *por eso* and cannot be fulfilled by *por esto*, *por ello* and *por tanto*.

3.3.4 Por esto

This form is not mentioned in synchronic descriptions of DMs but as a marked or infrequent variant of *por eso* or the schema *por + eso/ello/esto*. Interestingly and according to frequency, through the history it has been replaced by *por eso* in this signaling of cause-consequence relations, but is still preserved in its connective function though with a low frequency. Contexts that favor the persistence of *por esto* have not been identified and are supposed to be tied to stylistic preferences or dialectal variation.

3.3.5 Por ello

Por ello is a very conspicuous marker that deserves attention. The interest does not only come from its component form *ello*, to which many grammarians of Spanish have devoted huge efforts, but also from the historical evolution the prepositional phrase itself represents. It did not fulfill a connective function in the first periods of Spanish but acquired this use later, perhaps by drawing on the schema built by *por eso* and *por esto*, through the morphosyntactic closeness of the neuter personal pronoun *ello* to the demonstratives.

The relation between the personal pronoun and the demonstratives has been the subject of much research: there is, in general, a diachronic relation between demonstratives and personal pronouns in Spanish, since the latter have arisen out of the former in a process of grammaticalization that took place in Latin, but in the case of the neuter 3rd person personal pronoun the relation seems to be stronger. This is due to the hard fit it displays with the category of personal pronoun, since it can only refer to abstract referents which are usually previous discourse segments, being, then, anaphoric in nature. Thus, in many configurations where the anaphoric meaning is prominent and referring to a proposition or set of propositions, it seems to be in paradigmatic relation with *eso* and *esto*, still occupying the place of the formally reinforced new distal demonstrative *aquello*. This is what seems to occur in the case of *por ello*, since causal connective uses of *por aquello* are anecdotic.

Yet, *por ello* alternates with the demonstratives in some contexts but this does not mean that their meanings are exactly the same, since *ello* lacks the distance signaling feature (spatial deictic information) of the demonstratives. In fact, the alternate can be said to occur when the purely deictic meaning of demonstratives is neutralized in discourse.⁶⁵ Therefore, the meaning of *eso* and *esto* includes the features [+distance signaling, +referring], while *ello* only possesses

⁶⁵ This is to be expected, since exophoric uses of the demonstratives are the bridging context for the arise of 3rd person personal pronouns (c.f. Diessel, 1999).

[+referring]; in addition, the range of possible referents that neuter demonstratives could saturate comprises all non-animate entities, while *ello* only refers to previous discourse strings. In sum, its anaphorical and discourse marking function seems to be more straightforward than that of *por eso* and *por esto*.

As a connective it is nowadays considered as a non-fully-grammaticalized DM that still preserves a high degree of compositionality, as their syntactic combinations show. In this sense, it is important to note that, unlike *eso* and *esto*, the internal and external modifications appear to be constrained in some directions in the very use of *ello*. This is reported by Eberenz (2000) already for the 15th century, where no instances of the combination with *mismo* are found. The same occurs with noun modifiers introduced by a preposition, which are sporadically found in this century with *esto* or *e(s)so* (e.g. *esto de X*, *esso de X*), but non-existent with *ello*. Finally, Eberenz also notices the absence of *ello* in concessive phrases or structures governed by a negation particle, where *por eso* and *por esto* abounded (*no... por eso/esto*, *ni (...) por esso/esto*). The restriction is confirmed by a quick search in CORDE, which interestingly reveals that it first began to be used after negation in the 19th century.

These restrictions can perhaps be put in correlation with those present in *por tanto*, since *por ello* is the last structure entering in the consecutive connective paradigm as was *por tanto* when it began to contrast with *por eso* and *por esto*. A higher predisposition to the change is to be considered if we take into account the syntactic restrictions and special status of the neuter 3rd person personal pronoun.

Confining to the present-day connective status, some authors highlight its situational markedness: *por ello* is more frequently encountered in formal and written genres. Moreover, in the description of DPDE a subtle difference is added with regard to its positioning and scope compared to *por eso*, since, on the one hand, it can link a new act to a set of previous uttered acts and, on the other hand, it can appear in medial position of an act. This raises the question whether such functioning is to be regarded a historical development toward the prototype of the DM category.

Chapter 4. The paradigm of Spanish consecutive discourse markers through eye-tracking

4.1 Previous experimental approaches to the study of discourse markers.

Given the fact that discursive meanings, such as relations between sentences, arise whenever the speaker process texts (Sanders et al., 1993; Sanders and Pander Maat 2006), an important theoretical question arises: why do linguistic signs or constructions that encode discourse meanings —such as DMs— exist? Or, from a functional point of view, why do speakers draw on units that make such relations explicit?

From a theoretical standpoint, answers to this question have come from different linguistic and pragmatic schools that deal with the discourse level. Experimentation, however, has more directly addressed the question by looking for the cognitive effects of the presence of such units at different levels: a number of researchers have focused on reading times (Haberlandt, 1982; Köhne and Demberg, 2013), while others have concerned themselves with the memory, comprehension or coherence advantages (Caron et al., 1988); others still have put the different dimensions in correlation (Millis and Just, 1994; Millis et al., 1995; Murray, 1997; Sanders and Noordman, 2000; Zunino et al., 2012). The former method falls into the so-called online methods,⁶⁶ since it occurs as the processing unfolds and is, thus, able to reveal unconscious processes; the latter, in turn, are called offline methods, as they test effects taking place after the experimental conditions have been applied and actually respond to processes that are more conscious.

It seems that, within online methods, reading time is a suitable paradigm to analyze the functional dimension of linguistic units inasmuch as it reflects the way these words contribute to the processing of the sentence or the text. This paradigm has been developed through different techniques, such as self-paced reading or eye-tracking, being the latter preferred for achieving a more natural reading and disentangling the overall reading time (Godfroid et al. 2018: 565) in early and late measures (see 4.2.1). Offline data, as comprehension tests, can be recognized as complementary tools, such as post-tests, since sometimes processing times do not tell us anything unless we know what the output of the processing is (Loureda et al., in press).⁶⁷

⁶⁶ Online methods comprise direct and indirect procedures to inspect the brain activity triggered by language processing. Some techniques in neuroimaging such as functional magnetic resonance imaging (fMRI) and event-related potential recordings (ERP) capture in a direct but non-invasive way the cerebral activity; however, despite being a very straight access to the processing activity, they offer few clues about how it takes place. The study of eye movements during reading also implies inspecting the cognition in real time, that is, while unconscious processes are taking place, but in an indirect way, since we have access to the mental processes through eye movements and fixations, assuming a direct link between them that is endorsed by the eye-mind assumption or hypothesis.

⁶⁷ Offline comprehension test is one of the ways in which such output can be tested. Many times, however, such checking task is made by means of norming studies or surveys in which the intended discursive

Most of the studies done within this experimental paradigm, despite differences in the methods, has converged in the facilitating role of connectives (Haberlandt, 1982; Sanders and Noordman, 2000; Zunino et al., 2012; Van Silfhout et al., 2015, to name a few). There has been some discussion about when the integration of the discourse segment linked by a connective takes place, leading to two different models: delayed integration models (Kintsch and Van Dijk, 1978; Kintsch, 1988; Millis and Just, 1994) and incremental processing models (Traxler, Bybee and Pickering, 1997). The former predicts that the integration of discourse segments in presence of connectives takes place at the end of the second segment, during sentence wrap-up, while the latter hypothesizes that integration advances in line with the processing of the segment following the connective. In support of the second hypothesis, a number of studies have demonstrated that the effect of the connective begins to work from the very first time they are processed, that is to say, in the discourse segment following the connectives (Haberlandt, 1982; Traxler, Bybee and Pickering, 1997; Kleijn, 2012; Canestrelli, 2013; Silfhout, Evers-Vermeul and Sanders, 2015; cf. Cozijn et al., 2011).

Another recursive point in some of these studies is the difference in the influence of the connective depending on the discursive relation behind it. Thus, counterargumentative connectives have been proved to trigger greater processing benefits than additive or causal connectives, because of the difficulty that the relation without mark (implicit relation) involves. Among the last two, additives show a major impact than causal connectives, because the causal relation is a preferred interpretation in absence of a marker (it is cognitively prominent). The tendency to causally linking juxtaposed sentences by default seems to be motivated by the informative benefits that causal events yield compared to the simple addition or temporal sequency, since the human inferencing is biased towards the optimal extraction of contextual effects (Sperber and Wilson, 1986). This line of reasoning has been explained and coined as the *Causality by default hypothesis* (Sanders, 2005). Other intervening factors such as genre or text type (Canestrelli et al., 2016), world knowledge (Noordman and Vonk, 1998: 197-199; Zunino et al., 2012) and reading skills have also been recognized as affecting the processing of implicit and explicit relations between discourse segments.

Despite the importance of these results, it seems that they do not fully answer the above-mentioned question. Every observation needs a theory behind in order to get a value. The mentioned studies, in joint, lack a unitary framework that fully describes the nature and functioning of DMs. Most of them draw on a pretheoretical notion of DM that do not help delimit the category. It is not only that the kind of units studied do not fully fill up the range of linguistic items that cover such function, but also that we lack information about which properties make these units what they are and how they help trigger such cognitive effects. In addition, some of these studies also confine the function of DMs to the marking of existing relationships between sentences. The theoretical grounds of this view are not far from the

meaning of the sentences is evaluated. Another direct function of comprehension tests is to look for the comprehension effects of different types of linguistic independent variables.

traditional consideration of DMs as superfluous or burdensome units in languages, which is against the evidence provided by their ubiquitous presence in all languages.

The most consistent view on the very nature of the meaning of DMs and their functioning comes from a pragmatic theory, namely, Relevance Theory, where they are anchored in a wide theory about the nature of communication. Within this framework, a clear functioning and —from a functional point of view— the ultimate reason for their existence can be brought out: since communication is an activity that involves ostensive-inferential coordination, linguistic signals that explicitly constrain the direction in which inferences should be made are to be expected (Loureda et al., 2021: §1.2). Therefore, experimentation could benefit from a decisive and more autonomous framework of experimental pragmatics, which tries to get autonomy from the discipline of psycholinguistics (Loureda et al., 2021). As pointed out by Loureda et al. (in press), within it, proper pragmatic theories, such as those concerned with the implicit communication (Grice, 1975; Horn, 1984; Sperber and Wilson, 1995[1986]; Blakemore, 1987; Levinson, 2000) can be tested and, therefore, accepted or rejected.

As analyzed in §1.1, the distinction between conceptual and procedural meaning brought by Relevance Theory has impacted on a reassessment of the classification of linguistic units and has given a satisfactory explanation of their division of labor in the utterance interpretation. The central role of DMs in this new setting is enhanced because of some properties that differ from those carried by traditional grammatical words: they are not obligatory markers, they are non-truth conditional and they do not even act within the predicate of the sentence. However, as all the other grammatical marks, they provide instructions onto how to operate with conceptual words. Specifically, DMs do it by constraining the inferences that should be made over conceptual representations to reach the intended implicatures, thus, to construct discourse (Loureda et al., 2018).

Accordingly, they represent perfect candidates to inspect procedural meaning and become a yardstick to observe qualitative and quantitative differences between grasping the intended meaning through conventional implicatures or by drawing on conversational implicatures: that is to say, inferring implicatures out of the context or retrieving them by following the inference path encoded by the DM. Despite this, until recently, this perspective had not been taken into account in experimental studies and, therefore, the cognitive dimension of procedural meaning has been somehow overlooked.

In the last decade, some attempts have been made, especially within the DPKog research group (Nadal, 2017; Recio et al., 2018; Cruz and Loureda, 2019; Narváez, 2019; Recio, 2019; Salameh, 2019; Cruz, 2020; Torres Santos, 2020; Guillén, 2021; Rudka, in preparation), to experimentally test the working of DMs as encoders of procedural meaning and, thus, as guides for the inferential path. Through the analysis of a considerable body of very similar experiments with a wide range of Spanish DMs, recently (Loureda et al., 2021) some processing strategies common to all of them have been identified and explained as discourse marking processing principles. They can be taken as the skeleton or schematic meaning of the procedural meaning displayed by DMs. In the next section, we briefly show the findings of these experiments with Spanish DMs

and how they relate to the framework. In addition, we discuss how previous findings on the nature of such units fit with these hypotheses.

4.1.1 Individual studies of discourse markers with eye-tracking: towards the discourse marking principles

Following the line of reasoning summed up on the procedural meaning, two facts should be expected when testing this kind of units experimentally:

- on the one hand, a difference between conceptual and procedural words in processing is envisaged, according to their different roles in utterance interpretation;
- on the other, and most importantly, utterance processing should be affected by the presence of DMs, according to their leading role in utterance interpretation.

A series of experiments in Spanish has succeeded in accounting for these facts, by testing the effects of the presence of an object of study that can be characterized through the abovementioned features: linguistic forms that do not fulfill any function in the predicate structure, are non-truth conditional and guide the inferences the speaker has to do in the utterance interpretation. The kind of units that have been tested can be grouped under these features, since the experiments have focused on the following different types of DMs, which nearly exhaust the main taxonomy of DMs posited by Martín Zorraquino and Portolés (1999):

- argumentative connectives, such as the consecutive *por tanto* ‘therefore’ (Narváez, 2019; Recio, 2019), the counter-argumentatives *sin embargo* ‘however’ (Nadal, 2017; Recio, 2019), *a pesar de ello* ‘despite that’, ‘in spite of that’ (Guillén, 2021) or the additive *además* ‘furthermore’ (Thome, 2018);
- discourse organizers, such as *primero* ‘first’ and *segundo* ‘second’ (Loureda et al., 2021);
- reformulation markers, such as *o sea* ‘I mean’ (Salameh, 2018) or *es decir* ‘that is to say’ (Schröck, 2018);
- focus particles or operators, such as *también* ‘also’ (Loureda et al., 2021), *hasta* ‘even’ (Torres Santos, 2020) or *incluso* ‘even’ (Cruz, 2019).

As seen before, Relevance Theory posits a qualitative difference between conceptual and procedural meaning: the former is flexible and adaptable to the context, while the latter is rigid and imposes its meaning over the context (Leonetti and Escandell, 2004); or, in other words, it forces to change the set of assumptions to process its meaning. This qualitative difference envisages a different processing time. For checking whether this particular theoretical claim finds empirical demonstration, first, syntagmatic comparison can be taken as an indirect but illustrative evidence: that is to say, it is worth comparing the processing costs of the different kind of words in the same sentence, namely, conceptual and procedural words.

The results of eye-tracking experiments with argumentative connectives, such as *sin embargo* (Nadal, 2017; Loureda et al., 2016), *por tanto* (Narváez, 2019; Recio, 2019) and *a pesar de ello* (Guillén, 2021) show that DMs imply, by default, a longer processing time than lexical conceptual

words. The weight of processing these argumentative connectives in the utterance varies as well depending on syntactic and pragmatic properties, e.g., position in the sentence or plausibility of the relation according to the context provided.

The same can be applied to reformulation markers such as *o sea* (Salameh, 2019) or *es decir* (Schröck, 2018), where, again, the DM has turned out to be the most cost demanding discourse member, compared to the segments it has scope over.

Finally, operators also display this asymmetric pattern, as can be seen in experiments with the focus operator *incluso*, which displays a cognitive cost higher than the focus and the alternative areas (Cruz and Loureda, 2019).

This would lead to the conclusion that DMs become the axis of the argumentative connection and, by virtue of their leading or instructional role, require more cognitive effort (Nadal, 2017: 198). Such a conclusion entails a huge amendment to the traditional view of grammatical/function/procedural words as empty words and in particular to the semantic bleaching, weakening, reduction posited for the development of grammatical markers in grammaticalization theory (Lehmann, 2002[1982]). Instead, a view that treats semantic change in grammaticalization as a loss-gain process or a mapping schematic process (Traugott, 1988, 1995a; Sweetser, 1988) is confirmed. Specifically, at least for DMs, these experimental results endorse the pragmatic enrichment and strengthening of the forms (Traugott, 1988; 1995a; 1995b) in some part of the process, as claimed by Loureda and Pons Rodríguez (2016).

In addition, this experimental perspective calls into question the functional approach to grammatical status by Boye and Harder (2012) seen in §1.1 so as to render open the question of whether DMs should be conceived as grammatical words.

As seen in chapter 1, Boye and Harder (2012), in seek of a functional description of grammatical status that overcomes the insufficient and unclear structural approaches, describe grammatical meaning as the one communicatively secondary. Then, it should be explained why functionally (or communicatively) not prominent units are instead cognitively salient. In exploring such a paradox, one could argue for a distinction between kinds of procedural words, since eye-tracker studies do confirm a high rate of skips in short grammatical words, such as prepositions, conjunctions, articles, etc.

This raises the question of whether the high cognitive weight of DMs has to do with their special procedural meaning, namely, that helping construct discourse. In the point of view of Relevance Theory, are DMs more cost-demanding because they constrain the inferences? A negative answer to this question would come from the very nature of the theory. Most relevantists would consider reformulation markers as appositional markers that constrain not the implicatures but higher-level explicatures (Blakemore, 1996, 2007; see Pons, 2008a, for a thorough discussion), thus, acting at the same level than, for example, mood markers. However, the processing costs of this kind of units has been revealed to be similar to those actually acting over inferences. Moreover, one of the conclusions of Salameh (2019) on the functions of Spanish *o sea* relates conclusive *o sea* as a more grammatical function and paraphrastic and reformulative *o sea* as

more discursive functions regarding the processing costs of the utterance, but the difference between the area of the DM and the other discourse segments remains large in both functions.

If this solution (constraint over inferences as responsible of the cognitive overweight) is disregarded, the effect should be attributed to other distinctive features of DMs. In this sense, syntactic independence of DMs or extrapositional scope is one of the most particular properties that, furthermore, can be related to their non-truth conditional meaning. This idiosyncratic feature includes all the above mentioned categories and attitudinal and illocutionary adverbials as well.

As analyzed in the first part of the thesis (1.3), there is a specific framework that deals with this special syntactic feature and brings it up to concede a special role in communication. Within *discourse grammar* (Kaltenböck et al., 2011; Heine et al., 2013; Kaltenböck and Heine, 2014), two main domains are distinguished: sentence grammar and thetical grammar. Thetical grammar consists of units that are not integrated in the syntax of the sentence, are non-truth conditional and provide a metadiscursive/metacommunicative assessment of the utterance. The main contribution of thetical grammar is that it highlights the fact that some units are both conceptual and non-truth conditional in virtue of their syntactic behavior. Furthermore, this syntactic behavior goes hand by hand with a special role in communication. In this sense, both DMs and other conceptual constructions coopted from sentence grammar fall under the domain of thetical grammar.

The framework paves the way, from our point of view, to consider procedural meaning as a function attached to certain domains or functions of discourse. Thus, it is reasonable to formulate the question of whether all the units fulfilling a specific functional slot would trigger the same processing overload compared to conceptual propositionally integrated words.

The other main hypothesis to be proved about DMs has to do with the very nature of procedural meaning, that is to say, instructional meaning that helps speakers to constrain inferences and, therefore, manage processing efforts of the utterances in which they are embedded. For this hypothesis, a paradigmatic comparison (across conditions) becomes a suitable and more direct method; that is to say, areas of interest in an utterance with DMs must be compared to these same areas in the utterance without DMs.

The hypothesis can be formulated as the following qualitative principle (Principle I): a DM introduced in a given utterance modifies its processing strategy (Loureda et al., 2021). The modification can manifest itself as a reduction only in a specific member of the discursive relation or in the overall processing of the utterance. The first case accounts for the minimal expression of the principle, while the second constitutes the exponent of the maximal effect.

All the DMs studied accomplish such a qualitative constraint. The counterargumentatives *sin embargo* and *a pesar de ello*, the reformulative *es decir*, the focal operators *también*, *incluso* and *hasta* in most syntactic and semantic conditions and the correlative discourse organizer *primero/segundo* cover the maximal expression, since they show different overall processing

times compared to the unmarked condition. Focus operators in specific conditions⁶⁸ and the consecutive *por tanto* only modify one constitutive part of the discourse relation and so they fulfill the minimal effect of the qualitative principle.

From a quantitative point of view (Principle II), this maxim can be narrowed down as to constrain the directions in which the modification of the processing strategy can take place. It has been broadly proved in different studies in a minimal expression: all DMs trigger an overall utterance processing cost not higher than the one displayed by the same utterance without DM. It makes evident that a processing strategy takes place in presence of DMs, insofar as the cost of processing an extra conventional signal (i.e., the DM) does not raise the overall utterance processing, as implied by the following figure:

$$\text{DISCOURSE MEMBER 1 + DISCOURSE MARKER + DISCOURSE MEMBER 2} \leq \text{DISCOURSE MEMBER 1 + DISCOURSE MEMBER 2}$$

Figure 14. Quantitative principle (Principle II): implicit relations are not more cost-demanding than explicit relation

It can be figured out that this general principle can be paraphrased by the following more direct rule: utterances with DMs require the same or less time to be processed than the same utterances without DMs. The effect varies as to the meaning of the DM and the discursive relation entailed by them: some of them allow a speeding-up effect (acceleration), while others only preclude a slowdown effect (neutralization).

Thus, Recio (2019) and Narváez (2019) show, in experiments with the Spanish consecutive DM *por tanto*, that processing implicit and explicit causal related utterances implies the same total processing weight, reaching similar results to previous studies (for instance, Murray, 1995). Explanations to this fact come from different and complementary theories: the causal-by-default processing of juxtaposed information (Sanders, 2005) implies that the extrainformation provided by the connective floats the maxim of quantity of Grice (Narváez, 2019: 191) and, then, minimizes the speeding-up presupposed to the DM.

In the case of counter-argumentative relations, the facilitating role of DMs seems to be quite higher. A debate on whether this is possible to be measured in the same fashion than in causal relationships arise, as it is often held that implicit counterargumentative relations do not exist or lead to evident difficulties to connect segments (Murray, 1995; Cozijn et al., 2011: 495; Sanders and Canestrelli, 2012: 211; Canestrelli, 2013: 11; Narváez, 2019; Loureda et al., 2021: 48). However, the higher reducing effect holds even when the comparison concerns a consecutive implicit (non-marked) relation and a counter-argumentative marked relation, as

⁶⁸ It is the case of *hasta* when the alternative to the focus takes the form of a semantic entailment (Torres Santos, 2020) or *incluso* with simple or minimal alternative, i.e., the focus opposes only to one alternative (Cruz, 2020).

suggested by Nadal (2017: 275). In her contrast between these two kinds of utterances, counterargumentative utterances marked with *sin embargo* display a significant reduction of 16% of time demanded for processing the utterance. Guillén (2021) reaches similar results for the Spanish counterargumentative DM *a pesar de ello*, but the effects are lower than those of *sin embargo* (6% lower than the implicit causal relation).

In different kinds of reformulative relations that involve more or less communicative distance between the reformulated and the reformulator segments, the processing of the utterance lexical mean is significantly lower when it is marked by a specific marker —*es decir* (Schröck, 2018)—. Likewise, in argumentative operators such as focus particles, acceleration and neutralization effects are found in such a way that the unmarked condition is never read faster. The same applies to the correlative discourse organizer *primero/ segundo*, which show global reduction effects of 5.75%.

This overall processing strategy well attested for DMs can be broken down into more particular effects, by analyzing other areas of interest (see 4.2.3) and considering both early and late effects. For example, a closer inspection to the discourse member following or hosting the DM reveals that regulatory effects arise at this area early. This is what has been called the *immediate regulation of the discursive scope principle* (Principle III in Loureda et al., 2021): once the DM has been processed, the following discourse member under its scope is not processed slower than it is in the implicit condition.

In the case of *por tanto*, the immediate regulation manifest itself in the fact that the consecutive member in the marked (explicit) condition does not exceed the temporal limit of this member in the implicit condition when we look at the first readings (Narváez, 2019: 193; Recio, 2019: 202). In both studies, moreover, an enhanced reducing effect is reported in second reading times, where the consecutive member in the explicit condition does show a lower processing time with medium effects (Narváez, 2019: 193; Recio, 2019: 204). This effect translates into a reduction in the overall processing of the discourse member (total reading time):

From what has been seen in this subsection, it can be concluded that the connective accelerates the processing of the segment that hosts it by reducing the time required to process it. Hence, in the global reading, this segment is read 8.59% faster than its implicit counterpart. (Narváez, 2019: 194)

Early effects of DMs are more evident in other kind of discourse relations, such as paraphrasing and reformulation, where the acceleration of the second discourse member in explicit relations amounts to 47% and 12 % respectively in the first reading time for *o sea* (Salameh, 2019: 266) and 15% and 11.46% for *es decir* (Schröck, 2018). Close to the early reduction effect of reformulation is placed as well the counterargumentative *a pesar de ello*, with 11% of difference (Guillén, 2021).

The regulatory effect carried out by DMs is also evident in an operation, often called reanalysis, which takes place in re-readings. In particular, it can be seen in the relative contribution of re-reading time to the global processing: confirming the contextual effects arrived at with the guidance of DMs does not yield a slower global processing of the utterance than it is performed

when grasping such implications from the context. Therefore, reanalysis in discourse-marked structures is a controlled checking-task that does not slow down the processing of the utterance.

The relative nature of this corollary renders a wide range of types of reanalysis. Some DMs (*es decir, por tanto, hasta* and *también* in some conditions) show a positive reanalysis, in that the operation is performed faster. Others imply a neutral reanalysis (e.g., *incluso* in some syntactic environment), which means an equal processing in re-reading time; finally, the reanalysis can be negative, as long as the weight of re-reading does not cause the utterance being read slower in global terms; this is the case of *hasta, incluso* and *primero/segundo*.

All the results we have seen concern the role of DMs in constructing discourse by comparing the presence and absence of a specific DM in some utterances. This design has helped to find processing strategies triggered by DMs, arisen as facilitating effects in the overall processing or in one of the discourse members (or both).

4.1.2 Comparative studies of discourse markers with eye-tracking

Less attention has been drawn to show whether different DMs imply a different behavior, from the point of view of processing. An antecedent pointing to this goal can be found in Murray (1995), who compared the role fulfilled by causal, additive and counterargumentative connectives in online processing; the study reported lower reading times in the area following the connective for adversative, but not for causal and additive connectives. In other study, Murray (1997) came up with a hypothesis for the obtained results, according to which readers attend to a continuity expectation; any shift should be marked to solve the violation of the expectation; as a consequence, it is reasonable that causal and additive connectives (continuity relations) do not impact so much in reading as adversative markers do (signaling the discontinuity upcoming).

In a similar vein, but with the above-mentioned explanative model, Recio (2019) compares causal and counterargumentative explicit relations marked by *por tanto* and *sin embargo*. However, in such designs, the role of DMs is to some degree inherent to the discursive relation, namely, causal and counterargumentative relations, and cannot be isolated. In fact, Salameh (2019), in an onomasiological swift, succeeds to demonstrate different processing patterns triggered by the Spanish DM *o sea* in its different functions. Therefore, the “intricate relation between connectives on the one hand and the properties of the relation on the other” (Sanders and Canestrelli, 2012: 219) cannot be ignored.

Comparing morphosyntactic and functional properties of DMs requires drawing on an equal discursive relation by displaying the same contexts. One of the most quoted features of DMs that encloses both morphosyntactic and functional behavior is the varying degrees of grammaticalization they may display (Portolés, 1998; Zorraquino and Portolés, 1999). In this sense, a pragmatic paradigm of DMs (for the notion of pragmatic paradigm, see Estellés, 2009a) becomes suitable to analyze cognitive responses to the different degree of grammaticalization displayed by each of them. Here, Grammaticalization Theory can be recruited from the experimental arguments previously exposed.

In the implicit condition, argumentative relationships are recovered by means of particularized conversational implicatures (Grice, 1975; Levinson, 2000), that is to say, by drawing on the particular context of the utterance. In explicit conditions, the relationship is recovered through a conventional implicature; in other words, by decoding the procedural meaning of DMs. However, in an evolutionary point of view, structures do not directly pass from the first scenario to the second; instead, they undergo a gradual generalization of the implicature until its conventionalization. Therefore, theoretically, a gap between the two conditions studied in the previous section remains understudied and differences between units with a varying degree of grammaticalization can be envisaged.

This is the starting point taken by Recio et al. (2018) to undertake an eye-tracker study on the processing patterns triggered by different DMs belonging to the same functional subparadigm, namely, Spanish consecutive DMs *por tanto*, *por eso* and *por ello*. As analyzed in chapter 3, although they share the consecutive connective meaning and can be used in similar contexts, morphosyntactic differences are also noticed, whereby they can be sorted in two groups: the grammaticalized DM *por tanto*, on the one hand, and non-fully grammaticalized connective devices *por eso* and *por ello*, on the other. Differences of processing strategies can be attributed, according to the authors, to the varying degree of grammaticalization.

Accepting this theoretical argument permits formulating the hypothesis that, from a cognitive viewpoint, a grammaticalized procedural expression (like *por tanto*) and a connection carried out by means of an anaphoric substitution (like in the case of *por ello/eso*) might trigger different processing strategies, since they encode different instructions. *Por tanto* encodes an integrated instruction (a causal-consecutive argumentative connection), while *por ello/por eso* encode a complex instruction (a cause-consequence semantic relation and an anaphorical substitution of an identified antecedent) (Recio et al., 2018).

The research is conducted by means of two experiments: the first one concerning the comparison between *por ello* and *por eso* and the second one comparing *por tanto* and *por eso*. Regarding the first experiment, results show no differences between the overall processing of the utterances with *por ello* and *por eso*, nor for the connected discourse members, but a difference in the area of connectives is reflected: the area of *por ello* is 9% less cost demanding than *por eso*. A closer inspection to the early and late measures, however, reveals differences in the stages the overall processing core appears at: when the relation is signaled by *por ello*, earlier processing reduction effects appear, while the relation marked by *por eso* leads to late processing effects. In other words, utterances with *por ello* are processed faster in the first readings, while utterances with *por eso* display a lower processing effort in rereadings.

Apart from this difference, which is defined by the authors as a complementary distribution, the results highlight an analogue processing strategy triggered by both connectives: first, they become the axis of the relationship in the first readings, by assuming more attention at this stage; second, in re-readings there is an attention shift to the connected discourse members, where, in the authors' opinion, anaphorical resolution takes place; and, third, more processing weights are assumed by the causal member compared to the consecutive member in

reinspections. In a nutshell, these non-grammaticalized devices do not differ in terms of their overall recovery strategy.

In the second experiment (*por tanto* vs *por eso*), an overall quantitative equality regarding the utterance processing was found as well. However, the strategies leading to that processing differ, according to the authors: the area of *por tanto* assumes a higher processing cost during the construction and confirmation of the argumentative relation; the condition with *por eso*, in turn, leads to a further inspection of the discourse members, mainly the causal one, according to its anaphorical nature, which is manifested as a more effortful processing in the area of conceptual mean (those words affected by the instruction of the connectives). Therefore, though leading to the same quantitative processing, grammaticalized *por tanto* and non-grammaticalized *por eso* draw on different recovery strategies.

While the approach has been shown successful in mapping a grammaticalized/non-grammaticalized distinction into singular processing strategies, some particular issues arise as to a further generalizability of the proposal. Some particular questions arising from the results are the following:

- Why is there a processing difference in the area of the connective between non-grammaticalized devices, being *por ello* 9 % heavier to process than *por eso*?
- What is more, why is there a complementary distribution (different behavior) related to the stage in which the effect prominently starts, triggering *por ello* faster first readings and speeding up *por eso* the processing in second readings?

The general issues that can be derived from these particular questions are the followings:

- While the authors recognize that morphosyntactic differences between *ello* and *eso* can be held responsible for the results obtained, an open question from the study is: could the method distinguish only grammaticalized vs non grammaticalized items or is it also able to determine further degrees of grammaticalization, according to the gradualness accepted for the change and the gradience observable in synchronic samples?
- In this sense, which is the threshold for assuming that grammaticalization has affected the way a particular item behaves?

This first question certainly calls for a new experimental design to be answered. A paradigmatic comparison, where all the connectives are read by all the participants and, therefore, direct quantitative comparisons can be undertaken, becomes suitable to better analyze the actual architecture of the functional paradigm. However, as subtle processing differences between connectives not held by morphosyntactic introspective tests are to be expected (as in this study), the following more general question becomes worth considering:

- To what degree can grammaticalization framework alone explain the cognitive differences found or explain the subsequent paradigm drawn by the results?

In this sense, the conclusions of Recio et al. (2018) paves the way for a theoretical widening by drawing attention on the limits of the grammaticalization approach:

Whereas an expression like *aunque* ('although') has been syntactically, semantically and pragmatically indivisible for a long time and is associated as a minimal unit to a processing instruction of concessivity, an expression like *para que* ('in order to') still shows a conspicuous compositionality, insofar as it is integrated by an element expressing subordination (*que*) and another encoding a notion of purpose (*para*). This, however, does not prevent us from considering the sequence *para que* a complex unit with a final subordinating value. In other words, not only grammaticalized expressions, but also other ritualized combinations (in Haiman's sense, 1994) can be handled as sequences of signs associated to unitary meanings, in line with what Lehmann calls a "holistic" approach.

Certainly, construction grammar (Chapter 2) accomplishes such a holistic approach, which manage to encompass other ritualizations. Recall that the definition of construction has been widened to include not only form-meaning pairing whose meaning is not predictable from its parts but also those discourse strings that though transparent are strongly entrenched as a unit (§2.2) (Goldberg, 2003). In fact, the alluded conspicuous compositionality suits well with the conceptual distinction argued by some authors (Langacker, 1987, Croft and Cruse, 2004; Bybee 2010), where compositionality is set apart from analyzability. Let us quote Bybee for explaining this issue:

Both chunking and increase in autonomy are gradual processes, and the formation of a chunk (a storage and accessing unit) does not necessarily mean that speakers are no longer aware of the component parts and their meanings. That is, a sequence of words can become automated as a chunk through usage while a transparent relationship with the words in other contexts is maintained. (Bybee, 2010:72)

One of the most important advantages of applying a constructional view to historical changes is that it accounts for both changes in the formal and functional pole separately, as constructional changes. It is worth noting that the study of Recio et al. (2018) relies mainly on morphosyntactic differences to account for the degree of grammaticalization; that is to say, formal features remain as the differential criterion (even though anchored in a unitary account of the change, i.e.: a parallel form-meaning change).

Yet, other eye-tracking studies have focused on the functional divergences in causal connectives, as the main factor to be analyzed. Within the causal domain of connectives, there is, according to some authors, a specification of meaning regarding its degree of objectivity/subjectivity (§3.1.2), so it is just this subtle semantic-pragmatic property what is intended to be measured cognitively in these studies (Traxler, Bybee and Pickering, 1997; Kamalski et al., 2008; Kleijn, 2012; Canestrelli, 2013).

Canestrelli (2013) goes a step beyond Traxler, Bybee and Pickering (1997), who demonstrate a heavier processing of subjective causal relations, to analyze the online effects of subjective connectives. That is to say, while the first study inspects subjective causal relations marked with *because*, an underspecified connective with regard to the degree of subjectivity, Canestrelli compares Dutch forward and backward causal connectives specialized in objective or subjective relations.

The results of the six experiments consistently point to the role of the specified objective or subjective connectives in triggering objective or subjective readings. The corollary of the study can be outlined as follows:

- Subjective causal relations are harder to process than objective causal relations.
- Some connective triggers by virtue of their meaning one kind of relation.
- The subjective overload does not have to do with the mental space evoked by the marker, but with a difficulty associated with the relation itself.

4.2 Methodology

Up to now, a way through the frameworks that deal with diachronic changes leading to grammatical/procedural linguistic units has been drawn (chapters 1 and 2). Within it, we have described and discussed all the properties and mechanisms involved from both grammaticalization and constructionalization frameworks. From a methodological point of view, it has been emphasized that methods used so far have found several hurdles that impede to capture the changes clearly and, what is more important, have cast some doubts about the actual nature of the change.

Accordingly, a methodological widening to shed more light on these issues is needed and, we have claimed (§4.1), experimental linguistics/pragmatics provide suitable tools to undertake this enterprise. Findings on the role of procedural meaning of DMs in the processing of utterances shown by eye-tracker studies pave the way to study differences in the conventionalization of such procedural meaning, where a first study has already been carried out (i.e., Recio et al., 2018).

Specifically, our main goal is to check whether the developmental path from conceptual/intrapositional to procedural/extrapositional units correlates with cognitive patterns, assuming that some DMs with a similar function are placed at different points of this path. The path, as seen before (§2.3.1), can be reinterpreted as a network of constructions with different kind of links. Here, therefore, the results would not be straightforwardly connected to one framework, but provide answers to the following points:

- If the processing patterns match introspective distinctions about the morphosyntactic behavior of these DMs, grammaticalization as a unitary (form-meaning) change will be thought of as showing a cognitive reflection.⁶⁹
- If the processing patterns draw further distinctions between DMs, usage-properties will be thought of as affecting the cognitive representation of the grammatical status of these pieces or constructions.

⁶⁹ This is certainly the classical view on grammaticalization: “Here, too, the various factors — to be used as criteria of grammaticalization — apply to the sign as a whole, they do not differentiate between content and expression”. (Lehmann, 2002 [1982]: 109)

- If no differences are found between markers, being all of them equally relevant in modifying the processing of the utterance, a spontaneous (synchronic) account of procedural meaning should be conceived: eye-tracker responses capture the functional slot of the pieces, as a procedural one.

In order to explore such issues we have designed and carried out an eye-tracker experiment involving cause-consequence relations signaled by these markers. In the next sections, a global description of the experiment will be made, in order to make it understandable. In section § 4.2.1 we will explain the eye-tracking measures that reveals useful for the aims of the study and become, hence, the dependent variables of the experiment. Afterwards, in §4.2.2 we will get into the design of the experiment, addressing:

- a. Independent variables and experimental conditions (§4.2.2.1).
- b. Stimuli and condition distribution (§4.2.2.2).
- c. Internal description of the experiment (§4.2.2.3).

Finally, we will give account of the way in which the experiment has been run: the participants (§4.2.3), the procedure (§4.2.4) and the data treatment and statistical models (§4.2.5).

4.2.1 Eye-tracking measures: dependent variables

Choosing the suitable parameters for analyzing responses to specific experimental conditions within a defined framework becomes a fundamental decision in every experiment. Previous experiments on the role of procedural meaning of DMs presented in §4.1 and §4.2 have proved the validity and stability of three measures in order to observe the cognitive strategies triggered by DMs: *total reading time* (TRT), *first reading time* (FRT) and *re-reading time* (RRT). They all belong to *fixation duration measures*, that is to say, those based on the time spent in a region when the eye remains relatively still on it. This kind of measure is “likely to be the most used measure in eye-tracking research” (Holmquist et al., 2011: 377). Fixations are assumed to reflect the processing of the portion of text being fixated directly, according to the *eye-mind hypothesis* (Just and Carpenter, 1980) and the *immediacy assumption*: the former claims for a direct connection between eye-movements and cognitive processes and the latter holds that no delay is to be considered between the fixation of a portion of text and the processing of it.

Total reading time (TRT) becomes a basic measure, since it reflects the time needed to process utterances in every experimental condition. It is defined as the sum of all the fixations made in a specific area or region of interest.⁷⁰ However, for fine-tuning the observation of the discursive strategies triggered by DMs, more nuanced measures are required.

⁷⁰ This measure has been referred by different terms in the literature. *Total reading time* is used by Clifton et al. (2007), among others; *total dwell time* is also a broadly used term for the parameter, adopted by Holmquist et al. (2011); finally, *glance duration*, *gaze* or *total fixation time* have also been found referring to this measure in the literature.

One of these dependent variables is *first-reading time* (FRT), which is a broadly used measure in reading experiments. It is defined as the sum of all the fixations made in a region before passing onto the next region⁷¹ (Rayner, 1998; Hyöna, 2003; Holmquist et al., 2011). In some studies, it has been taken as an early measure that reveals first stages of processing or lower-order cognitive processes, such as lexical access or syntactic parsing (Clifton et al., 2007: 349; Holmquist et al., 2011: 390; Godfroid, 2020: 217). However, assuming that in language processing all the processes occur in parallel to some extent (Pulvermüller et al., 2009; Egorova, et al., 2013) it is rather thought of as revealing the time the speaker needs in solving the task of building a first sketch of communicated assumption (Loureda et al., 2021: §3.3). Our interpretation of this measure is in line with these approaches, since it fully matches the holistic view of grammar exposed in this thesis, where the meaning coded in constructions encompasses semantic meaning, pragmatic features and discourse functions.

The last measure we will use in this study is *re-reading time* (RRT), which can be defined as the time spent in a region after this has been left for the first time; that is to say, it reflects the time consumed in all the regressions into a specific area of interest. While some authors claim that this measure shows difficulties in processing or higher-level processing processes (Reichle et al., 2003: 450; Godfroid, 2020: 217), in the holistic approach taken here it is to be analyzed as the metapragmatic evaluation processes triggered by the speaker when (s)he is in the need to confirm the communicated assumption.

Note that assuming an integrative near-simultaneous model of processing where semantic and pragmatic processes run in parallel does not preclude from the existence of communicative tasks taking place at a later stage. Such tasks can be elicited by higher-order processes. This is what assume Egorova et al. (2013) advocating for a near-simultaneous processing model, in the light of their results of an ERP study on speech-act types. The claims are based on time windows elicited by the processing of utterances but can be extrapolated for analyzing the need to re-inspect areas of text.

4.2.2 Experiment design

4.2.2.1 Independent variable and experimental conditions

Our independent variable can be said to be the degree of grammaticalization of the linking connective used in the argumentative relation. As stated when discussing about the nature of the change (chapter 1), this variable is gradable and in the case of our experiment consists of four experimental conditions, represented by four different DMs (figure 15). From a constructional point of view, we use a causal construction with the linking slot filled by different connectives. These are themselves constructions that may display a different constructional status: they are more or less schematic and they are more or less linked to the DM category.

⁷¹ Other labels for this measure are *first pass dwell time* (Holmquist et alii, 2011) and *first pass gaze duration*.

Independent variable			
<i>Degree of grammaticalization / constructional status</i>			
A2 POR TANTO	A3 POR ESO	A4 POR ELLO	A5 POR ESTO
Experimental conditions			

Figure 15. Independent variable and experimental conditions

Absence of DM was included as a baseline for checking the behavior or not of such units as a class (the one of DM). Conditions are managed in stimuli and distributed in the same number of experimental lists, following a Latin-square distribution, as will be detailed below.

4.2.2.2 Sets and stimuli distribution

We built sentence-types designed for observing the effect of independent variables in our experiment (for the design of the sentences, see §4.2.3.1). The sentences were manipulated in order to vary only as to the condition of the experiment they involve and, therefore, one version of the sentence was created for each condition, which constitute tokens or critical stimuli. Afterwards they were grouped as a **SET** of stimuli or **TOKEN SET** (Gries, 2013: 46 and ff.). The table below shows the set constructed for one of the sentence types used in the experiment, including five stimuli, each one representing one condition.

SET 1	
Condition	Stimuli
∅	Guillermo y Victoria escriben novelas buenas. Venden muchos libros
Por tanto	Guillermo y Victoria escriben novelas buenas. Por tanto venden muchos libros.
Por eso	Guillermo y Victoria escriben novelas buenas. Por eso venden mucho libros.
Por ello	Guillermo y Victoria escriben novelas buenas. Por ello venden muchos libros.
Por esto	Guillermo y Victoria escriben novelas buenas. Por esto venden muchos libros.

Table 8. Example of a set of the experiment

For carrying out a within-subject experiment, where each participant reads all the experimental conditions, it is required that the experiment contains at least as many sets as conditions under study. In our case, a replica was added in order to avoid intra-subject variation: that is to say, we obtained two responses to each condition from every participant in order to make sure that the effect was due to the experimental condition and not to other factors occurring at the reading time. One replica unlikely creates conscious or unconscious reading automatization of the structure or construction, since we kept a 1:2 ratio of fillers and we added distractors in the same ratio. Moreover, conscious automatization is completely disregarded by the answers provided by participants when asked about the goal of the experiment after they had finished it.

Therefore, the conditions were included in 10 sets (two per condition) with their respective stimuli. The distribution of the stimuli followed a counterbalancing technique (Sandra, 2009: §3.1.7): they were distributed across five experimental lists following a Latin-square model, which means that only one stimuli of each set is presented in each experimental list, thus avoiding participants to read the same item in different conditions.

A schema of the item-condition crosses and the distribution across experimental lists is given in figures 16 and 17. The numbers that follow the letter “t” in figure 17 represent the sentence types and the numbers following “a” the experimental conditions; capital letters inside the box depict particular tokens or stimuli that include one condition in a sentence type.

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
A1	A	F	K	Q	V	AA	FF	KK	PP	UU
A2	B	G	L	R	W	BB	GG	LL	QQ	VV
A3	C	H	M	S	X	CC	HH	MM	RR	WW
A4	D	I	O	T	Y	DD	II	NN	SS	XX
A5	E	J	P	U	Z	EE	JJ	OO	TT	ZZ

Figure 16. Item-condition crosses

EXP1	EXP2	EXP3	EXP4	EXP5
A	B	C	D	E
G	H	I	J	F
M	O	P	K	L
T	U	Q	R	S
Z	V	W	X	Y
AA	BB	CC	DD	EE
GG	HH	II	JJ	FF
MM	NN	OO	KK	LL
SS	TT	PP	QQ	RR
ZZ	UU	VV	WW	XX

Figure 17. Experimental lists with item-condition crosses

We took the number of experimental conditions and, therefore, experimental lists, as the factor to calculate the minimum of participants required for the reliability of the statistical study.

4.2.3 Participants: population and sample

169 participants were recruited for the experiment in the Faculty of Philology, Translation and Communication of the University of Valencia. They were compensated for their participation with a voucher for the university cafeteria.

In the pursuit of a homogeneous sample, all our experimental subjects fitted some characteristics that are important because of both the goal of the research and some technical issues:

- All of them were between 18 and 35 years old, meeting the condition for an optimal reading performance.
- They were naive about the actual purpose of the experiment, avoiding, thus, contaminated readings.
- They had accessed higher education level, showing a homogenous instruction level.

4.2.4 Materials

4.2.4.1 *Internal structure of themes*

The stimuli were presented in brief “stories” about the life of different characters (themes). The stories consist of five parts, each one occurring in a different slide. In the first slide, a context introducing the characters is presented; there is a picture of them and a sentence describing their life, most of times, in terms of their occupation, hobbies or overall characteristics. The context is necessary in order to create a consistent frame, in which the critical item fits without extra inferring processes. That is to say, we intend to provide a sufficient common cognitive environment to render the cause-consequence relation natural; otherwise, the participant would need processing extra-costs to derive it, mostly in the condition without DM, thus distorting the real effects of DMs.

After the context, two sentences about some facts in the life of the characters, which act as *fillers*, follow. Fillers are, therefore, inserted in a 2:1 ratio, with regard to the critical item. The function of fillers is to hide the actual purpose of the experiment and to avoid (un)conscious automatization/ habituation of the structure at hand.

Finally, the theme contains the critical items. They are the stimuli where the independent variables are managed and manipulated. Since it constitutes our object of study, stimuli deserve a major attention, to describe and justify their design and structure that allow us to adjust it to the goals of the research and to prevent from undesired biases.

4.2.4.2 *Stimuli design*

Stimuli were designed seeking one major goal: finding a baseline where processing differences should be attributed to the semantic-pragmatic properties of the DMs, thus controlling other semantic and syntactic confounding factors. Such an optimal design was based and benefited from previous stimuli of experiments run in the DPKog research group and, thus, proved experimentally valid. We focused on three main levels that must be adjusted to a neutral status.

At the overall semantic level of the discourse relation, we intended to build the same by-default causal relation in all the sentence types. Hence, all the critical items were designed to trigger a forward (non-volitional) objective causality (chapter 3) by default: two states of affair are connected in a cause-consequence relation. The choice has to do with the natural fitness of all the markers in such relation.

Secondly, the syntactic structure chosen for conveying such a relation was the same in all the stimuli, which allows controlling processing cost differences associated to the degree of syntactic complexity (Clifton and Staub, 2011). The sentence is active, transitive and non-reflexive, with an explicit subject, displaying a SVO order. This can be said to represent the most natural syntactic construction in Spanish language. From a constructional point of view this structure stands as the most schematic and productive syntactic construction. A search in the ADESSE database of syntactic schemas of verbs (<http://adesse.uvigo.es>) yields a total of 2622

verbs with such structure. It is four times higher than, for example, verbs participating in a structure with both direct and indirect object.

Moreover, the two sentences connected in the stimuli still show the same syntactic pattern and only a subtle difference in the modification of the direct object head was applied: in the first sentence, a determiner in adposition carries out the modification while in the second sentence an adjective in postposition fulfills the modifier function. In argumentative terms, both kind of modifiers act as realizant modifier that increase the argumentative strength of the discourse segment (Anscombe and Ducrot, 1994[1983]: 266).

One important feature of the construction must be signaled. The verbal slot of the second sentence is occupied by verbs conveying not an action carried out by the subject but rather received by it; or we can at least say that the subject is not a controlling agent. Therefore, our examples instantiate a particular sub-construction of the transitive construction which has the following thematic roles: BENEFACTIVE / ACTION / THEMA. The reason underlying the use of this particular construction has to do with the first goal: to yield a non-volitional objective relation; for this to occur, something has to happen in the world without the intervention of an explicit conscious agent or subject of consciousness.

Lastly, at the level of words, all the lexical words contained in the sentence are familiar words in European Spanish, avoiding processing weights due to low-frequency words (Rayner and Duffy, 1986). They are also balanced in terms of number of syllables, only ranging from two to four. Moreover, differences in word lengths are balanced in the statistic treatment at the level of the areas of interest (see 4.2.6.)

Subjects were formed by two conjoined proper nouns in the first discourse segment and were implicit (null subject) in the following sentence, respecting the pragmatically non-marked subject in Spanish. The reason behind the use of plural subjects was to provide a space where the participants could reach a natural and regular pace, avoiding minimal readjustments caused by the change of slide.⁷² In addition, all the proper names have three syllables, which helps us to distribute the sentences in different lines preventing areas of interest (see 4.2.5) from finishing at the end of a line.

⁷² Such a risk was also controlled by the fix cross that the participant had to look at before the critical item.

Discourse segment 1 (Causal)				Connective	Discourse segment 2 (Consecutive)			
Subject	Verb	Direct Object			Subject	Verb	Direct Object	Object
		Head	Modifier				Modifier	Head
Valentín y Camila	ocupan	puestos	importantes.	Por tanto	∅	ganan	mucho	dinero
Valentín y Camila	ocupan	puestos	importantes.	Por eso	∅	ganan	mucho	dinero
Valentín y Camila	ocupan	puestos	importantes.	Por ello	∅	ganan	mucho	dinero
Valentín y Camila	ocupan	puestos	importantes.	Por esto	∅	ganan	mucho	dinero
Valentín y Camila	ocupan	puestos	importantes.	∅	∅	ganan	mucho	dinero

Table 9. Syntactic and discursive structure of critical items

Finally, it is important to add that there was an extra sentence in the slide where the critical item appears, following it. This postcritical “appendix” was excluded from the analysis, since its introduction was only aimed at avoiding the so-called spillover effect in the critical item.

As a corollary of this section, the following table instantiates the structure of themes, by showing two of them with their different parts (see Appendices for the remaining themes).

Thema	Context	Filler item 1	Filler Item 2	Critical item + postcritical
2	Susana y Ernesto trabajan de camareros en un restaurante lujoso de Barcelona.	En el restaurante suelen celebrarse muchas comidas de negocios.	Cuando acaban de trabajar se toman unas copas con los demás compañeros.	Susana y Ernesto tienen clientes ricos. Reciben muchas propinas. Están muy contentos con su trabajo.
9	Leticia y Estela son dos jóvenes a las que les gusta mucho ir de compras.	Van a muchos desfiles, invitadas por las marcas de moda, algunas veces fuera de la ciudad.	Tienen muchos amigos y una vida social demasiado intensa.	Leticia y Estela compran ropa cara. Gastan mucho dinero. En las tiendas las tratan muy bien.

Table 10. Examples of themes with their respective parts

4.2.5 Apparatus and procedure

Experiments were run with a SMI RED 250 mobile eye-tracker, which has a frequency record of 250 Hz. This device was mounted in a room of the Faculty of Philology, Communication and Translation, located at the underground flat of the building, where the fluency of students is lower. The room remained close while the experiments were running and a warning at the door prevented people from disturbing during the course of the experiment.

Participants were asked to fill a form with their personal data (place of birth, age, mother tongue, etc.) and sign a consent form to participate in the study before starting with the experiment. Afterwards, participants sat at 65 cm approximately from the screen. They were told about the overall nature of the experiment and instructed for the running: they were asked

to read naturally at their own pace and to press the space button for passing onto the following slide when they had completely finished to read it; they were informed that at the beginning of the experiment a calibration process was going to take place; when a cross appeared in the screen they had to fixate it with the eyes until the new slide showed up; finally, when a question about the stories appeared they had to answer by looking to the “yes” or “no” square in the screen.

After these oral guidelines, the participants read the same instructions in the eye-tracker screen. Then, a calibration process was undertaken for the device to track the eyes of the participant. Such process was always carried out twice, in order to choose the best calibration rate; when the rate did not stand under 0.5 deviation in any axis after the two trials, the process was repeated once again.

The participants read a story as a way of example and, then, the experiment began with the stories containing our critical items. Such stories appeared together with other ones serving for the purpose of other experiments, which we call distractors. All the stories appeared in random order in each trial, only meeting the requirement of not occurring two stories of the experiment at issue straightly. Two yes/no questions about the story recently read were introduced for ensuring that attention was paid during the reading.

4.2.6 Data treatment and statistical models

Raw data were analyzed with BeGaze™ software. Data from participants that do not reach the adequate calibration (below 0,5 deviation in each axis) and tracking ratio (85%) were discarded. Moreover, after a manual revision, flawed data due to eye-tracking problems were also removed. In total, 69 participants were discarded because of a bad calibration, low tracking ratio or technical problems during the experiment.

Among all the eye-movements and parameters recorded in the experiment, fixations from the non-flawed data were extracted and set for statistical analysis. In this step, fixations are grouped according to the chosen dependent variables (First Pass-Reading Time —FRT—, Re-Reading Time —RRT— and Total-Reading Time —TRT— and the analyzed areas of interest, which we explain in the following section.

Division of stimuli: areas of interest (AOI)

One important methodological decision to analyze the experimental data is to split the stimuli into different constitutive parts, in order to fine-tune the hypothesis and results. Such regions in which the researcher is interested to obtain fixation data for a specific purpose are called AOIs (Holmquist et al., 2011: 185 and ff).

In our eye-tracking study, the division of the critical items is made on the basis of discursive grounds. We intend to study discursive processes, and need, hence, discursive relations and constituents. In this sense, we take two AOIs for measuring overall processing and three local AOIs for finding out how such processing is distributed in the discursive constituents and where the effect of DMs takes place. Within overall AOI, *utterance mean* (E-S) represents the

Mixed models shed estimate values for all the AOI in every dependent variable. However, they are not interpretable in terms of absolute values. From these estimate values, predicted values have been worked out by positing an average word length calculated from the lengths of the words contained in the AOIs. Thus, the predicted values reflect absolute values and become the essential data for the analysis. No AOI length showed an important difference with regard to the standard calculated length, so the predicted values are reliable for all the AOIs of the experiment. The milliseconds of every AOI are given as the time in which an average word is read in each condition.

Comparisons between conditions were undertaken. For interpreting the relevance of the results obtained, we draw on the effect size or magnitude, instead of *p-values*.⁷⁴ The size is measured through the parameters established by DPKog research Group. The following table specifies the threshold and boundaries used for interpreting the magnitude of the effects found in the study.

Percentage range	Magnitude of the effect
> 20 %	Very large effects
10-19,99 %	Large effects
5-9,99 %	Medium effects
4-4,99 %	Small effects
<3,99 %	Trivial effects

Table 12. Percentage ranges for interpreting the magnitude of the effects

Trivial effects do not constitute a reliable source for considering the influence of conditions in the results; they are marginal effects. Small effects are considered as a range where some tendencies related to the conditions can be recognized. Steady tendencies are found with medium effects, while large and very large effects ensures a reliable influence of the conditions under study.

4.3 Results

In §4.1.2 we have claimed that, inspired by the work of Recio et al. (2018), our study intends to fill a gap in the eye tracking studies with DMs: comparing the cognitive behavior of a group of functionally similar DMs and shedding light on their relationships. By doing so, we are able to prove if there is a common behavior characterizing the group, that is to say, if the semantic-pragmatic shared features are cognitively justified: this functional commonality is to be understood as the base of the paradigm in a traditional view. Moreover, we can also look for differences between the specific constructions and prove whether they are organized in a particular way that mirrors their semantic/pragmatic and morphosyntactic idiosyncrasies. This would imply that the paradigm itself has a value and all the members within a paradigm take a value as opposed to the one contained in the rest of the members; that is to say, there is an overarching structure that concedes value to the particular signs. As we have seen, although this insight is conceivable in terms of schematic paradigmatic constructions (Diewald, 2009, 2015,

⁷⁴ For a review of the limitations of p-values analysis in psycholinguistic research, see Vasisht et al. (2018).

2020; Diewald and Smirnova, 2012), constructional networks and links also allow for a more dynamic and less stable relations based on formal or functional similarities (see §2.3.1).

For getting such a view, first, we draw on models where comparisons are made between the different DMs and the implicit condition, taken as the baseline of the causal relation. We take the discourse marking principles (treated in §4.1.1) as the parameters that guide the comparison (§4.3.1.). Afterwards, we will have a closer look at how the strategy is articulated in terms of overall and global effects (§4.3.2.1), construction and confirmation of the communicated assumptions (§4.3.2.2) and correlation between the reduction effects triggered by the DMs and their own processing weight (§4.3.2.3). In these sections, we will try to test differences across markers, so the models present comparisons between all of them.

4.3.1. In the pursuit of a core schematic meaning: discourse markers processing principles as cognitive reflections of functional resemblance.

Despite their morphosyntactic differences, all our markers are linguistic devices available to the speakers to yield a cause-consequence connection between two discourse segments (see §3.2 and §7.1.). Then, if, to a certain degree, they are specialized in fulfilling such a function, it is reasonable that speakers take advantage from their use and, subsequently, it results in a cognitive reflection in terms of a processing strategy triggered by them.

For checking this assumption, we take the discourse marking principles (Loureda et al., 2021; 2021) as the parameters that guide the examination of the cognitive behavior of explicit conditions: they characterize the strategy triggered by discourse marking structures in terms of the processing limits they impose in the overall and local segments affected by them.

4.3.1.1. Qualitative principle: modification of the cognitive strategy in explicit conditions.

As we advanced in 4.1, the most general qualitative principle of discourse marking (Principle I, Loureda et al., 2021) poses that the presence of a DM triggers a processing strategy, which can modify the global processing of the utterance (maximal expression of the principle) or one of the segments directly affected by the DM (minimal expression of the principle). This general principle is best represented by the conceptual mean, which is the mean of all the conceptual words of the sentence. Hence, let us look at this AOI in TRT, through the following table, where time to process conceptual words in average is provided in milliseconds for each condition; percentage differences with the implicit condition (absence of DM) are also displayed at the right column.

	Conceptual mean	Difference vs \emptyset
\emptyset	254.77 ms.	—
Por tanto	236.09 ms.	-7.33 %
Por eso	240.44 ms.	-5.62 %
Por ello	225.96 ms.	-11.31 %
Por esto	239.17 ms.	-6.12 %

Table 13. Conceptual mean in TRT. Comparison vs implicit condition

As we can see, conceptual words in the implicit condition exhibit a higher cost than they do in the condition with DM; the total reading time required for processing the conceptual words in

the implicit condition is higher than it is in the condition marked by *por tanto*, *por eso*, *por ello* and *por esto*. The differences range from 5.62% to 11.31%, so the magnitude of the effect (see §4.2.5) is sufficient in all of them. That is to say, the introduction of any of these markers in a cause-consequence relation yields a reduction of the processing time of the conceptual words in the utterance.

These results also account for the quantitative principle (principle II, Loureda et al., 2021), which states that the time needed to process the utterance in implicit condition establishes the utmost limit of time required in explicit conditions. All these markers show the maximal expression of the principle, since they not only do not exceed the cost of the implicit condition, but also reduce it more than 5%.

This is a clear symptom of the role that all these markers play, with a specific implication in their semantic contribution, because of two reasons. On the one hand, this result entails the fact that a processing strategy has taken place in their presence: speakers need less time to derive inferences from the conceptual words, because such inferences come from (or are directed by) the meaning of the markers. In other words, all these units assume a leading role in utterance interpretation by virtue of their meaning. On the other hand, the capacity of these markers to affect conceptual words implies a different nature (or function): these constructions have scope over the conceptual words; otherwise, they could not impose the meaning over them. Such an asymmetry is also reflected in the difference of processing between an average conceptual word and the different DMs, as the following table shows: DMs are always more cost-demanding than the average conceptual word of the utterance.

	Conceptual mean	DM	Difference
Por tanto	236.09 ms.	300.73 ms.	-21.49%
Por eso	240.44 ms.	312.59 ms.	-23.08%
Por ello	225.96 ms.	273.97 ms.	-17.52%
Por esto	239.17 ms.	352.7 ms.	-32.19%

Table 14. Differences between DM and conceptual words in TRT

These two principles can be broken down into more particular and local strategies triggered by DMs. This requires a closer inspection to the discursive areas and temporal parameters where the effects can take place. As a two-place elements (Fraser, 1999) or deictic signs (Portolés, 1998; Diewald, 2011a), their effect should be proved in the connected areas. In addition, as conventional guides to the recovery of discursive meaning, they should affect the distribution of efforts in the different tasks oriented to construct and confirm communicative assumptions.

4.3.1.2. Immediate local regulation principle

The immediate local regulation principle accounts for the different processing the segment that hosts the DMs displays. Once the DM is processed, the upcoming segment is automatically inserted in a set of assumptions that satisfies its meaning; as a result of the fact that it constrains the possible contextual assumption, this segment in explicit conditions is processed faster than it is in its implicit counterpart (maximal expression), or, at least, not slower, despite there is more semantic information to process (minimal expression). This immediacy of the effect can

be seen in first reading times (Loureda et al., 2021: 88). When the units are processed, the discourse segment following them should be inserted in a cause-consequence relation, thus narrowing down the range of possible assumptions which it is to be adjusted to.

	DS2	Difference vs \emptyset
\emptyset	237.48 ms.	—
Por tanto	220.97 ms.	-6.95%
Por eso	219.16 ms.	-7.71%
Por ello	209.51 ms.	-11.78%
Por esto	223.47 ms.	-5.90%

Table 15. Discourse segment 2. Comparison vs implicit relation (FRT)

The results seem to confirm this principle for all our markers. The meaning of them facilitates the accessing of the consecutive member in such early measure. The accessing differences with regard to the implicit relation are explained through the semantic/pragmatic distinction in terms of conventional and conversational implicature: whether the causal relation is retrieved by decoding the meaning of DMs (explicit conditions) or by inferencing through the context (implicit conditions).

A short comparison between areas of interest becomes an interesting and complementary evidence of the *immediate local regulation principle*. In the following figure, the processing cost of the causal and the consecutive member is compared in all the conditions (implicit condition included) in the FRT and RRT.

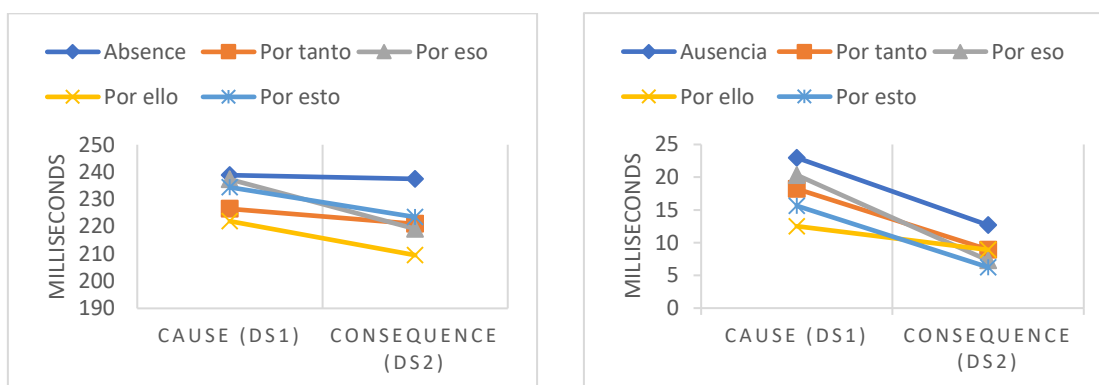


Figure 18. DS1 (cause) and DS2 (consequence) in FRT (left) and RRT (right)

In the FRT, processing the cause and the consequence in absence of DM (implicit relation) weights roughly the same: thus, the implicit condition (dark blue line) presents a linear horizontal pattern. This is evidence that efforts to yield a valid communicative assumption are constantly being made during all the sequence, without a conventional sign. Speakers come up with a first communicative assumption but at the expense of inferring through the context.

In the conditions with the units under study (explicit conditions), in turn, the pattern shows a downward tendency to a greater or to a lesser degree. Then, when the DM is processed, the speaker automatically integrates the segment following it as the consequence of what has been said before, constraining from the first time the inferences s/he makes.

Now, if we turn to the RRT, we observe that the downward tendency takes place in the implicit conditions as well. This could mean the following: once the communicative assumptions have

been sketched by means of inferences arisen out of the context in the FRT, the strategy develops in the same fashion as conditions with DMs do in the FRT: second segment is easily integrated in a cause-consequence relation. This clearly evinces the qualitative strength of the immediate local regulation principle, since the pattern that is fully available for conditions with DMs in early measures only arises in implicit condition in late measures, after a hypothetical assumption has been drawn out of the context in the first reading.

Final evidence for this effect comes from the observation of the pattern in the TRT. Taken together with the previous graphics, it reveals the relative contribution of FRT and RRT to the overall reading pattern shown by TRT in each condition. As can be seen in the figure 19 below, the tendency sketched by FRT (figure 18) is replicated in TRT in all the explicit conditions. The pattern of TRT in the implicit condition, conversely, does not show the linearity observed in FRT, but is affected by the difference found in RRT between cause and consequence.

Therefore, a first exploration of the different temporal parameters allows to set apart two groups by relying on the weight of FRT and RRT in the overall processing strategy: the relative weight of RRT in implicit conditions is higher, since it reveals a strategy aimed at solving the semantic *underdeterminacy* of the discourse relation; in explicit conditions, the weight of RRT for the general patterns is lower: a controlled checking-task takes place due to the conventional mark that constrain from the FRT the directions in which inferences about this relation should be drawn (see §4.3.1.3 below)

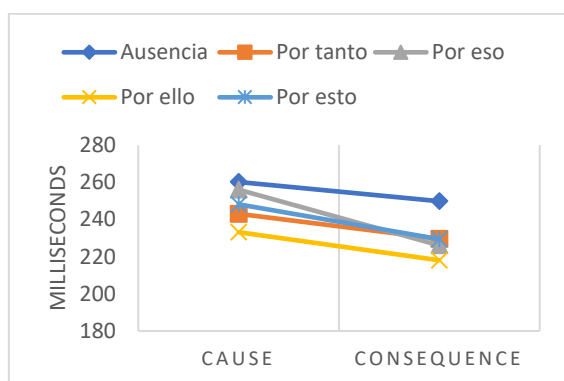


Figure 19. Cause and consequence in TRT

The relative weight of re-readings in explicit and implicit conditions can be also compared in other local and global parameters, as a corollary of the abovementioned qualitative and quantitative processing principles of discourse marking. By doing so, we obtain a complete overall examination of the degree to which all our units match the processing principles described in Loureda et al. (2021).

4.3.1.3 Optimal reanalysis: effects on the metapragmatic tasks

The first two principles imply, as a corollary, that DMs ensure a controlled reanalysis of the first communicative assumption in such a way that RRT does not slow down the total processing of the utterance, compared to the unmarked condition. The causal area (DS1) provides us a clear picture of the controlled reanalysis triggered by the DMs in re-readings. Re-reading the first

segment in conditions with DMs is less costly than do it when there is no discourse marking signal.

	DS1	Difference vs \emptyset
\emptyset	22,97 ms.	—
Por tanto	18,21 ms.	-20.72 %
Por eso	20,33 ms.	-11.49 %
Por ello	12,51 ms.	-45.54 %
Por esto	15,63 ms.	-31.95%

Table 16. Implicit vs explicit conditions in DS1. Re-reading time

This can only be explained by the conventional inferential constraint they exert, which renders fewer assumptions to be confirmed: the reanalysis of the causal relation is controlled by the meaning of the markers; in constructional terms, the structure is more easily fit in a cause-consequence relation. These insights are borne out by the global reanalysis, as made clear by the conceptual mean in RRT (Table 17).

	Conceptual mean	Difference vs \emptyset
\emptyset	11,56 ms.	—
Por tanto	7,94 ms.	-31,31 %
Por eso	5,71 ms.	-50,61 %
Por ello	6,16 ms.	-46,71 %
Por esto	5,64 ms.	-51,21%

Table 17. Implicit vs explicit conditions in conceptual mean (RRT)

The convergence of these results (RRT in DS1 and in conceptual mean) reveals that reanalysis is a global operation whereby speakers try to confirm the communicative assumptions built in FRT: the operation, however, can be split qualitatively into two different tasks on the basis of the structure at hand: reanalysis (implicit condition) and controlled-checking tasks (explicit conditions).

4.3.1.4. Conclusions

As a summary, all the consecutive units we are studying fulfill the principles of discourse markedness processing posed by Loureda et al. (2021). By means of their properties, they conventionally activate a cognitive routine to draw inferences about discourse relations optimally: processing these cause-related sentences is faster when they are marked with such units; their instruction is clearly evinced by the immediate reduction of the discourse segment in which they are hosted and, also, in the optimal reanalysis that speakers make when they re-read the different discourse segments. This strongly suggests that all these units are used as DMs and so processed as well. In this sense, the principles can be held as a core or schematic functional meaning shared by all of them.

Yet, apart from this core or schematic meaning drawn by the setting up of the principles, we can explore further qualitative and quantitative differences between them in the way they manage to constrain the speaker's inferences, according to their morphosyntactic, semantic and pragmatic properties, that is to say, according to their constructional properties. In the next section, we examine such differences by drawing on three kinds of evidences:

- a. Quantitative differences in the global and local effects (§4.3.2.1).

- b. The division of labor in the communicative tasks that speakers carry out in order to get a communicative assumption: construction of a communicative assumption and confirmation of the sketched assumption (§4.3.2.2).
- c. Relation between the reduction effects triggered by the different DMs and the weight the speaker invests in processing them (§4.3.2.3).

4.3.2 Different strategies: complementary distributions and other differences within the paradigm.

In 1.1 we have seen a common processing behavior characterizing the group of constructions *por tanto*, *por eso*, *por ello* and *por esto* as marks that conventionally guide the speakers to connect different discourse segments in a cause-consequence relation. It is the goal of this section to find differences in the way they pursue such inference constraint, and to prove whether they can be mapped onto the varying degree of grammaticalization alleged in the literature or, on the contrary, a more fine-grained view on their constructional status is needed.

For checking whether differences within the group of DMs can be found we use models in which comparisons involve all the explicit conditions. We draw on overall parameters (conceptual mean) and those that represent local segments under the scope of the DM (DS1 and DS2).

4.3.2.1 Global and local reductions effects.

In 4.3.1 we have shown that all the DMs we are studying trigger a reduction effect in conceptual words when compared to the implicit condition. It is worth studying, however, if there are differences in the extent to which each of these markers affect the processing of conceptual words in the utterance.

	Por tanto		Por eso		Por ello		Por esto
Por tanto	236.09 ms.		240.44 ms.		225.96 ms.		239.17 ms.
Por eso	-1.81 % (1.84)						
Por ello	4.48 % (-4.29)		6.41 % (-6.02)				
Por esto	-1.29 % (1.30)		0.53 % (-0.53)		-5.52 % (5.85)		

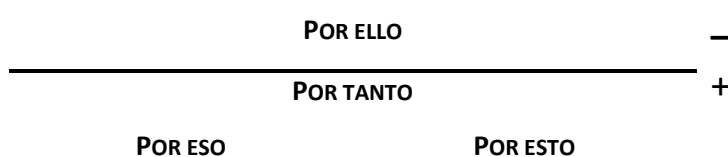
Table 18. Conceptual mean in TRT

According to the processing time in milliseconds, there is a scale of processing weight, or, a scale of reduction effect which is not fully predictable from the parameter of degree of grammaticalization, since *por ello* stands as the connective that facilitates the processing of conceptual words most. *Por tanto* stands in a second position and finally *por eso* and *por esto* appear as the costliest markers. In direct comparisons, however, only differences between *por ello* and the rest of markers remain, since only they overcome the threshold of 4%: there is a small reduction effect with regard to *por tanto* and a medium effect compared to *por eso* and *por esto*, as can be seen in the following table:

	Conceptual mean	Difference vs por ello	Magnitude of the effect
Por ello	225.96 ms.	—	
Por tanto	236.09ms.	-4.29%	Small effect
Por eso	240.44 ms.	-6.02%	Medium effect
Por esto	239.17 ms.	-5.52%	Medium effect

Table 19. Comparison between *por ello* and the rest of markers in conceptual mean (TRT)

Therefore, the results draw a line between *por ello* and the rest of markers in terms of benefit effects at processing the cause-consequence relation. Thus, considering the differences in terms of effects, the results definitely rule out a direct relation between reduction effects and the degree of grammaticalization of these markers, according to which *por tanto* should trigger a lower reading time.

Figure 20. Edge between *por ello* and the rest of consecutive DMs according to the weight in conceptual mean

Now let us compare how these overall processing is distributed across the different parts of the discursive relation, in order to prove if differences in the effort devoted to processing each discourse segment correlate with the varying degree of grammaticalization (or, semantically, their more or less deictic-based semantic nature).

Por tanto				
Por tanto	229.6ms	Por eso		
Por eso	1.56%(-1.53)	226.08 ms	Por ello	
Por ello	5.29% (-5.03)	3.68%(-3.55)	218.06 ms	Por esto
Por esto	0.09% (-0.09)	-1.47% (-1.45)	5.20% (-4.94)	229.4 ms

Table 20. Comparison between explicit conditions in DS2 (TRT)

In DS2, the discourse segment directly affected by the DM, again *por ello* yields the highest reduction effects. In terms of the magnitude of the effect, however, the differences stand only against *por tanto* and *por esto*, since the percentage distance with *por eso* does not reach the 4% .

	DS2	Difference vs por ello
Por ello	218.06 ms.	—
Por tanto	229.6 ms.	-5.03%
Por eso	226.08 ms.	-3.55%
Por esto	229.4 ms.	-4.94%

Table 21. DS2. Por ello vs rest of markers (TRT)

Assessing this setting in terms of semantic/pragmatic properties becomes difficult, inasmuch as the picture does not draw a linear distribution of markers according to one parameter. It could

be argued that the heavier processing of the linguistic unit that best sanctions the DM category, *por tanto*, is justified by the fact that the other units strongly rely on the causal segment to establish the cause-consequence relation (Montolío, 2001; see §3.2.2), so this focus leads to a compensating “overlook” of the consequence segment. This, however, does not explain why *por esto* deviates from *por eso*, being extremely similar in processing time to *por tanto*.

In the AOI DS1, the picture fits more with this view if we look at the absolute measures in terms of milliseconds. The scale reflects that *por tanto* is less costly than *por eso* and *por esto*, which could be explained by its lower focus on the cause. However, the hypothesis is not fully consistent because of two reasons: on the one hand, *por ello*, despite its inclusion as a “focus-in-cause marker”, does not fit into this schema, since it also shows ease of processing in this area, compared to the rest of markers; on the other, the difference between *por tanto* and *por esto* does not guarantee statistical reliability (it is below the 4%), so it cannot be predicted as an effect that would replicate in other experiments contrasting both markers.

	Por tanto		Por eso		Por ello		Por esto	
Por tanto	243.05 ms							
Por eso	-5.07(5.34)		256.04 ms					
Por ello	4.25% (-4.07)		9.82%(-8.94)		233.15 ms			
Por esto	-2.06% (2.10)		3.18% (-3.08)		-6.05% (6.44)			248.16

Table 22. DS1. Comparison between all the markers (TRT)

A complex picture, thus, arises, where *por ello* stands out as the optimal marker in this discourse segment and *por eso* marks the utmost limit of processing. *Por tanto* clearly occupies a medium position, since it contrasts with the highest limit marked by *por ello* (-4.07%) and the lowest boundary drawn by *por eso* (-5.07%). *Por esto*, although being clearly set off from *por ello* (-6.05%) blurs its boundaries in the region of heavier processing with *por tanto* and *por esto*, remaining the differences trivial.

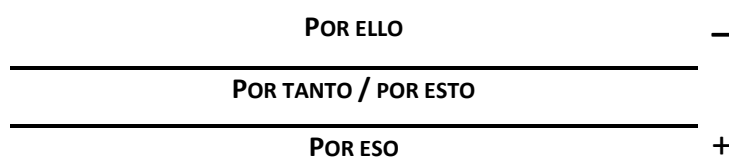


Figure 21. Maximal and minimal boundary in the weight of DS1 across implicit conditions

Several conclusions must be pointed out in the light of the results of this section. The effects accounted for by the principles discussed in §4.3.1 are all optimally triggered by *por ello*. This marker yields a greater effect than the others in reducing the time to process conceptual words in the utterance. Such global reduction effect is borne out by the advantageous processing it shows in both the causal (DS1) and the consequence (DS2) segment. This sharp distinction of *por ello* is somehow unexpected if we take into account the synchronic approaches to the form and functioning of these markers, where it is commonly grouped together with *por eso* and *por*

esto and eventually set off from *por tanto* in terms of formal properties. Hence, this striking finding leads us to the following more global conclusion that this first internal comparison sheds.

Apart from *por ello*, the other three markers do not distinguish through these parameters in a clear and explainable fashion. No differences between them are recognized in global reduction effects (quantitative principle). *Por eso* shows a complementary distribution in the processing of each segment that can be attributed to its focus in the cause to build the relation, as pointed out by Montolío: while it is easier to process than *por tanto* in the consequence segment, it displays a heavier processing in the cause segment, being both differences statistically relevant. The processing of the AOs in the condition with *por esto* does not allow to confirm this direction, since it resembles *por tanto* in the processing of the DS2 and neutralizes differences with *por eso* and *por tanto* in the DS1. It is fuzzier and seems to fit less easily in a schema than *por eso* and *por tanto*.

4.3.2.2. Division of labor in the pragmatic tasks to reach a communicative assumption: first reading time and rereading time

In §4.3.1 we have given conceptual mean a prominent role to observe the strategy triggered by the presence of DMs. We have considered such strategy in overall terms and so we have examined the total reading time, showing that reduction effect over conceptual words is confirmed. Now, does this effect occur at the same time with the same strength in all the markers? The previous study by Recio et al. (2018) shows that differences at the time the effect arises not only between a grammaticalized marker and a non-grammaticalized marker (*por tanto* vs *por eso*) but also between non-grammaticalized markers (*por ello* vs *por eso*). In fact, the latter asymmetrical behavior is so clear that is referred to as an example of a complementary distribution. We can prove where the core effect appears by looking at FRT and RRT measures. This means observing how the tasks aimed at reaching the communicative assumptions are distributed across FRT and re-readings in each marker. They are to be considered metapragmatic tasks that speakers carry out in their construction and confirmation of a full-fledged communicative assumption.

Let us take, as a way of introduction, the comparison against implicit condition in FRT, which has not been analyzed yet.

	Conceptual mean	Difference vs \emptyset
\emptyset	244.53 ms.	-
Por tanto	229.51 ms.	-6.14%
Por eso	236.17 ms.	-3.42%
Por ello	221.19 ms.	-9.54%
Por esto	234.91 ms.	-3.93%

Table 23. Conceptual mean. Implicit vs explicit conditions (FRT)

According to the reduction effect the markers trigger compared to the implicit condition, there exists an early effect in the conditions with *por tanto* and *por ello*, since they show a medium

effect. On the other hand, the effects of *por eso* and *por esto* are not sufficient to be regarded, since they do not overcome the 4%. Therefore, taking this model into account, it seems that *por tanto* and specially *por ello* trigger a reduction effect over the conceptual words from the beginning, while *por eso* and *por esto* do not affect so much in the FRT. Now let us check how this schema is reflected in the direct comparison between the explicit conditions.

	Por tanto		Por eso		Por ello		Por esto	
Por tanto	229.51 ms.							
Por	2.90 % (-2.82)		236.17 ms.					
Por ello	3.76 % (-3.63)		6.77 % (-6.34)		221.19 ms.			
Por esto	2.35 % (-2.30)		0.54 % (-0.53)		6.20 % (-5.84)			234.91 ms.

Table 24. Conceptual mean. Comparison between markers (FRT)

	Conceptual mean	Difference vs por ello
Por ello	221.19 ms.	—
Por tanto	229.51 ms.	-3.63 %
Por eso	236.17 ms.	-6.34 %
Por esto	234.91 ms.	-5.84 %

Table 25. Conceptual mean. Comparison vs *por ello* (FRT)

This tables show that, in our study, the difference between *por ello* and *por eso* shown by Recio et al. (2018) replicates in this parameter. Moreover, it is not only the fact that *por ello* shows an early effect in conceptual words compared to *por eso*, as proved by Recio et al. (2018), but the opposition reaches *por esto*, a marker not included in their study. This is proved by direct comparisons (table 25), where the effect between them is sufficient to hold a difference in such early measure. The effect with *por tanto*, however, does not reach such level, since it does not hold for direct comparison. Therefore, taken together the comparison to implicit condition and the internal paradigmatic contrast between markers, it seems that we can postulate a qualitative difference between *por eso/por esto* and *por ello/por tanto* in terms of early reduction effect, and a further quantitative distinction between *por ello* and *por tanto*. The causal connection is more readily drawn with *por ello* and *por tanto* in FRT, than with *por eso* and *por esto*. However, the entire picture can only be obtained by observing the behavior in RRT and, finally, by the relative contribution of this measure to TRT.

	Por tanto		Por eso		Por ello		Por esto	
Por tanto	7.94 ms.							
Por eso	39.05 % (-28.09)		5.71 ms.					
Por ello	28.90 % (-22.42)		7.88 % (-7.31)		6.16 ms			
Por esto	40.78 % (-28.97)		1.24 % (-1.23)		9.22 % (-8.44)			5,64 ms

Table 26. Conceptual mean. Comparison between markers (RRT)

An interesting picture arises when we look at RRT (table 26), where again three levels can be recognized. Contrary to what happens in first readings, *por eso* and *por esto* reach the highest reduction effect over conceptual words. *Por ello*, which has shown to yield highest reduction

effect in FRT, is now significantly costlier; therefore, regarding the stage at which the effect of DMs takes place, *por ello* results complementary with *por eso* and *por esto*. Finally, *por tanto* is strikingly the DM whose processing of conceptual words is costliest in RRT.

If we compare the relative contribution of RRT to the overall processing, we can notice that only the weight of *por tanto* becomes relevant, since it contributes to the emergence of the significant difference with *por ello* for conceptual mean in TRT. The other differences between *por ello* and *por eso* / *por esto* are already drawn in FRT. An explanation should be found for such an overload of *por tanto* in RRT. Up to here, what seems clear is that morphosyntactic differences as clues of grammaticalization degree do not totally predict the cognitive pattern triggered by the marker; rather, there should be different (formal and functional) aspects operating here.

The corpus study (Chapter 5) will help to disentangle such aspects, but for the moment it should be suspected that functional differences may be playing a role here. Different studies have found out a delay or overload for subjective causal relations (Traxler, Bybee and Pickering, 1997; Canestrelli, 2013). Regarding the stage at which the delay appears, data is not conclusive. Canestrelli (2013) claims for an immediate effect of DMs that carry such subjective meaning and reports delays in both early and late measures compared to the objective marked causal sentence. On the other hand, the pattern of an initial facilitating effect and a final slowdown has been described for subjective causal relations connected by *because*, since the speaker cannot come up with a subjective reading until the end of the sentence (insofar *because* is underspecified as to the objective or subjective causality). It is also reported for objective causal relations with the Dutch connective *omdat* ‘because’ by Cozijn et al. (2011), who assume that the initial facilitating effect is due to the integrating effect of the conjunction, while the final slowdown is invoked by the inferential processing (checking the causal relation against the world-knowledge). Even though the areas in which the experiment is focused and the terms in which such statement has been made are different, it evokes the idea that subjective causal relations —since they exploit this inferential part of the causal relation— could be processed in two stages: in the first one, the causal relation is assumed; in the second one, assumptions underlying the causal subjective relation are assessed.

This overload in RRT is not consistent with the results obtained by Recio et al. (2018), which show the reversed pattern: *por tanto* is costlier than *por eso* in FRT and easier in RRT. The question, then, arises as to whether any change in the design may have reversed the tendency. However, a more general and explanatory way to analyze both results is to focus on the commonalities they reveal. In this respect, both studies find significant differences between *por tanto* and *por eso* in one of the processing stages that could explain their similar outcome in the TRT, despite their morphosyntactic differences: the subjective extra-layer of meaning triggered by *por tanto* makes the difference. The common finding that we can argue from both studies is that subjective causal relations trigger an overweight due to the inferential layer of meaning and that *por tanto* clearly shows such a delay in the course of processing, being in an earlier stage, as in Recio et al. (2018) or in a later stage, as in our results. Thus, the overcost arising at a point

of processing would distort the overall measures and reduction effects made by virtue of the specification of the inferences (high degree of conventionalization).

Taking on a near-simultaneous processing model (Pulvermüller et al., 2009), it can be posed that pragmatic nuances are assessed in parallel to semantic and morphosyntactic features in the FRT. However, certain meta-pragmatic tasks can be processed as late-operations:

All the processing is done in a parallel rather than consecutive fashion, and leads to interaction between the various processing levels, which was shown here for the levels of semantics and pragmatics. The re-computation and post-processing in the later time windows is not necessary but can happen, giving rise to task-related post-understanding (e.g., decision about semantic-conceptual correctness, voice identity, etc.) and other second thought type of processing, if a more complex stimulus is encountered. (Egorova et al., 2013:10)

In sum, specificities in the functional pole of the construction *por tanto* can be manifested in early measures or, say, in the construction of a communicative assumption, but they may also be assessed as re-computation operations if the paradigmatic design renders the functional differences with the other DMs more salient for participants, giving rise to the meta-pragmatic task of assessing the inferential meaning of *por tanto* against the world knowledge background.

This section has shown differences across markers in the dependent variables FRT and RRT: conceptual words are read faster in the conditions with *por tanto* and *por ello* in FRT; complementarily, RRT shows advantages for the conditions with *por eso* and *por esto*. When FRT and RRT are confronted with TRT to see its relative contribution, only the overload of *por tanto* in RRT remains relevant, since it affects its global reading time. Such processing weight has been preliminarily attributed to the subjective layer of meaning it carries, which should be conventionalized —coded— only in this marker.

In the next section we will try to prove how the degree of conventionalization of procedural meaning contributes to the cognitive routine of retrieving inferences optimally, by comparing the reduction effects the markers trigger with the weight the processing of the marker itself requires.

4.3.2.3. On procedural meaning: correlations between time to process the discourse marker and reduction effects.

In §4.1.1 we have characterized the procedural meaning of DMs by looking at the reduction effects they yield in the conceptual words and secondarily the specific weight their processing carries in order to achieve this effect. The reduction effect over conceptual words and the specific cost the marker itself demands seem to be, hence, interrelated phenomena that explain the functioning of DMs: they function as conventionalized signs whose procedural meaning, once processed, helps constrain the inferences the speaker makes in order to reach a final communicative assumption.

Combination of both phenomena leads to the *utterance mean*, which is the most overall picture of the processing these constructions trigger. The relevance of the most overall measure, utterance mean, must be recognized, since it offers a general view on how the general complex

construction works: namely, how this causal construction filled by different DMs is processed, which is also saying how different DM constructions interact with the causal construction they are embedded in. These assessments should be made if we want to preserve certain degree of holistic behavior of constructions. If we compare how the marked construction filled by different markers differ from the non-marked construction, an interesting schema arises, where *por tanto* and *por ello* achieve acceleration effects, while *por eso* and *por esto* only yield neutralization effects.

	Utterance mean	Difference vs \emptyset
\emptyset	254.77 ms.	—
Por tanto	243.24 ms.	-4.53%
Por eso	249.27 ms.	-2.16%
Por ello	230.34 ms.	-9.59%
Por esto	252.91 ms.	-0.73%

Table 27. Utterance mean. Comparison against implicit condition (TRT)

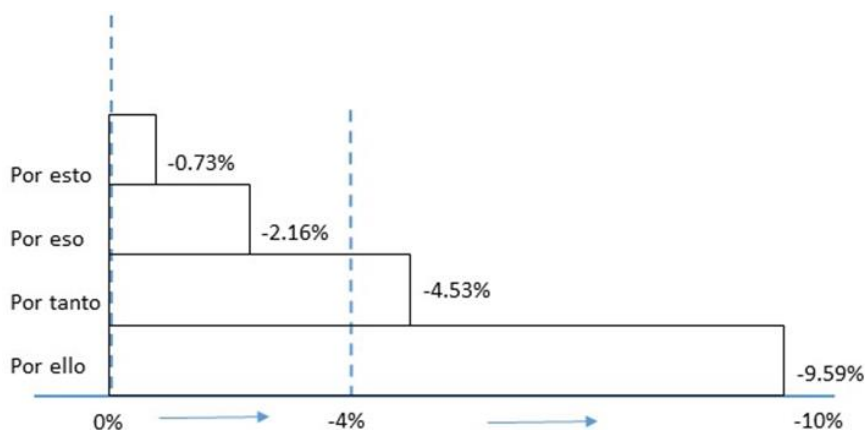


Figure 22. Differences between explicit and implicit conditions in *utterance mean* (TRT)

Now we can check whether the reduction effects are related in any way to the weight that the marker itself carries. Reduction effects have been assumed as evidence of the procedural meaning of the markers: only by virtue of this meaning they can make conceptual words to be processed easier. The question of whether the time the speaker needs to process the marker accounts for the kind of meaning encoded is also worth studying.

	Conceptual mean	DM
Por tanto	236.09 ms.	300.73 ms.
Por eso	240.44 ms.	312.59 ms.
Por ello	225.96 ms.	273.97 ms.
Por esto	239.17 ms.	352.7 ms.

Table 28. Conceptual mean and weight of the DM (TRT)

If we look at the time that the speakers need to process the marker itself (table 28 above), we can note that it is the AOI where the markers distinguish most clearly. Two aspects should be analyzed in light of this table and the following data. The first has to do with the

grammaticalization degree as a parameter related to the cognitive efforts demanded by the DM AOI. The scale built by our results breaks again a direct line or function between degree of grammaticalization (according to the formal tests applied in §3.2.1.1) and the cost of the marker in any direction. This is so because *por tanto* is located halfway between *por ello* and *por eso*. It follows from this that *degree of grammaticalization* (again, taken in a unitary account) does not account for the cognitive load of the marker alone; that is to say, more intervening factors should be taken into account.

We have seen that the cognitive weight of these constructions does not conform a scale arranged according to the grammaticalization degree. Let us look whether the scale of cognitive weight correlates with that of reduction over conceptual words: that is to say, is there any correlation between the time needed to process a DM and the effect it provokes? For this comparison we use the data of TRT in conceptual mean, specified in §4.3.1, and the above provided data of the TRT in the AOI DM.

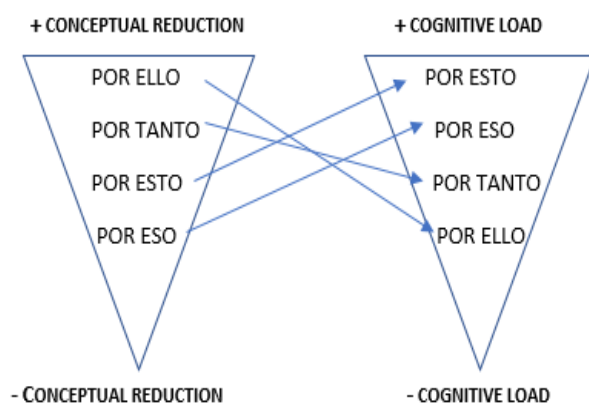


Figure 23. Correlations between reduction effects over conceptual words and cognitive weight of DM AOI (TRT)

Correspondences are found in *por tanto* and *por ello* in a somehow unexpected way, since there is a reverse relation between reduction over conceptual words and cognitive load of the DM: *por ello*, the one that provokes the greatest reduction effects over conceptual words is at the same time the marker that brings the least cognitive efforts; in this sense, it is the optimal marker for this kind of relation or, following the Relevance Theory, the one that leads to more contextual effects with less cognitive efforts. Likewise, *por tanto* is the second marker in terms of reduction benefits and, also, the second less costly regarding the processing of the DM AOI. However, if we focus on *por eso* and *por ello* such correspondence fades away, since *por esto*, which is by far the costliest DM to be processed, yields the same (a little bigger) reduction effect over conceptual words as *por eso*. Therefore, the reversal tendency does not hold in this case.

This correlation is represented by means of the following graphic (figure 24), where conceptual mean in total reading time is depicted in coordinate X and total reading time of DM AOI is shown by coordinate Y. If a relative correlation existed, the markers would draw a line in any direction. Note that, despite the distance with the point represented by *por ello*, such linear pattern can

be perceived in *por ello*, *por tanto* and *por eso*, but it is broken by *por esto*, which should stay at the right of *por eso* for this pattern to be accomplished.

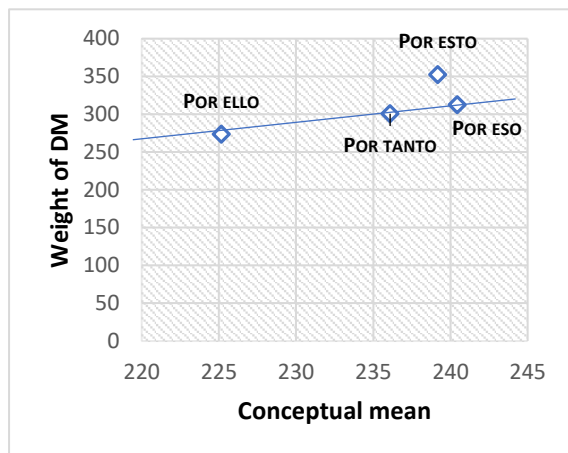


Figure 24. Correlation between reduction effect on conceptual words (x) and weight of AOI DM (y)

The heaviest processing of *por esto* is consistent with synchronic literature on Spanish DMs, where it is rarely included, or regarded as a marked variant of *por eso*, and synchronic frequencies of use, which indeed gives account of a low use. However, it remains open the question of why, if it has developed less as a DM, as its absence in specific literature compared to *por eso* seems to suggest, it manages to reduce the processing of the utterance roughly as effectively as *por eso*. It appears that this problem can only be solved by appealing to the notion of variant of *por eso/por esto* or by drawing on a picture of change with a prominent role of analogy. In both cases, construction grammar and constructionalization are the most insightful frameworks to understand the mechanisms and setting up better.

The first case has already been pointed out in the literature about DMs and has, at least, two explanations from the point of view of grammaticalization. The first postulates an incomplete process of formal fixation due to a lower (or not maximal) degree of grammaticalization (see Pons Bodería, 1998b for Sp. *mira, oye*). The second (but related) point refers to the process of specialization that takes place in grammaticalization (Hopper, 1991), where, from different items that are used to convey a meaning, one is selected over the others and progressively grammaticalized. From the point of view of construction grammar there is in both cases a construction with a certain degree of schematicity that allows a slot to be filled by, at least, two items.

The second case would imply that *por esto* is recruited by the speaker to fulfill the available slot of consecutive connection. That is to say, speakers recognize DM construction as an open slot that can be filled by different constructions according to the closeness they show, as hypothesized in §2.3.1. This explanation is consistent with the fact that *por esto* fulfills all the principles mentioned in §4.1.1, and is in fact very similar to *por eso*, but needs more time to be processed: this reflects the time the speaker needs for assigning this construction to the functional slot of DM (since it is, seemingly, less expected than the others); and, after doing such analogical process (in the spirit of Fischer, 2011), it triggers the cognitive effects of DMs. This

paves the way for a functional account of procedural meaning, which lies on a slot that can be filled by drawing on different specific constructions.

This is what the comparison of scales globally sheds, but let us cross this picture with the previous difference found out (early and late effects), by examining how the scales behave in FRT and RRT.

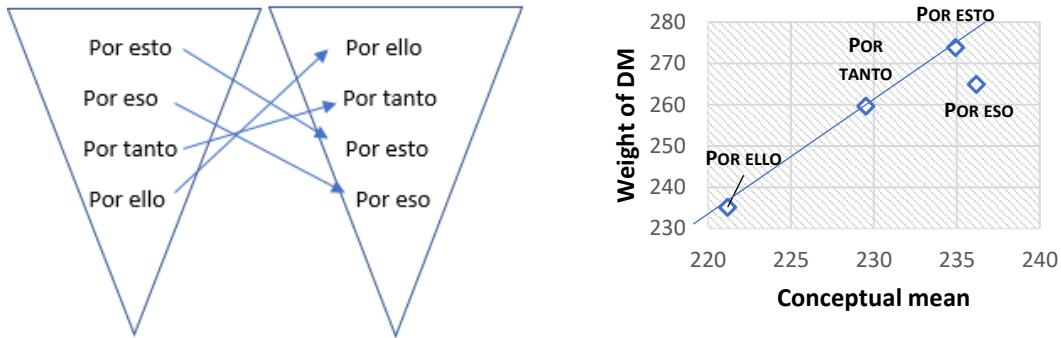


Figure 25. Correlations between reduction effects over conceptual words and weight of AOI DM in FRT

FRT shows the same scales as TRT, so, given its higher weigh in the distribution, we can say that it provides the pattern for TRT. *Por eso* and *por esto* are reversed but their differences only amount to one millisecond.

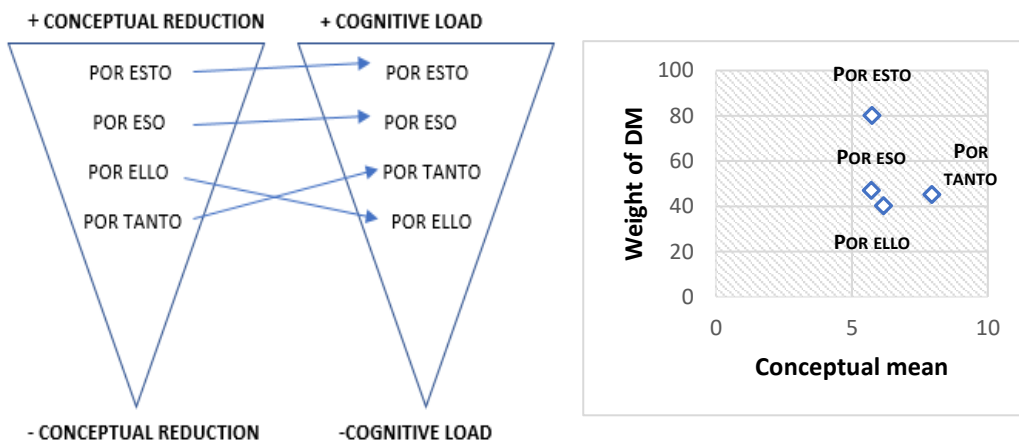


Figure 26. Correlations between reduction effects over conceptual words and weight of AOI DM in RRT

In RRT, it is interesting to see that time to process the DMs keeps the same order, while reduction effects are in this case higher in *por eso* and *por esto* and lower in *por tanto* and *por ello*. Therefore, in RRT a correspondence between processing weight of the DM and reduction effect over conceptual words seems to be accomplished for *por eso* and *por esto* and fades away with *por tanto* and *por ello*, which shows a reversal tendency. However, the difference between *por esto* and *por eso* in conceptual mean is very small to be considered, while the processing weight of *por esto* does result very significant. Considering this, what can be said is that the time needed for processing the markers and the reduction over conceptual words match each other if the markers are distributed in groups: *por esto* and *por eso* are heavier and, however, give place to a lighter processing of conceptual words than *por tanto* and *por ello* do.

As a corollary of this section, it can be said that degree of grammaticalization in a traditional way is not an explanative parameter for this measure. If degree of grammaticalization were reflected in the weight of the DM, it would be expected that less grammaticalized markers were less costly, that is, closer to conceptual words in weight. However, our results demonstrates that seemingly less grammaticalized markers imply higher cognitive weight, being especially evident in *por esto*. Therefore, there is a role reserved for the ease of speakers to analogize with DM constructions. The factors that influence this varying effort to carry out such an operation can be explored from a usage-based construction grammar view. In the next chapter we will undertake a corpus-based study that can feed such an insight. The study is aimed at comparing the DMs and getting an accurate profile of each of them, according to their formal and functional features. It is expected that these data could be used as a complementary source of evidence to explain the differences found in this section that can be summed up through the points addressed in the next conclusions section.

4.2.3.4. Conclusions

The analysis reveals that partial differences between all the markers emerge at different parameters and AOIs.

- *Por ello* leads to higher reduction effects over conceptual words, both in global and local measures. The other markers do not differ in global measures (conceptual mean) and cannot be straightforwardly sorted according to the differences in local measures (FRT and RRT).
- *Por ello* and *por tanto* result complementary to *por eso* and *por esto* in the weight of FRT and RRT in the recovery of a communicative assumption. However, only *por tanto* is affected by the relative overload of RRT in that it leads to a disadvantage with regard to *por ello* in TRT. Therefore, the benefits of *por tanto* are somehow overridden by a slowdown in RRT, compared to the rest of markers. This could provide a partial explanation to the finding of the previous point.
- Comparing the weight of the DM area gives clear distinctions between markers. Put in correlation with the effects over conceptual words, comparisons reveal that the overcost of *por esto* in the area of the marker does not correlate with its reduction effects. Thus, *por esto* clearly differs from *por eso* in this regard.

The next table summarizes differences found in these markers, highlighting the parameter at which they are reflected and the possible factor responsible for that difference.

Parameters	Remarkable difference	Direction of the difference	Suspected formal or semantic factor
Global and local effects on conceptual words (§4.3.2.1)	<i>Por ello</i> vs rest of markers	Advantageous effect	Procedural meaning
RRT weight (§4.3.2.2)	<i>Por tanto</i> vs rest of markers	Disadvantageous effect	Semantic complexity
Correlation between weight of DM and global effects on conceptual words (§4.3.2.3)	<i>Por esto</i> vs rest of markers	Non-correlated	Instantaneous (analogically-driven) procedural meaning

Table 29. Differences within the functional paradigm

Chapter 5. The consecutive discourse markers network from a corpus-based perspective

5.1 Methodology

The main goal of the research is, as mentioned, to look for correlations between the degrees of grammaticalization of some consecutive DMs —or, in constructional terms, their position in a constructional network— and the processing patterns they trigger in the sentences in which they are engaged. Therefore, we draw on a corpus study, which is one of the classical methods to determine the degree of grammaticalization of linguistic forms, according to the properties they show through examples of use and, subsequently, usage patterns. This will be contrasted with the results of the eye-tracking study (chapter 4), as a proof of the cognitive reflect of varying degrees of grammaticalization or particular constructional status.

From a structuralist point of view, it could be said that each one of these methods corresponds to a different level of language, namely, the universal and the particular dimension of language (Coseriu, 1985), thus raising the question whether the results of these methods can be put in correlation. Nevertheless, these two levels are tightly tied if we adopt a usage-based approach to language, where grammar is thought of as being modelled by the use of language (Hopper, 1987; Bybee, 2006, 2010, 2011, 2013; Boye and Harder, 2012; Diessel, 2015, Noël, 2016, etc.), more specifically by the experience of speakers with language. Grammar, in this view, can be defined as “the cognitive organization of one’s experience with language” (Bybee, 2006). According to Diessel (2015) this kind of approach “challenges the rigid division between the language system and language use, or competence (i.e., *langue*) and performance (i.e., *parole*)”, which in some sense blurs the theoretical problems abovementioned.

Moreover, from a methodological point of view, an increasing number of authors claims for a combined use of experimental and corpus-based studies, as a coherent and fruitful method:

The opposite extreme views (corpus) linguistics as part of the social sciences, considers meaning, while investigated corpus-linguistically or experimentally, as something that may well be studied outside the text and inside the mind, and regards corpus-based and cognitively-inspired approaches as highly compatible, if not related approaches. (Gilquin and Gries, 2009: 18)

This line of research has even begun to work out the epistemological validity of combining methods statistically, by approaching the degree to which predictions made on the basis of corpus studies match speakers’ choices in experiments (Bresnan, 2007; Divjak et al., 2016; Klavan and Veismann, 2017; etc., see §6.2.3).⁷⁵

In the subfield of causality, much of the cognitive inspired work have drawn on corpus studies and diverse experimental methods, obtaining quite convergent and explicative evidence (Sanders and Spooren, 2009; Stukker et al., 2009; Zufferey, 2012; Zufferey et al., 2017; etc.).

⁷⁵ For an in-depth exploration of the arguments in favor and against the psychological reality of corpus-based linguistic generalizations, see Blumenthal-Dramé (2012: Chapter 3).

Specifically, Sanders and others use eye-tracking as the specific online method to shed light on the nature of causal connectives by triangulating with corpus studies. There are sufficient cognitive and functional roots in grammaticalization and constructionalization theory to extend this hybrid methodology to case studies, mainly in such a view as ours, where functional and cognitive explanations appear maximally intertwined.

As mentioned in chapter 1, grammaticalization can be approached both from a synchronic and a diachronic perspective. While studies of grammaticalization from a historical point of view has been carried out with both qualitative and quantitative techniques (depending on the author), synchronic studies have privileged the quantitative method to obtain a picture about the status of the form and their ongoing changes.

This is the perspective we adopt in this study, in which we want to obtain a current —though fluid (Hopper, 1988) rather than static— approximation to the position and relations of these forms in a constructional network. In order to do this, we have extracted a sample of 400 examples (100 of each DM) in Present-day Spanish, which have been analyzed through a series of variables aimed at characterizing them functionally and categorically.

5.1.1 Corpus selection

The data were retrieved from *Corpus del Español del Siglo XXI* (CORPES XXI), which is the most modern corpus recollected by the Real Academia Española. It consists of over 286 millions of forms, from a time spanning from 2001 to 2016, being all the years equal in number of forms and in the typology of texts that has been considered. These features stay as important reasons for the selection of this corpus.

Firstly, the fact that it encompasses texts from the beginning of the 21st century until few years ago ensures that we capture the status of the forms that matches the psycholinguistic reality of our eye-tracking participants. Secondly, the vast number of examples does not suffice to guarantee the accuracy and validity of the study, but also a certain degree of representativeness and balance is required; CORPES XXI meets this condition, insofar it shows a balanced structure regarding the population per year and the typology of texts used. This also brings as an advantage that it enables normalized frequencies, thus providing us more valuable statistical data, in terms of frequency of use.

In this sense, we have to highlight that it gets a relatively fine-grained classification of texts, allowing for a genre selection within the different typologies and domains of use. It is important to note that, according to Lee (2001: 37), genre is “the level of text categorization which is theoretically and pedagogically most useful and most practical to work with”. In addition, it takes us closer to the concept of discursive tradition (Kabatek, 2005), which has been revealed as an important dimension to observe language change more accurately (Kabatek, 2005; Pons, 2008b; Garrido Sepúlveda, 2017).

Moreover, we can point to some specific and technical issues that support our choice: on the one hand, its searching engine allows for more complex and particular searches;⁷⁶ on the other hand, it retrieves all the tokens of a form, regardless of whether the first letter is a capital one or not, which in our case is an advantage.⁷⁷

5.1.2 Population and sample

The corpus study was constrained to the peninsular variety of Spanish, as the eye-tracking study was carried out in Spain. Using the sub-corpus of this area, we have done searches of *por esto*, *por ello* and *por eso*, allowing for a word in between, as these connectives still allow modification by a modifier: the particular search was to look for the form *por* with a distance filter of two words to the right before the form *esto*, *eso* and *ello*. In the case of *por tanto*, this was not possible, since it is categorized in CORPES XXI as a fixed structure (hence, as one word) and then it discards this DM (categorized as an adverb) and retrieves only the compositional constructions with *por* and *tanto* (e.g.: ***por qué tanto*** ruido). To solve this problem, we have extracted all the examples of the forms *por tanto* and *por lo tanto*, since this is the only possible variant in Present-day Spanish.

These searches produce a total of 47,465 occurrences, distributed in the following way:

	Por (lo) tanto	Por eso	Por ello	Por esto	Total
Absolute frequency	18,010	19,226	8,972	1,257	47,465
Relative frequency	37.9	40.5	18.9	2.6	100
Normalized frequency	199.71	213.2	99.4	13.9	

Table 30. Absolute, relative and normalized frequencies of *por (lo) tanto*, *por (+-X) eso*, *por(+X) ello* and *por (+-X) esto*

As a specific analysis of such a large number of examples is hardly feasible, a random selection was applied: all the examples of the different forms were transferred to a database and randomly sorted; afterwards, the first 100 examples of each form fitting the particular schema were selected in order to apply them the following variables.

5.1.3 Situational variables

5.1.3.1 Register

Although it is not the main trend in studies of DMs, neither in the grammaticalization framework, register has been regarded as a conditioning factor for the presence, frequency of use and polysemy of different DMs (e.g., Diewald, 2015). From a constructional point of view, this

⁷⁶ For example, in our case we wanted to retrieve all the tokens belonging to the following structure: *por (+determiner) ello/esto/eso/tanto*. This search is very hard to achieve in CREA, as the operator AND yields fragments with *por* and *eso*, *ello*, *esto* co-occurring in both directions, that is, e.g., *por(...) eso* or *eso... por*. On the contrary, the filter of proximity in CORPES makes this search easier, since it allows for intervals (distance ≤ 2 words) and the position of the words in between (at the right or the left of any of the forms).

⁷⁷ For achieving this in CREA, we should use the operator O (“por eso O Por eso”), which, in addition to the AND operator, necessary for finding words in between, would have rendered the searching process very difficult.

conditioning factor may be understood as a property of the DMs, if we conceive them as constructions: “the function pole in the definition of a construction indeed allows for the incorporation of factors pertaining to social situation, such as e.g., register” (Goldberg, 2003:221). This idea is also pointed out by Traugott (2018a), when describing the kind of links that constructions show: “this model could be expanded to include links with sociocultural, genre and other external domains, when their contextual effects are known” (Traugott, 2018a: 34). Moreover, beyond theoretical claims, imbrication of external context and linguistic constructions has been empirically proved in several studies (for example, Terkourafi, 2009). Inclusion of sociolinguistic factors in constructions can be explained by an exemplar representation model (Bybee, 2013), where all the usage events are stored in memory with a great deal of details of their context of use, including situational contexts.

These facts lead us to assume that description of paradigms of DMs should take into consideration sociolinguistic factors, which can help differentiate the members within it. Moreover, we can hypothesize, following some assumptions (Verhagen, 2000: 266-267; Kabatek, 2005; Pons, 2008b), that linguistic changes do not take place in a homogenous way, but they spread differently through social varieties or layers of language.⁷⁸ Accordingly, a specific form can reach varying degrees of grammaticalization or different constructional properties in different genres and registers, so register becomes an interesting area to apply cross-comparisons with the other designed variables.

Yet, we have to deal with some problems to operationalize the notion of register in our data. First of all, the distinction of register often mixes with the one between oral and written language, because they intersect in a way we cannot describe here for reasons of space.⁷⁹ They can be somehow collapsed (included to some extent) in a distinction between communicative immediacy and communicative distance, as presented by López Serena and Borreguero (2010), among others. A similar and related approach is presented by Briz (2010), but focusing on these (and other) factors as catalysts for the presence of a specific register.

According to the author, the diaphasic level is determined by the following situational factors:

- *Social and functional relation between interlocutors*: social (age, social group, etc.) and functional (role in communicative situation) proximity favors an informal register, while distance in these relations leads to a more informal register.

⁷⁸ This calls for new insights in diachronic research:

La única solución al problema de la coexistencia de tradiciones discursivas diferentes que influyen sobre la diacronía de la lengua es entonces una historia de la lengua que estudie las diferentes tradiciones sin limitarse a una solamente, manteniendo la diferenciación, es decir, una historia de la lengua menos monolítica que permitirá saber en qué TD se crea una innovación, cómo se difunde a través de las TD, y también dónde hay TD resistentes a las innovaciones, TD que preservan elementos que en otras TD ya no se usan. (Kabatek, 2005)

⁷⁹ In fact, it is the *mode* of communication the dimension of users' variation that has been many times taken into account in the study of DMs (for example, Montolío, 2001).

- *Shared experiences between interlocutors*: even with equal social conditions (same social group, same age), the degree of mutual knowledge conditions the presence of a more or less formal/informal register.
- *Frame of interaction*: an everyday-life scenario brings participants to an informal register; the more specific the scenario is the more it inhibits interlocutors from a natural colloquial register.
- *Subject*: specific subjects detract from the colloquial register; in everyday subjects the use of an informal register is much more common.
- *Degree of discourse planning*: discourse planning affects the linguistic choices and structures notably, i.e., it completely conditions the linguistic formulation. A low degree of planning relates to some colloquial mechanisms (for example in discourse coherence and cohesion); in higher degree of planning, more elaborated formulations are given.
- *Communicative goal*: the prototype of colloquial text is characterized by fulfilling an interpersonal function. On the contrary, when the function of communication becomes transactional the register usually rises up.
- *Tone*

The interaction of these factors (and the fact that many of them do not imply discrete distinctions) may yield a great range of diaphasic varieties, so the formal / informal distinction is not categorical or discrete, but gradual, conforming a variationist continuum, as represented by Briz (2010). Moreover, these social conditions can vary in the course of communication within the same exchange/ text, and texts often contain different subgenres and discursive traditions (syntagmatic compositionality, Kabatek, 2005).⁸⁰ Therefore, we cannot always categorize the degree of formality of our fragments only based on the genre they belong to, although in many cases we have to rely on the general correlations between these two categories, due to lack of context.

In order to categorize this range of situational variation, we have established four degrees of (in)formality:

- **The informal register** is characterized by being dialogal with no predetermined turns, social and functional proximity, common experience, daily topics, interactional goal and colloquial tone. The prototype would be the conversation between close people.⁸¹

⁸⁰ For example, we can illustrate this with one of our represented genres. Within a minister press conference, we can distinguish two subparts: the conference and the round of questions and answers. The former is a monological planned subgenre and the latter is dialogal, not planned with predetermined turns.

⁸¹ It includes not only real conversations, but also dialogues in fiction genres, even though we are aware that the degree of truthfulness of colloquial modality decreases to some degree. Nevertheless, we assume that the traits used by the author to reproduce a colloquial conversation are perceived as linguistic forms related to this informal register (relying thus to some degree on the “metasociolinguistic” consciousness of the author).

- **The semiinformal register** covers dialogal exchanges, where the relation between interlocutors is not close, but the topic is an everyday-life one; for example, some interviews addressing life experiences of people. It also includes monological (only one speaker) with dialogic features and daily topic, yielding an informal tone, as could be the case of comic monologues, some posts on internet blogs or some advertisements.
- **The semiformal register** encompasses mostly written monological (non-dialogical texts), with no relationship between interlocutors, addressing semi-daily topics. This is in our opinion, the case of most of news and reportages. Out from the journalist domain of use, many informational texts written with a spreading function and hence addressed to a wide public fall into this category.
- **Formal register.** We have here oral monological institutional discourses and statements, such as politics press conferences and also dialogal with no predetermined, such as the questions and answers in these political press conferences. In the written language, the prototype would be academic texts, because of the specific issues they deal with and the lowest degree of indexicalization. Juridical resolutions are also close to the prototype. Narration fragments of novels often are within this category and some essays as well.

Because of the internal variation of some genres, we have to consider the tone used in order to categorize. For instance, the huge genre of novel provides a wide range of situational variation: the classical omniscient (external) 3rd person narrator produces a more formal speech than an internal (perspective point of a character) 3rd person narrator, and this latter tends to a more formal register than the 1st person narrator. This gradual difference has to do with the level of indexicalization, being lower in the first case and higher in the last case. Anyway, the difference has to be reflected in the tone they use, because there are cases of considerable differences between, e.g., two different 1st person narrators.

Our distinction retains some of the bases of the notion of conceptual communicative immediacy or distance (Koch and Österreicher, 2007 [1990], as quoted in López Serena and Borreguero Zuloaga, 2010). These dimensions can be achieved by primary situational anchoring, i.e., monological or dialogal mode in nature, or by secondary situational anchoring, i.e., genres or modes embedded in a frame-genre (for example reported speech) or by imitation. Our informal register corresponds straightforwardly to the primary situation anchoring, being dialogal in nature, while the semiinformal belongs to the secondary situational anchoring, where the dialogal mode is imitated in monological genres, giving place to dialogicity.

As has been said, this situational variable will be contrasted with the variables aimed at obtaining clues for the position of some forms in the constructional network, which are formal and functional variables.

5.1.4 Formal variables

5.1.4.1 Formal fixation

Formal variability is one of the clues of the degree of grammaticalization of a certain form. In grammaticalization processes formal fixation takes place via decategorialization (Chapter 1), with loss of morphological (affixes variation) and syntactic (allowance for modifiers) features of the source category.

From a constructional point of view (Chapter 2), two insights are worth mentioning. It has been said that grammaticalization increases the productivity of a construction, as gradually it can occur in more and more contexts; it is what Himmelmann (2004) calls the syntactic, semantic-pragmatic and host-class expansions (§1.2). But from an internal point of view (the element-based point of view), productivity, compositionality and (sometimes) analyzability decrease (Traugott and Trousdale, 2013), and it can be defined as the process “by which the parts of a constructional schema come to have stronger internal dependencies” (Haspelmath, 2004: 26), thus increasing *unithood*. Put differently, a schematic construction (with some combinatorial choices) becomes a substantive fixed one.

In order to find out the level of morphosyntactic fixation that our connectives display, we pay attention to two different measures. First, we account for the percentage of examples in which they appear with a modifier, which reveals the internal variability / compositionality. This would resemble the criterion of *adjacency* proposed by Torres Cacoullos (2011) to measure *unithood*. Modifiers, in our case, can be adjectives (determiners, proper adjectives, or relative clauses) placed before (*por todo eso*) or after the head of the phrase (*por esto mismo*).

Secondly, we also count the examples in which the connective is under the scope of negation or a focalizer. This is an example of modification of the whole construction, as adverbs can modify adverbs or adverbial phrases. This kind of modification reveals a higher degree of conceptual weight in meaning and a higher contribution to propositional content, as far as only propositional content can be negated or focalized (see §5.2).

The distinction is also justified for practical reasons as these two kinds of modification can concur in an example:

- (67) Pero, **precisamente por todo esto**, cobra mayor relieve el hecho de que fuera precisamente Onésimo Redondo aquel de entre los dirigentes fascistas que enunciase de forma más sucinta y clara las razones por las que el nacionalismo revolucionario no podría ser ni confesional ni católico.

(Ismael Saz Campos, *España contra España. Los nacionalismos franquistas*, 2003 [retrieved from Corpes XXI])

5.1.4.2 Position

When applied to DMs, position becomes a chief parameter in researches of grammaticalization. In fact, in cases like ours it is regarded almost as an only criterion to consider the extrasentential scope of connectives. Recall the statement by Pons Rodríguez:

caso ilustrativo es el de los marcadores discursivos que incluyen demostrativos o elementos específicamente capacitados para trabajar fóricamente; formas como “por esto” o “por ende” pasan de ser solo intraoracionales a funcionar también, simultáneamente, de manera, supraoracional; pero, ¿cómo discernir los papeles durante el proceso intermedio? **Son la posición** y, en menor medida, la invalidación para funcionar saturando un argumento de la principal **los únicos índices, pero no dejan de ser pistas escurridizas** (Pons Rodríguez, 2010 [emphasis added])

The consideration of the position of an element such a DM in its linguistic environment, however, faces huge difficulties, as it involves a switch from sentence grammar to discourse grammar. In order to deal with this issue, academics adopt different operative criteria.

Pons Bordería (1998a) establishes three positions: initial, which is found in the first three words, and is placed, therefore, in the initial phrase (*mi hermano, por tanto*); internal, further from the first three words; and final, in the three last words of the utterance. Cuenca and Torres Vilatarsana (2008), in turn, only considers initial and final position with regard to the element it affects (has scope over). It seems necessary to mention the work carried out by the research group Val.Es.Co. In its system, the position can be initial, intermediate, final or independent (stand-alone); however, positions are not applied in an absolute way, but in relation to the specific discourse unit they operate in (intervention, act, subact). This kind of analysis has turned out very fruitful in the determination of the relation between the position and the function in DMs, both from a synchronic (Briz and Pons Bordería, 2010; Briz and Estellés, 2010) and from a diachronic (Pons Bordería, 2018) point of view.

For our purposes, however, it seems that a solution similar to the one taken by Traugott (2018a) suffices. She distinguishes initial and final position with regard to the unit “clause”, and it does not matter if the clause forms by itself a sentence or it is part of a complex sentence. Following this criterion, we use initial, intermediate and final position with regard to the propositional content it affects. Thus, all the following examples would count as initial position, because they appear before the propositional content:

- (68) (...) son contrarias a la teoría de Brandi, puesto que este defendía el máximo respeto por el original. Sin embargo en el arte contemporáneo la unidad potencial de la obra de arte a veces está desligada de la propia materia, es decir, la obra sólo es un medio para transmitir la unidad potencial, nunca una finalidad. **Por ello en la restauración del arte contemporáneo es tan importante la investigación y conocimiento profundo de la obra de arte y de su mensaje**, ya que nos permitirá discernir la importancia otorgada por el artista al aspecto matérico o la ausencia de valor de este, a favor de la idea o concepto que quiere manifestar.

(Carlota Santabárbara Morera, “La conservación del arte contemporáneo: ¿un desafío para la teoría de la restauración crítica?», 2016 [retrieved from Corpes XXI])

- (69) Así que también iba retrasando mi vuelta a Madrid, me refiero a una visita a mis niños y a mi padre y a mis hermanos y amigos, habían pasado demasiados meses sin poner pie en mi ciudad y **por lo tanto sin ver ni percibir a Luisa, que era lo que más me atraía y asustaba**

(Javier Marías, *Tu rostro mañana. 3 Veneno y sombra y adiós*, 2007 [retrieved from Corpes XXI])

- (70) Gracias, Rosario, yo me fío de ti, porque sé que las otras, bueno, las otras..., me dirían lo que fuera, lo primero que se les pasara por la cabeza, pero tú siempre dices las cosas de corazón, aunque sean impopulares. Rosario, **por eso confío en ti**. Porque no te importa ser impopular.

Elvira Lindo, *Una palabra tuya*, 2005 [retrieved from Corpes XXI]).

Medial or intermediate positions remain for the cases in which the connective is placed inside the propositional content it affects to, as in (71);

- (71) **Quedaban, por tanto, solo dos posibles candidatos en liza**, Barreiro y Feijóo, porque pronto se vio que López Veiga no tenía los apoyos que él pensaba.

Pilar Cernuda, *Contra el talante. Rajoy y la oposición a ZP*, 2008 [retrieved from Corpes XXI]

We recognize the domain of connection in three levels, being the clause the intermediate one, regardless of whether it is itself a sentence or part of a complex sentence: below this level, we find connection between and within phrases; above it, the connection of more than one sentence (act), or what Pons Bordería (2018) calls the set of acts (SoA).

For clarity's sake, here we do not use more discourse units described by Val.Es.Co, since, in some cases they do not allow distinctions similar to the ones presented in the last paragraph. Note that a connective linking members in a phrase would be understood as a medial position of subact, as these components, to my knowledge, would not be considered as distinct subacts. Hence, in the case of the consecutive DMs, clause and phrase are more informative to our purposes than the unit of subact. Look at the following examples taken from our database:

- (72) Se ha apoyado en una subsidiada y **por tanto ruínosa** agricultura continental, la cual ha convertido campos mesetarios en monzónicos cultivos de arroz y en tropicales fincas de maíz (Pedro Brufao, *Elmundo.es*, Natura, 2008 [retrieved from Corpes XXI])

- (73) **No es extraño por ello que Gracián recoja en sus obras y sobre todo en El Criticón la tradición de las esferas armónicas, a veces convertidas en coronas e islas, como signo de perfección**, y que haga en él un canto al sol, alma del mundo para Ficino, en sus comentarios al Filebo de Platón.

(Egido, Aurora, *La búsqueda de la inmortalidad en las obras de Baltasar Gracián*, 2014 [retrieved from Corpes XXI])

Both examples would be instances of a medial position of subact in the system of Val.Es.Co, although we can agree that there is a qualitative difference between them.⁸²

⁸² This is confirmed by the annotated examples they provide in the “advanced” description of position of DPDE:

#{SSD El discurso fue vehemente y, {SAT por ello, SAT} eficaz. SSD}#

#Pero la defensa de Salamanca [de mantener en la ciudad el Archivo de la Guerra Civil] no se basa sólo en razones históricas:# #se basa en sentimientos en agravio y de expolio a una ciudad, y de favoritismo a otra comunidad autónoma.# #SSD Estamos, {SAT por tanto, SAT} ante una situación muy delicada, de las que afectan a la cohesión nacional. SSD}# #SSD Permítaseme, {SAT por ello, SAT} expresar mi perplejidad por la desastrosa gestión gubernamental de este asunto. SSD}#

5.1.4.3 Parentheticality

Most of times DMs appear detached from the linguistic segment they affect by means of commas or other punctuation marks in the written mode, which are supposed to represent pauses in the oral speech (however, see Wichmann, 2011 and Cabedo, 2013). This feature has to do with their lack of integration or syntactic independence. As seen in §1.3 a new approach to language, called Discourse Grammar (Kaltenböck et al., 2011; Heine et al., 2013; Heine, 2013), has brought up this syntactic property to encompass and group a wide range of units fulfilling a special role in communication, called *theticals*. Their definition of this kind of units lies on form and meaning properties, but for the structural part, only prosodic detachment is mentioned and punctuation is also taken to be the counterpart of prosody in written texts.

We must note that this clue remains indirect for two reasons. On the one hand, punctuation marks are tied to orthographical matters and these do not always reflect the suprasegmental reality of oral speech faithfully. On the other, there is a huge interpersonal variation in the use of punctuation, which actually reveals aspects of writing skills and/or idiosyncratic style (written idiolect), and we should take into account this confounding factor.

Nevertheless, against these barriers, we can point out that there are authors who claim to rely on punctuation as an indirect evidence of the degree of fixation of a certain form as a connective in the mind of speakers/ writers (Estellés and Cuenca, 2017: 172; Cuenca and Visconti, 2017: 96, 98; Traugott, 2018a). As pointed before, from the point of view of Thetical Grammar the degree of integration does not necessarily mean a gradual change in the fixation of a form as a connective, but a sporadic use of this unit as a thetical or in the domain of Thetical Grammar. But whatever the framework we use and the implications it carries (for a theoretical account of the possible evolution of these units from a Discourse Grammar point of view, see §1.3, §2.3.1), we need to use punctuation as proof. This is the only way we have to address the degree of integration of these forms, mainly if we bear in mind that some of them are most of times found in written language.

5.1.4.4 Type of construction

Following Traugott (2018a), we characterize the examples as belonging to a schematic construction. This parameter actually represents an *interface* between formal and functional features, as far as constructions are supposed to represent fixed (conventional) pairings between these poles. By doing so we assume a perspective of changes anchored in a constructionalization framework, partially different from the one traditionally held in grammaticalization:

A grammaticalization perspective asks how a referential expression such as *after all* became a non-referential discourse markers, without consideration of the schemas it instantiates. [...] In the present analysis, constructionalizations are conceptualized as the outcome of speakers matching the expressions to extant abstract constructional schemas and subschemas. (Traugott, 2018a: 43)

We consider three possible constructions that they can instantiate: connective (example 74), intrapropositional adverb (example 75) and pseudo-cleft construction (*es por esto que*) (example 76); *doubtful* remains as a category for bridging cases, as in (77) and (78).

- (74) Las gentes de la izquierda perciben un pueblo que no sólo reclama su "derecho" a la prosperidad económica sino que, sobre todo, se hace directamente responsable de conseguirla, no de recibirla del estado; y, **por ello**, intenta ese mismo pueblo insertarse en la economía de mercado de todas las maneras posibles, incluyendo la de la pequeña empresa informal.

(Víctor Pérez Díaz, *Sueño y razón de América Latina. Política, cultura y sociedad civil en la gran transición*, 2005 [retrieved from Corpes XXI])

- (75) -Haré lo que usted quiera, pero no hable así de mi padre. Yo vine porque me mandaron, nada más que **por eso**.

(Armando López Salinas, "Una historia familiar". *Crónica de un viaje y otros relatos*, 2007 [retrieved from Corpes XXI])

- (76) **Es por esto que** la ecuación de Einstein debe ser entendida como la expresión de una identidad largamente ignorada por los investigadores del pasado. No es que la masa y la energía sean dos conceptos sustancialmente equivalentes; es más bien que se trata del mismo concepto denominado de dos maneras diferentes.

(Rafel Alemany, *Relatividad para todos*, 2004 [retrieved from Corpes XXI])

- (77) Con esto podemos ver que es mejor cambiar de caja, aunque obviamente corremos el riesgo de equivocarnos y no confiar en nuestra grandiosa suerte, **por esto** no tenemos un 100% de probabilidad de acierto.

("Un juego", Gaussianos. gaussianos.com: gaussianos.com, 08-02-2006 [retrieved from Corpes XXI])

- (78) Elías Querejeta ha sido probablemente la figura más determinante del cine español de los últimos 50 años; pero es seguro que no hubiera cambiado el reconocimiento que **por ello** merece por el indiscutible honor de ser el autor de aquel gol de 1955 al Madrid. Un gol que fue a la vez su opera prima y su obra maestra.

(Patxo Unzueta, "Intelectuales y fútbol", *El País*, 06-10-2013 [retrieved from Corpes XXI])

While it has been argued along these pages that the compositional semantic nature of these markers makes it difficult to set apart intrapropositional from extrapropositional scope, or connective meaning, there are some necessary conditions for the prepositional phrase to act as a connective:

- The phoric member should recover an abstract situation previously mentioned and not an extralinguistic referent. This is explicitly covered in the semantics of *por ello* (or *ello*, more exactly), but not in *por eso* and *por esto*, which can yield an exophoric deixis (deixis based on the communicative situation).
- The scope should at least exceed the verbal phrase and include all the discourse member. Unlike manner adverbials, causal complements —as spatial and temporal (Fischer, 2007)— have scope over the subject as well. However, this allows to discard

examples where the form clearly acts within the verbal phrase as the mandatory complement of certain verbs: for example, *optar por ello/eso/esto*, *apostar por ello/eso/esto*, *preocuparse por ello/eso/esto*. In addition, note that the prepositional phrase *por eso* in initial position can instantiate two constructions, with varying scope and, thus, different meaning. The contexts in (79) and (80) favor the different meanings: while in (79) *por eso* is a focalized prepositional phrase with scope within the VP, in (80) it has scope over the utterance, foregrounding its connective function. The scope of the negation is helpful to understand the difference.

- (79) No tengo miedo de perder el trabajo. **Por eso** no me preocupo, me importa más la consideración que tengan de mí. [No [me preocupo [por eso]]]
- (80) Sé que tengo cualidades para desempeñar el trabajo perfectamente. **Por eso** no me preocupo. [Por eso [no me preocupo]]

A complementary test for assigning connective status to our examples is to check the validity of an intrapositional causal concomitance. If it admits so, it means that the function is not covered by the marker under study.

As seen, we take a broad definition of connectivity, delimited by the specific properties of non-connective items exposed above. Such a decision is imposed by the difficulty to unambiguously judge the scope of the adverbial (Fischer, 2007) and resembles the criteria used in the DPDE to consider a particle status.

5.1.5 Functional variables

As we have broadly seen (chapters 1 and 2), grammaticalization and constructionalization focus on both formal and semantic changes. While some famous and classical approaches have privileged a hand-in-hand evolution, e.g., parallel reduction hypothesis (Bybee et al., 1994, Rhee, 2003), we can also note an asymmetric treatment in the differentiation between primary and secondary grammaticalization in the spirit of Traugott (2002) (§1.1). This attempt is even clearer in the framework of constructionalization (§2), where constructional changes in the formal or semantic pole can take place independently.

Then, we keep formal and functional variables separated for different reasons. On the one hand, changes occurring in one side (either formal or functional) account for a constructional change, which is different from a constructionalization (i.e., a change in both poles, producing a new construction in language). On the other, we don't expect to find discrete or categorical distinctions, but a constructional network with multiple links (Traugott, 2018a), where gradience plays a great role, and this would be the result of small mismatches of form and function (Rosenbach, 2010) that can be verified by our comparison. Finally, this approach could shed some light on the real dimension that eye-tracker measures respond to: procedural meaning could not be necessarily acquired in a diachronic development (with e.g., formal fixation accompanying) but related to a functional open slot: the one of *Adjacent Subact* (AS) in the Val.Es.Co system or the one of *Thetical* in Discourse Grammar (recall that cooptation is a synchronic and spontaneous procedure available for speakers, see §1.3). Confining ourselves to

this framework, the relevant question would remain as whether the category discriminated by some eye-tracking studies on DMs (Nadal, 2017; Recio, et al., 2018; Salameh, 2019; Narváez, 2019; Recio, 2019; Torres Santos, 2021; Guillén, 2021) correspond to conceptual theticals or DMs (ritualized conceptual theticals).

5.1.5.1 *Kind of causality*

Accounting for semantic changes in our markers with the framework provided by grammaticalization becomes a difficult task, as far as the compositional meaning of the source structure already conveys a cause-consequence relation, by explicitly and anaphorically signaling the previous segment as the cause of what follows the marker. That is to say, the connective use of these forms can be explained by only drawing on their compositional semantics. As pointed out before, such particularity of our markers brings the invalidation of a methodological approach where a context incompatible with the source meaning stays as a definitive proof of change in meaning (Diewald, 2002; Heine, 2002).⁸³

Then, we cannot trace semantic changes leading to causal connective meaning, but the semantic evolution and change can be confined within the domain of causality, as far as we are dealing with historical linguistic issues, and, as we have already pointed out, changes often take place as movements within the same schema or category (Garachana, 1997: 367 and following). Therefore, we focus in the area of causality to find variation across our markers.

While some authors have highlighted the different formal behavior of some Spanish consecutive DMs (Portolés, 1998; Recio et al., 2018), little attention has been paid to the functional differences they could display. The scarce attempts found in the literature remain rather as

⁸³ Isolating context in this case are more related to the intrapropositional nature of the phrase: the uncommon cases in which another element already fulfills the function of intrapropositional causal adverbial phrase can be regarded as isolating contexts, as in this example taken from an explorative diachronic study:

E así querían los del pueblo que los padres se combatiesen, e que tomasen armas [[con]] ellos, porque los peligros de la batalla fuesen cerca de aquellos cerca quales era el provecho. [3] E por tanto estava la corte triste e muy pavorosa **por el doble e dubdoso espantamiento que avían**, así de la discordia que era entre ellos, como de los enemigos.

(Pero López de Ayala, *Traducción de Las décadas de Tito Livio*, 1400 [retrieved from CORDE])

In the next case the argument allows us to make a double determination: the first one about *por tanto* and the other about *por ello*. It is a proof about the intrapropositional versus extrapropositional nature of these forms, or at least the difference in the kind of causality, since otherwise they should show paradigmatic opposition:

y el legislador democrático tiene el deber de regular el matrimonio en la legislación civil en una sociedad abierta / libre y pluralista / abriendo opciones para las distintas actitudes con que esos derechos se ejercen // **es por ello** / **por tanto** / que esta ley no busca ninguna confrontación / ni la espera / con la Iglesia católica

(*Ruedas de prensa del Consejo de Ministros del Gobierno español*, 1/10/2004. [Retrieved from Corpes XXI])

comments or notes and lack a systematic explanation⁸⁴: some of these notes, addressed in §3.2.2, include a difference in the prominence of the cause or the consequence highlighted by the markers (Montolío, 2001), which can also be related to the difference in the informative structure they require (Briz et al., 2008).

Furthermore, a theoretical distinction in the category of causality has been captured by many authors and applied to DMs of different languages; however, it remains underexplored for the Spanish consecutive DMs. We refer to the distinction in the domains or sources of causality, which have been dealt with in the chapter 3. Therefore, it seems necessary to fill this gap by studying the causal nature of these markers in order to address the following points, mentioned in 3.1.2 and repeated here for contextualizing the research questions:

- According to a number of authors (Pander Maat and Degand, 2001; Pander Maat and Sanders, 2001; Degaand and Pander Maat, 2003; Sanders, 2005; Zufferey et al., 2017), some languages, like Dutch, German or French have different connectives for marking each of these causal relations, so these languages have lexicalized this cognitive extant category. That is to say, the cognitive subcategories of causality have reflexes in language expressions. **Does this hypothesis stand for Spanish consecutive DMs?**

- Such differences in causality seem to be rooted in traditional distinctions of levels of language: representation of ideas, expression of the speaker, appeal to the listener (Bühler, 2011 [1934]); ideational, textual, interpersonal (Halliday and Hasan, 1976); content, epistemic, speech-act (Sweetser, 1990). A relation between these domains and a diachronic path through them have been suggested in different ways (Traugott, 2002; 2012; Traugott and Dasher, 2002). However, the relations between the theory of grammaticalization and the existence of the causal connectives in different domains has been so far only very weakly pointed (Degand and Fagard, 2012). The relevant question would be the following: **is there any diachronic semantic change through these kinds of causality in our markers?**

- Different kind of causality has been proved to trigger processing differences in eye-tracker studies (Draxler et al., 1997; Canestrelli, 2013). In our case, **do the data from eye-tracker correlate with the kind of causality entailed by the connectives according to their usage patterns?**

As stated in chapter 3 when treating the source of causality, there is no absolute agreement about the relevant subcategories to be established within causality amongst scholars, but rather multiple approaches and explanations, some of them apparently differing in the labels and others in the resulting distribution of subcategories (3.1.3). Our procedure will be to take the most restrictive classification and to apply their categories to our database, since later merging of categories is feasible in order to find out which actual subcategories of causality underlie the

⁸⁴ An interesting attempt to explain semantic differences of consecutive DMs by drawing on cognitive meaning schemas is found in Bermúdez (2003).

semantic mapping of our markers. We here bring back the distinctions addressed in §3.1.2.3, in order to contextualize later the tests that we will use for classifying the data.

Degand and Pander Maat (2001) follow the initial distinction by Sweetser (1990) between a content, epistemic and speech-act domain, which we briefly exemplify again:

- The *content domain* refers to real-world causal relations (although it can refer to thoughts).

A. Volvió porque la quería.

Backward content causal relation

B. La quería. Por eso volvió.

Forward content causal relation

- The *epistemic domain* works in inferential relationships where causes act as premises or arguments and consequences as conclusions:

A. La quería, porque volvió.

Backward epistemic causal relation

B. Volvió. Por tanto, la quería

Forward epistemic causal relation

- In *Speech-act causal relations* the cause is the reason that justifies a speech act, for instance, an interrogative speech act:

A. ¿Qué haces esta noche? Porque hacen una película muy buena.

Backward speech-act causal relation

B. Tengo entradas de sobra. Por tanto, ¿quieres venir conmigo?

Forward speech-act causal relation

However, in the same vein as Sanders (1997, 2005, etc.) and others (Degand and Pander Maat, 2001), they claim that there is a distinction overlooked by Sweetser in the content domain. According to them, the actual usage of DMs in French, Dutch and German sets apart a volitional content causality from a non-volitional one. This new subcategory would occupy an intermediate position between content causality and epistemic causality. These claims are based on three observations that we sum up again with the relevant examples:

- Many epistemic connectives fit in a volitional relation, but they hardly do in non-volitional content relations:

(81) The sun came up. As a result /*so the temperature went up.

(82) I felt tired *As a result/ so I left.

- Connectives such as *that's why*, *c'est pourquoi*, *daarom* and presumably more in other languages show specialization in this domain.

- The use of a matrix-verb or performative operator enables their occurrences in epistemic or speech-act causality:

- (83) A. The snow is melting. *That's why /*As a result, the temperature is above zero.
 B. The snow is melting. That's why /*As a result, I think the temperature is above zero.
- (84) A. You have been very impolite. *That's why /*As a result, leave the room immediately!
 B. You have been very impolite. That's why / *As a result, I demand that you leave the room immediately!

This intermediate position, thus, seem to draw a scalar perspective on the causal domain. The continuum can also be extended to the epistemic realm by distinguishing between *causally-based epistemic relations* —i.e., the conclusion is drawn from a real-world causality—, such as (85) and (86) from *non-causally-based epistemic relations* —i.e., based on an abductive reasoning—, such as (87)

- (85) It has rained continuously for two days. The tennis court will probably be unplayable.
 (86) The snow is melting. The temperature must be above zero.
 (87) The lights are off. They are not at home.

Nothing is said about differences in behavior of DMs across these two types of epistemic relations, and for the particular goals of the corpus study the difference will be disregarded. However, the observation is insightful for a better theoretical understanding of our object of study. Specifically, this distinction allows us to explain the causal relations entailed by *por tanto* properly. Whatever the discourse segments are engaged, *por tanto* takes the relation to a mental domain, where a conclusion is drawn, be it based on real-world causality or not. Therefore, the relation in (88A) would fall into the category of content causality, while (88B) accounts for causally-based epistemic relation.

- (88) A. Valentín y Camila ocupan puestos importantes. Por eso ganan mucho dinero.
 B. Valentín y Camila ocupan puestos importantes. Por tanto ganan mucho dinero.

In sum, there remain the following four categories of causality in our study: non-volitional content causality, volitional causality, epistemic causality and speech-act causality. We try to categorize all the examples of our database as conveying one of these kinds of causality, depending on which of the following paraphrases (adapted from Pander Maat and Degand, 2001) they fit with:

- The nonvolitional paraphrase was *this has/had the following consequence*;
- the volitional paraphrase was *this is/was the reason to perform the following act*;
- and the epistemic paraphrase was *this leads to the following conclusion*.

- For speech-act relations, two kinds of paraphrases were used: *this can be paraphrased/summarized as follows*; and *this is the reason to carry out the following speech act*.

However, the analysis of examples still shows some problems that we outline here. First of all, we have to mention that connectives or DMs can entail by themselves a specific speaker involvement, transferring it to the causal relation. As we have seen, this is what happens with *por tanto*: although it can appear in the same context than other consecutive markers, the resulting meaning imply subtle differences.⁸⁵ This leads us to a scenario where we don't analyze which causal relations can cover certain connectives, but which causal relations encode our markers.⁸⁶ Hence, one could think that the analyses of cases could be biased by our previous knowledge of the functioning of these DMs. However, since we draw on a synchronic study, our introspection as a present-day speakers applied to the paraphrases seems to suffice to prevent us from this bias.

On the other hand, there are ambiguous cases fitting with more than one paraphrase. This is, however, not a theoretical problem: recall that grammaticalization explicitly draw on the notion of bridging context for those examples admitting two readings (the old and the new one). As grammaticalization also works with layering as one of its principles (Hopper, 1991), not only old uses but also bridging (ambiguous) cases can be found when any change has already taken place. These cases are also computed in our count and related, if applicable, to a constructional explanation.

5.2 Results

5.2.1 Sociolinguistic constraints

	Register ⁸⁷				TOTAL
	Informal	Semiinformal	Semiformal	Formal	
Por eso	15 16.48 %	17 18.68 %	45 49.45 %	14 15.38 %	91
Por ello	1 1 %	3 3 %	60 60 %	36 36 %	100
Por esto	5 5.26 %	18 18.95 %	44 46.32 %	28 29.47 %	95
Por tanto	0 0 %	3 3.06 %	41 41.84 %	54 55.10 %	98

Table 31. Distribution of consecutive DMs across four degrees of (in)formality

⁸⁵ Such subtle differences are hardly noticeable, as their general functional components are many times identical, but differing in the focus made in the construal. These complex distinctions based on difference in the cognitive focus are attested in other areas of grammar, e.g., Estellés and Albelda (forthcoming) for the boundaries between indirect cognitive perception and inferential evidencial.

⁸⁶ This issue, however, is straightforwardly connected to the effects of grammaticalization (and degrees of grammaticalization) and the asymmetrical distinction between procedural and conceptual items regarding their contextual manipulation. In words of Diewald (2015: 254), "less grammaticalized items are context dependent signs, fully grammaticalized items are context creating signs"

⁸⁷ Cases remaining until 100 for each marker have not been assigned due to lack of sufficient context.

It seems that nearly all our markers display strong links to a semiformal register, which is actually due to the high frequency of journalistic texts. It makes sense that it is in this type of text (exposition and argumentation) where cause-consequence relations are prominent (and therefore implicitly marked). *Por tanto* still shows a preference for the formal register, as a consequence of its high use in minister press conference and academic texts. This fact should also be explained by drawing on functional motivations, so we will treat it in the next sections.

In any case, taking these results in isolation, the distinction between conceptual immediacy and distance remains useful for setting apart our markers: *por eso* shows percentages of use in the immediacy registers quite higher than the other forms (35% vs 24%, 4% and 3%); closer to it stays *por esto*, with 23%, while the presence of *por tanto* and *por ello* in these registers is far rare (4 and 3%).

5.2.2 Formal variables

5.2.2.1 Presence of modifiers

	Modification			TOTAL
	No	Before the head	After the head	
Por eso	99	0	1	100
Por ello	96	4	0	100
Por esto	83	12	5	100
Por tanto	81	19 ⁸⁸		100

Table 32. Percentages of modified and bare constructions

The results exhibit a strong tendency for all these markers to be used without modification. Now, this does not necessarily mean that they are in an advanced degree of formal fixation, because this combination may be minimal in frequency due to particular reasons, not only as a result of a progressive reduction of their combinatorial capacity. In this sense, only diachronic data can verify a decrease in formal variability.⁸⁹

However, we can suspect that the difference between *por eso* and *por esto* does provide clues in some directions: according to their formal similarity, there is apparently no reason to justify the fact that *por eso* barely admits modifiers while *por esto* does it in more than 15 percent of the cases. *Por ello*, in turn, occupies an intermediate position, with over a quarter of examples with modification compared with *por esto*.

One could agree that a further relevant qualitative distinction is to be made in this datum: the number gives account of the token frequency of modified constructions, but we can still provide notes on their type frequency. It is interesting to note not only that, unlike the other forms, modifiers in *por esto* occur both before and after *esto*, but also that some concrete adjectives

⁸⁸ As mentioned in the methodology section, the percentages of modification in *por tanto* correspond to the other fixed form *por lo tanto*.

⁸⁹ Comparisons with other prepositional phrases containing other preposition and *eso*, *esto*, *ello* would also be relevant to a certain extent, but this falls under the goals of other study (Cuello, in preparation).

modifying *esto* are not found in the other markers (e.g., *por esto último*, *por esto otro*, *por esto de medicina*): in other words, its type frequency is higher.

Applying a usage-based constructional interpretation, it seems that the construction *por eso* exists in the mind of the speaker (Barðdal, 2008) or is entrenched by the speaker⁹⁰ in a lower degree of schematicity than *por esto*, whose schema still shows a higher type-frequency. But the links to the immediate schema of *por eso* are still available for the speakers. *Por tanto*, on the contrary, given the impossibility of combination, exists only at this level of schematicity (which is the one of substantive constructions), without links to the former schema. Such a situation seems to fit with the representation that Clausner and Croft (1997, as quoted in Barðdal, 2008: 48) make to depict the gradient of productivity of constructions (figure 27).

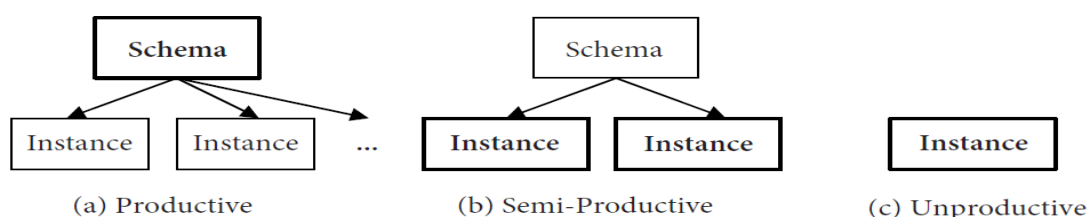


Figure 27. Gradient of productivity of a construction according to Clausner and Croft (1997)

Another measure of *unithood* used by Torres Cacoulos (2011) is *coordination*, according to which more chunked constructions detract from coordination. Applied to our case it would mean that cases as *por eso y otros motivos* would decrease as constructionalization (or at least formal constructional change) takes place.⁹¹

5.2.2.2 Focalization and negation

	Focalizer			Negation			External modification	
	Presence	Absence	Total	Presence	Absence	Total	Yes	No
Por eso	6	94	100	0	100	100	6	94
Por ello	7	93	100	5	95	100	12	88
Por esto	9	91	100	2	98	100	11	89
Por tanto	0	100	100	0	100	100	0	100

Table 33. Percentages of modification of the whole construction via focalizer or negation

Regarding focalization and negation as adverbial modification of the whole construction, it is confirmed, as pointed out by several authors (Portolés, 1998; Martín Zorraquino and Portolés, 1999, etc.), that *por tanto* cannot be negated nor focalized by a focus particle, while the others

⁹⁰ The difference between the two statements could seem subtle and even irrelevant from a practical point of view, but it carries implications with the theoretical background and assumptions. As Barðdal explains, seeing the higher level of schematicity of a construction as the level at which the construction exist in the mind of the speaker takes the hypotheses to a more psycholinguistic usage-based approach: “Given a bottom-up approach to grammar, constructions can only be assumed to exist at abstract schematic levels if there are linguistic data in support of such an analysis.” (Barðdal, 2008: 48)

⁹¹ This fact, that can be checked with a search in CORPES, is addressed in other study (Cuello, in preparation)

markers keep this possibility open. In general, this property would account for a higher conceptual weight and propositional content, as only propositional content can fall under the scope of negation, question or focalization. Hence, this parameter gives solid evidence of a sharp difference between *por tanto* and *por eso*, *por ello*, *por esto* regarding development to procedural non-propositional status.

Differences between markers in this feature are hard to analyze. It seems that *por esto* can receive focalizers a little bit more naturally than *por eso* and *por ello*, leading to the idea of its more conceptual nature: the token frequency is 2 and 3 points above the one of *por ello* and *por eso* and its type-frequency is minimally higher as well.

However, *por ello* is the marker that occurs more often under the focalization of negation (not only the adverb *no*, but also the preposition *sin*). *Por eso*, in turn, shows no examples of negation in our sample. The negation of this adverbial causal phrase with demonstrative is known as the source of some adversative conjunction, such as *pero* (from *per hoc*, Lat. ‘for this’), with the first degree of distance, and it remains to check whether functional specialization and structural pressure could explain a somehow exclusion or disfavor of the 2nd degree of distance (*por eso*) for this operation.

5.2.2.3 Position

Position ⁹²					
	Initial	Medial	Final	Stand-alone	TOTAL
Por eso	90 91.84 %	-	7 7.14 %	1 1.02 %	98
Por ello	80 84.21 %	6 6.32 %	9 9.47 %	-	95
Por esto	53 60.23 %	5 5.68 %	30 34.09 %	-	88
Por tanto	73 74.49 %	24 24.49 %	1 1.02 %	-	98

Table 34. Position of DMs

Again, the parameter of position allows to set apart *por esto* from *por tanto*, *por ello* and *por eso* by the higher preference of these latter forms to be used in initial position, the prototypical position of connectives and DMs (from 74 to 91% vs 60% of the cases). It must be said that the cases of final position (apart from the only one of *por tanto*) coincide with the ones we found lacking a connective function, and functioning as an adverbial phrase within the predicate (see section 4). Therefore, the subsequent conclusion we can draw concerns the asymmetry in their use with intrapropositional and extrapropositional scope. This does not imply that *por esto* cannot assume connective extrapropositional functions (indeed it does), but it seems to be less specialized in this function than the other forms.

⁹² Examples belonging to the pseudo-cleft construction are not accounted in the analysis of this parameter, since, in these cases, the forms are integrated in another construction and accounting for the position of this construction does not make sense. Also, doubtful examples, like some oral samples where, due to hesitations, it is not clear which position the marker occupies, have been excluded as well.

Yet, within the group we firstly differentiate with high initial position percentages, another interesting difference can be brought up from the data. As we can see, *por tanto* appears in a 24% of the examples in medial position, while *por eso* cannot occur in this position (according to our sample). *Por ello* can reach this position, but it happens in a low percentage of our examples (only 6%).

Bearing in mind the claims made in the historical literature (§4.1) about the common origins of these markers, we can, therefore, hypothesize that this capacity of *por tanto* to work in medial position constitutes a diachronic development. In fact, according to some work made on the rise and evolution of DMs, forms undergoing constructionalization into DM category often develop positional freedom, which actually means increasing syntactic detachment.

In this sense, it is also relevant to qualitatively account for the domain in which they establish the argumentative connection: while *por tanto* can connect phrases and elements of phrases, *por eso* has this possibility restricted; we have found one example of *por ello* fulfilling this kind of connection. These results are consistent with the specification made for the position of these markers in DPDE (Briz et al., 2008).

Note also that this domain of connection available for *por tanto* is also the one which the formal marker *por ende* is almost constrained to in Present-day Spanish:

- (89) Lista cual ardilla por genio y figura, doña Pepita no tardó en descubrir **la realidad y, por ende, la clase de futuro que le aguardaba junto a aquel hombre**, nada de lo que pareció importarle demasiado, dicho sea en honor a la verdad.

(José Luis Borao, “Ratones sin remedio”, *Camisa de once varas*, 2003 [retrieved from CREA])

Although it was the most used connective (among *por eso*, *por ello*, *por esto* and *por tanto*) with a wide connective scope in Medieval Spanish (Garrido Sepúlveda, 2017), as in the example (90), it seems to have specialized in this syntactic context we see in (89). We can suspect, therefore that the development observed for *por tanto* is shared with the changes undergone in the past by *por ende*.⁹³ Furthermore, *por tanto* seems to have become the unmarked member of the paradigm, as it shows less positional, sociolinguistic and context restrictions than the others.

- (90) En el nombre de Dios que es Padre e Fijo e Spiritu Sancto, tres personas e un Dios que uiue e regna porasiempre jamás. Natural cosa es que todas las cosas que naçen que feneçen todas quanto en la uida deste mundo cada una a so tiempo sabudo e non finca otra cosa que cabo non aya sinon Dios que nunca ouo comienço nin aurá fin e a semeiança de sí ordenó los ángeles e la corte celestial, que conmoquier que quiso que ouiessem comienço dioles que non ouiessem

⁹³ An explorative diachronic study suggests the following historical evolution in the position and the structural unit they form, following the Val.Es.Co conversational units' system. For examples of this kind of diachronic analysis, see Pons Bordería (2018) and Pons Bordería and Fischer (2021):

Part of a Substantive Subact / Medial or final position of Subact > Topicalized Substantive Subact / Initial position of Subact > Adjacent Subact / Initial position of Act > Adjacent Subact / Initial position of Set of Acts > Adjacent subact / Medial position of Subact

cabo ni fin mas que durassen por siempre, que assí conmo él es duradero sin fin que assí durasse aquel regno por siempre iamás. **Por ende** tod omne que de bona uentura es se deue siempre amenbrar daquel regno a que ha de yr e de lo que Dios le da en este mundo partirlo con él en remisión de sus pecados, que segunt dizen los Sanctos Padres que la cosa del mundo por que más gana omne el regno de Dios si es faziendo almosna.

(Anonymous, *Privilegio rodado*, 1304 [retrieved from CORDE])

Therefore, switching into a qualitative approach to the positions that these markers can cover, we obtain a picture such as the following:

	INITIAL		MEDIAL	FINAL
	Phrase	Act	SoA	
PAR. NON PAR.	POR TANTO			
PAR. NON PAR.	POR ELLO			
PAR. NON PAR.		POR ESO		
PAR. NON PAR.		POR ESTO		
PAR. NON PAR.	POR ENDE			

Table 35. Qualitative representation of DMs placement

In this table we have included a distinction concerning the parentheticality assumed by the use of “isolating” punctuation, which makes clear that final positions allowed for some forms are not instances of DMs or connective functions. We deal with this aspect in the following two sections: parentheticality and type of construction.

5.2.2.4 Parentheticality

	Punctuation ⁹⁴			TOTAL
	Parenthetical	Non parenthetical	Stand-alone	
Por eso	20 21.05 %	74 77.89 %	1 1.05 %	95
Por ello	46 46.46 %	53 53.54 %	-	99
Por esto	20 20.41 %	78 79.59 %	-	98
Por tanto	51 66.23 %	26 33.77 %	-	77

Table 36. Parenthetical and non-parenthetical uses of the DMs

This table shows interesting results regarding the syntactic features of these markers. *Por eso* and *por esto* behave in a very similar way, since they are treated (according to the punctuation) in most of cases as not parenthetical connectives, showing almost the same distribution of

⁹⁴ Oral examples included in these randomized selection of examples are not analyzed in this parameter, since the transcription does not provide enough clear prosodic notations to be extrapolated.

percentages. *Por ello* seems to be regarded by speakers/writers as a more parenthetical unit than *por eso* and *por esto*, displaying very balanced percentages of use with and without comma after it. *Por tanto*, as foreseen, shows the highest levels of parentheticality according to the punctuation, although it is manifest that it is also used as non-parenthetical (33%).

The results confirm that, on average, use of punctuation gives us clues (to some extent) on the internal representation speakers make about the syntactic properties of these constructions. However, as far as even *por tanto* can be used without commas, the following question remains open: to what extent are these patterns due to individual writing styles, or they stand for other structural or functional differences. To answer this, we will cross parentheticality with position first, and afterwards with the remaining variables of the study, in order to find regularities.

	Initial		Medial		Final	
	Par.	Non-par.	Par.	Non-par.	Par.	Non-par.
Por tanto	36	18	15	7	-	-
	67.67 %	33.33 %	68.18 %	31.82 %		
Por eso	20	66	-	-	-	9
	23.26 %	76.74 %				100 %
Por ello	46	34	-	6	-	9
	57.50 %	42.50 %		100 %		100 %
Por esto	20	33	-	2	-	21
	37.74 %	62.26 %		100,00		100 %

Table 37. Parenthetical and non-parenthetical uses for each position

For position, parentheticality leads to the following interesting findings:

- Parentheticality *ambiguity* for all the markers is constrained to initial position. In the rest of positions, only *por tanto* can present isolating commas.
- For *por tanto* it is interesting that the percentage of parentheticality stands across positions (67/33 in initial, 68/32 in medial).
- In the rest of markers, exclusion of medial and final positions from the consideration of parentheticality modifies the percentages, but they keep clearly distinguished: *por ello* reverses the tendency (more uses of parenthetical) but still shows a balanced difference; in *por esto*, parenthetical uses rise up, but they are much lower than non-parenthetical uses.
- In this position *por esto* is used 14% more than *por eso* as parenthetical.

These findings are related to the following results involving the type of construction that our examples instantiate.

5.2.2.5 Type of construction

Type of construction ⁹⁵					
	Connective	Int. Adv.	Cleft	Doubtful	TOTAL
Por eso	68	13	1	13	95
	71.58 %	13.68 %	1.05 %	13.68 %	
Por ello	76	9	4	10	99
	76.77 %	9.09 %	4,04 %	10.10 %	
Por esto	46	34	13	5	98
	46.94 %	34.69 %	13,27 %	5.10 %	
Por tanto	100	0	0	0	100
	100 %	0 %	0 %	0 %	

Table 38. Type of constructions

According to the type of construction which the examples represent, we can establish three groups. All the examples of *por tanto* belong to the DM/connective construction, which would mean that it cannot fulfill the function of intrapositional adverbial anymore, neither fit in a pseudo-cleft construction. However, the results could have been biased by the previous corpora annotation, excluding all the examples with no clear connective function.⁹⁶ In fact, an extra search has revealed a striking, unexpected finding: there exist (they have been uttered) pseudo-cleft constructions with *por tanto*, as the following:

Como véis, mi intención de ver esta ciudad como Dios manda se ha visto cumplida con creces. Y encima con amigos como Kalipo y Alicia, o como Vladi, nuevo en estas lides viajeras y con el que espero compartir otras aventuras. **Es por tanto que** este pequeño (debería de poner lo de pequeño entre comillas) apartado sobre Oslo va dedicado a ellos tres.

(José Miguel Redondo (Sele), “Viaje a Oslo 2007: Crónica de un fin de semana en la capital noruega”, *El Rincón de Sele*. [www.elrincondesele.com: elrincondesele.com], 2007-03-12 [retrieved from Corpes XXI])

Instead of concluding that *por tanto* can still function with its source compositional meaning (which, as seen in chapter 3, is not necessarily due to a lower degree of grammaticalization, but, possibly, to the typical layering of grammaticalization),⁹⁷ we rather consider more likely that these are cases of expansion of the consecutive construction [*es X que*], recruiting *por tanto*, via analogization, for a microconstruction: that is to say, [*es X que*] is a new construction, which

⁹⁵ Examples without a clear and sufficient context to be classified are not taken into account.

⁹⁶ Here the distinction grammar / pragmatics turns up very important, as we know that *por tanto* has been regarded as a fixed adverbial phrase, but we are not sure if this criterion includes functional connective features.

⁹⁷ In the words of Traugott and Trousdale (2010:28):

This means that all the various stages of a particular instance of grammaticalization may not coexist at any one moment in the history of a language, or if they do exist, they may not be considered to be in a gradient relationship to each other, so the link to synchronic variation may not be direct.

shows low type frequency and high semantic coherence and, therefore, according to Barðdal (2008) it is productive, allowing for analogy (extensibility).

In any case, the bias produced (if it came to exist) by the corpora annotation must be trivial, as it has been described that *por tanto* rejects formal properties of intrapropositional adverbs. Therefore, the results would confirm this difference in the degree to which DM constructional status has been reached, compared to the other forms.

Por ello and *por eso* stand in the second group with a high percentage of cases with connective function, but still some cases of intrapropositional adverbial function. The question remains whether the five percentage points keeping them away are to be considered in a continuum perspective. Anyway, the differences are in fact tiny compared to the percentage distance with *por esto* (47 % of connective function), which would account for the last level of specialization among our markers.

Moreover, the results look different if we break down this apparently monolithic reality into situational layers of language: from this perspective we find out that all the examples of semiinformal and informal registers (i.e., that belonging to conceptual immediacy) of *por ello* are adverbial phrase constructions, and only one adverbial phrase construction remains in the formal register. That is to say, *por ello* is strongly entrenched as a connective construction in the formal registers. As we will see below (section §6.3), this could explain the results in the eye-tracker experiment, as the experiment atmosphere builds a frame of conceptual distance which determines the expectations of participants regarding linguistic choices.

Taking into account the parameter of type of construction, we can split the previous schema of the position in which our forms can be placed, in order to get the actual behavior of the DMs or DMs-alike (formal and functional similarities) constructions *por tanto*, *por ello*, *por eso*, *por esto*.

	Position (DM)				TOTAL
	Inicial	Media	Final	Aislada	
Por eso	68 100 %	0 0 %	0 0 %	0 0 %	68
Por ello	71 93.42 %	5 6.58 %	0 0 %	0 0 %	76
Por esto	45 97.83 %	1 2.17 %	0 0,00	0 0 %	46
Por tanto	73 74.49 %	24 24.49 %	1 1.02 %	0 0 %	98

Table 39. Position in the DM construction

This table provides us a clearer picture of the differences between our DM. Medial position becomes here a key to understand positional freedom of our markers. *Por tanto*, apart from appearing once in final position, shows almost a 25% of uses in medial position, which means that this is a quite natural (though marked) placement for this marker (thus, green-colored number in absolute frequency). In *por ello* the medial position is possible for speakers, but far more marked than in *por tanto* (this is marked with yellow color). There is a clearer example of medial position of *por esto*, which remains trivial before a larger corpus inspection is carried

out.⁹⁸ Finally, no examples are found in this position for *por eso* in our sample, which would mean a virtual restriction in this position.

This leads to the following schema, where all the DM are distinguished with regard to the position and the scope of the connection:

	INITIAL		MEDIAL	FINAL
Phrase	Act	SoA		
POR TANTO				
POR ELLO				
	POR ESO			
	POR ESTO			
POR ENDE				

Table 40. Position and scope of consecutive DM

According to these data there is a scale of positional freedom which matches to some degree that of parentheticality. Both parameters can be collapsed in the property of syntactic detachment (intrapropositional or extrapropositional). In fact, our medial position equals what Schneider (2010) considers interrupting position (between elements with relatively strong syntactic relation) which is considered by this author as a parameter of parentheticality.

Furthermore, the restriction to the DM construction (besides the one concerning morphological variability) allows us to get closer to the frequency of the DM *por tanto*, *por ello*, *por eso* and *por esto* in the Spanish language. We use these percentages of DM/connective function from the sample in order to obtain approximate predictions over the population and afterwards get the normalized frequencies:

	Frequencies
Por eso	13,761.77
	152.61
Por ello	6,887.60
	76.31
Por esto	590.02
	6.52
Por (lo) tanto	18,010
	199.71

Table 41. “Estimated” absolute frequencies and normalized frequencies (per 1.000.000 words) of *por tanto*, *por eso*, *por ello* and *por esto*, as DMs

Apart from the striking gap between *por esto* and the other DMs, it is fully relevant that, removing the proportional percentage of intrapropositional adverbs from the estimation, the token frequency of *por tanto* as DM overcomes the one of *por eso*, confirming the observable increasing tendency, ongoing from the 15th century (see 5.2).

⁹⁸ Note that the count in *por esto* is limited to 46 examples, due to the high percentage of adverbial phrase uses, excluded in this table.

5.2.2.6 Conclusions: The formal side of *por tanto*, *por eso*, *por esto* and *por ello*

The parameters that we have selected to shed light on the degree of grammaticalization of *por tanto*, *por eso*, *por ello*, *por esto* help us draw their formal architecture. The differences between these DMs do not stand for all the parameters, but this is in line with the constructional approach, where multiple micro-steps take place as constructional changes.

In the case of *por tanto*, our analysis draws a substantive construction (no variation is allowed) completely instantiating the category of consecutive DM: rejection of external modification, high percentage of parenthetical use, positional freedom and extrasentential connective scope.

Por ello, in turn, shows a greater complexity. It still allows one type of modification with the adjective *todo*, but the percentage of modification remains so low that it is worth considering it to be entrenched at the lowest level of schematicity, building links with the DM construction. In this sense, it is likely that *por tanto* exerts attraction (recall the role of analogy and paradigms in grammaticalization and constructionalization, §1.3), inasmuch as *por ello* can also reach the medial position, but it still occurs in a small number of examples. Regarding the parentheticality usage percentage, it is placed in a somewhat middle position, displaying very balanced percentages of parenthetical and non-parenthetical punctuation (a half percent approximately). The cases of intrapropositional scope, though existent, are low if we compare them, for instance, with those of *por esto*; and, anyway, constrained to informal varieties and rare in formal registers.

Por eso exhibits also divergent behavior. On the one hand, it is strongly entrenched as a unit, if we take into account its hardly noticeable percentage of modification. On the other hand, as a connective, it maintains a relatively fixed position (initial) and, in this vein, it is used mainly as a non-parenthetical unit. The intrapropositional uses remain roughly as low as the ones of *por ello* in a general view.

Por esto seems to be placed in the other extreme of *por tanto*. It is an instantiation of the more schematic phrasal construction *por + noun phrase*, according to its higher type-frequency. Furthermore, intrapropositional examples are still numerous, and, in line with this, final non-peripheral position (prototypical position of phrase adverbials) reaches a 30 percent of examples.

	Modification		External modification	Position	Parentheticality	Type of construction
Por tanto	No		No	Freedom	High degree	Connective
Por ello	Low degree		Normal degree	Qualitative freedom	Medium degree	Mainly connective
Por eso	Very low degree	low	Low degree	Relatively fixed	Low degree	Mainly connective
Por esto	Normal degree		Normal degree	Final non-peripheral	Low degree	Considerable intrapropositional percentage

Table 42. Overview of formal parameters in *por tanto*, *por eso*, *por ello* and *por esto*

Taking into account all these formal parameters, a construction network representation of our markers would look this way:

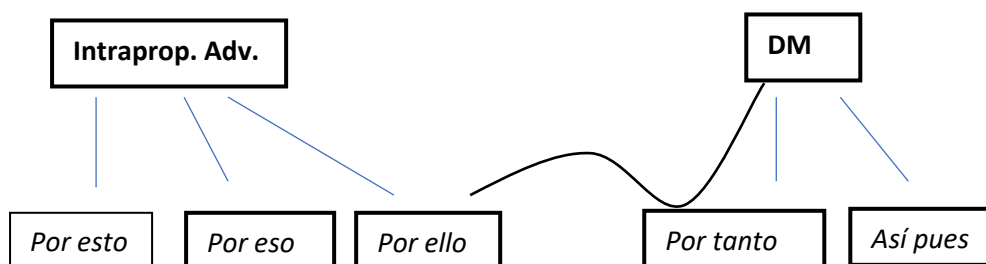


Figure 28. Constructional network of *por esto*, *por eso*, *por ello* and *por tanto*

Intrapropositional adverb construction sanctions *por esto*, *por eso* and *por ello* according to some properties they still maintain, mainly their negation and focalization allowance. However, there is a difference in the level in which they are entrenched. *Por esto* is still entrenched at its higher schematic level of intrapropositional adverb (actually the one of *por NP*), while *por eso* and *por ello*, given their low type and token frequency of modification, are entrenched at the substantive construction level, which is depicted by means of a border-remarked box.

Likewise, the degree to which they instantiate the construction differs, as they do not meet all the prototypical features of intrapropositional adverbs to the same extent, and, in order to account for this, they are laid out from left to right according to their prototypicality. The prototypical position of intrapropositional adverbs in Spanish is final, which is mostly found in *por esto*. *Por eso*, with regard to position, has inhibited this prototypical feature by prominently occupying the initial position, which, through the functional connective function, can be understood as a link to the DM construction.⁹⁹ In *por ello* the resemblance to the DM category is greater insofar as it not only occurs in initial position but has acquired more positional freedom. This is why a link to the DM construction has been included via analogization to *por tanto*. The same can be said regarding parentheticality: *por ello* deviates from *por eso* and *por esto* in the degree of parentheticality, which is getting closer to the one of *por tanto*.

5.2.2 Functional variables

Until now, some parameters regarding the formal nature of these forms have been analyzed, providing us with some relevant differences. It remains to look at the semantic pole in order to find out which functional features reveal differences between our markers and whether they are related to a diachronic development, an ongoing change or neither of both. From these findings we should check to what extent these differences relate to the formal distinctions

⁹⁹ In fact, in the Val.es.co system, *dislocation* of this kind of phrases accounts as *topicalized subact*, which can be understood as a bridge between intrapropositional adverb and extrapropositional adverb (adjacent subact).

observed; that is to say, which is the overlapping of form and function in our constructions. A further task will be to examine the relevance of functional distinctions in the eye-tracking study.

5.2.3.1 Kind of causality

Type of causality ¹⁰⁰								
	Content	Content-epistemic	Volitiva	Volitiva-epistemic	Epistemic	Epistemic-speech act	Speech act	TOTAL
Por eso	17 19.10 %	1 1.12 %	50 56.18 %	4 4.49 %	14 15.73 %	1 1.12 %	2 2.25 %	89
Por ello	15 17.05 %	11 12.50 %	29 32.95 %	2 2.27 %	29 32.95 %	0 0 %	2 2.27 %	88
Por esto	13 17.11 %	13 17.11 %	20 26.32 %	1 1.32 %	28 36.84 %	0 0 %	1 1.32 %	76
Por tanto	0 0 %	15 15.46 %	4 4.12 %	3 3.09 %	64 65.98 %	3 3.09 %	8 8.25 %	97

Table 43. Type of causality across markers

A first inspection to the content causal relations confirms a sharp distinction between *por tanto* and the other DMs (table 44). *Por ello*, *por eso* and *por esto* are able to introduce or fit in content relations with very similar percentages. On the contrary, *por tanto* does not usually convey this kind of relation, as we find no clear and unambiguous example in our corpus.

	Por eso	Por ello	Por esto	Por tanto
Examples	17	15	13	0
Percentage	19.10 %	17.05 %	17.1 %	0 %

Table 44. Percentage of content causal relations

Differences between *por eso*, *por ello* and *por esto* are evident in the domain of volitional causality, which means a step forward in the subjectivity scale. In this domain, *por eso* becomes the prototypical marker as more than half of its uses belong to this category; therefore, specialization of *por eso* seems clear; *por ello* and *por esto* display similar percentages, while *por tanto* is very rare in this context.

	Por eso	Por ello	Por esto	Por tanto
Examples	50	29	20	4
Percentage	56.18 %	32.95 %	26.32 %	4.12 %

Table 45. Percentage of volitional causal relations

Three levels can be observed with regard to the percentage of epistemic uses of our markers. On the one hand, specialization of *por eso* in volitional causality leads to a low percentage of epistemic uses (15%). On the other hand, the data confirms the specialization of *por tanto* in epistemic causality, which reaches 66 % of all the examples. In the middle point between these two poles can be put *por ello* and *por esto*, with 35% of uses.

¹⁰⁰ Examples where the lack of sufficient context makes the analysis impossible are not taken into account. Examples where the prepositional phrase is tied to the verb as a nearly mandatory complement are also discarded for this parameter.

	Por eso	Por ello	Por esto	Por tanto
Examples	14	29	28	64
Percentage	15.73 %	32.95 %	36.84 %	65.98 %

Table 46. Percentage of epistemic causal relations

The fact that *por ello* appears in epistemic causal relation in an increasing number of cases (compared to *por eso*) can be seen as the functional counterpart of its increasing formal resemblance with *por tanto*. However, there is no *a priori* explanation for the similar percentage of *por esto* in epistemic uses.

Finally, speech act relations are scarcely represented in our sample. It could be partly due to the kind of corpus we use, where the immediacy required for this kind of causality is not abundant, and partly to the existence of another consecutive markers occupying this space, namely, *así pues* and *así que*. Notwithstanding the low percentage of speech-act causality found, a considerable difference across markers is observed: *por tanto* reaches an 8% of cases, while in the other forms the representation is below 2,5%.

It follows from these results that consecutive DMs are not constrained to one area of causality but they are able to cover more than one kind of causality in usage. It draws a usage setting based on prototypical semantic structure, which is also used to explain usage patterns of Dutch, German and French causal DMs (Stukker and Sanders, 2012; Stukker et al., 2009).

From this insight, *por eso* shows a prototypical use of volitional causality, with a participant being the source of this causality. It can extend its meaning towards both sides, covering content and epistemic relations with similar percentages (19% and 16%).

Por tanto shows a greater specialization in the domain of epistemic uses, with the speaker being the source of causality. Peripheral uses of *por tanto*, though existent, are lower than in the other cases, but a considerable percentage belongs to ambiguous cases, as we will see later. In *por ello* and *por esto* the prototypical structure is not so prominent, as they are used in volitional and epistemic uses in almost the same percentage. Hence, a movement to more subjective uses can be considered compared to *por eso*.

Yet, confining the categorization to objective (content and volitional) and subjective (epistemic and speech act) causality, *por tanto* is the only marker clearly conveying subjective causality, remaining the other markers more or less strongly tied to objective causality, as we can see in the table 47.

	Objective	Subjective	TOTAL
Por eso	67 79.76 %	17 20.24 %	84
Por ello	44 58.67 %	31 41.33 %	75
Por esto	33 53.23 %	29 46.77 %	62
Por tanto	4 5.06 %	75 94.94 %	79

Table 47. Objective and subjective examples of *por tanto*, *por eso*, *por ello* and *por esto*

This could mean that, although the meaning of *por eso*, *por ello* and *por esto* can be used to cover subjective causal relations as (more or less) peripheral uses of its schematic meaning, conventionalization of this subjective meaning has only taken place in *por tanto*, which manifests in a higher processing cost in second reading times of the eye-tracker experiment, since it is the only marker able to convey subjective causality by itself: according to Degand and Pander Maat (2001): “nonvolitional relations turn into epistemic relations when high speaker-involvement connectives are inserted”. This issue could be straightforwardly connected to the effects of grammaticalization (and degrees of grammaticalization) and the asymmetrical distinction between procedural and conceptual items regarding their contextual manipulation. In words of Diewald (2015: 254), “less grammaticalized items are context dependent signs, fully grammaticalized items are context creating signs”.

As an indicative datum of this, we can specify the type of verbs occurring in epistemic examples of our markers. Taking the classification of verbs made by Adesse, we find out differences in the productivity of the constructions: in *por tanto* and *por ello* all the types of verbs (mental, relational, material, verbal, existential and modulation) are found in epistemic examples; *por esto* lacks existential and modulation verbs, while epistemic examples of *por eso* are constrained to *verbal*, *mental* and *relational*. It means that *por eso* requires verbs that enhance this subjectivity, in order to be read as epistemic, while in *por tanto*, extension to other kind of verbs, due to the acquisition of subjective meaning, has taken place. Furthermore, it is in *por tanto* where the percentage of *material* verbs (those implying physical actions and therefore not favoring subjective causal readings) is higher. Note that our analysis of context is here restricted to the kinds of verbs, but it can be expanded to other kind of signals in the context that facilitate a subjective reading. In this sense, our theoretical insight can even explain the results obtained by Santana et al. (2017) on the subjectivity of Spanish causal conjunctions. They got results contrary to their expectations based on theoretical literature, when they contrast the subjectivity of the sentences in which *porque*, *ya que* and *puesto que* occur by an automatic analysis of subjective elements. To their surprise, they found a lot of subjective signals in sentences with *porque*, the one considered by them neutral, and very few subjective cues in the sentences with *ya que*, the one expected to be more subjective. From our point of view, this is what is to be expected, since *ya que* would not need subjective clues to yield argument-claim relations, while *porque* would, since it is underdetermined in this sense.

In the previous table, ambiguous examples are not considered; these are the cases that, as we have pointed out in the methodology, can be substituted for two of the paraphrases used. However, they are interesting as another manifestation of the prototype structure of meaning. Following Stukker and Sanders (2012) and Stukker et al. (2009) the fact that some constructions admit two readings is the consequence of the intersection of the meaning of the marker with a peripheral context or usage. Switching to a grammaticalization framework, these cases would be understood as critical (Diewald, 2006) or bridging (Heine, 2010) contexts (§1.3), which we relate to bridging constructions in the construction grammar framework (§3.1).

This way, some conflicting cases between content and epistemic readings are found in *por tanto*, but also in *por ello* and *por esto*, where a functional movement to subjectivity can be noticed. Some structures leading to ambiguous cases are the following:

- When the consecutive member carries the modal verb *poder* ‘can’, we should decide whether it means deontic (permission, ability) modality (1 and 2), in which case we could assign a content reading, or it means epistemic modality (3), in which case it is a clear example of subjective epistemic causality. There are, however, examples that admit both readings, such as (4), where *poder* can be paraphrased for “it is possible that they” or “they are capable to”:

- (91) Éstos contienen anilinas, un producto cancerígeno. Éstas son absorbidas por el cuero cabelludo, pasan a la sangre y son filtradas por los riñones, que las concentran en la orina. La orina con anilinas permanece largo tiempo en contacto con la mucosa de vejiga urinaria y **por ello** pueden aumentar la probabilidad de cáncer.

(*El Mundo*, “Primer plano: Manolis Kogevinas ‘No hay datos definitivos sobre los tintes y el cáncer’”, 2006-07-29. [retrieved from Corpes XXI])

- The cases with a deontic (obligation) modality, can also invoke two readings, as we need to decide whether this obligation is a real fact, risen out of external reasons, or it is felt by the protagonist as a necessity derived by conclusion:

- (92) comportamiento de los animales en su medio natural) para darse cuenta de que los animales no se dejan comer fácilmente, antes huyen (de ahí las largas patas de muchos de los ungulados actuales que viven en sabanas y pastizales) o bien dan la cara y se defienden, como los elefantes. Los carnívoros, **por tanto**, deben actuar con agudeza y astucia para atrapar a sus presas. Y esas cualidades residen en el cerebro.

(Jacinto L. García, *Una historia comestible. Homínidos, cocina, cultura y ecología*, 2013 [retrieved from Corpes XXI])

- Out of verbs marked with modality, there are of course ambiguous cases where both epistemic and content reading are possible. They are especially abundant with some relational verbs (ADESSE), like the verb *tener* with a non-tangible, not physical possession meaning:

- (93) Los partidos cuentan cada vez más con potentes y más poderosos gabinetes de prensa, comunicación y de marketing, **por esto** tienen mayor capacidad para fabricar noticias que brindan a los medios de comunicación, enfocadas a dirigir el mensaje político deseado. Por otro lado, la mayor parte de los medios de comunicación se limita a contribuir a esta escenificación.

(Manuel A. Alonso, *Marketing político 2.0. Lo que todo candidato necesita saber para ganar las elecciones*, 2011 [retrieved from Corpes XXI])

In this example, it is hard to decide whether the second member is a physical (real) consequence or a conclusion. The indicative mood in the adjective-relative clause can provide clues in favor of a content reading, but the proof is not sufficient.

But it is also possible with other kind of verbs:

- (94) (...)la institución financiera subasta la vivienda y en caso de que no recupere el total de la deuda hipotecaria también puede embargar otros bienes del prestatario original. En Estados Unidos, sin embargo, cualquier persona puede dejar de pagar la hipoteca en todo momento, y la entidad financiera lo único que puede hacer es subastar la vivienda. **Por lo tanto**, al producirse los impagos el problema empieza a formar parte de la entidad financiera, o de quien posea los derechos sobre el préstamo.

(Juan Torres López y Alberto Garzón Espinosa, *La crisis financiera. Guía para entenderla y explicarla*, 2009 [retrieved from Corpes XXI])

- (95) fax, era antiguamente la única forma de comunicarse a larga distancia. La gente se escribía a menudo, y **por ello** era de vital importancia saber redactar correctamente y expresar adecuadamente los sentimientos al escribir. Aunque en la actualidad su uso ha disminuido, no debe quitarse importancia a la comunicación escrita.

(Bárbara de Senillosa, *El libro de la buena educación. Una guía completa de cómo comportarse en sociedad*, 2004 [retrieved from Corpes XXI])

5.2.3.2 Conclusions: the functional side of *por tanto*, *por eso*, *por ello* and *por esto*.

The analysis of the kind of causality has led to a complex schema: the specialization of *por eso* in volitional causality and the one of *por tanto* in epistemic uses seem clear, while *por ello* and *por esto* display a more balanced distribution. However, an interesting explanation can be brought up out of these results by taking into account the grammaticalization framework, more specifically, the semantic theory of change in grammaticalization.

It seems that recovering a subjective (epistemic) sense in causally related utterances is possible regardless of the marker that assures the causal relation. Our results confirm this point, which can also be illustrated by a few classical examples of non-grammaticalized structures conveying subjective causality.

- (96) Por sus caras, han suspendido el examen.

The retrieval of this sense often takes place as an inference of the speaker/writer based on the surrounding context.¹⁰¹ However, it may happen that the subjective causal instruction becomes conventionally coded in a linguistic form, so the unit can invoke this reading whatever the context operates in it. Acquisition of this meaning is a matter of degree, or at least a gradualness is diachronically observed in such changes, which gives rise to a synchronic gradience. Synchronic gradience, in this case, can be said to respond to the following maxim: the less the meaning is associated to the form the more it needs contextual clues favoring the inference (and the reversed). This is a way to sum up approaches dealing with the semantic change in

¹⁰¹ Some special prosodic features can also be said to help convey this meaning in the example above, but the point is very clear, as far as the subjective meaning can be retrieved in causal related sentences without explicit mark: *Tienen malas caras. Han suspendido*.

grammaticalization (chapter 1) —invited inferencing theory of semantic change (Traugott and Dasher, 2002), types of contexts in grammaticalization (Heine, 2002; Diewald, 2002, 2006)— and constructionalization (chapter 3) —context expansion (Himmelmann, 2004), bridging constructions (Rosenbach, 2010).

From all our markers, only *por tanto* is able to add by itself a layer of subjectivity to the causal relationship it connects. In the other markers, subjectivity must be activated to different degrees by a cue in the context, which is to be understood as a part of the construction. *Por eso* needs verbal, relational and cognitive verbs to give rise to this epistemic meaning. *Por esto* is able to do it also with *material* verbs and *por ello* with all the kind of verbs; however, epistemic uses of *por tanto* with a material verb are found in a higher amount than in *por ello*, and, furthermore, there are differences in the kind of verbs they convey epistemic uses with, but we won't get deeper in this issue, as larger research on this phenomenon is needed.¹⁰²

Actually, our findings are still presumable from introspective judgements about the pragmatic acceptability of some uses.

Verbs of communication:

We have signaled according to Degand and Pander Maat (2001) that verbs of communication allow some markers to introduce epistemic uses, since they make explicit that what follows is the result of an enunciation act. Therefore, these kinds of verbs are the most ancillary verbs for building subjective causality. However, for markers with coded subjectivity, this use results strange, as they have internalized this meaning of introducing enunciation acts.

- (97) a. La gente lleva paraguas. **Por eso** digo que llueve.
 b. La gente lleva paraguas. **Por esto** digo que llueve.
 c. La gente lleva paraguas **Por ello** digo que llueve.
 d. La gente lleva paraguas. **Por este motivo** digo que llueve.
- (98) a. #La gente lleva paraguas. **Por tanto**, digo que llueve.
 b. #Las calles están mojadas. **Por consiguiente**, digo que llueve.
 c. #Las calles están mojadas, **luego** digo que llueve.

Cognitive verbs

Similarly, in cognitive verbs the epistemic nature of the relation is enhanced, so it is also a good candidate to yield epistemic causality with any marker.

- (99) a. La gente lleva paraguas. **Por eso** pienso que llueve.
 b. La gente lleva paraguas. **Por esto** pienso que llueve.

¹⁰² Note that here only type of verbs, and only the first level of classification, is being regarded, but there are other linguistic forms as modality marks that can help to construct a subjective reading.

- c. La gente lleva paraguas. **Por ello** pienso que llueve.
- d. La gente lleva paraguas. **Por este motivo** pienso que llueve.
- a'. La gente lleva paraguas. **Por tanto**, pienso que llueve.
- b'. La gente lleva paraguas. **Por consiguiente**, pienso que llueve.
- c'. La gente lleva paraguas, **luego** pienso que lluevo.

Relational verbs

When relational verbs are involved in causal relations, epistemic readings are very common, since often they convey subjective judgement that are to be understood as a conclusion. In fact, most epistemic examples in our sample carry a relational verb.

- (100) a. No existe una fórmula única para entrenar, sino una fórmula para cada persona con EM. **Por ello** es necesario el trabajo conjunto, y el ensayo-error para conocer qué ejercicios son más favorables.
- b. No existe una fórmula única para entrenar, sino una fórmula para cada persona con EM. **Por eso** es necesario el trabajo conjunto, y el ensayo-error para conocer qué ejercicios son más favorables.
- c. No existe una fórmula única para entrenar, sino una fórmula para cada persona con EM. **Por esto** es necesario el trabajo conjunto, y el ensayo-error para conocer qué ejercicios son más favorables.
- d. No existe una fórmula única para entrenar, sino una fórmula para cada persona con EM. **Por este** motivo es necesario el trabajo conjunto, y el ensayo-error para conocer qué ejercicios son más favorables.
- a'. No existe una fórmula única para entrenar, sino una fórmula para cada persona con EM. **Por tanto**, es necesario el trabajo conjunto, y el ensayo-error para conocer qué ejercicios son más favorables.
- b'. No existe una fórmula única para entrenar, sino una fórmula para cada persona con EM. **Por consiguiente**, es necesario el trabajo conjunto, y el ensayo-error para conocer qué ejercicios son más favorables.
- c'. No existe una fórmula única para entrenar, sino una fórmula para cada persona con EM, **luego** es necesario el trabajo conjunto, y el ensayo-error para conocer qué ejercicios son más favorables

Material verbs

Material verbs, on the contrary, hardly yield subjective interpretations without other specific clues. Many times, physical actions are the base of content and volitional readings. Thus, use of markers with a coded subjective meaning and those without this conventional meaning results in an asymmetrical situation. If we use a purely physical verb, as the verb *llover*, in a way that a

cause-consequence sequence is impossible to recover, markers with non-conventionalized subjective meaning fit worse than markers with this “inferring” epistemic meaning:

- (101) a. #La gente lleva paraguas. Por eso, llueve.
 b. # La gente lleva paraguas. Por esto, llueve.
 c. # La gente lleva paraguas. Por ello, llueve.
 d. # La gente lleva paraguas. Por este motivo, llueve
- (102) a. La gente lleva paraguas. Por tanto, llueve.
 b. La gente lleva paraguas. Por consiguiente, llueve.
 c. La gente lleva paraguas, luego llueve.

If a material verb is inserted in a way that cause-consequence relation is retrieved by default, use of subjective and non-subjective markers does not affect acceptability, but gives rise to subtle differences in meaning.

- (103) a. María y Luis escriben novelas buenas. Por eso, venden muchos libros.
 b. María y Luis escriben novelas buenas. Por ello, venden muchos libros.
 c. María y Luis escriben novelas buenas. Por esto, venden muchos libros.
 d. María y Luis escriben novelas buenas. Por este motivo, venden muchos libros.
- (104) a. María y Luis escriben novelas buenas. Por tanto, venden muchos libros.
 b. María y Luis escriben novelas buenas. Por consiguiente, venden muchos libros.
 c. María y Luis escriben novelas buenas, luego venden muchos libros.

In sum, *por tanto* has conventionalized a subjective meaning, while *por eso*, *por ello* and *por esto* have not. Instead, they require some specific context to produce epistemic causal relations, but, according to our results, different degrees of generalization can be attributed to them, as token frequency points to and analysis of kind of verbs could confirm.

Chapter 6. Some correlations between usage and processing patterns

6.1. An enabling bridge: usage-based models.

Usage-based approaches to grammar are characterized by pursuing a psycholinguistic account of grammar in terms of speakers' representation of it. In this sense, it is virtually the suitable framework to address processing responses to the grammatical status of linguistic forms, as far as this status can be regarded as the psycholinguistic reflect of usage. That is to say, language use and linguistic choices (language events) leave traces in the internal grammar of speakers (i.e., in its representation): linguistic forms become more or less entrenched in certain uses and acquire specific grammatical roles through their use.

The main mechanism behind this theory is routinization due to frequency of use, which is sometimes explained as a neurophysiological response to repetition (Bybee, 2006). This is in line with psycholinguistic assumptions reinforced by experimental evidence from psycholinguistic studies. For instance, many studies have proved that words with high frequency of use are processed faster than less common words (Just and Carpenter, 1980; Rayner, 1998; Dahan et al., 2001; Reichle, Rayner and Pollatsek, 2003; Balota et al., 2003: 190-191; Rayner et al., 2006) and, other things being equal, words learned in an earlier period of life are less cost-demanding than those learned at later stages.¹⁰³ In sum, usage-based approaches to grammar seem to draw a bridge between grammar description and processing language principles, best represented by the explanations of well-known frequency effects in language (Bybee and Hopper, 2001; Divjak and Gries, 2012; Gries and Divjak, 2012; Divjak and Caldwell-Harris, 2015; Divjak, 2019).¹⁰⁴

It therefore seems that usage-based approaches intend to interrelate the different dimensions that language has been studied from, blurring the boundaries between them. People's use of language relies on their past experience on how language is used, and such experience is modeled in more or less entrenched linguistic structures through cognitive mechanisms acting in every communicative event. Language and use are, thus, communicating vessels: every language event is performed on the basis of the cognitive organization of past events, that is to

¹⁰³ The problems of setting apart these two factors are subject to debate. Blumenthal-Dramé (2012: 40) reaches the following intermediate conclusion:

Although it is commonly accepted that both predictors are highly correlated such that higher frequency words are learned earlier, it seems fair to say that the question is as yet unresolved. It has been suggested that age of acquisition and corpus frequency might actually represent two dimensions of a single underlying variable, cumulative frequency, which refers to the frequency of exposition to a given construction over lifetime (cf. Lewis, Gerhand, and Ellis 2001).

¹⁰⁴ Following Blumenthal-Dramé (2012) we have to say that this robust evidence, however, does not suffice to guarantee the usage-based view on language, since frequency effects are known and accepted by all linguistic theories, though differently treated by each of them: in non-usage-based theories, ease of processing due to token frequency would not have to do with the cognitive entrenchment of the form but with a better performance of speakers; that is to say, it would be a fact of performance and not of competence (Blumenthal-Dramé, 2012)

say, is allowed or sanctioned by it, and, at the same time, contributes to a new cognitive organization of language (since modelling cognitive principles are always working).

Given such interwoven relations at the theoretical level, it is expected that this view allows for wide empiric methodological approaches (Arppe et al., 2010) and permits them match in a somehow natural way. As pointed out by Bybee (2013: §4.1):

As the term implies, the object of study in Usage-based Theory is not only the native user's competence, which resides in the cognitive representation, but all the perception and production processes that are brought to the task of using language (Kemmer and Barlow 2000). Thus, the data considered applicable to formulating and testing hypotheses can be very broadly drawn from experiments, child language acquisition, language change, and large corpora representing natural usage.

The combination of observational, corpus-based methods, and behavioral, experimental approaches is spreading across different linguistic fields to obtain more robust evidences of specific linguistic phenomena (for example, Gries, 1999; Rosenbach, 2003; Bresnan, 2007), moving away from longstanding research practices where each of these methods remained tied to a specific linguistic area of research (see Gilquin and Gries, 2009, for a deeper exploration of the state of the art). However, the extent to which correlations can be found beyond the triangulation of methods, as posited by usage-based approaches, remains subject to debate and study (see Guilquin, 2008, and Arppe et al., 2010 for a state of the art; Divjak et al., 2016 for experiments assessing the psycholinguistic plausibility of corpus-based models). Before presenting the relations that evidences of our two proposed methods may show, we briefly survey the state of knowledge about the possible integration of methods. (Arppe et al., 2010; Blumenthal-Dramé, 2012; Milin et al., 2016).

6.2. Corpus studies and experimental methods: considerations on their combined use

One of the first issues researchers should keep in mind when trying to converge evidences from different methods is their nature and the phenomena that reflects each of them. Corpus analysis and experimentation stands as the two empirical methods available for language research (Sandra, 2009; Arppe et al., 2010). They, however, are based on very different kind of data, being corpora analysis natural “found” data and data from experiments, “elicited” data (Arppe et al., 2010).¹⁰⁵

It has usually been accepted that some online experiments (the main source for psycholinguistics) are adequate to reveal cognitive aspects of language, while corpus studies have been mainly understood as a source for observing how the properties of signs interact with the context they are embedded in or how speakers perform in natural environment depending

¹⁰⁵ The distinction between observational and experimental data forms, according to some authors (Gilquin and Gries, 2009; Gries, 2013), a continuum where different experimental methods show varying degrees of naturalness, depending on the experimental setting or environment, the stimulus and the kind of response required.

on the natural contextual factors. Cognitive corpus linguistics, however, tries to use corpus data the other way around to see what they reveal about the mind: the cognitive status of some linguistic forms, the factors affecting a linguistic choice, which describes its semantic or pragmatic profile, etc. Even when used to reflect an *a priori* single dimension (the cognitive one), the fact that the two methods shed light on the exactly same parameters has been called into question (Gilquin, 2008). For example, addressing the saliency of linguistic forms, Gilquin (2008) reaches the conclusion that corpus frequency does not stand as a direct indicator for it. According to Arppe et al. (2010: 9), “the lack of convergence between salience and text frequency challenges the ability of corpora to serve as a shortcut to cognition”.¹⁰⁶

There is, however, more reliance on the evidence that corpus frequency provides with regard to other cognitive factors, for example, entrenchment (see Blumenthal-Dramé, 2012, for an in-depth review; Divjak and Caldwell-Harris, 2015), and other indicators more refined than raw frequency extracted from corpus have been identified as reflecting the cognitive dimension of language. Even in this scenario, the evidence that corpus data show needs to be taken cautiously due to several dimensions that must be disentangled. We next discuss the chances of corpus linguistics to inform about mental representations of linguistic units and the assumptions behind this approach.

6.2.1 Corpus linguistics as a source of knowledge for linguistic representation of speakers

Although Corpus Linguistics is nowadays one of the major linguistic disciplines and their methods have been profited for analyzing a wide range of linguistic phenomena, its use as direct evidence of psycholinguistically real linguistic structures comes as a more recent contribution of cognitive linguistics and usage-based approaches in particular. This link is covered by the so-called *corpus-to-cognition principle* (Schmidt, 2000), which assumes that statistical corpus analysis reflects speakers’ representation of grammar, just as language use models the cognitive representation of linguistic structures. As pointed out by some authors (Blumenthal-Dramé, 2012), the principle, in its strong version, faces some internal-theoretical and methodological problems that should be solved.

First, the use of corpora as a direct source of knowledge for “the mental representation of syntactic, semantic, pragmatic and discourse meaning” (Blumenthal-Dramé, 2012: 30) relies on the assumption that statistical generalization over corpus data representing a population of speakers depicts individual-mental linguistic knowledge well. Although, as we will see below, this has been proved to a certain degree by different statistical models based on corpus data

¹⁰⁶ Arppe et al. (2010) themselves introduce caveats to the conclusions that can be derived from these diverging results regarding the possibility to reach knowledge about cognition from corpora. One of them concerns the possibility of having chosen the wrong corpus predictor for saliency, since other studies have found out other corpus predictors influencing processing better than absolute frequency of use, such as mutual information (Ellis and Simpson Blanch, 2009, as quoted in Arppe et al., 2010: 9).

that performed similar to speakers in psycholinguistic experiments, some of the theoretical assumptions underlying this model are worth exploring.

For example, Blumenthal-Dramé (2012: 34) draws attention on the fact that even the largest corpora cannot represent the input that different speakers are exposed to, since it varies from person to person depending on several social and individual factors.

This is in fact the basis for the Noël's (2016, 2017) claim for a radically usage-based diachronic construction grammar, namely, to clearly distinguish between the external system described on the basis of the observed usage in a community of speech and the internal system of a particular speaker. The two dimensions are partially taken into account in classical approaches to language change, but the relation between them has long evaded a clear understanding of researchers. For example, many authors distinguish two facets (and phases) of language change: individual innovation and spread across population, that is to say, innovation and replications or propagation (Croft, 2000). In Grammaticalization Theory it is assumed that a change cannot be said to be conventionalized until it spreads across a community of speakers (Traugott and Dasher, 2002). This confines the nature of the change to the social dimension of language and neglects the individual psycholinguistic aspect of it. Since some new approaches to grammatical change (diachronic construction grammar, constructionalization, etc.) draw on usage-based assumption and, therefore, should be implicitly or explicitly committed to describing changes as psycholinguistically real phenomena, the question arises as to whether the neoanalysis made by a speaker must count as a change or not. In this sense, some authors (Fischer, 2011) even call into question the relevance of reanalysis as a real mechanism of change from a psycholinguistic point of view and limit their scope to the external perspective of language: there is reanalysis from the point of view of the structures observed in a community of speakers but not from the point of view of the speakers; they only fit combination of words into existing patterns. Taking on these perspectives forces us to face several issues:

- According to Divjak et al. (2016), it has been an implicit assumption for a long time that grammars of speakers are very similar, but recent studies have proved that this is not the case (see for example, Dąbrowska, 2015). The question, then, arises as to how much (can) the system (i.e. the network of constructions) of different individuals of a community of speech diverge.
- Regarding the possible relation between the internal grammar of the speaker and the system described on the basis of the behavior of a community, another relevant question here is: to what extent is the speaker aware that his/her organization of a partial network is shared or not by part of the community? In other words, does the adoption of a change by a community of speech affect psycholinguistic individuals' representation of that unit? One could reach the conclusion that conventionalization of linguistic change (in the sense of the spread across the community) can also have an effect in the individual dimension, since greater exposure to a construction may lead to a reinforcement of the node. However, the magnitude of this effect in psycholinguistic terms is yet to be seized.

Despite these are epistemological problems that should be explored in the future, the successful relation between corpus studies and cognitive linguistic representation has also reasons for “cautious optimism” (Blumenthal-Dramé, 2012: §3.3). In the next section, we briefly review some researches that rely on combination of corpus and experimental methods to shed light on a specific phenomenon. The degree of relation range from the triangulation of methods to test hypotheses to the correlation of corpus and experimental parameters as interrelated variables. Moreover, other studies address directly the degree to which models based on frequencies predict the linguistic behavior of speakers properly.

6.2.2 Studies converging corpora and experiments

As has been pointed out before, many studies have reported converging evidence of corpus and experimental data on several phenomena from different linguistic fields. The frameworks we examine and adopt in this thesis show varying degrees of commitment at converging evidences.

Grammaticalization Theory has almost exclusively drawn on corpus analysis in order to empirically prove their hypothesis and have neglected an experimental path. The very few exceptions to this rule use experiments as the main source for testing hypotheses of the theory, but do not usually triangulate them with corpus data. For example, the work by Recio et al. (2018), as the experimental setting which inspires this work, relies on processing patterns of connectives as an additional (confirming) clue for the degree of grammaticalization. Hilpert and Correia (2018) set an experimental approach to test the Assymetric Priming Hypothesis (Jäger and Rosenbach, 2008, as quoted in Hilpert and Correia, 2018), which could explain the unidirectionality in grammaticalization, reaching results that rule out some of the leading hypotheses.

On the other hand, much of the work that does adopt the hybrid line of research is based on a constructional perspective, which, as stated above, is particularly geared towards such an integration, due to their functional and cognitive roots. Some relevant works in this line are the following: Gries (1999) on particle placement in English (corpus study and grammaticality rate experiment), Rosenbach (2003) on the genitive possessive alternation, Gries et al. (2005) on the as-predicatives, Perek (2015) on the cognitive entrenchment of verbs valencies, Yoon (2012) on coercion between verbs and argumental constructions, to name a few.

The work of Yoon (2012) deserves special attention for the purposes of this thesis, since it constitutes a good example of how the theoretical sources of usage-based construction grammar paves the way for the combination of methods. Her study addresses the notion of *coercion*, a mechanism by which the meaning of a construction is imposed over the meaning of the verb that participates in it, in case of partial incompatibility. She finds correlations between the degree of compatibility between a verb and a larger construction and the processing time needed to process it. Interestingly, the compatibility is based on usage-frequencies of cooccurrence that draws a gradual and not a discrete concept. Therefore, a general conclusion of the study is that the operation called coercion is a speaker-directed process to find compatibility between the meaning of the part and the meaning of the whole, by relying on knowledge about the usage of such constructions. The more incompatible the construction and

the verb are, the more time the speaker needs to work out the intended meaning of the construct, or, say, to fit such piece into the larger construction in a meaningful way. Processing time can thus reflect the fitness of an atomic construction into a complex one, according to usage.

In the work on DMs, although not directly developed from a usage-based constructional perspective, different authors have drawn on a combination of methods to check the hypotheses and provide robustness to the results.

Zufferey (2012) compares the distribution of French causal connectives across domains in corpus of natural data and elicitation tasks, which complement each other to fine-tune the differences between markers.¹⁰⁷ In Zufferey et al. (2017), the comparison between usage and processing is made through two experimental methods, namely, offline and online experiments. In the first experiment, responses to a completion task by speakers are taken as the reflection of usage; in the second, eye-tracking technique serves as a tool for exploring the processing these markers trigger; a plausible variable related to usage (register) is further tested and confirmed by means of another completion task.

As mentioned in chapter 3, Stücker et al. (2008) expose a more explicit usage-based view in the study of Dutch DMs reaching conclusions about the cognitive organization of a set of causal DMs from their usage-context, finding prototypical usage contexts (PUC) and non-prototypical usage contexts (NPUC) for each of them: NPUC represent an area in the intersection between two categories represented by these markers, following a non-discrete (continuous) mode of categorization. The study, however, lacks an experiment that strengthens this evidence on the categorization of DMs.

An interesting approach to the relation between usage-frequencies and cognitive representations of DMs is found in Asr and Demberg (2020), through a comparison between corpus data and a series of offline and online experiments. Addressing subtle discursive meanings that can virtually be conveyed by different markers (concession and contrast by *but* and *although*), they find correlations between the percentage of examples where each of these markers fulfills a specific connective meaning in the corpus and the interpretation given by speakers in a completion task, coherence judgment task and a sentence processing experiment. In other words, they prove that interpretations of utterances marked by connectives with ambiguous discursive meanings are guided by speakers' knowledge about the usage probabilities of these markers to occur in each discursive relation. Interestingly for our case, this

¹⁰⁷ The two methods are taken in this study as complementary tools, since the division of labor and limitations of each of them are explicitly stated:

The corpus study presented above has provided new elements for the analysis of *car*, *parce que* and *puisque*. However, by its very nature, a corpus study cannot give specific indications regarding the kinds of factors that make the use of a connective acceptable or not in a given domain. For this reason, this study has been supplemented by another kind of empirical data, obtained through an acceptability judgment task and a sentence completion task. These methods have the advantage of providing a test bed for specific factors that cannot be found by examining naturally occurring data (Gilquin and Gries 2009). (Zufferey, 2012: 14)

is reflected in the reading times that speakers invest in processing each discursive relation marked by one connective or another. The differences, therefore, can be attributed to the degree of difficulty of assigning such a discursive meaning to the DM by relying on the previous usage experience with such connective.

In general, the results are consistent with a cognitive categorization of linguistic units based on exemplar representation, where speakers store the usage event with details of the context in which it was uttered. As acknowledged by Asr and Demberg (2020: 395) the probabilistic effects can be reconciled with the idea of entrenchment due to frequency of use, where the notion encompasses the strength of association of a certain form with a specific meaning (recall that constructions can code pragmatic specific meanings).

Another body of research especially interesting for the combination of methods are those studies aimed at assessing the validity of statistical models that compute the probabilities for a linguistic item to occur in certain specific contexts. Next, we will briefly outline the findings of this line of research.

6.2.3 Modelling studies: testing corpus-based statistical models against experimental evidence

Within cognitive science, the design of computing models that try to simulate the processing of humans in different cognitive tasks has become a very insightful tool to test the psychological plausibility of different theories.

In recent years, some studies have addressed the plausibility of usage-based approaches by creating probabilistic statistical models based on corpus data to predict the selection of a particular item over other near-synonymous alternatives in a different corpus. Additionally, some studies have compared such corpus-based models to the human performance. The results of such an approach have partially validated the statistical modelling techniques: “studies that explicitly compare the performance of a corpus-based model to the classification behavior of native speakers in linguistic experiments conclude that the performance of the corpus-based model, by and large, reflects human behavior” (Klavan, 2017: 4).

Bresnan (2007) demonstrates that speakers’ implicit knowledge about the dative alternation (*give someone a present vs give a present to someone*) reflects usage probabilities calculated by a corpus-based statistical model. In addition, Divjak et al. (2016) explicitly address the issue from a constructional perspective, assuming that linguistic alternations differ in the fitness they show in larger constructions, which are defined by coding different structural and semantic features in the context. The models they test perform similar to human, with differences between the performance of humans as a group or as individuals (the model perform similar to the average of participants).

Since such approaches are growing and it is expected that they will refine its techniques to gain insight on the cognitive underpinnings of corpus data, in future it would be interesting to undertake statistical modellings of the use of near-synonymous DMs. Thus, this work will help to obtain a fine-grained profile of them and the constructions that favor or constrain the

occurrence of each of them. The next step would be to test these findings through experimental methods: offline grammaticality judgement rates are expected to decrease, while online reading times will probably rise up, in conditions with markers embedded in low frequent contexts. As this is a task assigned to future investigation, in the next section we will content ourselves to analyze explanations for the eye-tracking results based on corpus data.

6.3. Seeking for usage factors in the eye-tracking results

If frequency of use exerts strong influences in the processing costs, the huge differences in the normalized frequencies of the consecutive DMs should show a counterpart in the results of the eye-tracker experiment. For this issue, the relevant parameter is the processing time of the DM construction itself. As seen in §4.3.2.3, *por esto* shows the most demanding processing in the DM AOI, which is in line with the by far lowest frequency of use in Peninsular Spanish. The ultimate reason for this harder processing could be the more schematic entrenchment of the construction, due to its higher type and lower token frequency observed in the corpus study.

	Normalized frequency of use	Total Reading Time in AOI DM
Por eso	152.61	312.59
Por ello	76.31	273.97
<i>Por esto</i>	6.52	352.7
Por (lo) tanto	199.71	300.73

Table 48. Normalized frequencies of use and total reading time of the discourse marker

As we can see, both scales show the same order (processing time is a reversed function of frequency of use), except for *por ello*, which is less used than *por eso* and *por tanto* and, despite this, processed far faster than the other forms. Explanations of this unexpected finding can be found drawing on other factors.

On the one hand, the frequency of use of these forms could be limited to specific registers or discourse traditions in order to get a more accurate description of the speakers' knowledge about these markers. Our results (§5.2.1) confirmed that *por ello* is almost constrained to the Spanish formal register, while *por eso* is more common in informal registers. As an example of directly comparing both markers, we can take a look at their normalized frequencies in the academic domain of use, provided by Corpes XXI, where the occurrences of *por ello* are almost twice those of *por eso*:

	Token frequency	Normalized frequency
Por ello	700	184.59
Por eso	353	93.08

Table 49. Normalized frequencies of use in academic texts in Corpes XXI

If we take a wide exemplar's representation model, it follows that representation of our markers in the speakers' mind is shaped by particular instances in specific contexts of use, which include the domains of use. In this sense, *por eso* would look as less prototypical marker than *por ello* in

formal registers. Even though our sentences are intended to represent a standard variety of Spanish, it seems hard for the participants to evade the experimental atmosphere, which draw a formal situational frame. In this sense, it is reasonable that speakers expect *por eso* to be less natural, as a result of their language experiences in these situations.

An explanation related to register has been already given by Degand and Fagar (2012) for a more cost-demanding processing of the causal DM *car* in its natural functional environment (subjective causality). For them, however, the French DM *car* would be unexpected because of the clash between the high formal restrictions of the marker and the non-formal register used in the experiment. More specific experiments on responses to register variation are needed, as well as larger debates on this methodological issue.

On the other hand, some of the parameters analyzed in § 5.2.6 help us distinguish *por ello* from *por eso* and *por esto*. Although modification provides an interesting result in formal and semiformal register for *por ello*, the most clear proofs are syntactic in nature and draw an expansionist evolution —recall grammaticalization as expansion (Traugott, 2010a)—. First, *por ello* has acquired a greater syntactic mobility and, secondly it is conceived as a more parenthetical unit: it could mean that *por ello* has increased its scope over the sentence to some degree; in fact, we found only one intrapositional example in the formal register of our sample (even though it is possible to perform such a construction). By virtue of this wider scope, it would have a higher effect over the conceptual words, which can be observed in the total reading time of the conceptual words: conceptual words in the condition with *por ello* are processed over 6% faster than in the condition with *por eso* and *por esto*. Differences with *por tanto*, the marker with the highest degree of parentheticality (and widest scope), are lower (barely overcoming the 4% to consider minimal effects).

The combination of these factors (weight of the DM and reduction effects over structures affected by it) leads to the utterance mean, which, from our perspective, can be described as the overall processing cost of the forward causal construction with the connective slot (adjacent subact) filled by *por tanto*, *por ello*, *por eso* and *por esto*. Using the causal construction without marker as a baseline, only the construction with *por ello* yields a significant reduction effect, being large compared to the small effect of *por tanto* and the trivial or residual one of *por eso* and *por esto*.

At this point, one important question remains: why *por tanto*, as the most conventionalized DM, with clear extrapositional scope, does not reduce processing times of conceptual words to the same degree as *por ello*, nor is it processed itself faster than *por ello*, given its higher frequency of use? In this case, the insufficiency of formal parameters to explain processing data for all our markers paves the way to regard the functional specificity of *por tanto* as a conditioning factor.

As a departing point, let us recall the statement by Degand and Pander Maat (2001) that “nonvolitional relations turn into epistemic relations when high speaker-involvement connectives are inserted”. In §9.3.2 we have rethought this insight to claim that connectives with a conventionalized subjective meaning impose its reading over the context. As we have

seen, *por tanto* has shown to convey subjective causality in our corpus in such percentage that we can assume it has conventionalized this meaning. Therefore, in the sentences of our experiment, where content causality is ensured in absence of DM, the presence of *por tanto* would impose a subjective reading.

On the other hand, some psycholinguistic studies (Traxler, Bybee and Pickering., 1997 Canestrelli, 2013) have demonstrated that subjective causal related sentences are harder to process than objective ones. Then, if, as prognosticated by our explanation of the results of the corpus study, our experimental sentences with *por tanto* are processed as subjective causality, an overweight should arise at some point in the processing process. Note that this overcost would distort our previously mentioned overall processing measures, in which quantitative differences between *por ello* and *por tanto* were observed.

For instance, we have said that the conceptual mean of *por ello* is a little lower than the one of *por tanto*, but, this effect is trivial (not considerable) in the FRT (3.47% of difference). This way, the overcost is in this case reflected in the RRT: in this parameter, the utterance mean and the conceptual mean of *por tanto* are the highest ones; directly compared to the other markers, it sheds differences from 31 to 35% in the first case and from 28.90 to 40.78% in the second.

	Utterance mean	Difference vs por tanto
Por tanto	8.81 ms.	-
Por eso	6.72 ms.	31.10 %
Por ello	6.5 ms.	35.54 %
Por esto	6.54 ms.	34.71%

Table 50. Re-reading time of utterance. *Por tanto* vs *por esto*, *por eso*, *por ello*

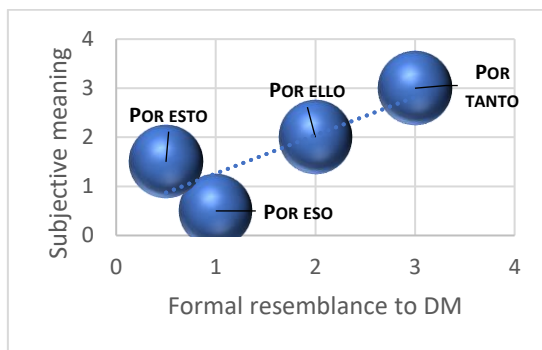
It is feasible that this “extra” layer of subjective meaning in the causal relation is reflected in the re-reading time, which is supposed to represent high level processes; in this case, confirmation of those assumptions holding a subjective/epistemic causal relation leads to higher re-reading times. Some authors have related this complexity to the metarepresentation entailed by subjective relations (Zufferey, 2010). The greater complexity is also evident if we assume, as several authors do, that objective causal relations integrate two affairs in one cognitive event (and therefore one speech act), while subjective causal relations derive a different speech act from a state of affairs.

Finally, if we rely on re-reading time as a measure providing clues on this subjectivity, we have to say that also the movement of *por ello* to more frequent subjective usages (degree of generalization of this meaning) checked in the corpus study has a reflect in the conceptual mean, where *por ello* is the second most cost-demanding marker after *por tanto*. However, the same movement in *por esto* has no reflect, as *por esto* behaves very similar to *por eso*.

	Conceptual mean	Difference vs \emptyset
\emptyset	11.56 ms.	-
Por tanto	7.94 ms.	45.59 %
Por ello	6.16 ms.	87.66 %
Por eso	5.71 ms.	102.45 %
Por esto	5.64 ms.	104.96 %

Table 51. Conceptual words mean. Implicit vs explicit conditions (RRT)

In sum, if we re-interpret the total reading time of the utterances with our markers, we should conclude that the architecture of the paradigm is more complex, as it responds to more than one factor. To this point, we have tried to regard the processing to formal features related to constructional changes on the one hand, and to the specific meaning of the markers, on the other hand. Thus, it can be depicted with the following graphic, where the x coordinate represents degree of formal resemblance to DM category and the y coordinate the conventionalization of subjective causal meaning.

Figure 29. *Por tanto*, *por ello*, *por eso* and *por esto* in a graphic with grammaticalization degree and subjectivity degree coordinates

Chapter 7. Conclusions

This thesis arises from the necessity of describing the differences between prepositional phrases and DMs and how they are reflected in a diachronic path (cline), where the former gradually advances toward the latter category. It was a strong assumption that the synchronic picture conformed by units which share a compositional origin and show varying formal or functional properties provides us a reliable frame for the diachronic process. In this sense, the Spanish consecutive resources *por eso*, *por ello* and *por esto* have been set off from the DM *por tanto* by virtue of several diverging properties in the literature. Such differences in formal or functional behavior are, according to the analyzed frameworks, the result of processes of change affecting constructions, namely, constructional changes and constructionalizations. Constructional changes and constructionalization can account for the actual status of the constructions, and the relations they hold are well depicted in a constructional network with multiple links, which can be regarded as a more dynamic conceptualization of the notion of paradigm.

Another assumption concerned the methodology that can better reflect such picture, avoiding some problems that this kind of units poses from an evolutionary point of view: in this sense, a combination of methods has been proposed, where language as an activity and language as a product are tested and put in correlation. This correlation does not only consist of a triangulation of methods in a traditional sense, but is truly consistent with usage-based approaches, where grammar is thought of as the reflection of speakers' categorization across usage events. Thus, psycholinguistic online methods, such as eye-tracking, provide us with a complementary tool for this kind of analysis, since they offer a picture of the processing efforts, which can be related to the usage-patterns they display when observed through real utterances in corpora.

In the next lines, we sum up the conclusions we found out from the two proposed methods (eye-tracking study and corpus study) and then we put them in correlation to get more far-reaching conclusions about the organization of the set of DMs we have analyzed and their individual properties.

7.1 Eye-tracking study

The eye-tracker study has revealed that an *a priori* distinction based on introspective judgments such as the one drawn in a number of studies, where *por tanto* is sharply set off from the rest of markers, does not fully correlate with eye-tracking processing responses.

Taking the discourse marking processing principles (Loureda et al., 2021) as a baseline, we have proved that all the selected units fulfill a DM function, since they meet all the principles: they trigger a processing strategy (*qualitative principle*), which is solved without extra processing costs (*quantitative principle*) and which consists of an immediate processing reduction at the discourse segment following the marker in early measures —FRT— (*immediate regulation principle*) and an easier processing of the first discourse segment in late-measures, such as RRT (*optimal reactivation*). Therefore, assuming that not all these units are equally “well-equipped” for discourse marking functions, since at least one of them (*por tanto*) has acquired formal properties that iconically match its procedural connective function, an open question remains

why all the units behave within the threshold of processing tendencies described for DMs in Loureda et al. (2020, 2021). A possible answer to the question comes from the constructional framework put forward: drawing on an organization of language structures based on networks of constructions, these results point to the links that exist between some prepositional phrases and the category of DMs, through functional resemblance; more specifically, between topicalized prepositional phrases and DMs: initial position of prepositional phrases becomes, thus, a functional schematic slot for discourse marking where our units contrast paradigmatically. This is, in constructional network's terms, a functional (horizontal) link at the schematic level of constructions.

Yet, despite the fact that all these markers meet the overall DMs principles, a closer look at some parameters still reveals some qualitative and quantitative differences between them that could be explained as reflecting morphosyntactic and semantic differences. However, again, the distinctions drawn by the eye-tracker results cannot be straightforwardly mapped onto the degrees of grammaticalization of these markers alleged in the literature.

The more striking finding is that *por ello* leads to lower reading times than the rest of the markers in the overall measures for every AOI, thus ruling out both a sharp distinction between *por tanto* and the rest of markers and a gradual difference, since, under this assumption, utterances with *por ello* should be less easily processed than those with *por tanto*. On the other hand, *por tanto* stands in a second position in terms of facilitating effects, but the difference is not so consistent as it appears: while it is relevant when compared to the implicit condition (a small effect of *por tanto* versus a trivial effect of *por eso* and *por esto*), it does not hold for the comparison between them, where the differences remain trivial. Finally, *por eso* and *por esto* are almost identical in overall measures, triggering the most cost-demanding processing of all the markers.

In terms of the strategy triggered by the markers in early and late measures, *por eso* and *por esto* also show very similar behavior, optimizing their procedural effect at the re-reading time, while *por ello* shows its higher effect (compared to the rest of markers) in the first reading time. Interestingly, *por tanto* is the costliest marker in re-reading times, what can reveal a difference in functional/pragmatic meaning that distorts the overall processing benefits. Lastly, and also in terms of cognitive strategy, the eye-tracker study proves that there is no absolute relation between the time needed to process a DM and the reducing effects over conceptual words it yields. The absence of relation is best shown by *por eso* and *por esto*, which yield roughly the same reduction (facilitating) effects and, however, imply a very different weight, being *por esto* much more difficult to process.

The absence of such relation can be explained through the above-mentioned functional link at the schematic level, where the procedural meaning is partly located. The differences in time to process the marker, as well as the other diverging strategies and reduction effects, should be accounted for by the specific links to the DM category at the substantive level, that is to say, at the level of the micro-constructions or specific markers. The overall results, hence, call for a more nuanced description of the properties of the markers. A fine-grained analysis has been reached through a usage-based explanation of corpus data.

7.2 Corpus study results

In the corpus study, following the claims made by the Constructionalization framework, we attempted at disentangling formal and functional properties of the DMs at issue.

At the formal pole, we corroborate differences between *por tanto* and the other DMs in all the selected parameters, which endorse the prototypical structural properties of *por tanto*. For further differences in the group, three parameters become critical. First, *por ello* is a more versatile DM in terms of position, covering some syntactic placements that are not found in *por eso* and *por esto*, such as initial position with phrasal scope or, especially, medial position. In this sense, it gets closer to the syntactic mobility of *por tanto*. Secondly, *por ello* is encountered in a parenthetical environment in 25% of examples more than *por eso* and *por esto*, which are extremely similar in this regard (the same percentage). Finally, for the type of construction, a lower number of intrapropositional examples are found in *por ello* when we restrict the count to the formal register; *por eso* is near *por ello* with a high percentage of connective uses, while *por esto* is clearly far away because of the high number of intrapropositional uses.

Taken together, these results endorse the clear positioning of *por tanto* at the prototype of the DM category. We can say that in terms of formal properties it is fully sanctioned by the DM schematic construction. But they also point to the existence of some links between the substantive construction *por ello* and the DM category through formal resemblance. *Por eso* and *por esto* are both further in the network of constructions. However, *por eso* is more entrenched as a substantive construction than *por esto* if we look at some parameters such as formal fixation, where *por esto* displays a much higher degree of productivity; in addition, *por eso* shows a higher entrenchment in the connective function as it is evinced by the higher proportion of connective uses in comparison to *por esto*. Figure 28, retrieved from §5.2.2.6, depicts such a setting:

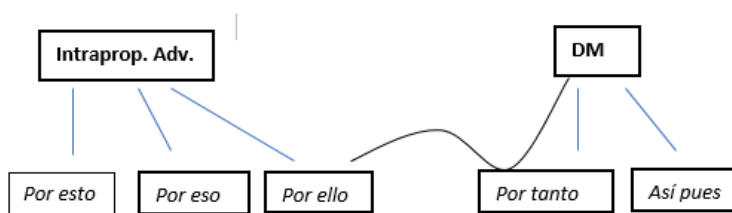


Figure 28. Network of *por eso*, *por ello*, *por esto* and *por tanto* constructions.

At the functional pole, on the other hand, the study partially reveals prototypical usages of the markers, according to the distinctions made by some authors (Pander Maat and Degand, 2001; Pander Maat and Sanders, 2001; Degand and Pander Maat, 2003; Sanders, 2005; etc.): while *por tanto* typically conveys epistemic causal relations and *por eso* shows a strong tendency for content-volitional causality, *por ello* and *por esto* are more equally distributed across types of usages. In a more classical distinction between objective and subjective causality, a very prominent preference of *por tanto* for subjective readings is noted and contrasts with the other markers, anchored in the objective causality to different degrees. These results are triangulated

with a complementary source of evidence. The range of verb-types encountered in examples annotated as subjective is much wider in *por tanto* than in *por eso* and *por esto*; although *por ello* appears in different types of verbs as well, the frequency of material verbs —the type of verbs that are less likely to convey subjective readings— found in this marker is lower than in *por tanto*. These findings are evidence of a difference in the coding of the subjective meaning across the markers: while *por tanto* has conventionalized the meaning to the extent that it can impose it to the context, the other markers still need some cues in the context to build subjective causality. The background and implications of such an interpretation is discussed in the next section of the conclusions.

7.3 The network of constructions according to experimental and corpus data and issues for further research

It seems that a constructional view of the setting of these markers properly account for the results found in both studies. In particular, they reveal that the architecture of the “functional paradigm” is more complex than previously thought. The links of *por ello* to the DM category through formal resemblance are optimally represented in the eye-tracker study by benefit effects in all the areas. The effects of *por tanto*, though visible with regard to *por eso* and *por esto*, are partially overridden by the overload that the subjective meaning causes (noticeable in the re-reading time). *Por eso* and *por esto* are still sanctioned by the prepositional phrase construction but, by virtue of the functional links between this category and the category of DM, they carry processing benefits associated to the connective procedural meaning. Yet, they lead to different cognitive weight in processing the DM due to the different level at which they are entrenched, being *por eso* entrenched at a lower level and *por esto* at a more schematic level.

The results of the study also sketch conclusions that point beyond the scope of this particular set of DMs and can be generalized over other DMs. Let us briefly note and discuss them here in order to pave the way for future research.

First, from the point of view of processing, the degree of entrenchment of a construction seems to be a more concrete and explanative parameter than the degree of grammaticalization. It manifests itself best in the processing weight of the AOI DM. It follows from our results that the speaker is sensitive to certain functional slots (schematic constructions) aimed at inference guiding. However, the processing costs of assigning such function to a specific form vary as to the degree of entrenchment that the form holds with regard to this function in the language (in the mind of the speaker, according to its use). This means that many forms could play the role of DM, according to several relations that enable them, and thus they trigger certain cognitive strategies (reduction of effort in processing the utterance, particularly at the conceptual words AOI), but, at the expense of this, the speaker invests efforts in the mapping between form and function. Moreover, it seems plausible that the assumption of this function by the speaker is more direct when the form is entrenched at the level of the microconstruction, that is to say, if the unit is accessed directly, while the cost is higher if it is accessed as the representation of a more schematic construction:

Each use of a word or construction increases the strength of its exemplar cluster, making that word or phrase more accessible lexically. In other terminology, frequency of use increases the level of resting activation of a stored instance of the construction. The greater lexical strength of such an instance makes it more likely to be accessed than a comparable yet more compositional construction. (Bybee, 2010: 75)

Our results account for this principle. All the markers lead to similar cognitive strategies, due to the fact that speakers assign them a functional role as inference guides, that is, they recognize them within the abovementioned functional slot. However, *por esto* requires a significantly higher processing cost in the area of DM than the rest of connectives, hardly explainable through the semantic and pragmatic differences between the pronouns; such an overload in the experiment correlates with some findings of the corpus study: a low token frequency and a higher type-frequency of *por esto*, besides a lower entrenchment in the discourse marking function.

This leads us to a new assessment of the *conceptual / procedural* distinction. If procedural meaning only depended on a semantic change which takes place gradually over time, it would be expectable that forms with a lower degree of procedural meaning display a similar behavior to conceptual words; that is to say, their processing cost should be lower (with regard to more procedural words) and so would be their reduction effect over conceptual words. Our results suggest roughly the opposite: the lower the coded procedural meaning (according to a priori introspection tests on the degree of grammaticalization) the higher the processing cost the marker itself requires. It can be explained as follows: procedural meaning is tied to a function and it is negotiated in every communicative exchange (process); it is a somehow abrupt function from the point of view of processing. Then, what role does gradualness play in this picture? According to a functional theory of grammaticality (Boye and Harder, 2012), all the constructions of a language can act as discursively secondary pieces (i.e., grammatical in a wide sense) in a specific utterance, but there are constructions that have developed the capacity of displaying a discursively secondary status by default; assigning a form such a role is cognitively the costlier the lower its capacity to assume that role by default.

Also related to the encoding of procedural meaning, another far-reaching conclusion of the study concerns the relation between degree of conventionalization of a procedural meaning in a linguistic unit and imposition of its meaning over the context. Be it in a direct or in a tangential way, this relation encompasses different traditions that study DMs from a synchronic or diachronic point of view. From the point of view of Relevance Theory, an asymmetry between procedural and conceptual words is posited, inasmuch as the former forces to adjust the context by virtue of its meaning, while the meaning of the latter is prone to modifications according to the context.

Secondly, Grammaticalization Theory has developed a diachronic theoretical model to explain the emergence and conventionalization of procedural words out of some contexts in which conceptual words are progressively embedded throughout history: the model holds that the

procedural meaning of a form is tied to certain specific contexts and gradually expands through new contexts until it is, at the end, totally tied to the form, regardless of the surrounding context.

From a synchronic point of view and based on a study exploring the degree of grammaticalization of different modal particles, Diewald (2015) sums up these traditions by stating that “non-grammaticalized forms are context-dependent items, while grammaticalized forms are context-creating forms”.

Here the term grammaticalization could result ambiguous; it can be, in fact, clarified or specified by drawing on the constructional framework developed by Traugott and Trousdale (2013), so a last step in this jigsaw of different traditions would be to show how this framework explains the abovementioned phenomenon. When the new meaning of a construction is conventionalized, schematization takes place, which means that speakers generalize over all the contexts (specific constructions) that carry such meaning and, therefore, the construction becomes entrenched at a higher (more schematic) level that allows licensing other new constructions (new contexts in a classical view).

The principle is notably reflected in our study in the differences of meaning that can be noted between *por tanto* and the rest of markers. Particularly, the corpus study shows how the subjective meaning of *por tanto* seems to be detached (untied) from particular contexts. In this sense, our study also posits a somehow different way of measuring the subjectivity inherent to certain markers. This issue has been a matter of discussion and has led to the exploration of different empirical methods. In the last years, for example, a group of authors has attempted at finding objective criteria for the subjectivity inherent to certain markers by looking at subjective cues in the context (Levshina and Degand, 2017; Santana et al., 2017, 2018). The implementation of automatic analysis of subjective clues in the context has not been without methodological problems (Santana et al., 2017) and in fact has sometimes led to unexpected results (Santana et al., 2018).

The problem could primarily be, however, a matter of the approach that underlies such searches. Following an explanation based on the acquisition of subjective meaning through conventionalization of pragmatic inferences, it is expected that markers that have conventionalized such meaning are able to convey inferential meaning by themselves, by virtue of their procedural meaning. It is therefore reasonable to assume the following relation, expressed in §4.2.3: the less a unit has conventionalized a specific procedural meaning the more it needs contextual clues to arouse such meaning, and vice versa. In order to observe this fact, let us recover a classical example:

(105) La calle está mojada. Por tanto, ha llovido.

This is a paradigmatic example of subjective consecutive relation. If we look at the context, no clues of subjective inferential meaning are found, unless we include the DM itself as the subjective item. (Note that in this context other connectives do not fit, because of the abovementioned reasons: they are not able to invoke the inferential meaning by themselves.) Therefore, there are many potential subjective relations marked by *por tanto* (or other

subjective consecutive markers —*luego, pues, por consiguiente*—) that lack subjective clues in the context.

Now, let us look at the following example:

(106) Las medidas adoptadas por el Gobierno son insuficientes. Por eso, creo, las comunidades autónomas deberían tomar cartas en el asunto.

In the example, many subjective clues (*insuficientes* ‘insufficient’, *creo* ‘I think’, *deberían* ‘should’) concur and lead to a subjective reading (since the second segment fits better as a conclusion drawn by the speaker than as a consequence) in a sentence linked by a connective that does not have a subjective profile. However, this should not tell us so much about the degree of subjectivity of the marker or at least it is not a critical evidence.

Therefore, empirically testing the subjectivity of a causal DM faces methodological problems. The automatic search for subjectivity cues does not detect examples that native speakers would classify as subjective causality, since it is the marker what conveys the inferential meaning.¹⁰⁸ On the other hand, the weaknesses of our approach are also prominent; it may lead to a circular argument: classifying examples as triggering subjective causality because they are marked by *por tanto* and considering that *por tanto* is a subjective consecutive marker because it appears in subjective examples. In addition, when manually analyzing the examples one could be biased by the *a priori* judgement of whether a marker is objective or subjective in nature. In this sense, we agree with Santana et al. (2017) about the possible benefits of a combination of automatic and manual analysis as a methodological option. In any case, from our point of view, hypotheses should take into account the abovementioned insight on the conventionalization of meaning and the role of conventionalized markers as *context-creating forms*.

As seen, we have proposed that the subjective causal meaning is coded at the functional pole of the micro-construction *por tanto*. This also carries some implications about its role in the processing of sentences. Up to now, the neutralizing, but non-facilitating role of *por tanto* in the processing of causal sentences observed in different studies has been attributed to the causality-by-default hypothesis (Sanders, 2005): *por tanto* does not impact so much in the integrating process, compared to the implicit condition, because speakers are biased to the causal integration of discourse segments in absence of DM (for example, Narváez, 2019; Recio, 2019; Loureda et al., 2021). In our opinion, a more nuanced explanation should be added in the light of the results, since *por tanto* does incorporate a meaning which is probably not present in the implicit condition, probably not even as an implicature.¹⁰⁹ This meaning (subjective, inferential, epistemic) renders (in our examples) the causal relation more complex and harder to process than the probable outcome of the processing of the implicit condition. Therefore, the time

¹⁰⁸ This is acknowledged by Stukker et al. (2008:160).

¹⁰⁹ However, the hypothesis that content relations are left implicit more often than epistemic is not confirmed in the parallel corpus study by Hoek et al. (2017). It is, nonetheless, assumed for the sentences used in the experiment.

course of processing sentences with *por tanto* is to be seen as a balance between yielding a more complex meaning and guiding it as a conventional (not conversational) implicature.

Therefore, our claims are in line with those approaches that experimentally test subtle procedural meanings of DMs (Canestrelli, 2013; cf. Asr and Demberg, 2020) beyond the coarse-grained analytical labels such as *causal*, *counterargumentative* and so on. These studies converge at attributing connectives the possibility of triggering by themselves a certain specific procedural meaning, be it in an absolute (Canestrelli, 2013) or in a probabilistic way (Asr and Demberg, 2020).

The role of a constructional view of DMs is describing their meanings in terms of the generalization over microconstructions, i.e., as a meaning located in a more schematic level, but also, and according to the usage-based approach, in terms of those specific semantic and pragmatic properties entrenched at the level of the micro-construction through the influence of the actual usage of the construction. It is also aimed at shedding some light on how some links between neighboring constructions could influence the attraction of items through language use, which can eventually result in a constructionalization, i.e., the passing from one category to another represented by a new node in the network. In this respect, our results also raise a question for future research: when and why does this constructionalization take place? In order to answer this question in the future, it seems that one should take into account the development of the modelling of horizontal and vertical links as discussed in the volume of Sommerer and Smirnova (2020).

Zehentner and Traugott (2020) develop the notion of horizontal relations and links previously sketched in Traugott (2018a), widening their theoretical scope. Taken together these studies, we can conclude that when horizontal relations between two constructions imply a functional overlap (two forms for the same function) it could result in two different outcomes. On the one hand, one of the constructions could exert an attraction effect, causing constructional changes and eventual constructionalization. But, on the other, if both constructions reach a high level of entrenchment in such a function, horizontal links may be strengthened, thus enabling such constructions to stablish as *allostructions* (Zehentner and Traugott, 2020; see Capelle, 2006) of a more general *constructeme* (Zehentner and Traugott, 2020). That is to say, a constructeme is generated in the speakers' minds, through the enhanced perception of the alternation of functional overlapping but structurally different constructions.

This last chance could explain the development of the network of constructions we have analyzed. Certainly, both modes of development point to the question posed by Recio et al. (2018) about the existence and persistence of two different structures fulfilling a consecutive connection. Specifically, this framework is geared towards the explanation of why *por eso* and *por esto* have functioned as consecutive argumentative resources from early documentations of Spanish, nonetheless not having crystallized as prototypical DMs, while in *por ello* the development seems to be taking place.

It would be necessary to undertake more theoretical and experimental studies to determine the factors that influence each of these developments (passing from one category to another or

strengthening of the alternation and emergence of a constructeme). Up to here, it seems that constructions that have gone along this specific path contained a non-prototypical deictic term (*por ende, por tanto, por ello*), while the more prototypical signaling devices have preserved their original features. Hence, widening the implication of such insights beyond the scope of our paradigm, the notions of constructeme and allostructions conform a theoretical development that could explain the non-constructionalization of lexical pieces oriented to the communication of procedural aspects and in continuous procedural use by speakers (e.g. Bolly and Degand, 2013, for the French *vu que* ‘since’; Estellés and Cuenca, 2021 for the Spanish *visto que*).

This thesis has tried to test some of the assumptions of construction grammar to structure a set of DMs by means of an eye-tracking and a corpus study. It is important to remark the importance of the usage-based approach adopted: highlighting the nature of DMs as constructions built up by usage helps to give the corpus study a psycholinguistic explanation that matches the results obtained in the eye-tracker experiment. Therefore, accommodation of this framework to the explanation of both the findings of eye-tracking and corpus studies results, in my view, in a great theoretical-methodological pairing and paves the way for a promising sub-area of study: experimental eye-tracking studies about DMs based on the assumptions of usage-based construction grammar.

Conclusiones

Esta tesis se planteaba la necesidad de describir las diferencias entre determinados sintagmas preposicionales y marcadores del discurso y de representar cómo estas se reflejan en un *cline* evolutivo, donde la primera categoría avanza gradualmente hacia la segunda. Una premisa fundamental del trabajo consistía en que el esquema sincrónico conformado por unidades que comparten origen composicional y muestran, en cambio, diferentes propiedades formales o funcionales nos proporciona un marco fiable del proceso diacrónico que han recorrido. En este sentido, las unidades consecutivas del español *por eso*, *por ello* y *por esto* han sido frecuentemente diferenciadas del marcador del discurso *por tanto* en virtud de ciertas propiedades divergentes. Tales diferencias en su comportamiento formal o funcional son, de acuerdo con los marcos teóricos que hemos analizado, el resultado de procesos de cambio que afectan a las construcciones, a saber, cambios construccionales y construccionalizaciones. Estos procesos pueden dar cuenta del estatus actual de las construcciones, y las relaciones que estas mantienen se representan adecuadamente en una red construccional con múltiples vínculos que aspira a conceptualizar de manera más dinámica la noción tradicional de paradigma.

Otro presupuesto teórico concernía la metodología que podía reflejar mejor el estatus de estos marcadores, soslayando los problemas que este tipo de unidades plantean desde un punto de vista evolutivo: en este sentido, se ha propuesto una combinación de métodos en la que se investigan y se ponen en correlación dos dimensiones: el lenguaje como actividad y como producto. Esta correlación no solo consiste en una triangulación de métodos en un sentido tradicional, sino que concuerda realmente con los enfoques basados en el uso, en los que la lengua se concibe como el reflejo de la categorización de los hablantes a partir de eventos de uso. Por tanto, los métodos experimentales en línea, como el *eye-tracking*, nos proporcionan una herramienta complementaria para este tipo de análisis, en la medida en que ofrecen un esbozo de los esfuerzos de procesamiento, que puede ponerse en relación con los patrones de uso que exhiben las distintas unidades analizadas en enunciados reales de corpus.

En las siguientes líneas, resumimos las conclusiones que hemos obtenido de los dos métodos propuestos (estudio de *eye-tracker* y de corpus) y las ponemos en correlación para alcanzar conclusiones más amplias sobre la organización de este conjunto de marcadores del discurso y sus propiedades individuales.

7.1 Estudio de eye-tracking

El estudio de *eye-tracker* ha revelado que una distinción basada en juicios introspectivos como la esbozada en diferentes estudios, donde se distingue claramente entre *por tanto* y el resto de marcadores, no se correlaciona con las respuestas de procesamiento obtenidas.

Adoptando los *principios de procesamiento de la marcación del discurso* (Loureda et al., 2020; 2021) como base de la comparación, hemos demostrado que todas las unidades seleccionadas cumplen una función de marcación del discurso, ya que concurren en ella todos los principios: dichos marcadores desencadenan una estrategia de procesamiento específica que modifica el procesamiento global del enunciado (cualitativo) sin generar sobrecostes (principio

cuantitativo) y que consiste en una reducción inmediata del coste del miembro discursivo que sigue al marcador en el FRT (principio de la regulación inmediata), junto con un procesamiento menos costoso tanto del primer segmento discursivo como de la media global en medidas tardías como el RRT (reactivación óptima).

Por tanto, asumiendo que no todas estas unidades se hallan igualmente “preparadas” para la marcación del discurso, ya que al menos una de ellas (*por tanto*) ha adquirido propiedades formales que representan icónicamente dicho significado procedimental, queda por resolver la cuestión de por qué todas las formas se sitúan dentro del umbral de las tendencias de procesamiento descritas para los marcadores del discurso en Loureda *et al.* (2021). El marco teórico construccional adoptado en esta tesis puede proporcionar una solución a dicho problema: si se recurre a una descripción de las estructuras lingüísticas basada en redes de construcciones, los resultados apuntan a los vínculos que existen entre algunos sintagmas preposicionales y la categoría de marcador del discurso, basados en semejanzas funcionales; específicamente, entre sintagmas preposicionales topicalizados y marcadores del discurso. La posición inicial de los sintagmas preposicionales deviene, por tanto, en un hueco funcional esquemático para la marcación del discurso en el que nuestras unidades contrastan paradigmáticamente. Esto es, en términos de redes construccionales, un enlace funcional en el nivel de las construcciones esquemáticas.

Pese a que todas estas unidades cumplen los principios generales de marcación del discurso desde el punto de vista del procesamiento, un escrutinio mayor de algunos parámetros nos permite apreciar divergencias cualitativas y cuantitativas que parecen reflejar ciertas diferencias semánticas y morfosintácticas entre las unidades. Sin embargo, las distinciones esbozadas por los resultados del *eye-tracker* siguen sin poder proyectarse claramente sobre los distintos grados de gramaticalización que se les ha atribuido a estas formas en la bibliografía.

En este sentido, sorprende que *por ello* conduce a tiempos de lectura más bajos que el resto de condiciones en las medidas generales para todas las áreas de interés, descartando de este modo una distinción nítida o gradual entre *por tanto* y el resto de marcadores, ya que, desde esta premisa, los enunciados con *por ello* deberían procesarse con mayor dificultad que los de *por tanto*. Por otro lado, en términos absolutos, *por tanto* se encuentra en la segunda posición en cuanto a efectos facilitadores, pero la diferencia no es tan robusta como parece: mientras que resulta relevante en la comparación con la condición sin marcador (un efecto pequeño frente al efecto trivial de *por eso* y *por esto*) no resiste la comparación directa con el resto de marcadores, ya que en este contraste la diferencia resulta residual. Finalmente, *por eso* y *por esto* se comportan casi idénticamente en las medidas generales, desencadenando el procesamiento más costoso de todos los marcadores.

En cuanto a la estrategia que desencadenan los marcadores en los diferentes parámetros, *por eso* y *por esto* muestran también un comportamiento casi idéntico, ya que optimizan su efecto procedimental en las relecturas, mientras que en *por ello* y *por tanto* el efecto se produce en el FRT. De hecho, *por tanto* es el marcador más costoso en RRT, lo que podría revelar una diferencia en su significado pragmático que distorsiona los beneficios de procesamiento que genera como

marcador del discurso. Finalmente, y también en términos de estrategia cognitiva, se desprende del estudio que no existe una relación absoluta entre el tiempo que se necesita para procesar un marcador del discurso y los efectos de reducción sobre las palabras conceptuales que este comporta. La ausencia de relación se aprecia de manera clara en *por eso* y *por esto*, ya que generan los mismos efectos facilitadores a pesar de que procesar el área del marcador del discurso resulta mucho más costoso en el caso de *por esto*.

La ausencia de relación puede explicarse a través del vínculo funcional en el nivel esquemático, de donde procede parcialmente el significado procedimental. Las diferencias en el tiempo de procesamiento del marcador, así como las diversas estrategias y efectos de reducción, se pueden explicar a través de los enlaces específicos a la categoría de marcador del discurso en el nivel de las construcciones sustantivas, es decir, en el de las micro-construcciones o marcadores específicos. Los resultados generales, por tanto, requieren de una descripción más minuciosa (detallada, matizada, exhaustiva) de las propiedades de los marcadores. Dicho análisis se ha alcanzado a través de la aplicación de un enfoque basado en el uso en la interpretación de los datos de corpus que presentamos a continuación.

7.2 Resultados del estudio de corpus

En el estudio de corpus, siguiendo los presupuestos teóricos del marco de la construccionalización, hemos tratado de desentrañar las propiedades formales y funcionales de los marcadores del discurso estudiados.

En el plano formal, hemos corroborado las diferencias entre *por tanto* y el resto de marcadores en todos los parámetros seleccionados, lo cual respalda el alto grado de semejanza de *por tanto* con el prototipo de marcador del discurso. Para alcanzar más diferencias en el grupo de marcadores, tres parámetros han devenido fundamentales. En primer lugar, *por ello* es más versátil en términos de posición, puesto que cubre ciertas posiciones sintácticas que no se encuentran en *por eso* y *por esto*, tales como posición inicial con alcance sobre un sintagma o, especialmente, la posición media. En este sentido, el marcador se asemeja a *por tanto* en su movilidad posicional. En segundo lugar, *por ello* se encuentra en entornos parentéticos en un 25% de ejemplos más que *por eso* y *por esto*, que resultan extremadamente parecidos en este parámetro. Finalmente, para el tipo de construcción, se ha encontrado un menor número de ejemplos intraproposicionales en *por ello* cuando restringimos el análisis al registro formal. *Por eso* se halla cerca de *por ello* con un alto porcentaje de usos conectivos, mientras que *por esto* se aleja claramente debido a su elevado número de usos intraproposicionales.

En conjunto, los resultados apoyan claramente el posicionamiento de *por tanto* en el prototipo de la categoría de marcador del discurso. Podemos decir que, en términos de propiedades formales, está completamente habilitado por la construcción esquemática de marcador del discurso. Pero los hallazgos revelan también la existencia de ciertas relaciones entre la construcción sustantiva *por ello* y la categoría de marcador del discurso a través de semejanzas formales. *Por eso* y *por esto* se encuentran más lejos en la red de construcciones. Sin embargo, *por eso* está más afianzada como construcción sustantiva que *por esto* sin repararnos en algunos

parámetros tales como la fijación formal, donde *por esto* muestra un mayor grado de productividad. Además, *por eso* exhibe un mayor arraigo en la función conectiva, como se desprende de su alta proporción de usos conectivos en comparación con *por esto*. La figura 28, recuperada de §5.2.2.6, trata de representar tal esquema.

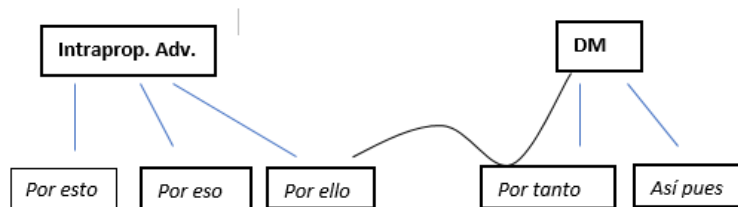


Figura 28. Red construccional de *por esto*, *por eso*, *por ello* y *por tanto*

En el plano funcional, por otro lado, se han constatado usos prototípicos de los marcadores, de acuerdo con las distinciones presentadas por algunos autores (Pander Maat and Degand, 2001; Pander Maat and Sanders, 2001; Degand and Pander Maat, 2003; Sanders, 2005; etc.): mientras que *por tanto* normalmente implica relaciones causales de tipo epistémico y *por eso* muestra una fuerte tendencia por la causalidad volitiva, *por ello* y *por esto* se distribuyen de manera más equitativa a través de los distintos tipos de uso. En una distinción más clásica entre causalidad objetiva y subjetiva, se aprecia una preferencia muy pronunciada de *por tanto* por lecturas subjetivas que contrasta con el resto de marcadores, anclados en la causalidad objetiva en diferente grado. Los resultados han sido triangulados mediante una prueba complementaria. El rango de tipos de verbo que se encuentra en ejemplos anotados como subjetivos es mucho más amplio en *por tanto* que en *por eso* y *por esto*. Aunque *por ello* aparece con diferentes tipos de verbos también, la frecuencia de verbos materiales —el tipo de verbo menos propicio para desencadenar lecturas subjetivas— que se hallan en este marcador es menor que la que encontramos en *por tanto*. Estos hallazgos suponen una prueba de la diferencia en la codificación del significado subjetivo entre nuestros marcadores: *por tanto* ha convencionalizado el significado en tal grado que puede imponerlo sobre el contexto, mientras que los otros marcadores todavía necesitan algunas “pistas” en el contexto para inducir una lectura causal subjetiva. El trasfondo e implicaciones de tal interpretación se discute en la siguiente sección.

7.3 La red de construcciones de acuerdo con datos de corpus y experimentales y cuestiones para investigación futura

Parece que una perspectiva construccional de la configuración de estos marcadores da cuenta de los resultados obtenidos en los dos estudios. En concreto, revela que la arquitectura del “paradigma funcional” es más compleja de lo que se pensaba. Los vínculos de *por ello* con la categoría de marcador del discurso a través de semejanza formal están óptimamente representados en el estudio de *eye-tracker* mediante los efectos de reducción en todas las áreas. Los efectos de *por tanto*, aunque visibles en comparación con *por eso* y *por esto*, se encuentran parcialmente enmascarados por el sobrecoste que supone el procesamiento del significado

subjetivo (apreciable en nuestro estudio en RRT). *Por eso* y *por esto* se hallan todavía en cierta manera sancionados por la construcción de sintagma preposicional encabezado por la preposición *por*, *pero*, en virtud de los vínculos funcionales entre esta categoría y la de marcador del discurso, conducen a ciertos beneficios de procesamiento asociados al significado procedimental conectivo. Aun así, comportan un peso de procesamiento del área del marcador del discurso desigual, debido al nivel en el que se encuentran almacenados en la mente del hablante: *por eso* está afianzado en un nivel más bajo y *por esto* en uno más esquemático.

Los resultados del estudio también esbozan conclusiones que exceden el alcance de este conjunto de marcadores del discurso y que pueden ser generalizadas sobre otros marcadores. A continuación las apuntamos y discutimos para sentar las bases de la investigación futura que puede abrirse.

En primer lugar, desde el punto de vista del procesamiento, el grado de afianzamiento de una construcción (*entrenchment*) parece ser un parámetro más concreto y explicativo que el grado de gramaticalización. Se manifiesta de manera óptima en el coste de procesamiento del área del marcador del discurso. Se sigue de nuestros resultados que el hablante es sensible a ciertos huecos funcionales (construcciones esquemáticas) destinadas a la guía de inferencias. Sin embargo, los costes de procesamiento de asignar tal función a una forma específica varían según el grado de *entrenchment* que muestra cada forma en relación con esta función en la lengua (en la mente de los hablantes, de acuerdo con su uso). Esto significa que virtualmente existen muchas formas que podrían desempeñar el rol de marcación del discurso, de acuerdo con las varias relaciones que lo habilitan, y, en consecuencia, desencadenan ciertas estrategias cognitivas (reducción del esfuerzo de procesamiento del enunciado, especialmente en el nivel de las palabras conceptuales), *pero*, a expensas de ello, el hablante dedica esfuerzos a la vinculación de forma y función. Además, parece razonable que el hablante asuma esta función de modo más directo si la unidad se encuentra afianzada en el nivel de las microconstrucciones, es decir, si se accede a ella directamente como unidad, mientras que el coste es mayor si se accede a ella como la representación de una construcción más esquemática:

Each use of a word or construction increases the strength of its exemplar cluster, making that word or phrase more accessible lexically. In other terminology, frequency of use increases the level of resting activation of a stored instance of the construction. The greater lexical strength of such an instance makes it more likely to be accessed than a comparable yet more compositional construction. (Bybee, 2010: 75)

Nuestros resultados representan dicho principio. Todos los marcadores conllevan estrategias cognitivas similares, debido a que los hablantes les asignan un papel funcional como guías de las inferencias; es decir, los reconocen dentro del mencionado hueco funcional. Sin embargo, *por esto* requiere un coste de procesamiento más alto en el área del marcador del discurso, difícilmente explicable por las diferencias semánticas y morfosintácticas entre pronombres. Dicho sobrecoste se correlaciona con algunos resultados del estudio de corpus: una menor frecuencia de muestra y una frecuencia de tipo más alta, además de un menor afianzamiento en la función de marcación del discurso.

Esto nos conduce a una nueva consideración de la distinción *conceptual / procedimental*. Si el significado procedimental dependiera únicamente de cambios semánticos que se producen gradualmente a lo largo de la historia, sería esperable que las formas con un bajo grado de significado procedimental mostraran un comportamiento similar a las palabras conceptuales; es decir, su procesamiento (en comparación con palabras procedimentales), así como su capacidad de producir efecto de reducción en las palabras conceptuales, deberían ser menores. Nuestros resultados sugieren más o menos lo contrario: cuanto menor es el significado procedimental codificado (de acuerdo con ciertos juicios introspectivos) mayor es el tiempo de procesamiento que el marcador requiere. Esto se puede explicar del siguiente modo: el significado procedimental está vinculado a una función y se negocia en cada intercambio comunicativo; es, desde el punto de vista del procesamiento, una función abrupta.

Por tanto, la pregunta que surge es: ¿qué papel desempeña la gradualidad en este esquema? De acuerdo con las teorías funcionales de la gramaticalización (Boye y Harder, 2012), todas las construcciones de una lengua pueden actuar como piezas discursivamente secundarias (i.e., gramaticales en un sentido amplio) en cada uno de los enunciados específicos, pero hay construcciones que han desarrollado la capacidad de mostrar un *status* secundario por defecto; asignar a una forma este papel más costoso cuanto menor es la capacidad de esta unidad de asumir dicho rol por defecto

También en relación con la codificación del significado procedimental, otra conclusión de largo alcance del estudio concierne a la relación entre el grado de convencionalización de un significado procedimental en una unidad de la lengua y la imposición de este significado sobre los distintos contextos. De una manera directa o tangencial, esta relación abarca diferentes tradiciones que estudian los marcadores del discurso desde un punto de vista sincrónico o diacrónico. Desde el punto de vista de la Teoría de la Relevancia, se postula una asimetría entre las palabras conceptuales y las procedimentales, en la medida en que las procedimentales fuerzan al contexto a adaptarse a su significado, mientras que el significado de las conceptuales es modulable de acuerdo con las exigencias del contexto.

En segundo lugar, la Teoría de la Gramaticalización ha desarrollado un modelo teórico diacrónico para explicar la emergencia y convencionalización de palabras procedimentales a partir de ciertos contextos en el que aparecen ciertas palabras conceptuales a lo largo de la historia: el modelo mantiene que el significado procedimental de una forma se encuentra ligado a ciertos contexto y se expande gradualmente por nuevos contexto hasta que, finalmente, se vincula indisolublemente a la forma, independientemente del contexto circundante.

Desde un punto de vista sincrónico, y en base a un estudio que explora los grados de gramaticalización de diferentes particula modales, Diewald (2015) resume perfectamente la esencia de estas diversas explicaciones cuando afirma que “non-grammaticalized forms are context-dependent items, while grammaticalized forms are context-creating forms”.

El término gramaticalización en estas líneas puede resultar ambiguo y, de hecho, puede ser especificado si recurrimos al marco construccional desarrollado por Traugott y Trousdale (2013), de modo que el último paso en este rompecabezas de distintas tradiciones consistiría en mostrar

cómo esta perspectiva explica el fenómeno que estamos tratando. Cuando el nuevo significado de una construcción se convencionaliza, ocurre una esquematización: los hablantes realizan una generalización a partir de todos los contextos (construcciones específicas) con que se liga este significado y, en consecuencia, la construcción se afianza en un nivel más alto (más esquemático) que habilita otras construcciones nuevas (nuevos contextos en una visión clásica).

El principio se refleja notablemente en las diferencias de significado que hemos apreciado entre *por tanto* y el resto de marcadores en nuestro estudio. En particular, el estudio de corpus muestra cómo el significado subjetivo de *por tanto* parece desligado de ciertos contextos específicos. En este sentido, nuestro estudio también plantea una manera diferente de medir la subjetividad inherente a ciertos marcadores. Esta cuestión ha sido materia de discusión y ha conducido a la búsqueda de diferentes métodos empíricos. En los últimos años, por ejemplo, algunos autores han tratado de encontrar criterios objetivos para la subjetividad inherente a ciertos marcadores buscando marcas subjetivas en el contexto (Levshina y Degand, 2017; Santana *et al.*, 2017; Santana *et al.*, 2018). La implementación de análisis automáticos de las marcas subjetivas en el contexto han topado, sin embargo, con ciertos problemas metodológicos (Santana *et al.*, 2017) y de hecho han conducido a resultados inesperados en algunos casos (Santana *et al.*, 2018).

El problema puede residir principalmente en una cuestión del enfoque teórico que subyace a estas búsquedas. Siguiendo una explicación basada en la adquisición del significado subjetivo a través de la convencionalización de inferencias pragmáticas, se espera que los marcadores que han convencionalizado dicho significado sean capaces de transmitir un significado inferencial por ellos mismos, en virtud de su significado procedimental. Resulta razonable, por tanto, asumir la siguiente relación, expresada en §4.2.3: cuanto menos ha llegado a convencionalizar una unidad determinado significado procedimental, más marcas contextuales necesita para hacer emerger dicho significado, y viceversa. Para mostrar este principio, mostramos el siguiente ejemplo clásico.

(105) La calle está mojada. Por tanto, ha llovido.

Este es un ejemplo paradigmático de una relación consecutiva subjetiva. Si miramos el contexto, no hay pistas de un significado inferencial subjetivo, a menos que incluyamos el marcador mismo como el ítem subjetivo. (Obsérvese que el resto de marcadores no encajarían en este contexto por las razones que ya hemos presentado: no son capaces de invocar el significado inferencial por ellos mismos). Por tanto, hay muchas relaciones subjetivas potenciales marcadas por *por tanto* (u otros marcadores consecutivos subjetivos —*luego, pues, por consiguiente*—) que carecen de marcas subjetivas en el contexto.

Ahora prestemos atención al siguiente ejemplo:

(106) Las medidas adoptadas por el Gobierno son insuficientes. Por eso, creo, las comunidades autónomas deberían tomar cartas en el asunto.

En el enunciado concurren muchas pistas subjetivas (*insuficientes, creo, deberían*) y favorecen una lectura subjetiva (en la medida en que el segundo segmento encaja más como una

conclusión trazada por el hablante que como una consecuencia), aun en una oración conectada por un nexos que no posee un perfil subjetivo. Sin embargo, esto no nos revela mucho acerca del grado de subjetividad del marcador o, por lo menos, no constituye una prueba concluyente.

Por tanto, comprobar empíricamente la subjetividad de un marcador del discurso consecutivo comporta ciertos problemas metodológicos. La búsqueda automática de marcas de subjetividad no detecta ejemplos que hablantes nativos clasificarían como subjetivos, ya que es el marcador el que aporta el sentido subjetivo¹¹⁰.

Por otro lado, las debilidades de nuestro enfoque también son evidentes, ya que puede conducir a un argumento circular: clasificar ejemplos como subjetivos porque están “marcados” por *por tanto* y considerar a *por tanto* un marcador subjetivo porque aparece en ejemplos subjetivos. Además, cuando se analizan manualmente los ejemplos, se puede incurrir en el sesgo de juzgar *a priori* si la naturaleza de un marcador es objetiva o subjetiva. En este sentido, coincidimos con Santana *et al.* (2017) en los potenciales beneficios de una combinación de análisis manuales y automáticos. En cualquier caso, desde nuestro punto de vista, las hipótesis deben tener en consideración la perspectiva anterior sobre la convencionalización del significado procedimental y el papel de los marcadores convencionalizados como “formas creadoras de contextos”.

Como se ha visto, hemos propuesto que el significado subjetivo está codificado en el polo funcional de la micro-construcción *por tanto*, lo cual conlleva ciertas implicaciones sobre su papel en el procesamiento de oraciones. Hasta ahora el efecto neutralizador pero no muy facilitador de *por tanto* en el procesamiento de oraciones causales que se ha observado en diferentes estudios se ha atribuido a la hipótesis de la causalidad por defecto (Sanders, 2005): *por tanto* no ejerce un influjo tan grande en el proceso de integración porque los hablantes se inclinan a la conexión causal de segmentos discursivos en ausencia de marca conectiva. En nuestra opinión, otra explicación debe añadirse a la luz de los resultados, ya que *por tanto* sí incorpora un significado que no está presente en la condición implícita, quizás ni siquiera como una implicatura¹¹¹.

Este significado (subjetivo, inferencial, epistémico) confiere mayor dificultad y complejidad de procesamiento que el resultado del procesamiento de la condición implícita. Por tanto, el tiempo de procesamiento de oraciones con *por tanto* debe concebirse como un equilibrio entre el hecho de producir un significado más complejo y el de canalizarlo como implicatura convencional.

Así pues, nuestras reivindicaciones concuerdan con los enfoques que prueban experimentalmente las sutilezas de los significados procedimental de ciertos marcadores del discurso (Canestrelli, 2013; Sanders *et al.*, 2013; cf. Asr y Demberg, 2020) más allá de las etiquetas analíticas de brocha gorda, tales como *causal*, *contraargumentativo*, etc. Estos estudios coinciden en atribuir a los MMDD la posibilidad de desencadenar un significado

¹¹⁰ Este problema ha sido explícitamente apuntado por Stukker *et al.* (2009:160).

¹¹¹ Sin embargo, la hipótesis de que las relaciones de contenidos quedan implícitas más a menudo que las epistémicas no se confirma en el estudio de corpus paralelo llevado a cabo por Hoek *et al.* (2017). Se asume, en cambio, para las oraciones de nuestro experimento.

procedimental específico, ya sea de un modo absoluto (Canestrelli, 2013; Sanders *et al.*, 2013) o probabilístico (Asr y Demberg, 2020).

El propósito de la perspectiva construccional sobre los marcadores del discurso es describir sus significado como una generalización sobre microconstrucciones, es decir, como un significado alojado en un nivel esquemático, pero también, y según los enfoques basados en el uso, en términos de los rasgos semánticos y formales específicos almacenados en el nivel de las micro-construcciones, debido a la influencia del uso real de las construcciones. También trata de arrojar luz sobre cómo ciertos vínculos entre construcciones cercanas pueden influenciar la atracción de ítems a través del uso de la lengua, lo cual puede dar finalmente como resultado una construccionalización, es decir, el paso de una categoría a otra representado mediante un nuevo nodo en la red. En este sentido, nuestros resultados plantean también una pregunta para futura investigación: ¿cuándo y bajo qué condiciones se produce la construccionalización? Para contestar a esta cuestión, parece que se debería tener en cuenta el desarrollo del modelo de relaciones horizontales y verticales, tal y como se discute en el volumen de Sommerer y Smirnova (2020).

Zehentner y Traugott (2020) desarrollan la noción de relaciones horizontales que se había trazado previamente en Traugott (2018a), ampliando el alcance teórico de estas. Tomando en conjunto los dos estudios, se puede concluir que las relaciones horizontales entre dos construcciones que implican un solapamiento funcional (dos formas para una función) pueden dar lugar a dos resultados diferentes. Por un lado, una de las construcciones puede ejercer un efecto de atracción, provocando cambios construccionales y una construccionalización final. Pero, por otro lado, si las dos construcciones alcanzan un grado de *entrenchment* en tal función muy fuerte, los vínculos horizontales podrían reforzarse, permitiendo así que dichas construcciones se establezcan como *alostrucciones* (Zehentner and Traugott, 2020; véase Capelle, 2006) de un *constructema* (Zehentner and Traugott, 2020) general. Es decir, se genera un constructema en la mente de los hablantes a través de la percepción amplificada de la alternancia de construcciones funcionalmente equiparables pero estructuralmente distintas.

La última posibilidad podría explicar el desarrollo de la red de construcciones que hemos analizado. Ciertamente, los dos modos de desarrollo apuntan a la cuestión planteada por Recio *et al.* (2018) acerca de la existencia y persistencia de dos estructura diferentes que cumplen una función conectiva consecutiva. En concreto, este marco está orientado hacia la explicación de por qué *por eso* y *por esto* han funcionado como recursos argumentativos consecutivos desde épocas tempranas del español y, a pesar de ello, no han cristalizado como marcadores del discurso prototípicos, mientras que cierto desarrollo parece estar surtiendo en *por ello*. Sería necesario llevar a cabo más estudios teóricos y experimentales para determinar los factores que favorecen cada uno de estos desarrollos (el paso de una categoría a otra o el refuerzo de la alternancia y la emergencia de un constructema). Hasta aquí, parece que las construcciones que se han movido a lo largo de la ruta evolutiva contenían un término deíctico no prototípico (*por ende*, *por tanto*, *por ello*), mientras que los medios de señalación más prototípicos han preservado sus rasgos originales. Así pues, ampliando las implicaciones de estas perspectivas

más allá del ámbito de nuestro paradigma, las nociones de constructema y alostrucciones constituyen un desarrollo teórico que podría explicar la no-construccionalización de piezas léxicas orientadas a la comunicación de aspectos procedimentales y en continuo uso instruccional por parte de los hablantes (por ejemplo, Bolly and Degand, 2013, para *vu que* en francés, Cuenca y Estellés, 2021 para *visto que* en español).

Esta tesis ha tratado de probar algunas premisas de la gramática de construcciones para estructurar un conjunto de marcadores a través de un estudio de *eye-tracking* y otro de corpus. Es importante recalcar la importancia del enfoque basado en el uso que hemos adoptado: resaltar la naturaleza de los marcadores del discurso como construcciones modeladas por el uso ayuda a proporcionar una explicación psicolingüística razonable al estudio de corpus que coincide con los resultados del *eye-tracker*. Por tanto, la adecuación de este marco a la explicación de los hallazgos de los estudios de *eye-tracking* y de corpus resulta, desde mi punto de vista, en un gran emparejamiento teórico-metodológico y allana el terreno para una subárea de estudio prometedora: trabajos experimentales de *eye-tracking* sobre marcadores del discurso basados en los presupuestos teóricos de la gramática de construcciones basada en el uso.

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Appendices

Appendix 1. Sets (themes in each condition)

SET 1		
A1	Guillermo y Victoria escriben novelas buenas. Venden muchos libros. Sus amigos los admiran.	L1
A2	Guillermo y Victoria escriben novelas buenas. Por tanto venden muchos libros. Sus amigos los admiran.	L2
A3	Guillermo y Victoria escriben novelas buenas. Por eso venden muchos libros. Sus amigos los admiran.	L3
A4	Guillermo y Victoria escriben novelas buenas. Por ello venden muchos libros. Sus amigos los admiran.	L4
A5	Guillermo y Victoria escriben novelas buenas. Por esto venden muchos libros. Sus amigos los admiran.	L5

SET 2		
A1	Tamara y Ernesto tienen clientes ricos. Reciben muchas propinas. Están muy contentos con su trabajo.	L5
A2	Tamara y Ernesto tienen clientes ricos. Por tanto reciben muchas propinas. Están muy contentos con su trabajo.	L1
A3	Tamara y Ernesto tienen clientes ricos. Por eso reciben muchas propinas. Están muy contentos con su trabajo.	L2
A4	Tamara y Ernesto tienen clientes ricos. Por ello reciben muchas propinas. Están muy contentos con su trabajo.	L3
A5	Tamara y Ernesto tienen clientes ricos. Por esto reciben muchas propinas. Están muy contentos con su trabajo.	L4

SET 3		
A1	Adrián y Elena hacen películas geniales. Ganan muchos premios. Este año han estado en el Festival de Venecia.	L4
A2	Adrián y Elena hacen películas geniales. Por tanto ganan muchos premios. Este año han estado en el Festival de Venecia.	L5
A3	Adrián y Elena hacen películas geniales. Por eso ganan muchos premios. Este año han estado en el Festival de Venecia.	L1
A4	Adrián y Elena hacen películas geniales. Por ello ganan muchos premios. Este año han estado en el Festival de Venecia.	L2
A5	Adrián y Elena hacen películas geniales. Por esto ganan muchos premios. Este año han estado en el Festival de Venecia.	L3

SET 4		
A1	Valentín y Camila ocupan puestos importantes. Ganan mucho dinero. Se pueden permitir lujos.	L3
A2	Valentín y Camila ocupan puestos importantes. Por tanto ganan mucho dinero. Se pueden permitir lujos.	L4
A3	Valentín y Camila ocupan puestos importantes. Por eso ganan mucho dinero. Se pueden permitir lujos.	L5
A4	Valentín y Camila ocupan puestos importantes. Por ello ganan mucho dinero. Se pueden permitir lujos.	L1
A5	Valentín y Camila ocupan puestos importantes. Por esto ganan mucho dinero. Se pueden permitir lujos.	L2

SET 5		
A1	Arturo y Nicolás arbitran partidos importantes. Sufren mucha presión. Antes de los partidos no duermen.	L2
A2	Arturo y Nicolás arbitran partidos importantes. Por tanto sufren mucha presión. Antes de los partidos no duermen.	L3
A3	Arturo y Nicolás arbitran partidos importantes. Por eso sufren mucha presión. Antes de los partidos no duermen.	L4
A4	Arturo y Nicolás arbitran partidos importantes. Por ello sufren mucha presión. Antes de los partidos no duermen.	L5
A5	Arturo y Nicolás arbitran partidos importantes. Por esto sufren mucha presión. Antes de los partidos no duermen.	L1

SET 6		
A1	Anthony y Melanie componen canciones bonitas. Tienen muchos seguidores. En verano darán conciertos en diferentes ciudades.	L1
A2	Anthony y Melanie componen canciones bonitas. Por tanto tienen muchos seguidores. En verano darán conciertos en diferentes ciudades.	L2
A3	Anthony y Melanie componen canciones bonitas. Por eso tienen muchos seguidores. En verano darán conciertos en diferentes ciudades.	L3
A4	Anthony y Melanie componen canciones bonitas. Por ello tienen muchos seguidores. En verano darán conciertos en diferentes ciudades.	L4
A5	Anthony y Melanie componen canciones bonitas. Por esto tienen muchos seguidores. En verano darán conciertos en diferentes ciudades.	L5

SET 7		
A1	Lucía y Emilio contratan abogados brillantes. Ganan muchos juicios. La empresa se enfrenta a una gran cantidad de casos cada año.	L5
A2	Lucía y Emilio contratan abogados brillantes. Por tanto ganan muchos juicios. La empresa se enfrenta a una gran cantidad de casos cada año.	L1
A3	Lucía y Emilio contratan abogados brillantes. Por eso ganan muchos juicios. La empresa se enfrenta a una gran cantidad de casos cada año.	L2
A4	Lucía y Emilio contratan abogados brillantes. Por ello ganan muchos juicios. La empresa se enfrenta a una gran cantidad de casos cada año.	L3
A5	Lucía y Emilio contratan abogados brillantes. Por esto ganan muchos juicios. La empresa se enfrenta a una gran cantidad de casos cada año.	L4

SET 8		
A1	Jennifer y Elisa tienen sueldos bajos. Pagan pocos impuestos. Buscan un trabajo mejor.	L4
A2	Jennifer y Elisa tienen sueldos bajos. Por tanto pagan pocos impuestos. Buscan un trabajo mejor.	L5
A3	Jennifer y Elisa tienen sueldos bajos. Por eso pagan pocos impuestos. Buscan un trabajo mejor.	L1
A4	Jennifer y Elisa tienen sueldos bajos. Por ello pagan pocos impuestos. Buscan un trabajo mejor.	L2
A5	Jennifer y Elisa tienen sueldos bajos. Por esto pagan pocos impuestos. Buscan un trabajo mejor.	L3

SET 9		
A1	Leticia y Estela compran ropa cara. Gastan mucho dinero. En las tiendas las tratan muy bien.	L3
A2	Leticia y Estela compran ropa cara. Por tanto gastan mucho dinero. En las tiendas las tratan muy bien.	L4
A3	Leticia y Estela compran ropa cara. Por eso gastan mucho dinero. En las tiendas las tratan muy bien.	L5
A4	Leticia y Estela compran ropa cara. Por ello gastan mucho dinero. En las tiendas las tratan muy bien.	L1
A5	Leticia y Estela compran ropa cara. Por esto gastan mucho dinero. En las tiendas las tratan muy bien.	L2

SET 10		
A1	Alfredo y Ángela hacen ofertas buenas. Tienen muchos clientes. Su bar es muy famoso entre los estudiantes.	L2
A2	Alfredo y Ángela hacen ofertas buenas. Por tanto tienen muchos clientes. Su bar es muy famoso entre los estudiantes.	L3
A3	Alfredo y Ángela hacen ofertas buenas. Por eso tienen muchos clientes. Su bar es muy famoso entre los estudiantes.	L4
A4	Alfredo y Ángela hacen ofertas buenas. Por ello tienen muchos clientes. Su bar es muy famoso entre los estudiantes.	L5
A5	Alfredo y Ángela hacen ofertas buenas. Por esto tienen muchos clientes. Su bar es muy famoso entre los estudiantes.	L1

Appendix 2. Statistical models

MODEL 1

FIRST READING TIME (FRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	FRT.PRED	FRT.PRED.STDER R
EC_A1	234.81	8.27	7.18	7.59	233.75	8.29
EC_A2	-1.93	7.29	7.44	7.59	231.82	8.28
E-S_A1	10.78	7.35	7.85	7.59	244.53	8.28
E-S_A2	2.60	7.52	8.15	7.59	236.35	8.37
Ca-S_A1	5.09	7.49	8.17	7.59	238.84	8.46
Ca-S_A2	-7.27	7.53	8.17	7.59	226.48	8.49
Co_A1	3.73	7.23	7.23	7.59	237.48	8.29
Co_A2	-12.78	7.27	7.22	7.59	220.97	8.32
E-M_A2	-7.24	7.27	7.14	7.59	226.51	8.33
E-SM_A2	-4.24	7.39	7.85	7.59	229.51	8.31
CoM_A2	2.89	7.41	7.89	7.59	236.64	8.30

RE-READING TIME (RRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	RRT.PRED	RRT.PRED.STDER R
EC_A1	13.41	8.22	7.18	7.59	16.92	3.78
EC_A2	-2.75	4.83	7.44	7.59	14.17	3.79
E-S_A1	-5.37	4.85	7.85	7.59	11.56	3.76
E-S_A2	-8.12	4.93	8.15	7.59	8.81	3.83
Ca-S_A1	6.04	4.90	8.17	7.59	22.97	3.80
Ca-S_A2	1.29	4.93	8.17	7.59	18.21	3.83
Co_A1	-4.25	4.80	7.23	7.59	12.68	3.77
Co_A2	-7.99	4.82	7.22	7.59	8.94	3.80
E-M_A2	-2.73	4.82	7.14	7.59	14.20	3.81
E-SM_A2	-8.99	4.87	7.85	7.59	7.94	3.79
CoM_A2	-7.15	4.88	7.89	7.59	9.78	3.80

TOTAL READING TIME (TRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	TRT.PRED	TRT.PRED.STDER R
EC_A1	252.52	9.35	7.18	7.59	250.53	9.38
EC_A2	-4.66	8.74	7.44	7.59	245.87	9.37
E-S_A1	4.23	8.79	7.85	7.59	254.77	9.35
E-S_A2	-7.30	8.96	8.15	7.59	243.24	9.45
Ca-S_A1	9.64	8.96	8.17	7.59	260.18	9.57
Ca-S_A2	-7.48	9.01	8.17	7.59	243.05	9.61
Co_A1	-0.69	8.67	7.23	7.59	249.84	9.38
Co_A2	-20.93	8.72	7.22	7.59	229.60	9.42
E-M_A2	-9.92	8.72	7.14	7.59	240.61	9.43
E-SM_A2	-14.44	8.83	7.85	7.59	236.09	9.39
CoM_A2	-5.26	8.87	7.89	7.59	245.27	9.38

MODEL 2*FIRST READING TIME (FRT)*

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	FRT.PRED	FRT.PRED.STDER R
EC_A1	234.81	8.27	7.18	7.59	233.75	8.29
EC_A3	0.54	7.31	7.25	7.59	234.29	8.34
E-S_A1	10.78	7.35	7.85	7.59	244.53	8.28
E-S_A3	10.09	7.44	7.88	7.59	243.84	8.34
Ca-S_A1	5.09	7.49	8.17	7.59	238.84	8.46
Ca-S_A3	3.56	7.57	8.20	7.59	237.31	8.53
Co_A1	3.73	7.23	7.23	7.59	237.48	8.29
Co_A3	-14.59	7.31	7.25	7.59	219.16	8.36
E-M_A3	-5.10	7.31	7.17	7.59	228.65	8.36
E-SM_A3	2.42	7.44	7.89	7.59	236.17	8.35
CoM_A3	2.30	7.33	7.41	7.59	236.05	8.32

RE-READING TIME (RRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	RRT.PRED	RRT.PRED.STDER R
EC_A1	13.41	8.22	7.18	7.59	16.92	3.78
EC_A3	-6.82	4.85	7.25	7.59	10.10	3.83
E-S_A1	-5.37	4.85	7.85	7.59	11.56	3.76
E-S_A3	-10.21	4.90	7.88	7.59	6.72	3.83
Ca-S_A1	6.04	4.90	8.17	7.59	22.97	3.80
Ca-S_A3	3.41	4.96	8.20	7.59	20.33	3.87
Co_A1	-4.25	4.80	7.23	7.59	12.68	3.77
Co_A3	-9.64	4.85	7.25	7.59	7.29	3.83
E-M_A3	-7.10	4.85	7.17	7.59	9.82	3.84

E- SM_A3 CoM_A 3	-11.21 -8.28	4.90 4.85	7.89 7.41	7.59 7.59	5.71 8.64	3.83 3.82
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TOTAL READING TIME (TRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	TRT.PRED	TRT.PRED.STDER R
EC_A1	252.52	9.35	7.18	7.59	250.53	9.38
EC_A3	-6.13	8.77	7.25	7.59	244.41	9.45
E-S_A1	4.23	8.79	7.85	7.59	254.77	9.35
E-S_A3	-1.26	8.89	7.88	7.59	249.27	9.43
Ca-S_A1	9.64	8.96	8.17	7.59	260.18	9.57
Ca-S_A3	5.51	9.06	8.20	7.59	256.04	9.66
Co_A1	-0.69	8.67	7.23	7.59	249.84	9.38
Co_A3	-24.46	8.76	7.25	7.59	226.08	9.46
E-M_A3	-12.18	8.76	7.17	7.59	238.35	9.47
E- SM_A3 CoM_A 3	-10.10 -5.97	8.89 8.78	7.89 7.41	7.59 7.59	240.44 244.57	9.44 9.42

MODEL 3*FIRST READING TIME (FRT)*

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	FRT.PRED	FRT.PRED.STDER R
EC_A1	234.81	8.27	7.18	7.59	233.75	8.29
EC_A4	-15.13	7.28	7.34	7.59	218.62	8.29
E-S_A1	10.78	7.35	7.85	7.59	244.53	8.28
E-S_A4	-8.29	7.46	8.03	7.59	225.46	8.34
Ca-S_A1	5.09	7.49	8.17	7.59	238.84	8.46
Ca-S_A4	-11.78	7.56	8.24	7.59	221.97	8.52
Co_A1	3.73	7.23	7.23	7.59	237.48	8.29
Co_A4	-24.24	7.27	7.23	7.59	209.51	8.32
E-M_A4	-18.83	7.27	7.16	7.59	214.92	8.33
E- SM_A4 CoM_A4	-12.56 -13.58	7.40 7.34	7.87 7.67	7.59 7.59	221.19 220.17	8.31 8.27

RE-READING TIME (RRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	RRT.PRED	RRT.PRED.STDER R
EC_A1	13.41	8.22	7.18	7.59	16.92	3.78
EC_A4	-6.48	4.83	7.34	7.59	10.45	3.79
E-S_A1	-5.37	4.85	7.85	7.59	11.56	3.76
E-S_A4	-10.42	4.90	8.03	7.59	6.50	3.81

Ca-S_A1	6.04	4.90	8.17	7.59	22.97	3.80
Ca-S_A4	-4.41	4.94	8.24	7.59	12.51	3.84
Co_A1	-4.25	4.80	7.23	7.59	12.68	3.77
Co_A4	-8.03	4.82	7.23	7.59	8.90	3.80
E-M_A4	-6.27	4.82	7.16	7.59	10.66	3.81
E- SM_A4	-10.77	4.87	7.87	7.59	6.16	3.79
CoM_A 4	-8.11	4.85	7.67	7.59	8.81	3.78

TOTAL READING TIME (TRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	TRT.PRED	TRT.PRED.STDER R
EC_A1	252.52	9.35	7.18	7.59	250.53	9.38
EC_A4	-21.48	8.73	7.34	7.59	229.06	9.38
E-S_A1	4.23	8.79	7.85	7.59	254.77	9.35
E-S_A4	-20.20	8.91	8.03	7.59	230.34	9.41
Ca-S_A1	9.64	8.96	8.17	7.59	260.18	9.57
Ca-S_A4	-17.38	9.05	8.24	7.59	233.15	9.65
Co_A1	-0.69	8.67	7.23	7.59	249.84	9.38
Co_A4	-32.47	8.72	7.23	7.59	218.06	9.42
E-M_A4	-25.06	8.72	7.16	7.59	225.47	9.43
E- SM_A4	-24.58	8.84	7.87	7.59	225.96	9.39
CoM_A 4	-22.06	8.79	7.67	7.59	228.47	9.36

MODEL 4*FIRST READING TIME (FRT)*

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	FRT.PRED	FRT.PRED.STDER R
EC_A1	234.81	8.27	7.18	7.59	233.75	8.29
EC_A4	-15.13	7.28	7.34	7.59	218.62	8.29
E-S_A1	10.78	7.35	7.85	7.59	244.53	8.28
E-S_A5	14.23	7.44	8.03	7.59	247.98	8.32
Ca-S_A1	5.09	7.49	8.17	7.59	238.84	8.46
Ca-S_A5	0.64	7.56	8.27	7.59	234.39	8.51
Co_A1	3.73	7.23	7.23	7.59	237.48	8.29
Co_A5	-10.28	7.25	7.23	7.59	223.47	8.31
E-M_A5	-5.52	7.25	7.16	7.59	228.23	8.31
E- SM_A5	1.16	7.38	7.87	7.59	234.91	8.30
CoM_A5	16.05	7.32	7.65	7.59	249.80	8.26

RE-READING TIME (RRT)

	ESTIMATE	STDERR	NLETTERS.WD_OBS	NLETTERS.WD_FIX	RRT.PRED	RRT.PRED.STDERR
EC_A1	13.41	8.22	7.18	7.59	16.92	3.78
EC_A4	-6.48	4.83	7.34	7.59	10.45	3.79
E-S_A1	-5.37	4.85	7.85	7.59	11.56	3.76
E-S_A5	-10.38	4.89	8.03	7.59	6.54	3.79
Ca-S_A1	6.04	4.90	8.17	7.59	22.97	3.80
Ca-S_A5	-1.30	4.94	8.27	7.59	15.63	3.83
Co_A1	-4.25	4.80	7.23	7.59	12.68	3.77
Co_A5	-10.67	4.81	7.23	7.59	6.25	3.79
E-M_A5	-6.31	4.81	7.16	7.59	10.61	3.79
E-SM_A5	-11.28	4.86	7.87	7.59	5.64	3.78
E-CoM_A5	-9.24	4.84	7.65	7.59	7.68	3.77

TOTAL READING TIME

	ESTIMATE	STDERR	NLETTERS.WD_OBS	NLETTERS.WD_FIX	TRT.PRED	TRT.PRED.STDERR
EC_A1	252.52	9.35	7.18	7.59	250.53	9.38
EC_A4	-21.48	8.73	7.34	7.59	229.06	9.38
E-S_A1	4.23	8.79	7.85	7.59	254.77	9.35
E-S_A5	2.38	8.89	8.03	7.59	252.91	9.39
Ca-S_A1	9.64	8.96	8.17	7.59	260.18	9.57
Ca-S_A5	-2.37	9.04	8.27	7.59	248.16	9.62
Co_A1	-0.69	8.67	7.23	7.59	249.84	9.38
Co_A5	-21.13	8.69	7.23	7.59	229.40	9.40
E-M_A5	-11.78	8.69	7.16	7.59	238.76	9.41
E-SM_A5	-11.36	8.82	7.87	7.59	239.17	9.37
E-CoM_A5	6.50	8.76	7.65	7.59	257.03	9.34

MODEL 5

FIRST READING TIME

	ESTIMATE	STDERR	NLETTERS.WD_OBS	NLETTERS.WD_FIX	FRT.PRED	FRT.PRED.STDERR
EC_A1	234.81	8.27	7.18	7.59	233.75	8.29
EC_A2	-1.93	7.29	7.44	7.59	231.82	8.28
EC_A3	0.54	7.31	7.25	7.59	234.29	8.34
EC_A4	-15.13	7.28	7.34	7.59	218.62	8.29
EC_A5	4.38	7.26	7.34	7.59	238.13	8.27
E-M_A2	-7.24	7.27	7.14	7.59	226.51	8.33
E-M_A3	-5.10	7.31	7.17	7.59	228.65	8.36
E-M_A4	-18.83	7.27	7.16	7.59	214.92	8.33
E-M_A5	-5.52	7.25	7.16	7.59	228.23	8.31

E-S_A2	2.60	7.52	8.15	7.59	236.35	8.37
E-S_A3	10.09	7.44	7.88	7.59	243.84	8.34
E-S_A4	-8.29	7.46	8.03	7.59	225.46	8.34
E-S_A5	14.23	7.44	8.03	7.59	247.98	8.32
E-						
SM_A2	-4.24	7.39	7.85	7.59	229.51	8.31
E-						
SM_A3	2.42	7.44	7.89	7.59	236.17	8.35
E-						
SM_A4	-12.56	7.40	7.87	7.59	221.19	8.31
E-						
SM_A5	1.16	7.38	7.87	7.59	234.91	8.30
E-S_A1	10.78	7.35	7.85	7.59	244.53	8.28

RE-READING TIME

	ESTIMATE	STDERR	NLETTERS.WD_OBS	NLETTERS.WD_FIX	RRT.PRED	RRT.PRED.STDERR
EC_A1	13.41	8.22	7.18	7.59	16.92	3.78
EC_A2	-2.75	4.83	7.44	7.59	14.17	3.79
EC_A3	-6.82	4.85	7.25	7.59	10.10	3.83
EC_A4	-6.48	4.83	7.34	7.59	10.45	3.79
EC_A5	-6.18	4.81	7.34	7.59	10.74	3.78
E-M_A2	-2.73	4.82	7.14	7.59	14.20	3.81
E-M_A3	-7.10	4.85	7.17	7.59	9.82	3.84
E-M_A4	-6.27	4.82	7.16	7.59	10.66	3.81
E-M_A5	-6.31	4.81	7.16	7.59	10.61	3.79
E-S_A2	-8.12	4.93	8.15	7.59	8.81	3.83
E-S_A3	-10.21	4.90	7.88	7.59	6.72	3.83
E-S_A4	-10.42	4.90	8.03	7.59	6.50	3.81
E-S_A5	-10.38	4.89	8.03	7.59	6.54	3.79
E-						
SM_A2	-8.99	4.87	7.85	7.59	7.94	3.79
E-						
SM_A3	-11.21	4.90	7.89	7.59	5.71	3.83
E-						
SM_A4	-10.77	4.87	7.87	7.59	6.16	3.79
E-						
SM_A5	-11.28	4.86	7.87	7.59	5.64	3.78
E-S_A1	-5.37	4.85	7.85	7.59	11.56	3.76

TOTAL READING TIME (TRT)

	ESTIMATE	STDERR	NLETTERS.WD_OBS	NLETTERS.WD_FIX	TRT.PRED	TRT.PRED.STDERR
EC_A1	252.52	9.35	7.18	7.59	250.53	9.38
EC_A2	-4.66	8.74	7.44	7.59	245.87	9.37
EC_A3	-6.13	8.77	7.25	7.59	244.41	9.45
EC_A4	-21.48	8.73	7.34	7.59	229.06	9.38
EC_A5	-1.64	8.71	7.34	7.59	248.89	9.36
E-M_A2	-9.92	8.72	7.14	7.59	240.61	9.43
E-M_A3	-12.18	8.76	7.17	7.59	238.35	9.47

E-M_A4	-25.06	8.72	7.16	7.59	225.47	9.43
E-M_A5	-11.78	8.69	7.16	7.59	238.76	9.41
E-S_A2	-7.30	8.96	8.15	7.59	243.24	9.45
E-S_A3	-1.26	8.89	7.88	7.59	249.27	9.43
E-S_A4	-20.20	8.91	8.03	7.59	230.34	9.41
E-S_A5	2.38	8.89	8.03	7.59	252.91	9.39
E-						
SM_A2	-14.44	8.83	7.85	7.59	236.09	9.39
E-						
SM_A3	-10.10	8.89	7.89	7.59	240.44	9.44
E-						
SM_A4	-24.58	8.84	7.87	7.59	225.96	9.39
E-						
SM_A5	-11.36	8.82	7.87	7.59	239.17	9.37
E-S_A1	4.23	8.79	7.85	7.59	254.77	9.35

MODEL 6*FIRST READING TIME (FRT)*

	ESTIMATE	STDErr	NLETTERS.WD_OB S	NLETTERS.WD_FI X	FRT.PRED	FRT.PRED.STDErr
Ca-S_A1	239.90	8.34	8.17	7.59	238.84	8.46
Ca-S_A2	-12.36	7.27	8.17	7.59	226.48	8.49
Ca-S_A3	-1.53	7.31	8.20	7.59	237.31	8.53
Ca-S_A4	-16.87	7.28	8.24	7.59	221.97	8.52
Ca-S_A5	-4.45	7.25	8.27	7.59	234.39	8.51
Ca_A1	-18.69	7.52	6.97	7.59	220.15	8.41
Ca_A2	-25.28	7.56	6.93	7.59	213.56	8.46
Ca_A3	-21.20	7.60	6.97	7.59	217.64	8.48
Ca_A4	-30.38	7.55	6.97	7.59	208.46	8.44
Ca_A5	-19.86	7.54	6.95	7.59	218.98	8.43
CoM_A						
2	-2.20	7.44	7.89	7.59	236.64	8.30
CoM_A						
3	-2.79	7.54	7.41	7.59	236.05	8.32
CoM_A						
4	-18.67	7.47	7.67	7.59	220.17	8.27
CoM_A						
5	10.96	7.45	7.65	7.59	249.80	8.26
Co_A1	-1.36	7.46	7.23	7.59	237.48	8.29
Co_A2	-17.87	7.50	7.22	7.59	220.97	8.32
Co_A3	-19.68	7.54	7.25	7.59	219.16	8.36
Co_A4	-29.33	7.50	7.23	7.59	209.51	8.32
Co_A5	-15.37	7.48	7.23	7.59	223.47	8.31
M_A2	20.88	7.54	9.00	7.59	259.72	8.84
M_A3	26.14	7.67	7.00	7.59	264.98	8.41
M_A4	-3.69	7.48	8.00	7.59	235.15	8.33
M_A5	35.04	7.47	8.00	7.59	273.88	8.31

RE-READING TIME (RRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	RRT.PRED	RRT.PRED.STDER R
Ca-S_A1	19.45	9.13	8.17	7.59	22.97	3.80
Ca-S_A2	-4.75	4.82	8.17	7.59	18.21	3.83
Ca-S_A3	-2.64	4.85	8.20	7.59	20.33	3.87
Ca-S_A4	-10.46	4.82	8.24	7.59	12.51	3.84
Ca-S_A5	-7.34	4.81	8.27	7.59	15.63	3.83
Ca_A1	10.98	4.95	6.97	7.59	33.95	3.81
Ca_A2	12.50	4.98	6.93	7.59	35.47	3.84
Ca_A3	6.71	5.00	6.97	7.59	29.68	3.87
Ca_A4	0.40	4.98	6.97	7.59	23.37	3.84
Ca_A5	4.38	4.97	6.95	7.59	27.35	3.82
CoM_A 2	-13.19	4.83	7.89	7.59	9.78	3.80
CoM_A 3	-14.33	4.91	7.41	7.59	8.64	3.82
CoM_A 4	-14.16	4.85	7.67	7.59	8.81	3.78
CoM_A 5	-15.29	4.84	7.65	7.59	7.68	3.77
Co_A1	-10.29	4.89	7.23	7.59	12.68	3.77
Co_A2	-14.03	4.92	7.22	7.59	8.94	3.80
Co_A3	-15.68	4.94	7.25	7.59	7.29	3.83
Co_A4	-14.07	4.92	7.23	7.59	8.90	3.80
Co_A5	-16.72	4.90	7.23	7.59	6.25	3.79
M_A2	22.20	4.90	9.00	7.59	45.16	4.05
M_A3	24.06	5.00	7.00	7.59	47.03	3.87
M_A4	17.21	4.83	8.00	7.59	40.18	3.81
M_A5	57.18	4.81	8.00	7.59	80.15	3.79

TOTAL READING TIME (TRT)

	ESTIMATE	STDERR	NLETTERS.WD_OB S	NLETTERS.WD_FI X	TRT.PRED	TRT.PRED.STDER R
Ca-S_A1	262.16	9.44	8.17	7.59	260.18	9.57
Ca-S_A2	-17.13	8.72	8.17	7.59	243.05	9.61
Ca-S_A3	-4.14	8.76	8.20	7.59	256.04	9.66
Ca-S_A4	-27.03	8.72	8.24	7.59	233.15	9.65
Ca-S_A5	-12.02	8.70	8.27	7.59	248.16	9.62
Ca_A1	-7.43	9.00	6.97	7.59	252.75	9.51
Ca_A2	-12.48	9.06	6.93	7.59	247.70	9.57
Ca_A3	-14.09	9.10	6.97	7.59	246.09	9.60
Ca_A4	-29.58	9.05	6.97	7.59	230.60	9.54
Ca_A5	-15.15	9.03	6.95	7.59	245.02	9.54
CoM_A 2	-14.91	8.90	7.89	7.59	245.27	9.38
CoM_A 3	-15.61	9.02	7.41	7.59	244.57	9.42
CoM_A 4	-31.71	8.93	7.67	7.59	228.47	9.36

CoM_A						
5	-3.15	8.91	7.65	7.59	257.03	9.34
Co_A1	-10.34	8.93	7.23	7.59	249.84	9.38
Co_A2	-30.58	8.98	7.22	7.59	229.60	9.42
Co_A3	-34.10	9.02	7.25	7.59	226.08	9.46
Co_A4	-42.12	8.98	7.23	7.59	218.06	9.42
Co_A5	-30.78	8.95	7.23	7.59	229.40	9.40
M_A2	40.55	8.94	9.00	7.59	300.73	9.92
M_A3	52.41	9.15	7.00	7.59	312.59	9.52
M_A4	13.79	8.94	8.00	7.59	273.97	9.40
M_A5	92.52	8.92	8.00	7.59	352.70	9.38
