

Spanish Dialects Meeting

20-21 April 2017, Universidad Complutense de Madrid

Received: 28-12-17

Accepted: 30-11-17

Reviewed by Lorena Castillo Ros, M.Pilar Colomina and Samanta Planells
Universitat Autònoma de Barcelona

Our understanding of the linguistic microvariation that can be found in both American and European dialects of Spanish has qualitatively and quantitatively improved. Such dialects, the core of systematic research ever since the first linguistic atlases were compiled at the beginning of the 20th century (e.g., Menéndez-Pidal's ill-fated ALPI; see also Fernández-Ordóñez 2009, García-Mouton 2016), are currently being explored by new tools and technologies that offer a better mapping of their properties and the boundaries between them.

In the last few decades, dialectal studies have explored different lines of research that focus on grammatical (especially syntactic) domains, rather than lexical, derivative morphological and phonetic ones. As a result, much recent literature has been devoted to investigation of syntactic variation (see Bosque & Demonte 1999, Cerrudo et al. 2014, RAE-ASALE 2011, Hualde et al. 2012, Gutiérrez-Rexach 2016, and others). Along with the appearance of such publications, in the last forty years, syntactic theory has developed and put into practice emergent tools and data-retrieving methods, like Geographic Information Systems (GIS) and social networks. To a certain extent, this is due to the fact that the Principles and Parameters (P&P) framework (Chomsky 1981) and comparative syntax have made considerable progress in characterizing many languages, establishing points of uniformity (the "principles") and points of variation (the "parameters") (see Belletti & Rizzi 1996, Barbiers 2014, Biberauer 2008, Cinque & Kayne 2005, Gallego 2011, Kayne 2000, 2005, Mendivil 2009, Picallo 2014, and references therein).

Given that context, the Spanish Dialects Meeting offers a forum for discussions of different approaches, both theoretically and descriptively oriented, to help us in our knowledge and understanding of the variation found in American and European dialects of this Romance language.

The opening session was performed by **Ángela L. Di Tullio** (Instituto de Filología Dr. Amado Alonso), whose talk explores the linguistic variation in the 1st person plural. In particular, she assumes that languages parametrically vary in the 1st person plural morphology. Some Asian and Amerindian languages (Tamil, Chinese and Quechua) have two forms of *Nosotros* ('We'), that is, the personal pronoun could have an inclusive or an exclusive interpretation. While Romance languages have a unique *Nosotros*, with a heterogeneous plural interpretation. There is more: within Romance languages, nouns also manifest an additive plural or an associative plural. However, this does not seem to be correct in languages

like Spanish, where, according to Di Tullio, this difference is syntactic, not morphological, as shown by the data in (1).

- (1) a. Los estudiantes defendemos las universidades
 the students (3rd person) defend (1st plural) the universities.
 ‘Students defend universities’
 b. Hemos muchos estudiantes en esta reunión
 there are (1st plural) many students in this meeting.
 ‘There are many students in this meeting’

The second talk was given by **Michael Zimmermann** (Universität Konstanz), and it dealt with the syntax of interrogatives in Caribbean Spanish. The author focused on varieties that allow the non-inversion of the subject and the finite verb in simple non-subject argumental *wh*-interrogatives, like those in (2).

- (2) ¿Qué tú quieres? (Caribbean Spanish)
 what you want.to
 ‘What do you want?’

First, empirical evidence was introduced. In particular, Zimmermann presented data from Caribbean, Cuban, Dominican and Puerto Rican Spanish. To determine the extent and the kinds of the intervening subjects, the author presented examples from the Andrade Corpus, a corpus of colloquial Dominican Spanish dating from 1930’s. In addition, the author put forward an analysis based on different morphological changes that connect the state of these varieties to the scenario described in Medieval French. Specifically, to account for the *whSV(X)* order, Zimmermann paid attention to three relevant aspects: the development of a paradigm of weak subject pronouns (following Cardenaletti & Starke’s 1999 classification), the associated projection of SpecTP as a dedicated subject projection and the overall tendency to derive the *SV(X)* order.

Raquel González (Universidad de Castilla-La Mancha), in her examination of the different positions that the subject of non-finite clauses preceded by *al* occupies in different Spanish dialects, showed that while in European Spanish (ES) the subject always appears after non-finite verbs (see (3a)), Puerto Rican Spanish (PRS) expresses both preverbal and postverbal positions (see (3b)).

- (3) a. Al {él/su padre} marcharse, María llamó *ES PRS
 to-the he/her father leave-_{INF} María phoned
 ‘When {he/her father} left, María phoned’
 b. A marcharse {él/su padre}, María llamó ES PRS
 to-the leave-_{INF} he/her father María phoned
 ‘When {he/her father} left, María phoned’

Following Gallego’s (2010) proposal regarding non-finite clauses, González connects the nature of the preposition *a* with the possibility of deleting (or not) the non-interpretable tense features of C. Consequently, Puerto Rican Spanish has both options because the preposition is added by external merge, eliminating—like T in European Spanish—the non-interpretable tense features of C.

The goal of **Lorena Castillo-Ros**' (Universitat Autònoma de Barcelona) talk was to account for the behaviour of ECM-marked DPs in infinitive clauses and non-infinitival clauses (gerunds, participles, APs and PPs). According to this author, only the ECM subjects of non-infinitival clauses receive structural accusative Case, as shown by the fact that they cannot undergo passivization when the clause is headed by an infinitive ((4)):

- (4) a. *María fue vista {yendo al cine/acompañada por Pablo}*
 Mary was seen going to the cinema/accompanied by Pablo
 'Mary was seen going to the cinema/accompanied by Pablo.'
 b. **?María fue vista/hecha ir al cine.*
 Mary was seen/made to go to the cinema
 'Mary was seen/made to go to the cinema.'

In order to account for such asymmetry, Castillo-Ros argued that the type of Case that ECM-marked DP receives depends on the category of embedded clause. In Spanish, infinitive clauses must be assigned Case unlike non-infinitive clauses. Therefore, when the embedded clause is infinitive, there are two arguments that must be assigned Case (to 'Goals', in Chomsky's 2000 sense): the subordinate clause itself (the infinitival TP) and the embedded ECM subject; crucially, given that there is only one 'Probe' (v^*), both dependents enter into a competition for accusative Case (much like DO and IO enter into a competition in double object constructions; Ormazabal & Romero 2007).

Castillo-Ros takes the embedded clause to be syntactically closer to matrix v^* than the DP, which predicts the impossibility for the latter to receive Case. In the case of English, things are different, as infinitival clauses don't get Case. Thus, the ECM subject can receive the structural accusative Case. This author suggests that this follows if English infinitivals are closer to Spanish gerunds/participles. The proposal is interestingly related to constructions like ditransitive or anticausative ones and phenomena like dative shift, which is featured in some contexts of Peruvian Spanish (*María fue prohibida de leer el libro* - Eng. 'María was prohibited to read the book').

The presentation by **Adolfo Ausín** (Michigan State University) analyzed the phenomenon so-called 'leísmo' in Spanish (the use of le_{DAT} instead of lo_{AC}). Although the author introduced different types of leísmo, he developed his proposal concentrating on a specific type: courtesy leísmo (see (5)).

- (5) a. ... a usted no le conozco
 to you(polite) no CL meet
 'I don't meet you.'
 b. Si a usted le invitan a una fiesta...
 if to you(polite) CL invite to a party...
 'If they invite you to a party.'
 c. Yo, a usted, le cacheo.
 I to you(polite) CL check
 'I pat you down.'

Ausín, according to Garcia's (1990) proposal, defended that courtesy leísmo is a strategy to show deference to the speaker. Following Pineda's (2013) analysis, he assumes that dative marked objects are less affected than accusatives ones. For this reason, he argued that the choice of a dative structure is a strategy to avoid affecting a deferential second person object. In addition, to support his analysis, Ausín offered evidence from English's polite forms. Besides, his proposal accounted for the fact that feminine leísmo is less common than masculine leísmo.

Samanta Planells (Universitat Autònoma de Barcelona) offered a contribution that had two goals. On the one hand, it analyzed some of the classical morphological and syntactic properties associated with the clitic SE (Belletti 1982, Manzini 1986, Raposo & Uriagereka, and others), and, on the other hand, it explored agreement patterns of Impersonal SE sentences (see (6a)) in different Spanish dialects. Special attention was paid to situations where the verb agrees with the prepositional accusatives (see (6b)).

- (6) a. En esta escuela se castiga a los alumnos
 in this school SE punish *a* the students
 'In this school the students are punished'
 b. En esta escuela se castigaron a los alumnos
 in this school SE punish_{pl} *a* the students.
 'In this school the students were punished'

[from Dobrovie-Sorin 1998]

On the basis of acceptability judgments collected from speakers of Spanish (from different regions), Planells argued that the observed agreement variation is not dependent on regional/dialectal criteria but rather seems to be ideolectal.

The talk by **Paz González** and **Margarita Jara** focused on the microvariation of the Spanish Perfect and aimed at accounting for its grammaticalization path. On the one hand, the present perfect (PP) is used for hodiernal contexts in peninsular Spanish, but as these authors point out, it has been extended to prehodiernal contexts too in some dialects. On the other hand, in Latin-American Spanish speakers use past simple for hodiernal contexts, unlike in peninsular variants. Thus, this dialect does not follow the peninsular grammaticalization of the PP.

González and Jara made four additional claims. In order to test the predictability of the hypothesis, the authors performed an online language questionnaire in three groups of native speakers: 48 from Spain, 20 from Peru and 20 from Argentina. The results indicated that in LA varieties, the PP seems to be going through a very different type of grammaticalization process. To conclude, there is no cross-linguistic consistency as LA Spanish does not follow that path either. Moreover, there is no unidirectionality, since LA Spanish PP and preterite have developed independently.

The aim of **María Luisa Regueiro's** (Universidad Complutense de Madrid) contribution was to investigate the different mechanisms of meronymia, focusing on data from American Spanish. She suggested that NPs in which body parts, physical actions or human capacities are expressed indicate possession with respect to their referents. However, this relation can be represented in different ways. The contrast in (7a) and (7b) shows that European Spanish admits the

definite article *el* ('the') to manifest possession, while some American varieties tend to use the possessive counterpart *su* ('her/his').

- (7) a. Carlota se torció el pie (European Spanish)
 Carlota SE twisted the foot
 'Carlota twisted her foot'
 b. Carlota se torció su pie (American varieties)
 Carlota SE twisted her foot.
 'Carlota twisted her foot'

The goal of **Edita Gutiérrez's** (Universidad de Castilla-La Mancha) talk was to study the appearance of the preposition *de* before infinitives (the ill-understood phenomenon of 'deísmo'). In particular, the author focused on this phenomenon in copulative constructions such as (8).

- (8) a. La reacción del gobernador fue de apaciguar los ánimos
 the reaction of.the governor was of pacify the spirit
 'The governor's reaction was to pacify the spirit'
 b. La tendencia actual es de cambiar los cultivos tradicionales
 the tendency current is of change the crops traditional
 'The current tendency is to change the traditional crops'
 [taken from CORPES]

This construction is documented in informal contexts in European and American Spanish coexisting in both dialects with the non-deísta form. Throughout her presentation, Gutiérrez compared (8) with constructions where <*de* + infinitive> occupies an argumental position (see (9)).

- (9) Era de dudar que aviones nacionales tomaran esa actitud.
 was of doubt that planes national take this attitude
 'It was doubtful that national planes take this attitude.'

The author argued that <*de* + infinitive> is an attribute in (8) (as an adjective), whereas in (9) it is a subject. Additional evidence comes from the fact that the infinitive verb receives passive interpretation in (9). Moreover, the author suggested that in case of (8) the copulative structure is identificative or specificative.

The next talk was by **Montserrat Batllori** (Universitat de Girona) and **Assumpció Rost** (Universitat de les Illes Balears). The goal of their presentation was to explore the structure and interpretation of imperatives as well as the position of the clitic (enclitic or proclitic) from a diachronic point of view. First, in order to introduce the data, the authors provided examples extracted from two main diachronic corpora: CORDE (for medieval and classic Spanish) and CORDIAM (for Hispano-American Spanish varieties). In their proposal, Batllori & Rost, following Rivero & Terzi's (1995) classification of imperative forms, argued that classical and medieval Spanish, on one side, and current Spanish, on the other side, belong to two differentiated imperative types. More specifically, this presentation defended that imperative verbs in current Spanish are related to a feature that encodes the imperative mode. On the contrary, imperatives lack this feature in

classical and medieval stages. Finally, according to Cinque (1999), they argued in favor of a Speech-Act-Mood projection for host imperatives in ancient Spanish.

The talk by **Laura González** was aimed to account for the presence of possessives in vocative phrases in some dialects of Spain and American Spanish. In this language, vocatives cannot be constituted by a determinant ((**El/aquel/nuestro*) *amigo, ven*), but only by DPs that contain pronouns (*Tú, ven*), proper nouns (*Lola, ven*) or NPs (*Niño, ven*).

However, possessives seem to be allowed to merge with certain types of NPs in vocative phrases in some dialects of Spanish. In order to explain that fact, González explores the following hypothesis: according to Espinal (2013), the vocative phrases with determinants are false vocative phrases since they do not hold referential and deictic features, but are lexicalized forms. However, it is not true since there are some DPs with possessives that do not behave as a false vocative. For this reason, it is plausible to suppose that in these cases the possessives are not determinants. The author, following Espinal and Hill, proposes a vocative phrase where all the vocatives are hosted. This phrase takes as a complement a DP whose head has to be empty unless the vocative is a pronoun. If the head of DP were occupied by a determinant, it would have features that would bind it to the discourse and that is incompatible with the vocative. Nevertheless, when there is a DP with a possessive, it seems that the D is full. González points out that the possessive is not in the head of DP, but in the specifier of IP inside DP.

The presentation by **Laura González** (Universidad Complutense de Madrid) and **Gemma Cuesta** (Universidad de Alcalá de Henares) analyzed intransitive locative adverbs (such as *arriba, afuera, adentro, abajo, atrás, adelante*) taking into account diatopic and diastratic variation. In their talk empirical evidence came from two main sources: PRESEEA and CREA. The authors showed that these adverbs are transitive in certain contexts (see (10)), being more frequent in American Spanish.

- (10) El chiquillo / metiéndose abajo de los carros
 the boy getting into below of the cars
 ‘The boy is getting under the cars’

[taken from México, PRESEEA, 2008]

In addition, González & Cuesta put forward a proposal that accounted for this pattern. Following Horno Chéliz (2002) & Romeu Fernández (2014), they assume that locative adverbs enter into Figure and Background relations (such as prepositions). Specifically, the authors defended that locative adverbs possess a [+relation] feature, whereas their complements present a [+location] feature. The preposition (*abajo, afuera, adentro*) incorporates a [+vectorial] feature. Finally, the authors introduced additional evidence to support their analysis. This evidence comes from the fact that transitive locative adverbs admit a Measure Phrase.

The talk by **Silvia Gumiel, Isabel Pérez** and **Norberto Romero** explores the variation of <*ser/estar* + gradable adjectives> in predicational copular sentences. In order to show this phenomenon, they consider examples like (see (11)), where the copula *estar* is allowed in American varieties (contrary to European and Southern Cone ones).

- (11) Mi mamá me ponía esa ropa cuando estaba chiquita
 my mom me put this clothing when was a child
 ‘When I was a child my mom used to dress me in this clothing’
 [Venezuela, Facebook, Dec. 2016]

Furthermore, additional evidence is provided to show that the presence of an implicit experiencer, that is, the entity responsible for the assertion/attribution of the property, triggers the evidential reading even with inanimate subjects (see (12)).

- (12) a. *El bikini está {pequeño/grande}.
 the bikini is small big
 ‘The bikini is small/big.’
 b. El bikini **me** está {pequeño/grande}.
 the bikini me is small big
 ‘The bikini is small/big for me’

Finally, they suggest that due to the lack of differences with respect to the gradability properties of adjectives or with the properties of *estar*, these varieties also admit—like in (12)—the presence of an implicit experiencer in predicational copula structures with gradable ‘age’ adjectives.

Ueda’s presentation showed a collection of data from Spanish speakers obtained by answering a questionnaire of 100 questions that diatopic variation information is extracted from. The users had to choose one of these answers to each sentence: (i) I would say so; (ii) I would not say so, but I have heard it in (the place of questionnaire); (iii) I would not say so nor I have not heard it in (the place of questionnaire). All the clauses of the questionnaire contained a feature that is subdued to diatopic variation like for instance: subjunctive mode, prepositions, reflexive pronouns, agreement, leísmo, laísmo, gerunds, relatives, queísmo, dequeísmo, causative construction. The questionnaire was made by Spanish speakers, not only from Spain, but countries of America too like Venezuela, Argentina, Ecuador or Bolivia. On the other hand, the talk by Ueda describes some tools of analysis he and their research team have developed in order to examine the online linguistic data where historical and modern corpus data from different languages are found. The program is called LYNEAL.

The next presentation was carried out by **Lorena Castillo Ros** (Universitat Autònoma de Barcelona), **M. Pilar Colomina** (Universitat Autònoma de Barcelona), **Samanta Planells** (Universitat Autònoma de Barcelona) and **Francesc Roca** (Universitat de Girona), whose talk presented the project *ASinEs* (Atlas Sintàctico del Español). Throughout the presentation, the authors explained the antecedents and the goals of the project. Also, they showed how to use this tool (www.asines.org). *ASinEs* (project in progress) is an interactive tool that focuses on the characterization of syntactic variation in Spanish dialects. Whereas traditional atlases largely dealt with phonetic, phonological, morphological and lexical variation, this project constitutes an innovation in this regard, as it describes the syntactic variation that has not been already attested in previous atlases. Currently, *ASinES* incorporates data from reference grammars of Spanish (*Gramática Descriptiva de la Lengua Española* cf. Bosque & Demonte 1999;

Nueva Gramática de la Lengua Española cf. RAE-ASALE 2009, 2011). In future steps, the project also will take into account dialectal data from *Twitter*. As the authors pointed out, geolectal information is structured by worksheets that contain the following fields: data, grammatical description, geographical distribution and analysis. In addition, an ontology is being developed to organize the data and facilitate the search to the user.

Sumarizing, the conference offered a showroom of the current research on Spanish dialectal variation. On the one hand, there were several authors that focused on showing a description of a morphological or syntactic phenomenon or construction that is subject to diatopic, diastratic or diachronic variation; other talks provided, apart from a description, an analysis of the data too. On the other hand, there were some talks that do not adscribe themselves to either a theoretical or a descriptive framework; in fact, a few authors, instead of showing the investigation of a grammatical aspect, displayed tools so as to facilitate the retrieval or the mapping of linguistic data from the different varieties of Spanish. Overall, the first Spanish Dialects Meeting set the stage for a fruitful and dynamic venue where researchers of Spanish variation can interact and exchange ideas. Next time (in May 2018), the meeting will take place at the Universidad de Castilla La Mancha, and we are sure that the presentations will also contribute to our understanding of Spanish variation and, more broadly, of the faculty of language as such.

References

- Barbiers, S. 2014. Syntactic doubling and deletion as a source of variation. In M. C. Picallo (ed.), *Linguistic Variation in the Minimalist Framework*. pp. 197-223. <http://dx.doi.org/10.1093/acprof:oso/9780198702894.001.0001>.
- Belletti, A. & Rizzi, L. (ed.). 1996. *Parameters and functional heads: Essays in comparative syntax*. Oxford: Oxford University Press.
- Belletti, A. 1982. Morphological passive and pro-drop: The impersonal construction in Italian. *Journal of Linguistic Research* 2: 1-34.
- Biberauer, T. (ed.). 2008. *The limits of syntactic variation*. Amsterdam: John Benjamins Publishing. <http://dx.doi.org/10.1075/la.132>.
- Bosque, I. & Demonte, V. 1999. *Gramática descriptiva de la lengua española*. Madrid: Espasa.
- Cardinaletti, A. & Starke, M. 1999. The typology of structural deficiency: A case study of the three classes of pronouns. In Henk van Riemsdijk (ed.), *Clitics in the languages of Europe*, 145–233. Berlin / New York: Mouton de Gruyter.
- Cerrudo, A., Gallego, Á. J., Pineda, A. & Roca, F. 2015. ASinES: prolegómenos de un atlas de la variación sintáctica del español. *Linguamática* Vol. 7 n° 2: 59-69.
- Chomsky, N. 1981. *Lectures on government and binding: The pisa lectures*. Dordrecht, Holland: Foris Publications. <http://dx.doi.org/10.1515/9783110884166>.
- Chomsky, N. 2000. Minimalist inquiries: the framework. In Martin, R., Michaels, D., Uriagereka, J. (eds.). *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*. Cambridge, Mass.: MIT Press, pp. 89-155. <http://dx.doi.org/10.1017/s0022226702271625>.

- Cinque, G. & Kayne, R. S. (eds.). 2005. *The Oxford Handbook of Comparative Syntax*. Oxford: Oxford University Press.
<http://dx.doi.org/10.1093/oxfordhb/9780195136517.001.0001>.
- Cinque, G. 1999. *Adverbs and Functional Heads: a Cross-linguistic perspective*. Oxford: Oxford University Press.
<http://dx.doi.org/10.1017/s0022226705243396>.
- Dobrovie-Sorin, C. 1998. Impersonal se Constructions in Romance and the Passivization of Unergatives, *Linguistic Inquiry* 29 (3): 399–437.
<http://dx.doi.org/10.1162/002438998553806>.
- Fernández-Ordóñez, I. 2009. Dialect grammar of Spanish from the perspective of the Audible Corpus of Spoken Rural Spanish. *Dialectologia* 3: 23-51.
- Gallego, Á. J. 2010. On the prepositional nature of non-finite verbs. *Catalan Journal of Linguistics* 9: 79-102. <http://dx.doi.org/10.5565/rev/catjl.95>.
- Gallego, Á. J. 2011. Parameters. In Boeckx, C. (ed), *The Oxford handbook of linguistic minimalism*. Oxford: Oxford University Press.
<http://dx.doi.org/10.1093/oxfordhb/9780199549368.001.0001>.
- García Mouton, P. (coord.), Inés Fernández-Ordóñez, David Heap, Maria Pilar Perea, João Saramago, Xulio Sousa. 2016. ALPI-CSIC [WWW.ALPI.CSIC.ES], edición digital de Navarro Tomás, Tomás (dir.), *Atlas Lingüístico de la Península Ibérica*, Madrid, CSIC.
- García, E. C. 1990. Bilingüismo e interferencia sintáctica. *Lexis* 14 (2): 151–95.
- Gutiérrez-Rexach, J. 2016. *Enciclopedia de lingüística hispánica*. UK: Routledge.
<http://dx.doi.org/10.4324/9781315713441>.
- Horno-Chéliz, C. 2002. *Lo que la preposición esconde. Estudios sobre la argumentalidad preposicional en el predicado verbal*. Zaragoza: Prensas Universitarias de Zaragoza.
- Hualde, J. I., Olarrea, A., Escobar, A. M., & Travis, C. E. 2009. *Introducción a la lingüística hispánica*. Cambridge: Cambridge University Press.
<http://dx.doi.org/10.1017/cbo9780511808821>.
- Belletti, A., & Rizzi, L. (eds.). 1996. *Parameters and functional heads: Essays in comparative syntax*. New York, NY: Oxford University Press.
- Kayne, R. S. 2000. *Parameters and universals*. Oxford: Oxford University Press.
- Kayne, Richard S. 2005. *Movement and silence*. Oxford: Oxford University Press.
<http://dx.doi.org/10.1093/acprof:oso/9780195179163.001.0001>.
- Manzini, M. 1986. On Italian si. In Borer, H. (ed.) *Syntax and semantics 19: The syntax of pronominal clitics*, pp. 241–262. New York: Academic Press.
- Mendivil, J. 2009. La Facultad del Lenguaje y la diversidad de las lenguas: ¿una paradoja? *Ciencia Cognitiva: Revista Electrónica de Divulgación* 3(1): 33-35
- Ormazabal, J. & Romero, J. 2007. The Object Agreement Constraint. *Natural Language and Linguistic Theory* 25 (2), 315–347.
<http://dx.doi.org/10.1007/s11049-006-9010-9>.
- Picallo, M. C. (ed.). 2014. *Linguistic variation in the minimalist framework*. Oxford: Oxford University Press.
<http://dx.doi.org/10.1093/acprof:oso/9780198702894.001.0001>.
- Pineda, A. 2013. What lies behind Romance double object constructions and Dat/Acc alternations? *23rd Colloquium on Generative Grammar* (Madrid).

- RAE-ASALE. 2011. *Nueva gramática de la lengua española*. Madrid: Espasa.
- Rivero, M. L. & Terzi, A. 1995. Imperatives, V-movement and logical mood. *Journal of Linguistics* 31: 301-332. <http://dx.doi.org/10.1017/s0022226700015620>.
- Romeu-Fernández, J. 2014. Cartografía mínima de las construcciones espaciales. PhD Dissertation.