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**Expletiveness across Functional Categories:
Evidence from Greek**

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PhD Thesis

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Universitat Autònoma de Barcelona

2023



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Lingüística
Teòrica

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ACKNOWLEDGMENTS

This is the part where academic conventions allow me to get as “expletive” as I can, and I will take the chance. I will start by thanking the two people without whom the present thesis would objectively not exist. The first is my supervisor, Prof. Dr. M.Teresa Espinal. Any number of words would fall short of reality. Therefore, I will limit myself to acknowledging her personal and academic care, her work and research ethics, her intellect, her genuine interest in my research, her patience, the enormous amount of time she so generously allocated to me, the stimulating and often exciting discussions about linguistics, the explicit and implicit mentoring regarding research and academia...her knowing what will happen before it happens, and her making things happen! With my PhD journey coming to an end, I would describe it as a demanding but happy process of growth. And that, I owe it all to M.Teresa.

The second person who played a fundamental role in the elaboration of this thesis is Joan Borràs-Comes. Joan came into my academic life and took down all the barriers between my purely theoretical training and experimental research. Being always incredibly patient, he helped translate my theoretical hypotheses into experimental designs, and the obtained data into theoretically relevant findings. Thank you, Joan, for, among many other things, explaining to me with a straight face that the centesimals of a minute are different from seconds.

The research presented in the pages to follow has benefitted greatly from discussions with many other inspiring linguists. I owe special thanks to Artemis Alexiadou, for instantly agreeing to host me as a visiting researcher at Humboldt University and the RUESHeL research group, to Florian Schäfer, for kindly and generously offering his time and knowledge, to Despina Oikonomou, for sharing her advice on theoretical and experimental

matters, to Anna Roussou and Marika Lekakou, for providing challenging feedback on both presented and written work of mine, to Elena Castroviejo, for her insightful comments, suggestions and observations regarding both the formal and the empirical part of my research, and to Anastasia Giannakidou, for beating the time difference between Europe and the States to engage in stimulating discussions.

I am as much obliged to the professors-members of my very host research center, the Centre de Lingüística Teòrica at the Universitat Autònoma de Barcelona. I would like to thank especially Xavier Villalba, Anna Gavarró and Jaume Mateu, for presenting me with valuable feedback throughout the years, Sergi Balari, for bringing me face to face with the consequences of my own hypotheses via 5-minute discussions, and Eulàlia Bonet, for making my teaching experience smooth, instructive and enjoyable. No lesser acknowledgment is due of the professors of the School of Philology of the Aristotle University of Thessaloniki, where my interest in linguistics was born, before it turned into a passion. Out of these, Melita Stavrou and Savvas Tsochatzidis deserve special mention. Anna Kampanarou and Eirini Apostolopoulou should be added to the above, for our brainstorming sessions, the critical reviewing of each other's ideas and the literally online emotional support.

I should say that I have enjoyed fruitful discussions about linguistics also with my fellow PhD students and post-doctoral researchers. When it comes to them though, I am more tempted to highlight the personal aspect of our relationship, that made PhD life a happy life. I will start from my (former and actual) officemates. Daria Seres has been a beacon of fun and –as she likes to call it– “life-wisdom” since day one. With Paolo Morosi, I have shared endless coffee and comfort. With Cristina Ruiz Alonso, I have made up the most hilarious stories (some of which became true). Yihang Liu came last to our office to make it an even happier place.

Knocking on the rest of the doors in the corridor and moving back and forth in time, I have to thank Alessandro Bigolin, for sharing a subliminal connection, Ziwen Wang, for being an all-giving creature, Irene Fernandez, for being the sweetest person with the sweetest dog, Alejandra Keidel, for letting me hold her newborn baby Max, Katerina Thomopoulou, for sharing

with me a lot more than our “greekness”, Laura Arias, for making me laugh inappropriately during class, Jon Ander Mendia, Tala Nazzal, Srabasti Dey, David Ginebra, Oriol Quintana, Bernat Castro, Isabel Crespí, Clarissa Facchin and Iman el Hadeif. Thank you all for making these years memorable...or better yet, unforgettable.

Before closing this section, I would like to acknowledge also the indispensable help and support that came from a distance and, specifically, from Greece. My deepest gratitude goes to all my friends, for their patience and care, and my family, for their unconditional love and trust in something that little did they understand but never disrespected.

The present research acknowledges financial support from an FI predoctoral fellowship (March - August 2019; AGAUR) and an FPI predoctoral fellowship (September 2019 - June 2023; Spanish MINECO), as well as further funding from the Spanish Ministerio de Ciencia e Innovación (*FFI2017-82547-P*, *PID2020-112801GB-I00*) and the Generalitat de Catalunya (*2017SGR634*, *2021SGR00787*).

ABSTRACT

The present thesis adopts for the first time a unifying approach to expletiveness, which is traditionally understood as the existence of linguistic form that is void of meaning, and seeks to identify the characteristic properties that so-called expletive categories share. Based on experimental evidence on the distribution and interpretation of five allegedly expletive categories from Greek, I demonstrate that expletiveness arises systematically in the co-presence of (i) a syntactically local semantic dependency, (ii) a truth-conditional contribution not richer than an identity function, and (iii) the potential development of a speech act-related interpretative import.

I start with the investigation of the expletive voice emerging in Greek anticausative verbs with non-active voice morphology and motivate empirically two main claims: Expletive voice does not affect the truth conditions of the sentence it appears in, and it merges always in a syntactic environment that formally encodes cause-related information. I proceed with the study of the expletive determiners involved in Greek polydefinite DPs and show experimentally that they are preferred, both syntactically and semantically, in the context of restrictive modification. Additional evidence is provided that such expletive determiners belong to colloquial registers of Greek and often develop an expressive meaning. Next, I investigate the expletive plural number on Greek mass nouns and demonstrate that it does not alter the already cumulative denotation of the noun it combines with but, like the expletive polydefinite determiners, carries expressive meaning. Finally, I study allegedly expletive instances of the Greek sentential negation markers *min* and *dhen*. I argue, both empirically and theoretically, that *min* conveys a positive speaker bias inference when occurring in polar questions and fear-predicate complements, while *dhen* does not appear to show expletive uses.

Under the light of the novel findings above, I conclude that expletives do not correspond to linguistic forms that are devoid of meaning. The major contribution of the thesis is that expletive categories are shown to be interpretable at the level of Logical Form and also beyond grammar, at the level of speech act-information interpretation.

RESUM

Aquesta tesi adopta per primera vegada un enfocament unificador de l'expletivitat, tradicionalment entesa com l'existència d'una forma lingüística sense significat, i cerca la identificació de les propietats característiques que comparteixen les anomenades categories expletives. Basant-me en treballs experimentals sobre la distribució i interpretació de cinc categories suposadament expletives del grec, demostro que l'expletivitat sorgeix sistemàticament quan es produeix simultàniament (i) una dependència semàntica sintàcticament local, (ii) una contribució veritativa no més rica que una funció d'identitat, i (iii) el desenvolupament potencial d'un significat relacionat amb l'acte de parla.

Començo amb la investigació de la veu expletiva que sorgeix en els verbs anticausatius amb morfologia de veu no activa del grec i motivo empíricament dues afirmacions: la veu expletiva no afecta les condicions de veritat de la frase en què apareix, i es fusiona sempre en un entorn sintàctic que codifica formalment informació relacionada amb una causa. Tot seguit, estudio el cas dels determinants expletius implicats en els SDs polidefinits del grec i demostro experimentalment que els parlants s'estimen més una construcció polidefinida quan hi ha modificació restrictiva. Aporto proves addicionals que mostren que aquests determinants expletius pertanyen a registres col·loquials del grec i que sovint desenvolupen un significat expressiu. A continuació, investigo el nombre plural expletiu dels noms de massa en grec i demostro que no altera la denotació cumulativa del nom amb el qual es combina, però –com en el cas dels determinants polidefinits expletius– aporta un significat expressiu. Finalment, estudio els usos suposadament expletius dels marcadors de negació oracional *min* i *dhen* del grec. Argumento, tant empíricament com teòricament, que *min* implica un biaix positiu per part del parlant quan aquest operador apareix en preguntes

polars i en posició de complement de predicats de temença, mentre que *dhen* no sembla que manifesti usos expletius.

Tenint en compte els resultats anteriors, concloc que els expletius no corresponen a formes lingüístiques sense significat. La principal contribució d'aquesta tesi és que mostra que les categories expletives són interpretables al nivell de la Forma Lògica i també més enllà de la gramàtica, al nivell de la informació relacionada amb la interpretació dels actes de parla.

ABBREVIATIONS AND NOTATION

*	ungrammatical sequence
#	infelicitous sequence
1	first person
2	second person
3	third person
ACT	active voice
ActP	Speech Act Phrase
AP	Adjective Phrase
CardP	Cardinality Phrase
CL	clitic
ComP	Commitment Phrase
COMP	complementizer
CP	Complementizer Phrase
DefP	Definiteness Phrase
DIM	diminutive
DP	Determiner Phrase
EPP	Extended Projection Principle
EXPL	expletive
FEM	feminine gender
FIP	Full Interpretation Principle
GEN	genitive case
IMP	imperative mood
IP	Inflection Phrase
JP	Judgment Phrase

LF	Logical Form
NACT	non-active voice
NCI	Negative Concord Item
NEG	negation
NegP	Negation Phrase
NIMP	non-imperative mood
NP	Noun Phrase
nP	little n Phrase
NPAST	non-past tense
NPERF	non-perfective aspect
PF	Phonetic Form
PL	plural number
PP	Prepositional Phrase
PPI	Positive Polarity Item
PredP	Predicate Phrase
PRO	pronominal determiner phrase without phonological content
PTCP	participle
REFL	reflexive
REL.OP	relative operator
RES.P	resumptive pronoun
SG	singular number
SpecX	Specifier of head X
SUBJ	subjunctive mood
TP	Tense Phrase
VoiceP	Voice Phrase
VP	Verb Phrase
vP	little v Phrase
X⁰	head of category X

1 What is an expletive?

1.1 Setting the scene

One of the fundamental distinctions made within the framework of generative grammar (Chomsky 1981, 1986, 1995, ff.) is that between lexical and functional linguistic categories. In the simple English sentence that follows, the words *boy*, *read*, and *book* are considered to belong to the former group, while the words *the* and *a* are classified in the latter.

(1) The boy read a book.

Lexical and functional categories are distinguished on the basis of several different criteria. Lexical categories are standardly considered to bear descriptive content, they are usually morphophonologically independent, and they form an open word class. Functional categories, on the other hand, are best described as carrying grammatical instead of descriptive content, they are often morphophonologically dependent and belong to a closed word class (Parodi 2006). However, it is an understated asymmetry between the two groups of categories that will be of highest relevance to the present discussion: Functional categories, but not lexical ones, can be used as expletives (Grimshaw & Samek-Lodovici 1998; van der Beek & Bouma 2004).

Concretely, already in traditional grammatical descriptions (Jespersen 1917; Vendryès 1950; Jakobson 1978), the observation is made that some sentences involve linguistic elements that can be characterized as *expletive*, *pleonastic* or *abusive*. Intriguingly, these terms are applied exclusively to functional categories which come in two guises. The first subtype of

expletives involves elements that seem to lack meaning altogether and are added to the clause merely to satisfy the universal condition that all sentences have a syntactic subject –what is commonly known as the Extended Projection Principle (EPP; see Chomsky 1981; Rothstein 1995).

(2) Il pleut. *French*
it rains
'It's raining.'

(3) Sitä leikkii lapsia kadulla. *Finnish*
SITA play children in.street
'Children are playing in the street.'

(Holmberg & Nikanne 2002: 71, ex. (2a))

(4) Það hlupu þrjár rollur yfir veginn. *Icelandic*
EXPL ran three sheep over road.the
'Three sheep ran over the road.'

(Wood 2015: 36, ex. (58a))

(5) There arrived a tired shepherd.

French *il*, Finnish *sitä*, Icelandic *Það* and English *there* above are not assigned a thematic role from the main predicate, either because the predicate does not have a role to assign in the first place (2) or because the available role is assigned to another nominal (3-5). It is in this sense that these constituents are regarded as having virtually no meaning. Since they always satisfy a syntactic requirement, these are dubbed as syntactic expletives by Tsiakmakis and Espinal (2022).

The second subtype of expletives comprises functional categories that convey some meaning but do so in a redundant way; their meaning is already encoded elsewhere in the clause.

- (6) Em temo que no escullin nou director.
 me am.afraid that not elect.SUBJ.3PL new director
 ‘I’m afraid a new director would be elected.’¹

(Espinal 2000: 54, ex. (11b))

- (7) Epesan nera sto kefali mu. Greek
 fell.3PL water.PL on.the head mine
 ‘Water fell on my head.’

(Tsoulas 2009: 131, ex. (1))

Starting from example (6), the presence of the matrix fear-predicate *em temo* allows that the negative marker *no* does not reverse the truth conditions of the sentence it occurs in. Instead, *no* is taken to redundantly convey the same negative meaning as the fear-verb in this case (Espinal 1992, 1997, 2000, 2002). As for example (7), the plural morphology on *nera*, literally ‘waters’, appears to contribute cumulativity (Link 1983) to a noun that already has cumulative reference just by virtue of being mass-denoting (Link 1983; Krifka 1989; Tsoulas 2009). Notice that this subcategory of *redundant* expletives do not satisfy any syntactic need. They are best described via reference to a relationship to other elements that encode the same meaning. Following Tsiakmakis & Espinal (2022), I will label those as semantic expletives.

The very existence of expletive categories, in the way the latter were described above, gives rise to two fundamental research questions. The first one can be broadly formulated as follows:

- (i) *What does expletiveness mean for the relationship between syntax and interpretation in natural language grammar?*

Since Chomsky (1986), the generative linguists’ understanding of the connection between syntax and meaning has been shaped by the requirement

¹ An interpretation according to which the speaker fears that a new director will not be elected is also available in this case. See Fabra (1956) for details.

that “every element of PF and LF, taken to be the interface of syntax (in the broad sense) with systems of language use, must receive an appropriate interpretation” (Chomsky 1986: 98) –what came to be known as the Full Interpretation Principle (FIP). If expletive categories have no meaning or convey only a redundant meaning, they constitute apparent violations of the FIP, thus putting at stake the standard conceptualization of form to meaning mapping.

The previous distinction between syntactic and semantic expletive categories has interesting repercussions for this theoretical problem. Specifically, Chomsky (1986) reconciles the existence of syntactic expletives with the FIP early on by postulating that they never reach LF in the first place. On the contrary, they are deleted and replaced by a meaningful syntactic associate before the syntactic derivation interfaces with the interpretative system. Let us repeat example (5) for reference.

(8) There arrived a tired shepherd.

Following Chomsky (1986), *there* in (8) is coindexed with the DP *a tired shepherd*. At the level of LF, *there* is deleted and the indefinite DP associate that does have a meaning takes its place.²

Crucially, the delete-and-replace assumption cannot account for those syntactic expletives that do not have a syntactic associate. Let us repeat also example (2).

(9) Il pleut.
it rains
'It's raining.'

There is evidently nothing that can be coindexed with and consequently replace the French subject *il* in (9) or its English equivalent *it* in the provided translation. However, this problem is solved even earlier by treating subjects

² For more recent analyses of English expletive *there* that further justify its presence from a syntactic perspective, see Moro (1997, 2017), Kayne (2008), Deal (2009), Wu (2019), among others.

of weather predicates as quasi-arguments (Chomsky 1981) that do have some referential capacity and are therefore not expletive. The following example from Svenonius (2002) shows that the English weather subject *it* can control a null PRO subject in an adjunct.

(10) It often clears up here right after snowing heavily.

(Svenonius 2002: 4, ex.(5))

Considering the above, the existence of syntactic expletives is in principle consistent with the FIP and the syntax-meaning mapping that it postulates. The compatibility of semantic expletives with the same principle, on the other hand, is underexplored. Let us return to expletive plural in Greek mass nouns for the sake of discussion, repeating example (7) for convenience.

(11) Epesan nera sto kefali mu.
 fell.3PL water.PL on.the head mine
 ‘Water fell on my head.’

(Tsoulas 2009: 131, ex. (1))

Importantly, the expletive category in this case is the bound plural morpheme *-a*, which arguably cannot have a syntactic associate in the same way as expletive *there*, for instance. Tsiakmakis and Espinal (2022; see also Tsiakmakis et al. 2023) propose that, in a way parallel to syntactic expletives, semantic expletives always have a semantic associate. The first goal of the present thesis is to test this hypothesis and address the research question in (i) by uncovering the relationship between the existence of semantically expletive categories and the FIP.

Successfully pursuing this goal is expected to inform also the answer to the second general research question raised by the existence of expletive categories in natural languages, that happens to coincide with the title of this chapter and can be formulated in the following way:

(ii) *What is or can be an expletive category?*

Looking for a definition of expletiveness may seem trivial at first, but one soon discovers that it is not. In this preliminary discussion, expletives have been implicitly defined as categories that are void of meaning or encode some redundant meaning. Crucially, this turns out to be a necessary but not sufficient condition for expletiveness.

Let us start with the absence of meaning. The English copular verb *be* and the indefinite article *a(n)*, both instances of functional categories, are excellent candidates for realizing forms that lack meaning. This is demonstrated by the fact that the interpretation of the sentence in (12a) can be represented simply as predicating of Nefeli the property of being a linguist (12b).

- (12)a. Nefeli is a linguist.
 b. linguist(Nefeli)

Intriguingly, though, neither the copula nor the indefinite article have been considered as expletive to my knowledge. This suggests that the (alleged) absence of meaning is not enough to identify an expletive category.

Moving on to the encoding of redundant meaning, this is not a safe criterion for delineating expletiveness either. Number and gender agreement marking on an Italian adjective (13) or number agreement marking on a Spanish verb (14) are instances of redundant functional categories par excellence; yet nobody has used the term *expletive* to describe them.

- (13) la ragazza bionda *Italian*
 the.SG.FEM girl.SG.FEM blonde.SG.FEM
 ‘the blond girl’

- (14) Los niños cantan. *Spanish*
 the.PL boy.PL sing.PL
 ‘The boys sing.’

In example (13), the marking of both singular number and feminine gender on the adjective *bionda* is pleonastic, given that the same information is

already encoded in *la ragazza*. As for (14), the plural number marked on the verb *cantano* is encoded also by the subject DP *los niños*. Especially the latter case is strikingly parallel to the Greek expletive plural example in (11). However, no category present in (14) is considered as related to expletiveness in any way.

The situation above suggests either that the term *expletive* has been used sloppily by linguists or that a precise definition of expletiveness still eludes us. This marks the second major goal of the present thesis, which aims to address the research question in (ii) by identifying the characteristic properties of expletive categories and predicting what can and what cannot be expletive.

1.2 Finding the appropriate theoretical tools

Having determined the main research questions to be addressed, it is now time to seek the most adequate way to approach them. The expletiveness puzzle was earlier shown to reside in the very link between linguistic form and meaning. Consequently, it is only accessible via a modeling of natural language grammar such that syntax and interpretation are assumed to be in contact with each other. This assumption opens two major possibilities: this contact is symmetrical and the two linguistic levels allow a back-and-forth information exchange, or the contact is asymmetrical and there is only one dominant level that feeds the other.

In order to make a choice between the two possibilities above, one needs to consider whether a complementary phenomenon to expletiveness exists in natural languages. Expletive categories have so far been described as instances of form that do not have a substantial interpretative import; they either encode a redundant meaning or they lack meaning altogether. But do natural languages also display the opposite, namely instances of meaning that are not realized by a corresponding form? The null subjects of English imperatives (15) or the elided constituents (16) in ellipsis-licensing environments may come to mind as an answer to this question.

(15) Tell me what expletiveness is!

(16) Nefeli can tell me what expletiveness is, and Cristina can too.

It is evident to any speaker of English that the subject of the imperative verb *tell* in (15) is *you*, that is the addressee, and that what Cristina is capable of doing in (16) is telling me what expletiveness is. It is also evident that both examples involve meanings that are not coupled with overt linguistic forms.

Despite appearances, null arguments and elided material do not instantiate a reverse case of expletiveness for two main reasons. Firstly, such formless meanings occur under well-defined structural, semantic, or pragmatic conditions –see Merchant (2018) for a recent overview of the literature on ellipsis, Zanuttini (2008) on English imperative subjects, and Haider (2019) for a rich discussion on null subjects across languages. As already shown, this is not the case when it comes to expletiveness. Secondly, and most tellingly, these meanings are only optionally formless:

(15') You tell me what expletiveness is!

(16') Nefeli can tell me what expletiveness is, and Cristina can tell me what expletiveness is too.

Expletive categories, on the other hand, are not necessarily optional (Espinal to appear), as suggested by the ungrammaticality of the examples below.

(17) *Rains.

(18) *Arrived a man.

The existence of expletiveness as a linguistic phenomenon that roughly involves linguistic forms without meaning, considered against the apparent absence of a mirror-case phenomenon, supports a conceptualization of grammar according to which the relationship between form –or syntax to be precise– and interpretation is asymmetrical in such a way that the objects

created by the former are fed into the latter. In light of this, the research presented in this thesis is developed within the set of fundamental hypotheses regarding language commonly known as the Minimalist Program (Chomsky 1995). Concretely, an architecture of grammar that can be represented by the inverted Y schema below is assumed.³

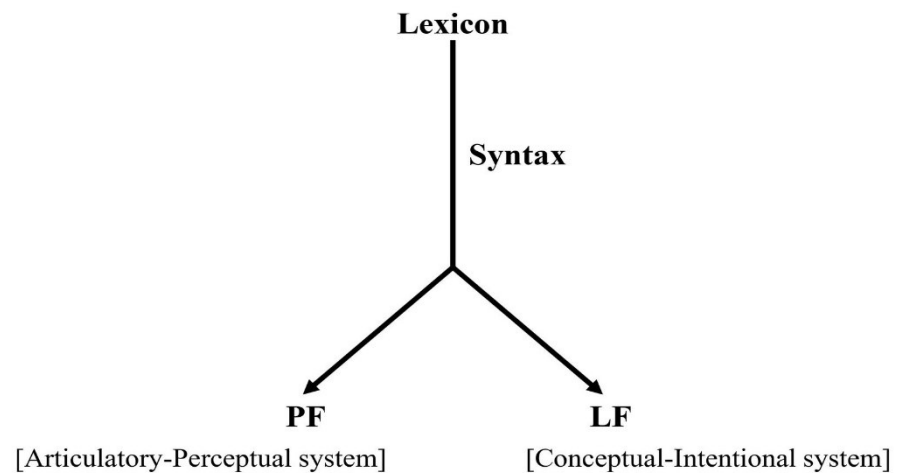


Figure 1. The Y-model of grammar (Chomsky 1995)

In this model, syntax is regarded as the core level of language that feeds the two externalization systems, namely the Articulatory-Perceptual system and the Conceptual-Intentional system, via the two interface levels, that is the Phonetic Form (PF) and the Logical Form (LF) respectively. Since this thesis instantiates an investigation of expletiveness, it will be mostly concerned with the LF area in the schema above.

The question that is raised next is what kind of meaning syntax can encode and consequently feed into the LF-interface within the very abstract grammatical model demonstrated in Figure 1. Let us set the simple English sentence in (19) as the point of departure in the pursuit of an answer.

(19) It rained in Thessaloniki yesterday.

³ On the appropriateness of the Y-model for the study of interface phenomena, see also Irurtzun (2009).

Syntactically speaking, example (19) involves the weather-verb *rain* in the past tense with the DP *it* in its subject position, the PP modifier *in Thessaloniki*, and the adverbial modifier *yesterday*. In view of the Compositionality principle (Frege 1906; Partee 2004), the sentence is interpreted as being true in a state of affairs such that rain has fallen in the city of Thessaloniki on the day before the utterance of (19). In this sense, the syntax of the sentence in (19) contains information that is necessary for the speaker to compute its truth conditions. Notice, however, that (19) involves also the expletive subject *it*, which seemed to have zero impact on this computation. If syntax encodes truth-conditional meaning through non-expletive categories, could it encode other types of meaning through expletive categories?

Rizzi, already in 1997, argues independently of expletiveness that the syntactic structure of a clause bears interpretation-related information richer than truth-conditional meaning. Specifically, he proposes that the highest structural layers of a sentence –what is commonly referred to as the left periphery– encode among other things illocutionary force (Austin 1962; Searle 1969), that is information about whether the speaker makes an assertion, asks a question, gives an order or does something else by means of their utterance. Intriguingly, this aspect of syntax turns out to be particularly relevant for the study of expletive categories, some of which have been claimed to encode discourse or speech act-related meaning (Hinzelin & Kaiser 2007; Greco et al. 2017; Tsiakmakis & Espinal 2022).⁴

(20) Ello está lloviendo. *Dominican Spanish*
 it is raining
 ‘It is raining!’

(Hinzelin & Kaiser 2007: 177, ex. (a))

(21) Nó không có ma. *Vietnamese*
 NÓ NEG exist ghost

⁴ See also Partee and Borschev (2008) for the claim that a functional category such as Case may encode information related to the speaker’s perspectival center, motivated on Russian examples featuring the so-called genitive of negation.

‘There are no ghosts.’ (speaking of a certain place/time)

(Greco et al. 2017: 78, ex. (14a))

According to Hinzelin and Kaiser (2007), *ello* in (20) is an expletive pronoun that is interpreted as a pragmatic marker. Something similar is proposed by Greco et al. (2017) for *nó* in (21), which is analyzed as an expletive encoding speaker-related meaning. Importantly, for the idea that syntax includes information relevant to utterance-level interpretation to take the form of a well-defined theory, one needs to have a clear view on how the different types of utterances or speech acts are interpreted.

Interestingly, Cohen and Krifka (2011, 2014) and Krifka in a series of works (2015, 2017, 2019, 2021a, 2021b) develop a contemporary framework with this specific aim. With the vast literature on speech acts in mind (Austin 1962; Searle 1969; Bach & Harnish 1979; Szabolcsi 1982; Speas & Tenny 2003; Beyssade & Marandin 2006; Farkas & Bruce 2010; MacFarlane 2011; Wiltschko 2017, Geurts 2019, among many others), the authors’ general proposal is that speech acts be treated as functions that operate on the commitments of the speaker and the addressee. The set of the consistent interlocutors’ public commitments constitute a commitment state. A current commitment state together with all its possible, that is consistent or non-redundant, continuations form a commitment space. According to Cohen and Krifka (2014) and Krifka (2015; 2017; 2021a), speech acts modify commitment states and/or restrict commitment spaces.

But let us see what exactly the above means starting from assertions. Assertive speech acts are often considered to convey (i) the speaker’s belief that the expressed proposition is true, and (ii) the speaker’s desire that the addressee also adopts this belief (Bach & Harnish 1979). Krifka (2019, 2021b) observes that both of these interpretative components can be derived if we follow MacFarlane (2011) –building on Searle (1969), among others– in taking the speaker’s public commitment to the truth of the expressed proposition and their consequent liability to social penalties in case this proposition turns out to be false as the main content of an assertion. Let us take an example.

(22) Nefeli bought a new car.

If John utters (22), he will commit publicly to the proposition corresponding to *Nefeli bought a new car* being true. If Nefeli does not have a new car, John will be socially sanctioned; he will be considered a liar and possibly lose general credibility. Since John being part of a community knows the consequences of a false assertion, he is expected to assert (22) only in the case that he believes it to be true. In other words, John's belief that the expressed proposition is true is an implicature derived from the fact that he is willing to commit publicly to it (Krifka 2021b). If John believes in the truth of the asserted proposition, then there is good reason for the addressee to believe in it too.⁵

Building on Peirce (1994), Krifka (2019, 2021b) proceeds to claim that, apart from the public commitment, assertions involve also a private component regarding the truth of the asserted proposition, which he dubs as *judgment*. The importance of this distinction is revealed when comparing (22) to (23) below.

(23) I believe that Nefeli bought a new car.

In this latter case, John –our speaker– commits publicly not to Nefeli having bought a new car but merely to holding the private belief that this is the case. Notice that the chances of John getting social sanctions after uttering (23) are much slimmer regardless of whether Nefeli is still driving her old car, especially given the fact that confirming whether somebody is lying about believing something is extremely difficult.

In view of all the above, within the commitment-based semantics framework developed by Cohen and Krifka (2014) and Krifka (2019, 2021b), assertions are considered to update the commitment state of the interlocutors (or the information state according to Krifka 2021b) with the speaker's public commitment to their private judgment that the expressed proposition is true.

⁵ Krifka's (2019, 2021b) commitment is a social act and is therefore different from the epistemic commitment found in Wiltschko (2017) and Giannakidou and Mari (2021), among others.

Once this commitment is undertaken, the addressee can share the commitment and admit the expressed proposition in the common ground (roughly understood as in Stalnaker (2002)) or simply acknowledge the speaker's commitment but refuse to share it; in that case, the asserted proposition is not included in the common ground (Krifka 2021b).

With a clear idea about how assertions are interpreted, that is how they affect the speaker and addressee's commitments, it is now time to move to questions.

(24) Did Nefeli buy a new car?

By uttering the canonical question (Farkas 2020) in (24), John does not undertake any public commitment. Instead, he asks the addressee to commit publicly to the truth of the proposition corresponding to *Nefeli bought a new car*. Therefore, Krifka (2015, 2017, 2021a) claims that questions bring about no update or modification of the speaker and addressee's commitment state. However, they constrain the commitment space, that is the possible continuations of the conversation. Following Krifka (2015, 2017, 2021a), John's question (24) restricts the possible ways in which the interlocutors' interaction can unfold to only two: either the addressee agrees to undertake the commitment proposed by the speaker or he/she rejects the offered commitment. The addressee is most likely to respond with an assertion so the way the commitment space will develop from that point on has already been described. Considering the above, questions can be regarded as the mirror speech act type to assertions: the speaker does not commit to a private judgment regarding the truth of the expressed proposition but asks the addressee to undertake this commitment.

The commitment-based framework of Cohen and Krifka (2011, 2014) and Krifka (2015, 2017, 2019, 2021a, 2021b) offers an insightful answer to how the two main speech act types, namely assertions and questions, are interpreted. Getting back to where we started though, is it feasible that all this information is encoded in syntax? Krifka (2021b), continuing a long tradition of speech act syntactization analyses (Ross 1970, Schreiber 1972; Speas & Tenny 2003; Wiltschko 2017, among others), answers the question positively.

Concretely, he proposes that the left periphery of the sentence involves three distinct speech act-related projections: “a judgement phrase, representing subjective epistemic and evidential attitudes; a commitment phrase, representing the social commitment related to assertions; and an act phrase, representing the relation to the common ground of the conversation” (Krifka 2021b: 1). Let us see how each of these projections is syntactically motivated.

Starting from the Judgment Phrase (JP), which encodes the speaker’s private judgment, its syntactic substance is based on the existence of adverbs such as *certainly*.

(25) Nefeli certainly bought a new car.

The adverb *certainly* arguably does not modify the public act of commitment. If Nefeli still only has her old car, the speaker, John, will be sanctioned in the same way no matter whether he utters (25) or its counterpart in (22) that lacks this modifier. What *certainly* adds to the utterance is the inference that John is extremely sure as to the truth of his private judgment. On these grounds, Krifka (2021b) proposes the projection of JP, which syntactically hosts a null operator *J*- in its head and adverbs like *certainly* in its specifier, and semantically introduces a judge *j* who evaluates the truth of the proposition denoted by the CP.

Intriguingly, there are other adverbs, like *truly* for example, that target the public commitment component of an assertion.

(26) Nefeli truly bought a new car.

Here the speaker does not intensify his private judgment but highlights the fact that he commits, in front of everyone, to the truth of this judgment. Consequently, by uttering (26) John is in for heavy sanctions if he is caught lying. Krifka (2021b) takes adverbs like *truly* as evidence for the existence of Commitment Phrase (ComP), which is projected by a covert operator *Λ* and whose specifier is filled by *truly*-type adverbs. As regards its semantics, ComP ensures that the judge *j* introduced by JP commits publicly to the truth of the expressed proposition.

Finally, phrases that signal a rhetorical relation between a new utterance and the previous discourse are Krifka's (2021b) motivation for postulating the syntactic projection of a Speech Act Phrase (ActP).

(27) By the way, Nefeli bought a new car.

The introductory phrase *by the way* in (27) does not interact either with the speaker's private judgment regarding the truth of Nefeli having bought a new car or with the public commitment to this judgment. Instead, it indicates that the utterance represented by (27) conveys something only peripherally related to the previous discussion. Therefore, *by the way* merges syntactically in the specifier of ActP, which is projected by an *ASSERT* operator in the case of assertions and a *REQUEST* operator in the case of questions (Krifka 2021a, 2021b). The semantic contribution of ActP is that it fixes the identity of the judge and the committer and ultimately derives the difference between assertions and questions (Krifka 2021b) –and possibly other speech act types.⁶

All the above can be summed up in the claim that the abstract syntactic representation of assertions is as in (28a), which is adopted from Krifka (2021b), and that of questions is as in (28b), which is consistent with the main insights in Krifka (2015, 2017, 2021a). Lower case *p* stands for the expressed proposition.

(28) a. [_{ActP} [_{Act} ASSERT] [_{ComP} [_{Com} †] [_{JP} [_J J-] [_{CP} [_{TP} *p*]]]]]]

b. [_{ActP} [_{Act} REQUEST] [_{ComP} [_{Com} †] [_{JP} [_J J-] [_{CP} [_{TP} *p*]]]]]]

A last comment is in order before concluding this section. It has to do with how minimal(ist) the postulation of three distinct speech act syntactic layers is. There are two reasons why one should not worry about the potential incompatibility of Minimalism (Chomsky 1995) with the semantics and concretely commitment-based speech act syntactization framework by Krifka

⁶ See Speas and Tenny (2003) for additional syntactic motivation for ActP, and Miyagawa (2022) for more evidence in support of postulating ActP and ComP.

(2021b). First, Minimalism is not a framework; it is a program. This means that it consists in a set of fundamental hypotheses regarding the nature of language and its knowledge that allows considerable freedom of implementation when it comes to the analysis of specific phenomena. Second, the Minimalist Program is mostly concerned with the mechanics of the operations that take place in syntax. Krifka's framework on the other hand, which will be used in this thesis, makes minimalistically default assumptions regarding the creation of syntactic objects, and focuses on what the LF-interface actually reads off these syntactic objects.

1.3 An overview of the data

Investigating expletiveness as a syntax-interpretation interface phenomenon across languages is a project that inevitably exceeds the limits of a single thesis. Therefore, the scope of the present study had to be delimited in such a way that best served its purpose. A first decision in this direction was to focus on semantically expletive categories and exclude syntactically expletive ones. This was based on the consideration that one of the two major research questions to be addressed concerns the relationship between expletiveness and Chomsky's (1986) FIP. Since syntactic expletives have been reconciled with this principle from the very beginning (Chomsky 1981, 1986), it was the study of semantic expletives that promised to shed new light on the syntax-interpretation mapping.

The second research question, namely the pursuit of a definition of expletiveness, motivated the second restriction on the scope of the study. Concretely, Modern Greek (henceforth Greek) was set as the major object language. The reason for that was that the linguistic literature has postulated the existence of (semantically) expletive categories across the structural domains of Greek: the nominal domain (Tsoulas 2009; Lekakou & Szendrői 2012), the verbal domain (Alexiadou et al. 2015; Oikonomou & Alexiadou 2022), and the sentential domain of the clause (Chatzopoulou 2018). This fact indicated this specific language as a research area allowing a thorough yet homogeneous study of expletiveness.

It is opportune at this point that we get briefly acquainted with the exact expletive categories the investigation of which will form the main body of this thesis. Let us start with a look at the following minimal pair:

- (29) a. To kitrino podhilato klapike.
 the yellow bike was.stolen
 b. To kitrino to podhilato klapike.
 the yellow the bike was.stolen
 ‘The yellow bike was stolen.’

Examples (29a) and (29b) receive the same interpretation, as suggested by the fact that only one English translation is provided. Their sole difference is that the subject of (29a) has the form of a standard definite DP, while the subject-DP of (29b) displays an additional definite article; it is a polydefinite DP in Kolliakou’s (1995, 2004) terminology. Definite determiners are traditionally considered to contribute independent iota operators (Sharvy 1980; Partee 1986). This is clearly not the case in (29b), though, where the DP *to kitrino to podhilato* features two definite articles but refers to only one unique and contextually salient yellow bike. Since the definite determiners of Greek polydefinite DPs do not get their standard iota-introducing interpretation, they have been treated as expletive (Lekakou & Szendrői 2012) and are, therefore, a great candidate for the present research.

Staying within the nominal domain, Greek mass nouns with plural morphology (Tsoulas 2006, 2009; Alexiadou 2011; Kouneli 2019; Erbach 2019), firstly mentioned in the introductory section, are also included in this study.

- (30) a. Trexi nero apo ti skepi.
 run.SG water.SG from the roof
 b. Trexunnera apo ti skepi.
 run.PL water.PL from the roof
 ‘There is water coming from the roof.’

The members of this minimal pair, too, are interpreted in the same way and differ only in one respect: the mass noun for ‘water’ is morphologically singular in (30a) but morphologically plural in (30b) –the verb simply agrees with the subject in both cases. Tsoulas (2006, 2009) observes that plural morphology on *nera* ‘waters’ in (30b) does not give rise to a *unit/measurement-* or a *brand-*reading, as would happen in the corresponding examples from English. It does not need to add cumulativity either; being a mass noun, *nero* ‘water’ is already cumulative (Link 1983; Krifka 1989). Therefore, plural morphology on mass-denoting Greek nouns has been characterized as expletive (Tsoulas 2006).

A third expletiveness specimen to be studied comes from Greek anticausatives, that display contrasts like the following:

- (31)a. To kastro gremise.
the castle crumbled
b. To kastro gremistike.
the castle crumbled.NACT
‘The castle fell.’

The examples in (31) feature a minimal pair whose members are interpreted in the same way and differ only in their morphological marking; *gremise* ‘crumbled’ (31a) is morphologically unmarked with respect to voice, while its counterpart in (31b), *gremistike* ‘crumbled’, bears non-active morphological marking. Alexiadou et al. (2015) take non-active voice morphology as evidence for the syntactic projection of a non-active VoiceP. Following Kratzer (1996), the category of Voice is responsible for the introduction of the external argument: an agent, a causer, or a holder. However, (31b) exemplifies an anticausative construal and therefore lacks an external argument, by definition (Levin 1993; Levin & Rappaport Hovav 1995, 2005). Since the VoiceP projected in (31b) does not make the expected interpretative contribution to the semantic derivation of the clause, it has been argued to be an expletive category in the verbal domain of Greek (Alexiadou et al. 2015; Oikonomou & Alexiadou 2022).

The last category to be considered, namely expletive negation, was alluded to earlier with reference to Catalan and French and shows that expletives can even scope over whole TPs. Instances of it are found also in Greek (Chatzopoulou 2018):

- (32) a. Fovame oti irthe i Danai.
 I.fear that came the Danai
 ‘I fear that Danai came.’
- b. Fovame min irthe i Danai.
 I.fear not came the Danai
 ‘I fear that Danai may have come.’

The examples above are not exactly equivalent interpretation-wise. Nevertheless, they both convey the speaker’s fear towards Danai’s coming. This is particularly interesting in the case of (32b), which features the Greek sentential negative marker *min* (Holton et al. 1997). In its standard uses, *min* is interpreted as introducing an operator that reverses the truth conditions of the sentence it appears in. However, this is evidently not the case of (32b). Here *min* is not interpreted as canonical negation and is therefore considered as an expletive negative marker.

Crucially, Greek has a second negative marker which is in complementary distribution with *min*, that is *dhen* (Holton et al. 1997; although see Lekakou to appear). *Dhen* has also been claimed to have non-negative uses (Espinal 1997; Romero & Han 2004).

- (33) a. Posi fitites perasan apo afta ta
 how.many students passed from these the
 thrania!
 desks
- b. Posi fitites dhen perasan apo afta
 how.many students not passed from the
 ta thrania!
 the desks
 ‘A lot of students have sat on these desks!’

The pair above exemplifies two exclamations (Michaelis 2001) which are minimally different in that (33b) involves the negative marker *dhen*, but (33a) does not. The unique English translation given suggests that the two sentences are interpreted in the same way and, consequently, *dhen* in (33b) does not reverse the truth conditions of the expressed proposition in the way a standard negative marker would. Its non-negative interpretation makes *dhen* an expletiveness candidate and leads to its inclusion in the present study.

1.4 Methodology

The investigation of the allegedly expletive Greek functional categories presented in the previous section, namely the determiners of polydefinite DPs, the plural number of mass nouns, the voice of anticausatives, and the non-negative uses of *min* and *dhen*, is organized in five individual studies. The methodology followed is similar across these studies and basically combines or, better said, intertwines a theoretical and an empirical part. Concretely, each study consists of (i) the description of the grammatical phenomenon under investigation, (ii) a critical review of the literature on the topic, (iii) an experimental study that tests the claims made in the literature against the native speakers' actual intuitions, (iv) an empirically motivated formal analysis of the phenomenon under investigation, and (v) a concluding discussion about what the study can add to our understanding of expletiveness.

Parts (i), (ii) and (v) are self-explanatory, and the framework in which part (iv) is developed was extensively described and motivated in Section 1.2. So let us elaborate on part (iii), to which no prior reference has been made. The expletiveness-related phenomena that form the core of this thesis have been studied before in the literature and one can usually find several alternative theoretical accounts for each. The vast majority of these accounts has been based on the researchers' introspective judgments. Crucially, though, the different researchers' judgments and, consequently, theoretical proposals often do not coincide in their essence, thus leading to unresolved debates. Disentangling these debates and taking a motivated stance regarding

the distribution and interpretation of the expletive categories under consideration required the introduction of an experimental part in each of the individual studies, with the main aim of getting quantitative evidence of the native speakers' linguistic intuitions.

But what exactly is the content of this experimental part? This thesis includes 8 acceptability judgment tasks, 1 elicitation task, 1 interpretation task and 1 forced-choice task (Matthewson 2004; Ionin & Zyzik 2014; Schütze & Sprouse 2014; Juzek 2016; Schütze 2016, among others). All the experiments were approved by the Ethics Committee on Animal and Human Experimentation of the Universitat Autònoma de Barcelona –protocol number CEEAH-4442. The details concerning the design, the construction of materials, the procedure, and the statistical analysis of the results are given in the corresponding section of each chapter. At this point, it is worth simply mentioning that the experiments were designed in accordance with Matthewson's (2004) general instructions on carrying out semantic fieldwork.

Specifically, all the experiments were based on the collection of judgments, which is considered a sound methodological practice. Moreover, they mostly employed contexts in order to trace subtle interpretative asymmetries. Since it could not be taken for granted that the native Greek participants were fluent also in a second language that could ideally be used as a meta-language, both the stimuli and the contexts were presented in Greek. It was ensured, though, that the tested material did not appear in the context. The instructions for each experimental task were also phrased in Greek to make sure that participants understood them correctly. The responses of non-cooperative or inadequate participants were excluded from the statistical analyses in all cases.

1.5 The structure of the thesis

The ordering of the five individual studies that make up the body of the thesis reflects a gradual transition from prototypical expletiveness candidates to dubious ones. In other words, the categories that according to the existing

literature are most likely to have zero interpretative import come first. The investigation of the categories for which previous research has convincingly identified some (non-truthconditional) content follows.

Concretely, the study of expletiveness starts in Chapter 2 with the expletive voice of Greek anticausatives. This phenomenon differs from those studied in the following chapters in that it is considered as lexical (Alexiadou et al. 2015), not syntactic. The main research hypothesis in this chapter is that non-active voice morphology on Greek anticausative verbs does not affect the truth conditions of the sentence that these verbs occur in (pace Alexiadou et al. 2015; Oikonomou & Alexiadou 2022). This hypothesis is supported by the results of two experimental tasks indicating that (i) native Greek speakers usually have a clear verb-specific preference as regards morphological voice marking in anticausatives, and (ii) this preference is not affected by contextual information. A third experimental finding with intriguing theoretical implications suggests that the expletive voice of Greek anticausative verbs occurs always in syntactic environments that encode cause-related information.

Chapter 3 takes a leap from the verbal to the nominal domain and focuses on the expletive determiners of Greek polydefinite DPs. This chapter primarily tests the hypothesis that polydefiniteness is a structure instantiating restrictive nominal modification (Alexiadou & Wilder 1998; Lekakou & Szendrői 2012; Alexiadou 2014). The results of the experimental study carried out confirm the native speakers' preference for restrictively interpreted modifiers as parts of polydefinite DPs, but they also show that grammar does not reject non-restrictively modified polydefinites. This is considered as evidence that restrictiveness is not encoded either in the syntax or the semantics of the additional determiners of Greek polydefinite DPs (pace Kolliakou 1995, 2004). Further experimental findings suggest that the Greek expletive polydefinite determiners may encode register information (Manolessou 2000) and at times develop an expressive meaning.

The expletive plural of Greek mass nouns is investigated in Chapter 4. The research hypothesis addressed in this chapter is inspired on Erbach (2019), according to whom the emergence of plural morphology on a mass-denoting nominal is licensed by context. This hypothesis is specified further

by identifying the speaker's dissatisfaction with the described situation as the contextual aspect that triggers expletive mass plurals. Experimental evidence from both language comprehension and production in support of the dissatisfaction-hypothesis is obtained. In light of such results, the expletive number of Greek mass plurals appears to not alter the internal structure of the denoted substance (cf. Borer 2005) but, in a way similar to polydefinite determiners, carry some expressive content.

Chapter 5 is devoted to the study of expletive instances of the Greek negative marker *min*. In the linguistic literature, non-negative *min* has been claimed to convey positive epistemic bias or absence of bias (Makri 2013), but also negative bias (Giannakidou & Mari 2019). An experimental study consisting of three tasks is designed in order to shed light on this apparently contradictory situation. Its results offer evidence in support of a uniform analysis of expletive *min* as encoding positive speaker bias. Thus, expletive *min* is shown to have developed not an expressive meaning component but an epistemic one.

The study of Greek expletive negation is resumed in Chapter 6 that focuses on the second negative marker, namely *dhen*. Specifically, this chapter tests the hypothesis that *dhen* also has expletive uses, which is motivated in the literature mostly by extending insights from languages other than Greek (Espinal 1997; Romero & Han 2004). A careful examination of the suspicious uses of *dhen* together with an experimental study targeting a subset of these uses fail to get evidence for the existence of a non-negative *dhen*. Although provisionally found to not relate strictly to expletiveness, the study of *dhen* opens the possibility that the canonical interpretation of a linguistic category may sometimes be simply masked by peripheral factors.

Chapter 7 concludes the present thesis. It combines the local insights contributed by the previous content chapters in order to answer the two broad research questions set in the beginning, that is illuminate the relationship between semantic expletiveness and the FIP and provide a definition of expletiveness. As regards the former, the existence of semantic expletives is found to be consistent with the FIP, in accordance with the hypothesis advanced in Tsiakmaki and Espinal (2022). Concerning the latter, expletive categories can have an interpretative import computed beyond core grammar,

at the level where syntax interfaces with speech acts. In light of this, if expletiveness is absolutely defined as form without meaning, then its very existence in the grammar of natural languages is doubtful.

2 Expletiveness in the verbal domain: Greek anticausatives and expletive voice⁷

2.1 Introduction

Schäfer (2008) is the first to motivate substantially the claim that the functional category of voice has expletive instances. Specifically, he studies verbs that enter what is known as the causative alternation, that is verbs with an intransitive variant describing a change of state and a transitive variant conveying that somebody causes this change of state; the former, exemplified by (1a), is dubbed as *anticausative*, while the latter, exemplified by (1b), is labeled as *causative* (Levin 1993; Levin & Rappaport Hovav 1995, 2005; Rappaport Hovav 2014, among others).

- (1) a. The window broke. *Anticausative*
b. Fivos broke the window. *Causative*

As shown in (1), in languages like English, the same verb form is used for both the anticausative and the causative construal, what is sometimes referred to as labiality (Kulikov & Lavidas 2017). However, there are languages where one of the two variants is distinctively marked (see Haspelmath 1993, 2016, for crosslinguistic data).

- (2) a. Se rompió la ventana. *Spanish*
SE broke.3SG the window
'The window broke.'

⁷ This chapter is a re-elaboration of the study published as Tsiakmakis et al. (2023).

- b. Juan rompió la ventana.
Juan broke.3SG the window
'Juan broke the window.'

The Spanish anticausative in (2a) differs from its causative counterpart in (2b) in that it contains *se*. Schäfer (2008) takes *se* in (2a) to be merged in the syntactic position where external arguments are canonically generated and, thus, to indicate the syntactic projection of a VoiceP.⁸ However, since the anticausative window-breaking event above does not involve a semantic external argument, *se* is not assigned a thematic role and therefore, Schäfer argues, the head projecting this VoiceP is semantically expletive.

As stated in the introduction, the present thesis aims to uncover the very essence of expletiveness and determine its status in grammar. Pursuing this goal, the study presented in this chapter approaches the *expletive voice* hypothesis via a language that offers more direct evidence than Spanish for the presence of voice in anticausatives, namely Greek, and proceeds in two steps: First, it seeks to confirm that Greek anticausative voice makes a good expletiveness candidate. Second, it attempts to identify the interpretative and syntactic reflexes of this instance of expletiveness.

The chapter is organized as follows: Section 2.2 consists in an overview of the status of voice in the Greek verbal system, with special emphasis on anticausatives. The previous literature on the role and interpretation of voice in Greek anticausatives is summarized in Section 2.3. Section 2.4 presents an experimental study on the distribution and meaning of voice in Greek anticausative verbs. The empirical and theoretical consequences of this experimental study for Greek anticausatives and expletive voice are exposed and discussed in Section 2.5. Section 2.6 concludes the chapter.

⁸ See Labelle (2008) for the view that the French equivalent of *se* realizes the head of VoiceP.

- (6) O Fivos telefonise.
 the Fivos called.ACT
 ‘Fivos called.’

In the above cases, active voice morphology is considered as the realization of an active VoiceP¹¹ that introduces the external argument in its specifier (Alexiadou & Anagnostopoulou 2004; Tsimpli 2006; Alexiadou et al. 2015).

Interestingly, active voice emerges also in Greek verbs that form part of construals lacking an external argument, i.e., unaccusative structures:

- (7) I triantafilia anthise.
 the rose-bush bloomed.ACT
 ‘The rose-bush bloomed.’

This empirical point, in conjunction with the fact that Greek disposes of no morphology realizing exclusively active voice (see Ralli 2005, for the details of the morphological decomposition of Greek verbal forms),¹² led to the idea that active voice marking may signal not only the projection of an active VoiceP, but also the absence of such a projection altogether (Tsimpli 2006; Alexiadou et al. 2015).

As for non-active voice morphology, this is easily mapped onto specific morphemes (Ralli 2005) and, therefore, it is unambiguously considered as the instantiation of a non-active VoiceP that does not project a specifier (Embick 1998, 2004). Consequently, non-active VoiceP appears in intransitive structures that involve no syntactic external argument (Alexiadou et al. 2015).

- (8) a. O Fivos xtenistike.
 the Fivos combed.NACT
 ‘Fivos combed himself.’

¹¹ While *voice* with a lowercase *v* is used for the respective morphological category, *Voice* with a capital *V* is used to make reference to its syntactic counterpart.

¹² The idea that active voice in Greek is realized by a null morpheme is compatible with the data but not standardly endorsed.

- b. O Fivos xtenistike apo epagelmatia komotria.
 the Fivos combed.NACT from professional hairdresser
 ‘Fivos was combed by a professional hairdresser.’

Notice that the examples above involve not a syntactic but a semantic external argument –namely an agent– which is existentially bound by the non-active Voice head (Doron 2003; Alexiadou & Doron 2012; Alexiadou et al. 2015)¹³ and, in the case of the reflexive in (8a), happens to coincide with the theme argument of the verb (Spathas et al. 2015).¹⁴

With a schematic overview of the Greek voice system in place, it is now time to move to the specific group of verbs to be investigated, that is the anticausative variants of those Greek verbs that enter the causative alternation (Theophanopoulou-Kontou 2000; Alexiadou & Anagnostopoulou 2004; Tsimpli 2006, among others). Anticausative verbs are, by definition (Levin 1993; Levin & Rappaport Hovav 1995, 2005), syntactically intransitive, as they do not involve any syntactic external argument. Considering what has been said regarding the distribution of active and non-active voice morphology so far, anticausatives are then expected to feature either active or non-active voice marking. The examples that follow confirm that this is the case.

- (9) I varka vuliakse mesopelagha.
 the boat sank.ACT mid-sea
 ‘The boat sank in the middle of the sea.’

- (10) O keros veltiothike simandika.
 the weather improved.NACT significantly

¹³ For complementary proposals on the function of non-active voice as theta-role attraction or absorption, see Manzini and Roussou (2000) and Tsimpli (2006), respectively.

¹⁴ It is worth noting that Greek is one of the languages that have so-called deponent verbs (Triantafyllidis 1941; Holton et al. 1997), that is verbs with non-active voice morphological marking but transitive syntax:

- (i) O Fivos iperaspistike ton filo tu.
 the Fivos defended.NACT the friend his
 ‘Fivos defended his friend.’

For a discussion on how the existence of deponents is compatible with the view that non-active Voice lacks a specifier, see Grestenberger (2018) and Alexiadou (2019a).

‘The weather improved significantly.’

In fact, Alexiadou et al. (2015), building on previous work (Alexiadou & Anagnostopoulou 1999, 2004), report that Greek anticausative verbs can be divided into three distinct classes. Class A is characterized morphologically by the presence of non-active voice marking and syntactically by the projection of a non-active VoiceP (11). Class B is identified by the presence of active voice morphology on the verb and the absence of a VoiceP in syntax (12). Lastly, Class C is characterized by the optionality of non-active voice marking on the verb and, consequently, the optionality of the projection of a non-active VoiceP (13).¹⁵

(11) I fimi dhiadhothike ghrighora. *Class A*
 the rumor spread.NACT quickly
 ‘The rumor spread quickly.’

(12) I porta eklise ksafnika. *Class B*
 the door closed.ACT abruptly
 ‘The door closed abruptly.’

(13) To frurio gremistike/ gremise. *Class C*
 the fortress crumbled.NACT crumbled.ACT
 ‘The fortress crumbled.’

Comparing *dhiadhothike* with *eklise* and *gremistike* with *gremise*, it is evident that the two verbs on the one hand, and the two variants of the same verb on the other, differ morphologically (non-active vs. active voice marking) and, by hypothesis (Alexiadou et al. 2015), syntactically (projection

¹⁵ Alexiadou et al. (2015: 88) provide the following examples for each class:

Class A: *komatiazo* ‘tear’, *miono* ‘decrease’, *eksafanizo* ‘diminish’, *veltiono* ‘improve’, *diplasiazo* ‘double’, *singendrono* ‘gather’, *dhiadhidho* ‘spread rumors’, *vithizo* ‘sink’

Class B: *asprizo* ‘whiten’, *kokinizo* ‘redden’, *vuliazio* ‘sink’, *katharizo* ‘clean’, *strogilevo* ‘round’, *klino* ‘close’, *anigo* ‘open’, *plateno* ‘widen’

Class C: *zarono* ‘wrinkle’, *tsalakono* ‘crumple’, *zesteno* ‘heat’, *skizo* ‘tear’, *erimono* ‘desert’, *madao* ‘pluck’, *lerono* ‘dirty’, *gremizo* ‘collapse’

Haspelmath (1993, 2016) shows that the existence of morphologically distinct classes of anticausatives within the same language is common from a typological perspective.

vs. non-projection of a non-active VoiceP). But do they have different semantics? All the three verb forms describe anticausative events. However, two of them arguably contain Voice (*dhiadhothike*, *gremistike*). The question that is at the heart of the study presented in this chapter is in what way exactly anticausative Voice affects the meaning composition of sentences like (11-13).

2.3 Interpreting anticausative Voice: setting the debate

Given the empirical landscape of Greek anticausatives described in the previous section, there are two ways to pursue identifying the meaning contribution of anticausative voice. The first one is to contrast verbs belonging to Class A with verbs belonging to Class B: the non-actively marked form of a verb X vs. the actively marked form of a verb Y. The second possibility is to contrast the different variants of a Class C verb: the non-actively marked form of a verb Z vs. the actively marked form of the same verb Z. Most of the linguists interested in the topic have opted for the latter alternative, possibly because it relies on the comparison of truly minimal pairs.

Alexiadou and Anagnostopoulou (1999, 2004) report judgments according to which the aspectual adverb *endelos* ‘completely’ is incompatible with an actively marked Class C anticausative, but fine with a non-actively marked Class C anticausative, as in (14) below.

- (14) a. To xamospito gremise (#endelos).
 the old.house crumbled.ACT completely
- b. To xamospito gremistike (endelos).
 the old.house crumbled.NACT completely
 ‘The old house (completely) crumbled.’

Abstracting over the reported asymmetry, the authors suggest that anticausatives of Class C that bear active voice morphology unambiguously convey partial change of state –this is why *endelos* is out in (14a). On the

contrary, Class C anticausatives with non-active voice morphology may describe either a partial or a complete change of state.

Alexiadou and Anagnostopoulou (1999, 2004) offer a concrete answer to whether and how the active and the non-active variant of a Class C verb differ in interpretation. However, their intuitions are contradicted by other native speakers. Moreover, it is theoretically surprising that the partial vs. complete change distinction is associated with voice, which has been mostly related to the external argument (Kratzer 1996). It needs to be noted, though, that this was not a concern for the authors at that moment, since they located the difference between actively and non-actively marked anticausatives not only to VoiceP, but also to the existence of a result component in the structure of the latter (Alexiadou & Anagnostopoulou 2004: 131-135). But even if the hesitations above are dismissed, it cannot be maintained that this proposal covers the interpretative contribution of voice in Greek anticausatives. As the same authors observe in subsequent work (Alexiadou et al. 2015), the infelicity of *endelos* ‘completely’ does not carry on to anticausatives of Class B:

- (15) To aleksiptoto anikse endelos.
 the parachute opened.ACT completely
 ‘The parachute opened completely.’

The compatibility of the actively marked anticausative *anikse* ‘opened’ with *endelos*, for example, suggests that the distinction between partial and complete change of state cannot be mapped onto the active vs. non-active voice morphology distinction, when all three classes of Greek anticausatives are considered.

Lavidas et al. (2012) present a corpus study on the voice morphology of verbs belonging to what has been labeled here as Classes B and C in the diachrony of Greek. They find a general tendency for extending active voice marking to anticausative verbs, at the cost of its morphological counterpart, that is non-active voice marking. In order to explain this result, Lavidas et al. postulate that active voice morphology is generalized across one-argument structures, possibly in analogy with unergative constructions. Non-active

voice, on the other hand, is restricted to signaling merely argument-absorption (see Tsimpli 2006). Under the prism of such a hypothesis, the authors suggest that non-actively marked Class C anticausatives differ from their actively marked counterparts in that the former involve an implicit (syntactically absorbed) argument that needs to be activated in the parsing. The claim is not made more specific. Any attempt to elaborate on it by using examples is dismissed as precarious.

The hypothesis put forth by Lavidas et al. (2012) is at first sight consistent with the literature on voice. Non-active voice in anticausatives is argued to be interpreted in the same way as in the other construals it appears in (e.g., passives), namely as absorbing (syntactically suppressing) an argument. Crucially, though, the idea that the difference between actively and non-actively marked anticausatives is the activation, or lack thereof, of an implicit argument does not receive sufficient empirical support. Specifically, Lavidas and colleagues tested the frequency of active and non-active verb forms, the voice morphology in anticausative construals, the animacy of the subject and the frequency of transitive uses of the studied verbs. None of these factors seems to have served for tracing activated or deactivated implicit arguments in anticausative event descriptions. Furthermore, Lavidas et al. (2012) left what is here dubbed as Class A of anticausatives outside their study. Therefore, their claim is not straightforwardly extended to all instances of non-active voice morphology in Greek anticausatives.

A proposal similar to the previous one in spirit, but independently founded both empirically and theoretically, is made by Oikonomou (2014), who builds on acceptability data as the following:

- (16)a. To ftero tu aftokinitu mu #tsalakose/
the fender of.the car mine crumpled.ACT
tsalakothike.¹⁶
crumpled.NACT
‘The fender of my car crumpled.’

¹⁶ Oikonomou (2014) uses the question mark ? to signal infelicity in this example. For the sake of uniformity, ? is here replaced by the # symbol.

b. I fusta mu tsalakose/ tsalakothike.
the skirt mine crumpled.ACT crumpled.NACT
'My skirt crumpled.'

(Oikonomou 2014: 45, exs. (84a, b))

The author claims that Class C verbs with active voice marking are infelicitous when the described change of state is initiated (violently) by an external entity, as happens in the event of a car fender crumpling (16a); they are perfectly fine when the described event involves no such external initiator (16b). Non-actively marked anticausatives, on the other hand, are appropriate for both event types.

In order to derive the asymmetry she reports, Oikonomou (2014) assumes that the syntactic voice-related head that is realized as non-active voice morphology in Greek anticausatives introduces an unspecified semantic external argument; concretely, it binds it existentially. Note that she takes anticausative voice to be interpreted as standard non-active voice, thus coinciding with Lavidas et al. (2012) in essence, but not in the details of the mechanics of meaning composition. In Oikonomou's view, the non-active voice of *tsalakothike* 'crumpled' introduces the external force that brought about the crumpling of the car fender in (16a). In (16b), where no external force is required, voice introduces an event –recall that the introduced argument is by hypothesis unspecified– which is identified with the causing event itself, i.e., the crumpling of the skirt. As regards the active anticausative *tsalakose* 'crumpled', it is appropriate in (16b) because no additional argument needs to enter the semantic derivation for the skirt to crumple. The same verb form is not appropriate for the event described in (16a), because a crumpled car fender requires a violent external initiator that, due to the lack of a voice projection, has no way to enter the semantic derivation.

Oikonomou (2014) offers a straightforward answer to what the interpretation of anticausative voice is: non-active voice marking signals the existence of a semantic external argument causing the change of state, while active voice marking conveys the absence of such an argument. Note, however, that this proposal is built around something very close to the internal vs. external causation distinction (Levin & Rappaport Hovav 1995), the

grammatical relevance of which has been questioned (Rappaport Hovav 2020). Most importantly, Oikonomou's (2014) main idea is not sufficiently motivated on an empirical basis, as was the case also with its predecessors.

Alexiadou et al. (2015) offer a substantially different alternative to the issue under discussion, namely the meaning contribution of voice in Greek anticausative verbs. Noticing the –mostly empirical– shortcomings of the attempts to establish a voice morphology/syntax-semantics mapping, they build on Schäfer (2008, 2017) and Wood (2014, 2015) and propose that Greek non-actively marked anticausatives feature an expletive non-active Voice head that is interpreted as introducing an identity function over events. Under such a hypothesis, anticausatives with active and non-active voice marking are predicted to be semantically equivalent, as regards their event structure. The emergence of active or non-active morphological marking on a verb is ultimately attributed to information carried by the verbal root (see also Oikonomou & Alexiadou 2022).

The expletiveness hypothesis put forth by Alexiadou et al. (2015) appears to have the broadest empirical coverage; it predicts random alternation between active and non-active morphology in the set of verbs that can be interpreted as anticausative. On the other hand, it raises acquisition issues. The expletiveness of voice would mean that children acquiring Greek need to learn separately the voice morphology that combines with each verb as part of the respective lexical entry. Arguing in favor of such a view is legitimate, as long as one shows that other, more economical alternatives are not empirically confirmed, a task that, to my knowledge, has not yet been undertaken by linguists working on the topic.¹⁷

Summing up the literature on the interpretation of voice in anticausatives in Greek, the partial vs. complete change of state distinction (Alexiadou & Anagnostopoulou 1999, 2004) is dismissed as irrelevant, since it was refuted by the very authors that introduced it in the first place (Alexiadou et al. 2015). One is then left with two opposing insights: (i) the idea that non-active voice

¹⁷ In the literature on anticausatives inspired on languages other than Greek, a tight relation is often established between anticausativity and reflexivity (Kallulli 2006; Labelle 2008; Koontz-Garboden 2009, to name a few). This has not been included in the main discussion as the alleged kinship between reflexives and anticausatives has not been proposed for the case of Greek.

correlates with the existence of an (implicit) external cause of the described change (Lavidas et al. 2012; Oikonomou 2014), and (ii) the view that non-active voice in anticausatives is expletive and, therefore, does not affect the structure of the described event (Alexiadou et al. 2015). Given that, as was stated earlier, neither line of analysis has been sufficiently motivated, the debate can be settled only by presenting robust empirical evidence in either direction. This was exactly the main goal of the experimental study presented in detail in the following section.

2.4 In search of linguistic evidence: the experimental study

An experimental study was carried out in order to address from a strongly empirical angle the following broad research question: What is the interpretation of voice in Greek anticausative verbs? The *expletive voice* hypothesis, according to which anticausatives with non-active voice marking feature an expletive non-active VoiceP and, therefore, have a similar event structure as their actively marked counterparts (Alexiadou et al. 2015), was adopted as the main working hypothesis.

The experimental study was designed as a two-stage process. First, a simple acceptability judgment task containing sentences built around anticausative verbs was conducted. Then, the very same sentences were tested by means of another acceptability judgment and interpretation task. This time the test-sentences were embedded under a contextual setting in order to further check whether the acceptability and interpretation of anticausative verbs are determined by voice morphology, by contextual information, by both or neither of these factors. The two experiments are presented in detail below.

2.4.1 Experiment 1: The distribution of voice in Greek anticausatives

As mentioned in Section 2.3, most of the attempts to ascribe certain meaning to the voice morphology of Greek anticausatives built on alleged contrasts

between the active and the non-active variant of Class C verbs. This suggested Class C as the most appropriate field from which to draw evidence in support of the opposing view, namely that both anticausative variants receive a similar interpretation (Alexiadou et al. 2015).

Specifically, the main goal of Experiment 1 was to put to test the very existence of Class C in the grammar of Greek. If speakers accept equally the active and the non-active morphological variant of the tested anticausatives, Class C has the same status as Classes A and B in the grammar of native Greek speakers, and one needs to keep digging in order to check whether voice morphology correlates with interpretation in the ways suggested by Lavidas et al. (2012) and Oikonomou (2014), for example. Alternatively, if speakers tend to systematically associate a subset of Class C verbs with active voice marking and a different subset with non-active voice marking, then a grammatical description of Greek anticausatives could make do with only two morphological classes; one characterized by active voice marking (Class B) and one characterized by non-active voice marking (Class A). Note that in the latter case one still needs to check whether the two classes of anticausatives receive a different interpretation. However, the existing analyses in support of this view will have already lost significantly in credibility.

Under the rationale above, Experiment 1 contrasted directly the active and non-active variants of the same Class C anticausative verbs, asking participants to rate the acceptability of both verb forms. The experiment was administered via the *Alchemer* platform.

Participants

With the help of various social media platforms, 90 native speakers of Greek (44 male, 44 female, 2 other; mean age 28.91 years, SD = 3.99) were recruited. They all completed Experiment 1 voluntarily.

Materials

The materials used for Experiment 1 were built around 10 anticausative verbs reported to behave as members of so-called Class C, that is as admitting both active and non-active voice morphology in anticausative construals: *rayizo* ‘crack’, *madhao* ‘pluck’, *zarono* ‘wrinkle’, *erimono* ‘desert’, *zesteno* ‘heat’, *lerono* ‘sully’, *dhialio* ‘disperse’, *gremizo* ‘crumble’, *tsalakono* ‘crumple’,

skizo ‘tear’. All verbs appeared in both morphological variants, leading the set of critical experimental items to a total of 20. Two minimal pairs that formed part of the experiment are given below along with their English translations for expository purposes.¹⁸

- (17)a. To palio spiti tis yayas gremise.
the old house the.GEN grandma crumbled.ACT
- b. To palio spiti tis yayas gremistike.
the old house the.GEN grandma crumbled.NACT
- ‘Grandma’s old house crumbled.’

- (18)a. To metopo tu zarose.
the forehead his wrinkled.ACT
- b. To metopo tu zarothike.
the forehead his wrinkled.NACT
- ‘His forehead wrinkled.’

In order to confirm the participants’ competence to evaluate voice morphology independently of the specific research question addressed by Experiment 1 concerning the anticausative Class C, the set of critical items was complemented with an equal number of control items. These were again sentences built around anticausative verbs which, however, display only one morphological variant. Concretely, the set of controls involved 10 Class A anticausatives with obligatory non-active voice marking (*metavalome* ‘change’, *vithizome* ‘sink’, *anatrepome* ‘turn over’, *peristrefome* ‘rotate’, *mionome* ‘diminish’, *epidhinonome* ‘deteriorate’, *veltionome* ‘improve’, *anaptisome* ‘grow’, *trelenome* ‘go crazy’, *ekrighnime* ‘explode’) and 10 Class B anticausatives that were necessarily marked as active (*alazo* ‘change’, *vuliazio* ‘sink’, *anapodhoyirizo* ‘turn over’, *yirizo* ‘rotate’, *lighostevo* ‘diminish’, *xiroterevo* ‘deteriorate’, *kaliterevo* ‘improve’, *meghalono* ‘grow’,

¹⁸ The list of materials used for Experiment 1, together with sociolinguistic information on the participants, can be found here: <https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1068058/full#supplementary-material>.

salevo ‘go crazy’, *skaο* ‘explode’). The attentive reader notices that each Class B verb chosen had a synonym in the group of Class A anticausatives. This was a conscious move that aimed at maintaining a parallel design across the critical and control conditions. There follow two control minimal pairs from the item list, translated into English.

- (19) a. To karavi vithistike. *Class A*
the ship sank.NACT
b. To karavi vuliakse. *Class B*
the ship sank.ACT
‘The ship sank.’

- (20) a. O triferos vlastos anaptixthike. *Class A*
the tender stem grew.NACT
b. O triferos vlastos meghalose. *Class B*
the tender stem grew.ACT
‘The young stem grew.’


Participants were given the following instructions: “In what follows, you will be presented with a set of sentences. Each sentence is followed by a scale. We ask you to use this scale to rate how good each sentence is in your opinion (left extreme = bad, right extreme = good).”

All participants rated the complete set of experimental items, thus providing 40 ratings each. The reported results were based on the statistical analysis of a total of 3,600 responses (90 participants × 40 ratings).

Procedure

Participants used their personal computer or smart device to complete Experiment 1. The main task started only after they had read the instructions and answered a questionnaire regarding their sociolinguistic background. In this experiment, participants were asked to read a set of sentences in the absence of any context and use a scale to report how good or bad they found each one of them.

The experimental items were randomized. An example of what participants saw on their screens is given below, translated into English.

- (21) I vomva eskase.
the bomb exploded.ACT
'The bomb exploded.'
kaki  kali
'bad' 'good'

The median duration of the experiment was 6' 93".

The exposition and discussion of the results of Experiment 1 is deferred until after the detailed presentation of Experiment 2, that instantiated the second stage of the study described in this section.

2.4.2 Experiment 2: The interpretation of voice in Greek anticausatives

The second experiment was similar to Experiment 1 in three main respects: (i) it aimed at getting evidence in support of the working hypothesis that Greek non-actively marked anticausatives project an expletive non-active VoiceP (Alexiadou et al. 2015), (ii) it was based on an acceptability judgment task, and (iii) it contrasted the active and non-active anticausative variant of Class C verbs. Crucially, the two experiments differed in that Experiment 2 embedded the test-sentences in a contextual setting. Specifically, the latter was designed to not only obtain judgments related to the acceptability of the Class C morphological variants, but also to test whether the acceptability and interpretation of Class C anticausatives are sensitive to contextual information.

Considering that there are infinite aspects of the contextual setting that could affect the speakers' preference for active or non-active morphological marking and its interpretation, and bearing in mind the literature summarized in Section 2.3, the presence vs. absence of a (violent) external initiator for the

described change of state (Lavidas et al. 2012; Oikonomou 2014) was identified as a most appropriate suspect.

To be specific, Experiment 2 addressed a two-tier question. On a first level, it attempted to test whether the contextually imposed (non-)salience of an external initiator interacted with the acceptability of active or non-active voice morphology. Two possibilities lay ahead: First, speakers may map systematically the two different types of morphological marking (active vs. non-active) to the two different contextual conditions; the *overt cause condition*, when the external initiator is salient, and the *non-overt cause condition*, when it is not. This would suggest that voice morphology actually has interpretative consequences. Note that, if Lavidas et al. (2012) and Oikonomou (2014) are in the right path, it is non-active voice morphology that will be associated with overt cause contexts. Alternatively, the speakers' preference for the active or the non-active Class C variant will not be affected by the salience of the external initiator. In that case, the preference pattern obtained from Experiment 2 is expected to replicate the one obtained from Experiment 1. Notice that, under such findings, a voice morphology-interpretation mapping will remain unmotivated.

On a second level, Experiment 2 pried directly into the meaning of Class C anticausatives. Concretely it investigated whether the speakers' interpretation of anticausative event descriptions as involving a specific cause or not depends mostly on the voice morphology of the verb or on the existing contextual information. Given the design of the experiment, there were again two possibilities: Speakers may rely on morphology and attribute a cause interpretation to non-actively marked anticausatives but a no-cause interpretation to their actively marked counterparts. This result would indicate some truth-conditional effect of voice morphology on Greek anticausative verbs (pace Lavidas et al. 2012; Oikonomou 2014). Alternatively, Greek speakers may systematically link overt cause contexts to cause interpretations and non-overt cause contexts to no-cause interpretations, regardless of voice morphology. This would be regarded as evidence in favor of the expletiveness approach to anticausative voice (Alexiadou et al. 2015).

Targeting the double goal exposed above, Experiment 2 contrasted actively and non-actively marked Class C anticausatives against two types of

contextual settings (overt cause vs. non-overt cause) and two kinds of interpretations (cause vs. no-cause). This time participants were asked to read a set of sentences and, given the context that preceded each one of them, provide judgments on their naturalness and interpretation. This experiment was also administered via *Alchemer*.

Participants

Experiment 2 was completed by 76 volunteers (20 male, 55 female, 1 other; mean age 29.91 years, SD = 5.69), all native speakers of Greek, recruited via different social media platforms.

Materials

The critical items of Experiment 1 were used also for Experiment 2. However, this second experiment further involved context. Consequently, each of the 20 test-sentences appeared embedded under an overt cause context and a non-overt cause context, leading to a sum of 40 critical items for Experiment 2.¹⁹ Example (22) that follows shows how example (17) from Experiment 1 was modified for the purposes of the second experiment.

(22)a. Overt cause context – Active voice morphology

[Auntie called to tell us about the earthquake at the village this morning. They shook a lot.]

To palio spiti tis yayas gremise.
the old house the.GEN grandma crumbled.ACT
'Grandma's old house crumbled.'

b. Non-overt cause context – Active voice morphology

[I went back to the village after a long time. We should have made repairs all these years.]

To palio spiti tis yayas gremise.
the old house the.GEN grandma crumbled.ACT
'Grandma's old house crumbled.'

¹⁹ The set of experimental items and sociolinguistic information regarding the participants of Experiment 2 can be accessed at <https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1068058/full#supplementary-material>.

c. Overt cause context – Non-active voice morphology

[Auntie called to tell us about the earthquake at the village this morning. They shook a lot.]

To palio spiti tis yayas gremistike.
the old house the.GEN grandma crumbled.NACT
'Grandma's old house crumbled.'

d. Non-overt cause context – Non-active voice morphology

[I went back to the village after a long time. We should have made repairs all these years.]

To palio spiti tis yayas gremistike.
the old house the.GEN grandma crumbled.NACT
'Grandma's old house crumbled.'

The contextual setting of (22a, c) introduces explicitly an external initiator of the crumbling of the house, namely the earthquake. This is not the case for the context of (22b, d), which does not specify such an external initiator—some different type of cause may still be accommodated in this case. This is the way the distinction between overt cause and non-overt cause contexts was understood and incorporated into the experimental design. Recall that, under the expletiveness hypothesis of anticausative voice (Alexiadou et al. 2015), no significant difference in acceptability was foreseen between (22a) and (22b) on the one hand, and (22c) and (22d) on the other.

Experiment 2 was meant as a complementation of the first experiment. In order to make sure that the results of the two acceptability tasks are comparable, the set of control items of Experiment 1 was used also for Experiment 2, each item embedded under an overt cause context and a non-overt cause context, so as to have a design parallel to the criticals. Example (23) demonstrates how (19) from Experiment 1 was adapted for the purposes of this second experiment.

(23)a. Overt cause context – Active voice morphology

[Everybody knew that it was a well-made ship. Unfortunately, though, the storm it faced that night was too heavy.]

To karavi vuliakse.
the ship sank.ACT
'The ship sank.'

b. Non-overt cause context – Active voice morphology

[The pirates stole the cargo and abducted the crew. They left “Argo” empty and unmanned.]

To karavi vuliakse.
the ship sank.ACT
'The ship sank.'

c. Overt cause context – Non-active voice morphology

[Everybody knew that it was a well-made ship. Unfortunately, though, the storm it faced that night was too heavy.]

To karavi vithistike.
the ship sank.NACT
'The ship sank.'

d. Non-overt cause context – Non-active voice morphology

[The pirates stole the cargo and abducted the crew. They left “Argo” empty and unmanned.]

To karavi vithistike.
the ship sank.NACT
'The ship sank.'

Experiment 2 addressed not only the acceptability of anticausatives with active and non-active voice morphological marking, but also their meaning. Therefore, each experimental item was followed by two possible interpretations: one according to which the described change of state was due to a specific cause and one that explicitly denied the existence of a specific cause for the same change. Note that, if anticausative voice is indeed expletive (Alexiadou et al. 2015), speakers will base their interpretation not on morphology, but on contextual information. Consequently, they will match overt cause contexts with cause interpretations and non-overt cause contexts with no-cause interpretations.

The following instructions were given to participants: “In what follows you will read a set of small texts. Each text consists of the description of a

situation followed by an utterance. First, we ask you to rate how natural each utterance is with respect to the situation using a scale (left edge = totally unnatural, right edge = absolutely natural). Second, we ask you to use a similar scale to rate how salient each of the two provided interpretations of the utterance is, always in relation to the situation (left edge = impossible, right edge = extremely possible).” The reader notices that, while Experiment 1 elicited participants’ judgments in terms of *good* and *bad*, Experiment 2 asked them to characterize the test-sentences as *natural* or *unnatural*. It was the presence of situational contexts in the latter that designated naturalness as a more appropriate term. Crucially, both experiments tested the speakers’ grammatical preference for active or non-active voice morphology on Greek anticausatives, which is here dubbed simply as acceptability, comprising both “goodness” and naturalness judgments.

Experiment 2 included the 40 experimental items used for the first experiment, each embedded under two different contexts. This brought the total of experimental materials to 80. Considering that a lengthy task would discourage participants, two versions of Experiment 2 were created by splitting the items in half; each version included 20 critical items (5 Class C verbs \times 4 conditions) + 20 control items (5 control synonym pairs \times 4 conditions). All participants rated the set of items producing 3 ratings each: one naturalness rating and two salience ratings related to the two interpretations given. The results reported for Experiment 2 are based on the statistical analysis of 9,120 responses (76 participants \times (40 \times 3) ratings).

Procedure

The procedure followed for Experiment 2 was similar to the one described for Experiment 1 in that participants used their personal device and started the main task only after they read the instructions and answered the same sociolinguistic questionnaire. For each experimental item, participants were presented with a context, a test sentence and two possible interpretations. They were instructed to rate the naturalness of the test-sentence and the salience of the two interpretations, always bearing in mind the respective context.

The critical and control items were randomized. There follows an example of what participants of Experiment 2 saw on their screens, translated into English:

(24)[Thousands of protestors gathered this morning at Aristotelous square.

After some minutes, a terrible storm broke out.]

To plithos dhialithike.

the crowd dispersed.NACT

‘The crowd dispersed.’

Rate how natural the utterance is in relation to the situation.

katholu fisiko  apolita fisiko

‘totally unnatural’

‘absolutely natural’

Rate how salient each interpretation of the utterance is in relation to the situation.

a. A storm was the cause of what happened.

katholu pithani  ekseretika pithani

‘impossible’

‘extremely possible’

b. There was no specific cause for what happened.

katholu pithani  ekseretika pithani

‘impossible’

‘extremely possible’

The median duration of the experiment was 18' 84".

2.4.3 Results of Experiments 1 and 2: evidence obtained

Due to the comparable design of the two experiments –testing the same active and non-active anticausative pairs of the same 10 alleged Class C verbs in the absence and in the presence of context–, the results are reported in a single section, divided into two parts. First, the acceptability judgments obtained via Experiments 1 and 2 are analyzed, which have been combined into a single database. The possible effect of Voice (active, non-active) is analyzed across every specific item as well as the occurrence of each item in the different contextual conditions. This analysis is run separately on control and critical

items. Second comes the analysis of the saliency of the two possible interpretations that have been provided in Experiment 2, as reported by the participants.

Concerning the statistical analyses, a series of beta mixed-effects ANOVAs were performed using the *glmmTMB* package in R. To fulfill the requirements of a beta distribution, the 0-100 response values obtained (see, e.g., (21)) were first divided by 100 (to obtain a 0-1 distribution), and then the two ends were replaced by very close values (0.0000001 for 0, and 0.9999999 for 1). The omnibus test results are reported, which are complemented with Sequential Bonferroni-corrected pairwise contrasts (obtained using the *emmeans* package) and Cohen's *d* as a measure of effect size. In each reported model, the chosen random effects' structure was the most complex structure providing no model convergence problems.

2.4.3.1 Acceptability results

2.4.3.1.1 Acceptability results for control items

Figure 1 displays the results of the perceived acceptability ratings among the control items of Experiments 1 and 2. As can be seen, there is a preference for non-active voice items, a sort of preference for items presented without a context, and, among the items that did involve a context, a preference for those with an overt cause one. In general, control items received mean acceptability ratings higher than 70%, indicating that the participants were indeed capable of providing judgments on Greek voice morphology.

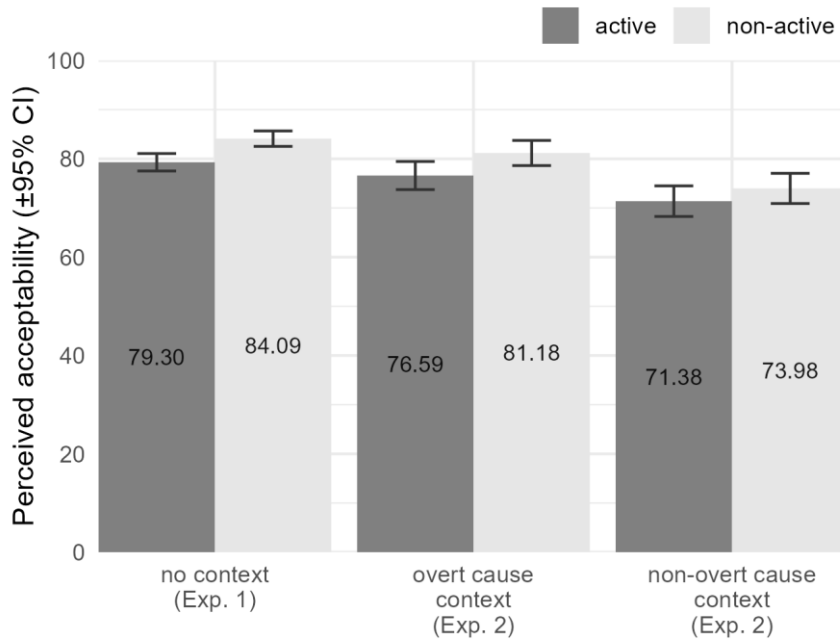


Figure 1. Acceptability results of control items in Experiments 1 and 2 (Tsiakmakis et al. 2023: 8, Figure 1)

A beta mixed-effects model was performed for the acceptability responses for control items of Experiments 1 and 2. The fixed factors were Voice (i.e., active, non-active), Context (i.e., no context, overt cause context, non-overt cause context) and their paired interaction. The random effects' structure included a random intercept for Subject plus a random slope for Context by Item.

The omnibus test results showed a significant main effect for both Voice, $\chi^2(1) = 11.676, p = .001$, and Context, $\chi^2(2) = 10.152, p = .006$, but no significant interaction. The main effect of Voice relates to an overall greater acceptability of items presented with non-active morphology ($d = 0.177, p = .001$). The main effect of Context indicates lower acceptability rates for items presented with a non-overt cause context, compared to those presented with no context at all ($d = 0.696, p = .016$), and those presented with an overt cause context ($d = 0.381, p = .039$), with no significant difference between the latter two ($d = 0.315, p = .561$).

2.4.3.1.2 Acceptability results for critical items

Figure 2 displays the results of the perceived acceptability ratings among the critical items of Experiments 1 and 2. As can be seen, the acceptability obtained does not vary much across the different context conditions, even though a generalizable preference for non-active voice forms over active ones seems to occur. Nevertheless, the statistical results below indicate that this preference for non-active voice items is just an artifact caused by the specific verbs selected for the experimental tasks. Specifically, six out of the ten verbs tested display a preference for non-active voice forms, three of the tested verbs display a preference for active voice forms, and one can take either the active or the non-active voice morphology (see Table 1 below).

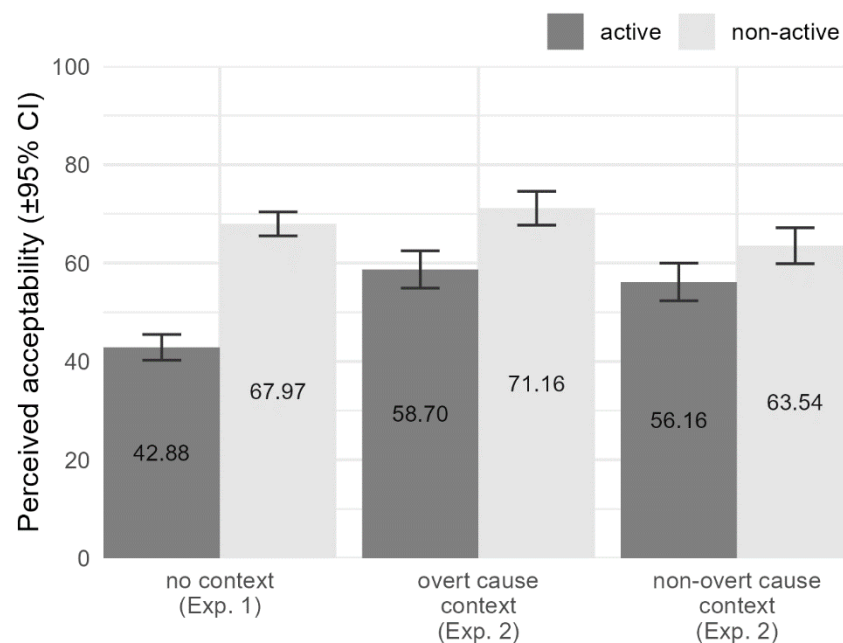


Figure 2. Acceptability results of critical items in Experiments 1 and 2 (Tsiakmakis et al. 2023: 9, Figure 2)

A beta mixed-effects model was performed for the acceptability responses for critical items of Experiments 1 and 2. Again, the fixed factors were Voice (i.e., active, non-active), Context (i.e., no context, overt cause context, non-overt cause context) and their paired interaction. The random effects' structure included a random intercept for Subject plus a random slope for Voice by Item.

The omnibus test results showed significant results for Context, $\chi^2(2) = 14.501, p = .001$, and for the paired interaction Voice \times Context, $\chi^2(1) = 40.473, p < .001$. However, no significant main effect was found for Voice, $\chi^2(1) = 1.447, p = .229$ (which is in line with the hypothesis that the effect of Voice is verb-specific). The main effect of Context indicates higher acceptability rates for items presented with an overt cause context, compared to those presented with no context at all ($d = 0.605, p = .015$), and those presented with a non-overt cause context ($d = 0.564, p = .014$), with no significant difference between the latter ($d = 0.041, p = 1.000$).

The interaction Voice \times Context can be interpreted as such that different preferences for Context conditions are found when exploring active or non-active morphology. On the one hand, when active morphology is used, items without a context receive lower acceptability ratings, compared to those with overt cause contexts ($d = 0.939, p < .001$) and with non-overt cause contexts ($d = 0.714, p = .007$), with no significant difference between the latter ($d = 0.224, p = .620$). On the other hand, when non-active morphology is used, items accompanied with a non-overt cause context receive lower acceptability ratings, compared to those with overt cause contexts ($d = 0.572, p = .003$) and those presented without a context ($d = 0.493, p = .021$), with no significant difference between the latter ($d = 0.079, p = 1.000$).

An additional statistical model was run over the acceptability of critical items, including Voice (active, non-active), Context (no context, overt cause context, non-overt cause context), the specific Item, and all their possible interactions as fixed factors. The model included a random slope for Voice by Subject. In this analysis, the focus was on the potential effect of Voice within every specific item and every contextual condition in which each item had been presented.

All main effects and interactions were found to be significant. The ones of interest here are, first, the paired interaction Voice \times Item, $\chi^2(9) = 123.220, p < .001$, and, second, the triple interaction Voice \times Context \times Item, $\chi^2(18) = 75.480, p < .001$. The pairwise contrasts associated with the paired interaction Voice \times Item are summarized in Table 1: while active voice morphology is preferred for *rayizo* ‘crack’, *madhao* ‘pluck’, and *zarono* ‘wrinkle’, non-active voice is preferred for *gremizo* ‘crumble’, *tsalakono* ‘crumple’, *dhialio*

‘disperse’, *zesteno* ‘heat’, *lerono* ‘sully’, and *skizo* ‘tear’, and no significant preference is found for *erimono* ‘desert’.

Table 1. Mean (and standard deviation) values for the reported acceptability of each specific critical item across active and non-active voice morphology in both Experiment 1 and 2 (Tsiakmakis et al. 2023: 9, Table 2). The last two columns indicate the results of the pairwise contrasts associated with the significant interaction Voice \times Item.

		Mean (SD) acceptability reported		Pairwise contrasts	
Item		Active voice	Non-active voice	Cohen’s <i>d</i>	<i>p</i>
<i>rayizo</i>	‘crack’	83.56 (23.23)	20.84 (28.75)	4.046	< .001
<i>gremizo</i>	‘crumble’	26.70 (32.76)	88.24 (18.94)	−3.489	< .001
<i>tsalakono</i>	‘crumple’	27.02 (32.56)	87.07 (20.36)	−3.936	< .001
<i>erimono</i>	‘desert’	81.73 (25.94)	76.88 (29.97)	0.286	.283
<i>dhialio</i>	‘disperse’	32.06 (36.01)	87.42 (20.38)	−3.227	< .001
<i>zesteno</i>	‘heat’	55.16 (36.83)	77.73 (24.95)	−1.116	< .001
<i>madhao</i>	‘pluck’	64.90 (34.49)	29.89 (32.60)	2.593	< .001
<i>lerono</i>	‘sully’	30.88 (33.46)	79.70 (29.02)	−3.021	< .001
<i>skizo</i>	‘tear’	21.48 (29.77)	87.04 (18.84)	−3.953	< .001
<i>zarono</i>	‘wrinkle’	74.65 (30.42)	38.08 (34.81)	2.465	< .001

Regarding the effect of Voice in the triple interaction Voice \times Context \times Item, it is statistically relevant only for two verbs, i.e., *erimono* ‘desert’ and *zesteno* ‘heat’. In these cases, Voice plays a role in the reported acceptability only when no contextual information is provided (i.e., only in Experiment 1), but not when there is an overt or a non-overt cause context. Specifically, *erimono* shows a significant preference for active voice ($d = 0.720$, $p = .026$), and *zesteno* displays a significant preference for non-active voice morphology ($d = -2.631$, $p < .001$).

2.4.3.2 Interpretation results

Figure 3 illustrates how salient the participants consider the two possible interpretations offered in Experiment 2. While the first row depicts the

reported saliency of a cause interpretation for items presented with an overt cause context (left) and a non-overt cause context (right), the second row shows the reported saliency of a no-cause interpretation in the same types of contexts. Overt cause contexts favor a cause interpretation and disfavor a no-cause interpretation; non-overt cause contexts disfavor a cause interpretation, while being unclear as regards no-cause interpretations.

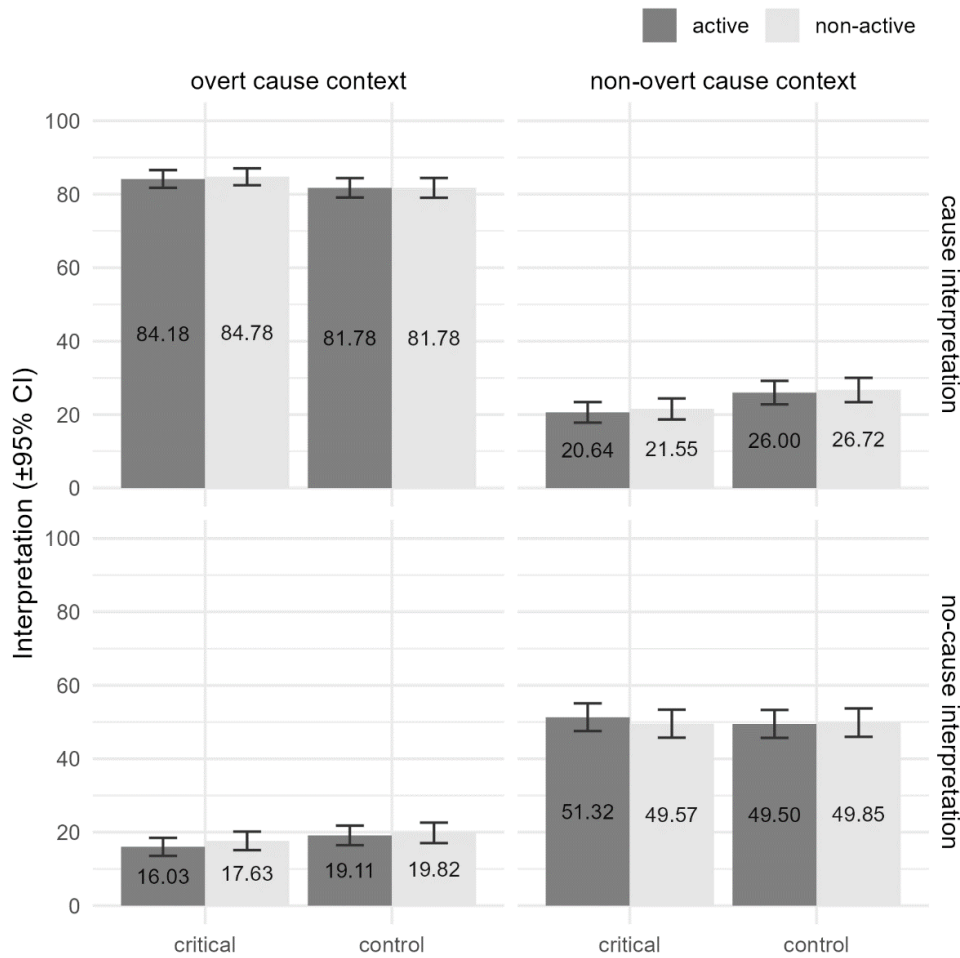


Figure 3. Reported saliency of the two possible interpretations offered in Experiment 2: cause and no-cause interpretations (by rows), for items presented with an overt cause context or a non-overt cause context (by columns), across Item Type and Voice (Tsiakmakis et al 2023: 10, Figure 3)

A statistical model was run taking the reported saliency of the specific interpretation as the dependent variable. It included as fixed factors Voice (active, non-active), Context (overt cause context, non-overt cause context), Interpretation (cause interpretation, no-cause interpretation), and Item Type

(critical, control). The random effects' structure included a random slope for both Context and Interpretation by Subject, plus a random intercept for Item.

Four fixed effects were found to be significant, i.e., two main effects and two interactions. The significant main effects were Context, $\chi^2(1) = 67.789$, $p < .001$, and Interpretation, $\chi^2(1) = 54.487$, $p < .001$, though they are better explained by looking at their paired interaction, which was also found to be significant, $\chi^2(1) = 2185.895$, $p < .001$. The paired interaction Context \times Interpretation can be explained in two complementary ways. First, cause interpretations are rated higher in overt cause contexts than in non-overt cause contexts ($d = 4.161$, $p < .001$), and no-cause interpretations are considered more salient in non-overt cause contexts than in overt cause contexts ($d = -2.127$, $p < .001$). Alternatively, for overt cause contexts, cause interpretations receive higher ratings than no-cause interpretations ($d = 4.340$, $p < .001$), whereas for non-overt cause contexts, no-cause interpretations receive higher ratings than cause interpretations ($d = 1.947$, $p < .001$). Lastly, the other interaction found to be significant was the triple interaction Context \times Interpretation \times Item Type, $\chi^2(1) = 8.352$, $p = .004$, which can be related to the fact that, in assigning a cause interpretation to a non-overt cause context, control items obtained higher ratings than critical items ($d = 0.290$, $p = .013$). No significant effect of Voice was found whatsoever.

Since it was also interesting to know whether there is a significant difference between the two less preferred interpretations (i.e., cause interpretation of non-overt cause contexts vs. no-cause interpretation of overt cause contexts) and between the two preferred ones (i.e., cause interpretation of overt cause contexts vs. no-cause interpretation of non-overt cause contexts), an additional statistical model was run in which the combination of Context and Interpretation was modeled as a single variable with four levels (i.e., the four panels in Figure 3). The results indicate no significant differences between the two less preferred interpretations ($d = 0.178$, $p = .483$), and significantly greater values for the cause interpretation of overt cause contexts compared to the no-cause interpretation of non-overt cause

contexts ($d = 1.888$, $p < .001$). The rest of the effects described above were found intact.²⁰

2.5 Interpreting anticausative voice: settling the debate

Let us now take stock of the results of the experimental study and consider their empirical and theoretical consequences. Experiment 1 tested the active and the non-active morphological variant of 10 anticausative verbs allegedly belonging to Class C (as defined by Alexiadou et al. 2015). Interestingly, the verbs that formed part of this first task were found to behave either as members of Class A (*gremizo* ‘crumble’, *tsalakono* ‘crumple’, *dhialio* ‘disperse’, *zesteno* ‘heat’, *lerono* ‘sully’, *skizo* ‘tear’) or as members of Class B (*rayizo* ‘crack’, *erimono* ‘desert’, *madhao* ‘pluck’, *zaronno* ‘wrinkle’). In other words, participants linked systematically non-active voice morphology to a subset of the tested verbs and active voice morphology to the complementary subset, thus suggesting that Class C is not productive (cf. Alexiadou et al. 2015). Importantly, the results of Experiment 1 further showed that morphological class membership is not categorical as regards Greek anticausative verbs; the verb *gremizo* ‘crumble’ for example displayed more prototypical Class A behavior than the verb *zesteno* ‘heat’ (see Table 1).

Experiment 2 tested the same morphological voice distinction as Experiment 1 (active vs. non-active voice) against two types of contextual settings (overt cause vs. non-overt cause). Intriguingly, the results obtained from the first experiment were reproduced, with the exception of those related to *erimono* ‘desert’ and *zesteno* ‘heat’, for which the significant preference for non-active and active voice, respectively, disappeared. Such findings indicate that the morphological marking of Greek anticausatives is not sensitive to the (contextually induced) salience or non-salience of an external

²⁰ Four separate one-sample t-tests were performed to the four different combinations of Context × Interpretation (values transformed to a 0-1 scale, $\mu = 0.5$). The category of data pertaining to the non-overt cause context × no cause interpretation condition shows a bimodal distribution, with a set of responses close to 0 and another set close to 100, which however cannot be explained by means of the variable Voice.

initiator (cf. Lavidas et al. 2012; Oikonomou 2014). Moreover, by replicating the preference pattern obtained from the first experiment, Experiment 2 provided additional evidence against the productivity of the so-called anticausative Class C.²¹

The second experimental task tested the active vs. non-active voice distinction not only against two different types of contexts, but also against two different types of interpretation (cause vs. no-cause). The results related to the latter turned out to be as interesting as the ones related to acceptability. Specifically, participants rated the interpretations that did not match their respective contexts, that is cause interpretations under non-overt cause contexts and no-cause interpretations under overt cause contexts, as of low saliency. This result, which was obtained irrespective of the voice morphology on the anticausative verb in the test-sentence, can be simply attributed to the inconsistency between the situational context and the interpretation, one of which introduced explicitly an external initiator while the other encouraged an absence-of-initiator inference. As for the items where context and interpretation matched, i.e., overt cause contexts with cause interpretation and non-overt cause contexts with no cause interpretation, participants gave high saliency ratings, once again regardless of whether the anticausative test-verb was actively or non-actively marked. Until this point, the obtained results seem to suggest that speakers rely on the contextual information and not on voice morphology when interpreting anticausative event descriptions.

Crucially, though, the preference for no-cause interpretations in the non-overt cause context condition was found to be significantly lower than the preference for cause interpretations in the overt cause context condition in Experiment 2. This result cannot be predicted under the hypothesis that the speakers' saliency ratings in Figure 3 are based merely on the interaction of context and interpretation. However, it can be accommodated if these ratings are treated as reflecting the interaction of not two, but three different factors: (i) the contextual information, (ii) the provided interpretation, and (iii) the causative semantics of both actively and non-actively marked anticausatives

²¹ For additional, indirect evidence in support of the non-productivity of Class C, see Fotiadou (2022).

(Alexiadou et al. 2015), that leads speakers to compute a cause whenever interpreting anticausative events.²²

Let us see exactly what the view suggested above predicts. The overt cause context – cause interpretation condition will receive the highest saliency ratings because it is optimal; the information contributed by the context, the interpretation and the semantics of the anticausative verb converge in favoring the existence of an initiator of the reported change of state. The non-overt cause context – no cause interpretation condition will trigger lower ratings since it is suboptimal; the context and interpretation coincide in favoring the absence of an external initiator, but they both go against the causative semantics of the anticausative verb. Finally, the remaining two conditions, that is overt cause context – no cause interpretation and non-overt cause context – cause interpretation are expected to be dismissed as fully incongruent due to the information clash described earlier and, thus, elicit extremely low saliency ratings. All these predictions are borne out (see Figure 3).

The main results of Experiments 1 and 2 can be summarized in the following three major empirical claims: (i) Anticausative Class C in Greek is not productive; the vast majority of verbs entering the causative alternation behave as members of either Class A (non-active voice marking) or Class B (active voice marking). (ii) The native Greek speakers’ preference for active or non-active voice morphology on anticausative verbs is not affected by the (non-)salience of an external initiator of the described change of state. (iii) As regards anticausative event descriptions, speakers show a tendency to interpret a cause for the reported change of state, independently of the voice morphology of the anticausative verb.

²² Alexiadou et al. (2015) argue that Greek anticausatives have causative semantics based on the empirical observation that anticausatives with active and non-active voice morphology are compatible with PP-modifiers carrying causer-related information, as in the examples that follow:

- | | | | | | | |
|------|---------------------------------------|-------|---------------|------|-----|-----------|
| (i) | To | tzami | espase | apo | ton | aera. |
| | the | glass | broke.ACT | from | the | wind |
| | ‘The glass broke from the wind.’ | | | | | |
| (ii) | I | muxla | diplasiastike | apo | tin | ighrasia. |
| | the | mold | doubled.NACT | from | the | humidity |
| | ‘The mold doubled from the humidity.’ | | | | | |

See Koontz-Garboden (2009) for the claim that anticausatives involve a causative component motivated on languages other than Greek.

The question to be addressed next is how the empirical claims above relate to the theoretical literature on Greek anticausatives. In Section 2.3, it was shown that the analyses that attribute certain meaning to the voice morphology of Greek anticausative verbs have focused on contrasts between the active and the non-active variant of the members of Class C (Alexiadou & Anagnostopoulou 2004; Lavidas et al. 2012; Oikonomou 2014). The empirical generalization in (i), however, suggests that Class C is not productive and, therefore, not a safe ground on which to build a voice morphology-interpretation mapping. Generalization (ii) further shows that, even if such a mapping could be maintained, it has not been captured by the previous literature (Lavidas et al. 2012; Oikonomou 2014); Experiment 2 provided evidence that the contextually induced salience of an external initiator causing the described change does not determine the voice morphology of the anticausative verb.

Let us make the point clearer by returning to example (16a) from Oikonomou (2014), repeated below for ease of reference.

- (25) To ftero tu aftokinitu mu #*tsalakose*/
the fender of.the car mine crumpled.ACT
tsalakothike.
crumpled.NACT
‘The fender of my car crumpled.’

(Oikonomou 2014: 45, exs. (84a, b))

In view of the results to Experiments 1 and 2, it seems that the judgments reported by the author in this very example are correct. Nevertheless, the reduced acceptability of the actively marked *tsalakose* ‘crumpled’ is not due to the need for the violent external initiator that brings about the crumpling of the fender to enter the derivation. It likely reflects the grammatical preference for non-active voice marking on the anticausative variant of the alternating verb *tsalakono* ‘crumple’.

In other words, it appears that Greek grammar specifies two complementary morphological rules when it comes to anticausative formation: marking with active voice morphology or marking with non-active

voice morphology. Whether an alternating verb is subject to one or the other rule is arbitrary and, therefore, needs to be learnt by children acquiring Greek as part of the respective lexical entry (pace Alexiadou et al. 2015; Oikonomou & Alexiadou 2022). This must also be the case for the very few verbs that actually allow for both active and non-active marking. The conclusion that anticausative voice morphology is verb-specific and, therefore, learnt indicates that the view that active and non-active anticausatives are semantically equivalent as regards their event structure is feasible. In this sense, the results of the experimental study presented in the previous section are very much in line with the hypothesis that Greek non-actively marked anticausatives project an expletive VoiceP, that is interpreted as an identity function over predicates of events (Schäfer 2008; Alexiadou et al. 2015; Oikonomou & Alexiadou 2022).

It is noted in passing that the results related to the control items of Experiments 1 and 2 offer additional evidence in support of the expletiveness of anticausative voice. The reader is reminded that the list of controls was built around 20 verbs, organized into 10 pairs of synonyms, each consisting of an actively marked anticausative (Class B) and a non-actively marked anticausative (Class A). After additional analyses, 7 out of the 10 pairs tested were found to display no significant difference in acceptability between their Class A and Class B member, thus confirming experimentally their synonymy.²³ Note that the very existence of synonym verbs across anticausative classes suggests that one can barely map an interpretative distinction to the active vs. non-active voice morphological distinction in Greek anticausatives. See Schäfer and Vivanco (2016) for a similar line of argumentation with reference to other languages.

In light of the above, non-active voice in Greek anticausatives is a good expletiveness candidate, whose meaning contribution is most likely an identity function over events of the type $\langle\langle s,t \rangle, \langle s,t \rangle\rangle$, following Schäfer (2008, 2017) and Wood (2014, 2015). Crucially, there is more than that to the expletive status of anticausative Voice. Recall the third empirical generalization above: Greek speakers tend to interpret a cause for all

²³ The details of the statistical analyses can be found at Tsiakmakis et al. (2023).

anticausative events. This is considered as evidence that both active and non-active anticausatives involve a causative component (Koontz-Garboden 2009; Alexiadou et al. 2015; cf. Kallulli 2006). Consequently, non-active voice in Greek anticausatives is interpreted as an identity function over predicates of not any kind of events but of *causative events*. It is claimed here that it is the local syntactic relationship between a VoiceP and a little vP carrying a cause formal feature that allow the former to be interpreted as an expletive category.

For the vague proposal above to unfold, it is necessary to dive into the syntactic derivation of the constructions under study. For the sake of discussion, the main aspects of the analysis by Alexiadou et al. (2015) are adopted: both anticausatives with active voice morphology and anticausatives with non-active voice morphology correspond structurally to little vPs . The latter further project a non-active VoiceP, that lacks a specifier. There follow two examples of an active (26) and a non-active anticausative (27), with their respective partial syntactic representations.

- (26) a. I tixi rayisan.
 the walls cracked.ACT
 ‘The walls cracked.’
 b. [_{VP} [_v v √rayiz] [_{DP} i tixi]]

- (27) a. I kurtines tis mamas lerothikan.
 the curtains the.GEN mom sullied.NACT
 ‘Mom’s curtains sullied.’
 b. [_{VoiceP-NACT} [_{Voice-NACT} thik-] [_{vP} [_v v √leron] [_{DP} i kurtines tis mamas]]]

Moving on to interpretation, Alexiadou et al. (2015) postulate that the semantics of all anticausatives up to the vP layer corresponds to a causative event, irrespective of voice morphology and thus Voice syntax. As already mentioned, this claim is independently supported by our empirical generalization (iii). The question at the very center of this chapter is in what way the specifierless VoiceP of Greek anticausatives with non-active voice

morphological marking contributes to the semantic derivation of the described event.

Since Kratzer (1996) the syntactic projection related to voice has been associated with thematic roles such as agent, causer and, in the case of stative predicates, holder. It is postulated here that the non-active VoiceP projected in Greek anticausatives initially carries causer information, that is it is not expletive in the beginning. The anticausative VoiceP merges with the causative little ν P that, as mentioned above, is considered the main building block of both active and non-active anticausatives. The semantic redundancy of cause-related information triggered by the local relationship between the causer VoiceP and the causative ν P allows the former to function as an expletive category and be interpreted merely as an identity function over the causative event introduced by ν P. Under this view, the VoiceP that appears in Greek anticausatives is not projected by some quirky or special Voice head marked for expletiveness in the Numeration (Chomsky 1995). Its expletiveness is the by-product of the syntactic environment it is found in and, specifically, its local relation to the causative ν that gives rise to redundancy.

This proposal shares with the one in Oikonomou (2014) the insight that anticausative Voice bears causer information. It differs from the latter in that it assumes that, in the end, the non-active VoiceP of Greek anticausatives neither introduces nor binds existentially any argument; semantically, it instantiates an identity function. In this way this account predicts correctly that there is no systematic truth-conditional difference between actively and non-actively marked anticausatives, i.e., between anticausatives that lack a Voice projection and those that do have it. Ultimately, the interpretative import of non-active VoiceP of Greek anticausatives, realized as non-active voice morphological marking, is defined as an identity function over causative events.

With all the details in place, it is now time to go formal. The meaning of Greek anticausative non-active Voice is represented in (28). The part of the semantics of examples (26) and (27) that is relevant to our discussion is given in (29) and (30), respectively.

(28) Anticausative voice: $[-thik-CAUSE]^{24} = \lambda P_{\langle s,t \rangle}. P_{\langle s,t \rangle}$

(29) $[[[_v CAUSE [_{VP} I tixi rayiz]]]] = \lambda e_{CAUS}(\text{crack}(e) \ \& \ \text{theme}(e) = \text{the walls})$

(30) $[[[_{Voice} -thik-CAUSE [_v CAUSE [_{VP} I kurtines tis mamas leron]]]]$
 $= (\lambda P_{\langle s,t \rangle}. P_{\langle s,t \rangle}) (\lambda e_{CAUS}[\text{sully}(e) \ \& \ \text{theme}(e) = \text{mom's curtains}])$
 $= \lambda e_{CAUS}(\text{sully}(e) \ \& \ \text{theme}(e) = \text{mom's curtains})$

It is made clear throughout the chapter that the idea that Greek anticausatives project an expletive non-active VoiceP is not new (Schäfer 2008, 2017; Alexiadou et al. 2015; Oikonomou & Alexiadou 2022). Neither is the view that the expletiveness of VoiceP depends on its syntactic context –see the syntactic alloosemy approaches by Wood (2015) and Oikonomou and Alexiadou (2022). The crucial point in which the account introduced here departs from its predecessors is that the expletive interpretation of Voice is identified as an identity function over causative events and is attributed to the redundancy resulting from the local relationship between Voice and the causative little *v*P, not to idiosyncratic information carried by the verbal root (cf. Alexiadou et al. 2015; Oikonomou & Alexiadou 2022). The syntactically local (cause-related) semantic redundancy together with the identity function semantics in (28) are identified as the essential constitutive properties of the expletiveness of Greek anticausative Voice and, consequently, as the answer to the major question that motivated the study presented in this chapter.²⁵

²⁴ The definition of anticausative expletive Voice here includes *-thik-* as it is the morphological exponent that appears in the specific examples under discussion. Voice morphology in Greek can take different forms depending on the tense, aspect and mood specification of the verb. The interested reader is referred to any grammar of Greek or Ralli (2005) for details.

²⁵ I would like to propose that the novel analysis of Greek expletive Voice put forth here can be extended to deponent verbs (Triantafyllidis 1941; Holton et al. 1997; Zombolou & Alexiadou 2014; see also footnote 14).

(i) I Maria iperaspistike tin ikoyeniatis.
the Maria defended.NACT the family hers
‘Maria defended her family.’

The sentence above arguably involves an agent-DP, namely *I Maria*. This DP cannot have merged in SpecVoiceP since here Voice, being non-active, does not project a specifier. Grestenberger (2018) argues that in such cases the agent is introduced in the structure by a functional projection FP located under VoiceP. A partial syntactic analysis along these lines would look as follows:

2.6 Conclusions

Chapter 2 inaugurated the exploration of the status of expletiveness in the grammar of natural languages by focusing on the allegedly expletive non-active voice morphology found in part of Greek anticausative verbs. An experimental study consisting of two experiments, one based on an acceptability judgment task and one based on an acceptability judgment and interpretation task, was carried out in order to pursue the following double aim: First, to gather evidence in support of the view that Greek anticausatives with active voice morphology and Greek anticausatives with non-active voice morphology are truth-conditionally equivalent and, consequently, the non-active VoiceP projected in the latter is legitimately considered an expletive functional category (Schäfer 2008, 2017; Wood 2014, 2015; Alexiadou et al. 2015; Oikonomou & Alexiadou 2022). Second, to determine the very essence of the expletiveness of Greek anticausative non-active voice.

The results of the two experiments allowed significant generalizations regarding Greek anticausatives, in particular, and expletive voice, in general. Starting from the former, the experimental study presented here motivated three main empirical claims: (i) The vast majority of Greek verbs that enter the causative alternation fall either into Class A, i.e., they bear non-active voice marking, or into Class B, i.e., they display active voice marking; the alleged Class C, whose members are only optionally marked with non-active voice morphology, is not productive in Greek (cf. Alexiadou & Anagnostopoulou 2004; Alexiadou et al. 2015). (ii) The native Greek speakers' grammatical preference for active or non-active morphological marking on an anticausative verb is neither determined nor affected by the (contextually induced) presence of an external initiator bringing about the

-
- (ii) $[[\text{VoiceP-NACT} [\text{Voice-NACT tik-}] [\text{XP} [\text{DP I Maria}] [\text{X}' [\text{X}] [[\text{vP} [\text{v } \sqrt{\text{iperaspiz}}] [\text{DP tin ikoyenia tis}]]]]]]]$

Under the same rationale as the one laid out for non-actively marked anticausatives, I postulate that the redundancy of agent-related information, caused by the local syntactic relation between an agentive VoiceP and an XP that syntactically introduces an agent, allows the non-active VoiceP of Greek deponents like *iperaspizome* 'defend' to be interpreted expletively. The tentative proposal is represented schematically below.

- (iii) $[[[\text{Voice -tik-AGENT} [\text{XP I Maria}_{\text{AGENT}} [\text{vP} [\text{vP iperaspiz tin ikoyenia tis}]]]]]]]$
 $= (\lambda P_{(s,t)}.P_{(s,t)}) (\lambda e[\text{defend}(e) \ \& \ \text{theme}(e) = \text{her family} \ \& \ \text{agent}(e) = \text{Maria}])$
 $= \lambda e(\text{defend}(e) \ \& \ \text{theme}(e) = \text{her family} \ \& \ \text{agent}(e) = \text{Maria})$

change of state described by the verb (cf. Lavidas et al. 2012; Oikonomou 2014). (iii) Regardless of the voice morphology on the anticausative verb, speakers show a general preference for interpreting or accommodating a specific cause when encountering anticausative event descriptions.

The first and second empirical claims above suggest that the emergence of active or non-active voice morphology in Greek anticausatives is arbitrary, that is lexically defined, and are therefore consistent with the theoretical proposal that non-actively marked anticausatives project an expletive non-active VoiceP, a VoiceP that is interpreted merely as denoting an identity function over the event denoted by the little *v*P it merges with (Wood 2014, 2015; Alexiadou et al. 2015). The third empirical generalization fortifies Alexiadou et al.'s (2015) theoretical claim that Greek anticausatives, irrespective of their voice morphology, involve a cause component. By extension, it illuminates an additional aspect of the expletiveness of Greek anticausative voice: apart from the identity function semantics, non-active Voice in Greek anticausatives stands in a local syntactic relationship with a causative little *v* with respect to which it encodes redundant cause-related information. It is argued here that it is exactly this local semantic redundancy that allows Greek anticausative VoiceP to be interpreted as expletive. In light of the above, the expletiveness of voice in Greek non-actively marked anticausatives can be decomposed into an identity function semantics and a structurally local semantic redundancy.

3 Expletiveness in the nominal domain I: Greek polydefinites and expletive determiners²⁶

3.1 Introduction

The investigation of expletive categories continues with switching focus from the verbal domain of the clause to the nominal domain. In this chapter the grammatical category of determiners is set as the object of study. Let us explore how much they can tell us about expletiveness.

Determiners have been granted the most prominent position in nominal syntax since at least Abney (1987). Definite determiners, in particular, are standardly ascribed the semantics of an iota operator (Sharvy 1980; Partee 1986); they are considered to introduce functions that take a property as their argument and return the (contextually) unique entity that has this property.

- (1) a. The boy arrived.
b. $[[\text{the}]] = \lambda P.\iota x[P(x)]$
 $[[\text{the boy}]] = \iota x[\text{boy}(x)]$
 $[[\text{The boy arrived}]] = \iota x[\text{boy}(x) \ \& \ \text{arrived}(x)]$

Crucially, there are languages where definite articles cooccur not only with common nouns, as in (1) above, but also with proper names:

- (2) La Maria ha mangiato. *Italian*
the Maria has eaten
'Maria ate.'

²⁶ This chapter is partly based on the study published as Tsiakmakis et al. (2021a).

- (3) O Fivos efaye. Greek
 the Fivos ate
 ‘Fivos ate.’

If proper names, like *Maria* and *Fivos* in (2) and (3), are regarded as rigid designators (Kripke 1980), then the semantics of the definite articles *la* and *o* in the respective examples cannot be the same as the one of *the* in (1b). In other words, if proper names themselves refer to the same unique entity across worlds, then the iota function introduced by the definite determiner is redundant (see Espinal to appear).

Longobardi (1994) is one of the first to characterize the instances of definite articles preceding proper names as expletive determiners, that is as determiners with zero semantic import. Espinal (to appear) further specifies their expletiveness as the lack of iota function semantics. Given that they are obligatory in Greek, definite determiners accompanying proper names would be a great candidate for the present study. However, the view that proper names denote entities and not properties, on which the expletiveness view of these determiners heavily relies, is not undisputed. The alternative view, namely that proper names are predicates, has also been put forth in the linguistic and philosophical literature (Boër 1975; Matushansky 2006, 2008; Fara 2010; Bach 2015). Especially for Greek, arguments for the latter have been provided based on the interpretation of articleless proper names (Alexopoulou & Folli 2011) and the unavailability of proper name compounds in this language (Alexiadou 2019b).²⁷

²⁷ Proper names in English appear without a definite determiner and can partake in compound formation. Greek proper names, on the other hand, are obligatorily preceded by the definite article and cannot form part of a compound. Compare the examples below:

(i) Kerry supporter (Alexiadou 2019b: 855, ex. (1))

(ii) *tsipr-o- thavmastis
 Tsipras admirer
 ‘admirer of Tsipras’ (Alexiadou 2019b: 856, ex. (5b))

Alexiadou (2019b) considers the contrast above as evidence that Greek proper names differ from their English counterparts in that the former are not referential. Therefore, they need to co-occur with the definite article when they are used as arguments. Notice that the intended interpretation in (ii) can only be conveyed by (iii), which includes the definite determiner:

(iii) thavmastis tu Tsipra
 admirer the.GEN Tsipras.GEN
 ‘admirer of Tsipras’ (Alexiadou 2019b: 856, ex. (7a))

Given that the expletiveness of the definite determiner in the environments discussed above is contingent on independent assumptions regarding the semantics of proper names, another Greek construction that allegedly involves expletive determiners is preferred for the case study to be presented in this chapter. Specifically, Greek polydefinite DPs (Kolliakou 1995) are picked out as the most adequate choice. Once again, the aim is twofold. First, to confirm that the definite determiner emerging in polydefinite constructions is a good expletive candidate. Second, to determine the content of the expletiveness of this determiner and gain more general insight on the status of expletive categories.

The chapter is organized as follows: Section 3.2 is an exposition of the form and properties of Greek polydefinite DPs. In Section 3.3, the existing insight on Greek polydefiniteness is summarized. Section 3.4 describes in detail an experimental study aiming at shedding light on the syntax and interpretation of polydefinites. In Section 3.5 the consequences of the experimental results for polydefiniteness are exposed. Section 3.6 explores how the study of Greek polydefinite DPs can inform the study of expletiveness. Finally, Section 3.7 concludes the chapter.

3.2 Greek polydefinites: what are they?

In Greek definite DPs, adjectival modifiers appear before the noun, while postnominal adjectives in this environment normally lead to ungrammaticality (Tzartanos 1989; Holton et al. 1997); compare examples (4a) and (4b) below. The asymmetry in grammaticality between prenominal and postnominal adjectival modification disappears when the definite determiner spreads across the DP (Androutsopoulou 1995) in the way shown in (4c, d).

- (4) a. ta kitrina podhilata
 the yellow bikes
 b. *ta podhilata kitrina
 the bikes yellow

- c. ta kitrina ta podhilata
 the yellow the bikes
- d. ta podhilata ta kitrina
 the bikes the yellow
 ‘the yellow bikes’

Kolliakou (1995) is the first one to carry out a thorough study on the constructions exemplified by (4c, d), within the Lexical-Functional Grammar framework. She labels DPs with this form as *polydefinites*, contrasting them with standard definites (4a), which she dubs as *monadic*. This terminology is adopted for the purposes of the present chapter.

Polydefinite DPs are more complex than one can infer from the examples above. They can involve multiple modifiers, with complete (5a, b) or partial spreading of the determiner (5c, d). Stavrou (1995) and Alexiadou and Wilder (1998) note that partial determiner spreading sounds marked but is still accepted by native speakers of Greek. The only restriction that must be observed in this latter case is that each postnominal adjective be preceded by its own determiner; notice the ungrammaticality of (5e).

- (5) a. ta podhilata ta palia ta kitrina
 the bikes the old the yellow
- b. ta kitrina ta podhilata ta palia
 the yellow the bikes the old
- c. ta kitrina podhilata ta palia
 the yellow bikes the old
- d. ta palia podhilata ta kitrina
 the old bikes the yellow
- e. *ta kitrina ta podhilata palia
 the yellow the bikes old
 ‘the old yellow bikes’

Moreover, polydefiniteness grants constituent ordering freedom to definite DPs. Unlike English, Greek is one of the languages that have no strong restrictions when it comes to the order of adjectives within the DP

(Holton et al. 1997). However, some orders are considered as more natural than others. What appears to be spreading of the definite determiner makes all possible constituent orders felicitous (Alexiadou et al. 2007), once again with the caveat that every postnominal adjective must be preceded by its own determiner.

- (6) a. ta palia kitrina ksilina podhilata
the old yellow wooden bikes
- b. #ta ksilina kitrina palia podhilata
the wooden yellow old bikes
- c. ta palia ta kitrina ta ksilina ta podhilata
the old the yellow the wooden the bikes
- d. ta ksilina ta kitrina ta palia ta podhilata
the wooden the yellow the old the bikes
‘the old yellow wooden bikes’

For the sake of completeness, it must be noted that polydefinite DPs can contain not only adjectives but also participles (7).

- (7) a. ta skuriazmena ta podhilata
the rust.PTCP the bikes
- b. ta podhilata ta skuriazmena
the bikes the rust.PTCP
‘the rusty bikes’

Most intriguingly, polydefiniteness can arise even in DPs consisting of full proper names (Mackridge 1985), as in the examples below. Recall that Greek is one of those languages where proper names in argument position are obligatorily preceded by the definite article. Therefore, it is only the presence of the second definite determiner that makes (8a, b) relevant for the present discussion.

- (8) a. o Kostas o Papadhopoulos
the Kostas the Papadhopoulos

b. o Papadhopoulos o Kostas
 the Papadhopoulos o Kostas
 ‘Kostas Papadopoulos’

Examples (4-8), and all their possible word order permutations that have been omitted due to space considerations, give a broad but accurate idea about the external properties of Greek polydefinite DPs, what they look like. However, the relationship between polydefiniteness and expletiveness may still remain unclear to the reader. For this, one needs to turn to the meaning of Greek polydefinites.

The monadic DPs and their polydefinite counterparts from the previous examples involve the same nouns and modifiers, differing only in the number of determiners they include. As mentioned already in the introduction, definite articles are standardly assumed to denote the (contextually) unique entity characterized by the property denoted by the noun they combine with (Sharvy 1980; Partee 1986). This creates the expectation that, in the simplest polydefiniteness case where there are two determiners, reference will be made to two distinct entities. However, the attentive reader has already noticed that this is not the case.

In the examples above, monadic and polydefinite DPs received the same English translation, suggesting that the two types of definite DPs share the same contribution to meaning. This must mean that at least one of the definite determiners in (4c), for example, does not introduce an iota function. An additional argument in support of this conclusion comes from agreement data. The Greek verb agrees with the subject in person and number. A singular polydefinite subject-DP triggers singular agreement on the verb, which shows that it refers only to one entity despite its multiple definite determiners (Lekakou & Szendrői 2012).

(9) To podhilato to kitrino xalase /*xalasan.
 the bike the yellow broke.SG broke.PL
 ‘The yellow bike broke.’

The generalization that the different determiners of a polydefinite DP do not introduce independent iota functions is further supported by the fact that they give rise to what is known in the literature as the Haddock’s puzzle –see Bumford (2017) for a recent discussion and a potential solution. Put simply, the polydefinite DP *to podhilato to kitrino* ‘the yellow bike’ from example (9) does not refer to a unique bike in the immediate context and a unique yellow object in the immediate context, finally identifying the two. Instead, the use of this DP is felicitous also when there is more than one contextually salient bike, there is more than one contextually salient yellow object, but there is only one object that is both a bike and yellow (Kolliakou 2004).

If Greek polydefinite DPs feature instances of the definite article that do not contribute their standard semantics to the meaning composition of the sentence they appear in, they are primary suspects for hosting expletive determiners and, consequently, excellent candidates for a case study of expletiveness in the nominal domain of Greek. The next step in this study, that is the breakdown of this expletiveness in its constituting parts, requires that one looks into potential interpretative asymmetries between monadic and polydefinite DPs.

3.3 Greek polydefinites: why are they?

Upon alluding to the existence of polydefiniteness in proper name DPs as a construction that forms part of Greek grammar, Mackridge (1985) specifies that proper name polydefinites differ from their monadic equivalents in that the former have a colloquial status. While example (10a) could be found both in a magazine or in a late-night television show, (10b) would be expected only in the contextual setting of the latter.

- (10)a. I Ana Visi taksidese stis Maldives.
 the Anna Vissi travelled to.the Maldives
- b. I Ana i Visi taksidese stis Maldives
 the Anna the Vissi travelled to.the Maldives
 ‘Anna Vissi travelled to Maldives.’

Manolessou (2000) generalizes this claim to Greek polydefinite DPs that involve common nouns, characterizing polydefiniteness in general as a colloquial phenomenon, reserved for spoken speech and informal registers (see also Panagiotidis & Marinis 2011; Guardiano & Stavrou 2019). Using the same newspaper vs. late-night show distinction as before for illustration, example (11a) is suitable for the cooking section of both the magazine and the television show. Example (11b), on the other hand, is appropriate only for the latter.

- (11) a. Anakatevume to koskinismeno alevri me ta avgha.
 we.mix the sift.PTCP flour with the eggs
- b. Anakatevume to alevri to koskinismeno me ta
 we.mix the flour the sift.PTCP with the
 avga.
 eggs
 ‘We mix the sifted flour with the eggs.’

It is noted that the colloquiality of Greek polydefinites is not explored further in Manolessou’s study, thus being treated merely as a descriptive generalization.

Kolliakou (1995, 2004) highlights a second respect in which polydefinites differ from their monadic equivalents. In fact, she makes the first attempt to capture the essence of this special construction by formulating her Polydefiniteness Constraint: “Greek polydefinites are unambiguously non-monotone anaphoric expressions: the discourse referent Y of a polydefinite is anaphoric to an antecedent discourse referent X, such that $Y \subset X$ ” (Kolliakou 2004: 273).²⁸ Let us make this clearer by reference to the following minimal pair.

²⁸ See also Tsakali (2008) for the claim that Greek polydefinites, like Greek clitic-doubled DPs, are subject to Heim’s (1982) Prominence Condition: they can refer to their antecedent anaphorically but not associatively. In (i) below, adapted from Alexiadou (2014: 23, ex. (20b)), the polydefinite DP *ton dhiasimo ton singrafea* ‘the famous author’ can only refer to Arthur Miller and not to the author of the book that Yanis read.

(i) O Yanis dhiavase ena vivlio ya ton Arthur Miller;
 the Yanis read a book for the Arthur Miller
 ke thelise na gnorisi ton dhiasimo ton singrafea_{j/#i}
 and wanted to meet the famous the author

- (12)a. O proponitis apofasise oti *i* *anipakui*
 the coach decided that the disobedient
 athlites tha apovlithun.
 athletes will be.expelled
- b. O proponitis apofasise oti *i* *anipakui*
 the coach decided that the disobedient
 i *athlites* tha apovlithun.
 the athletes will be.expelled.

‘The coach decided that the disobedient athletes will be expelled.’

The monadic DP *i anipakui athlites* ‘the disobedient athletes’ in (12a) is ambiguous between a non-restrictive reading of the adjective, according to which all the athletes talked about are disobedient, and a restrictive reading of the adjective, according to which only those athletes who are disobedient will be expelled. Interestingly, Kolliakou (1995, 2004) observes, the polydefinite variant *i anipakui i athlites* in (12b) only receives the latter interpretation; the discourse referent introduced by the polydefinite, i.e., the set of disobedient athletes, is a proper subset of the discourse referent to which the polydefinite DP refers anaphorically, i.e., the set of athletes relevant to the discussion.

Kolliakou’s (2004) Polydefiniteness Constraint suggests that not all monadic DPs have a polydefinite equivalent. Specifically, it predicts that only predicative modifiers that can be interpreted intersectively and restrictively make appropriate constituents for polydefinites. Adjectives that cannot be used predicatively (13), or adjectives that have a predicative source but cannot receive a restrictive interpretation (14), are predicted to make bad polydefiniteness candidates:

apo konda.
 from close
 ‘Yanis read a book about Arthur Miller and wanted to meet the famous author in person.’

- (13) a. #O listis itan ipotithemenos.
 the thief was supposed
 b. #o listis o ipotithemenos
 the thief the supposed

- (14) a. I sigrusi itan apotropea
 the conflict was hideous
 ‘The conflict was hideous’
 b. #i sigrusi i apotropea
 the conflict the hideous

It is important to bear in mind that Kolliakou (2004) constrains the kinds of modifiers that can appear as parts of a Greek polydefinite DP at the level of discourse interpretation. This is in part different from what is found in the generative literature on polydefiniteness, which has often tried to derive the Polydefiniteness Constraint in the core grammar, either at the level of syntax –by postulating a reduced restrictive relative clause structure for polydefinite DPs (Alexiadou & Wilder 1998; Alexiadou 2014, among others)– or at the level of semantics (Lekakou & Szendrői 2012) –by analyzing polydefiniteness as the result of theta-identification in the sense of Higginbotham (1985). Interestingly, next to these proposals one also finds studies drawing attention to polydefinite examples that involve a non-restrictively interpreted modifier (Manolessou 2000; Panagiotidis & Marinis 2011).

- (15) Kalos ta koritsia ta omorfa!
 well the girls the beautiful
 ‘Hello, beautiful girls!’

- (16) Vyes na se fisiksi o krios o aeras.
 get.out to you blow the cold the wind
 ‘Go get some fresh air.’

The tension between those analyses that take the restrictive interpretation of the modifier as an intrinsic property of polydefiniteness (Alexiadou & Wilder 1998; Lekakou & Szendrői 2012; Alexiadou 2014) and those analyses that relate the two only indirectly (Manolessou 2000; Campos & Stavrou 2004; Guardiano & Stavrou 2019) has given rise to an unresolved debate, oftentimes softened with the speculation that non-restrictively modified polydefinites involve coercion into a restrictive reading (Lekakou & Szendrői 2012), that they exemplify a phenomenon distinct from polydefiniteness proper (Lekakou & Szendrői 2012; Giusti 2015), or that their very existence is subject to dialectal variation (Alexiadou 2014).

The gathered wisdom regarding the essence of Greek polydefinite DPs that distinguishes them from their monadic counterparts can be summarized in (i) the fact that they involve at least one determiner that is not interpreted standardly as introducing an iota function, (ii) the understated observation that they belong to colloquial Greek, and (iii) the controversial claim that they involve restrictively interpreted modifiers. Crucially, with the exception of Manolessou's (2000) corpus study on polydefiniteness in the diachrony of Greek, no attempt has been made to provide sufficient empirical support to the insight reflected in (ii) and (iii). The experimental study presented in detail in the following section aims to fill exactly this gap, ultimately pursuing to provide an empirically motivated analysis of Greek polydefinites and illuminate the different aspects of the expletiveness of the determiners they involve.

3.4 Restricting polydefiniteness: three experiments

In order to take an empirically motivated stance as to the claims made in the previous linguistic literature, an experimental study focusing on the distribution and interpretation of Greek polydefinite DPs was carried out. The

study consisted in three separate experiments, which are thoroughly described in the following subsections.²⁹

3.4.1 Experiment 1: On the restrictiveness of polydefinite modifiers

The first experiment was an acceptability judgment task that addressed the most discussed property attributed to Greek polydefinites, that is the restrictive interpretation of the modifiers that form part of this construction (Kolliakou 1995, 2004; Alexiadou & Wilder 1998; Alexiadou et al. 2007; Lekakou & Szendrői 2012; Alexiadou 2014, among others). It aimed to test the accuracy of this generalization and, ideally, explain the debate that it has given rise to. To this end, the distinction between monadic and polydefinite DPs was tested against prototypically restrictive and non-restrictive modifiers. The subject vs. object position of the test-DP was added as an additional factor that may correlate with the acceptability of restrictively and non-restrictively modified polydefinites.

Considering the reportedly colloquial status of polydefiniteness, the stimuli were presented to participants in the form of recorded question-answer pairs performed by Greek speakers.³⁰ Participants were asked to rate the naturalness of each answer, taking into account the respective question. This experiment was administered via SurveyGizmo.

Participants

A total of 77 native speakers of Greek (20 male, 57 female; mean age 28.87 years, SD = 10.36) voluntarily completed Experiment 1. Participants were recruited via Facebook and other social media platforms.

Materials

The materials used for Experiment 1 were built around 5 modifiers that are easily interpreted as restrictive (*kokinos* ‘red’, *meghalos* ‘big’, *xondros* ‘fat’/‘thick’, *oreos* ‘beautiful’, *dhermatinos* ‘leather’) and 5 modifiers that

²⁹ A pilot experimental study on Greek polydefinites, preceding the one described here, can be found in Tsiakmakis et al. (2022a).

³⁰ Special thanks to Anna Kampanarou and Maria Konstandinidou, for lending their voices to Experiments 1 and 2.

prototypically receive a non-restrictive interpretation. The latter included three privative modifiers (*feromenos* ‘alleged’, *ipotithemenos* ‘supposed’, *proin* ‘former’), the relational adjective *elinikos* ‘Greek’ and the subjective evaluative adjective *ekpliktikos* ‘amazing’.

Each of the 10 modifiers listed above appeared as part of two monadic and two polydefinite DPs, leading to a total of 40 experimental items. Half of the DPs were in subject position whereas the other half were construed as objects. The constituent order of all test polydefinites was consistent across items: determiner + noun + determiner + adjective.

The test-DPs were presented to participants as responses to *who*-, *which*- and *what*-questions, giving the experimental items the form of short dialogues. Note that the different *wh*-words created different discourse conditions for the referents of the answer-DPs. This manipulation of the information structure allowed to check not only whether polydefinites prefer restrictively interpreted modifiers but also whether this restriction becomes relevant at the level of discourse interpretation (Kolliakou 2004) or it stems from the semanticosyntactic structure of polydefinite DPs (Lekakou & Szendrői 2012; Alexiadou 2014, among others). Two examples from the item list, translated into English for the reader’s convenience, are provided below.³¹

(17)Q: Pios aftoktonise ya na min paradhothi?
who self.killed for to not self.turn.in
‘Who committed suicide not to turn himself in?’

A: O feromenos dhrastris.
the alleged murderer.
‘The alleged murderer.’

(18)Q: Pion sinelavan kiolas?
who arrested already
‘Who did they arrest already?’

³¹ The complete list of experimental materials of Experiment 1 and the obtained sociolinguistic information on the participants can be found at <https://doi.org/10.6084/m9.figshare.14706303>.

A: Ton taraksia to feromeno.
the trouble-maker the alleged
'The alleged trouble-maker.'

The responses in both (17A) and (18A) involve the prototypically non-restrictively interpreted modifier *feromenos* 'alleged'. They differ in that the former consists of a monadic DP, whereas the latter features a polydefinite DP. If the constraint regarding the restrictive interpretation of polydefinite modifiers holds, (17A) is predicted to trigger significantly higher naturalness ratings than (18A). It is further noted that the two responses differ as regards their syntactic position in the clause; (17A) is a subject while (18A) is construed as an object. Crucially, this asymmetry was not expected to play any significant role as no such claim has been made in the previous literature on polydefiniteness.

The set of critical items of Experiment 1 was complemented with 20 question-answer pairs that worked as distractors. These had the form of *when*, *where*, and *how*-questions answered either by DPs of the type determiner + noun or PPs of the type preposition + determiner + noun. The responses related to these filler items did not involve any modifier, they did not have polydefinite variants and, therefore, they were irrelevant to the specific research question addressed by the experiment.


Participants were given the following instructions: "Now, you will listen to a set of mini-dialogues, which are divided into a question and an answer. After listening to each mini-dialogue, a scale will appear on your screen from totally unnatural to absolutely natural. We ask you to use that scale to rate how natural each reply is to the respective question."

All participants rated the total of items producing 60 ratings each (40 criticals + 20 fillers). Leaving the fillers aside, the reported results are based on 3,080 responses (77 participants × 40 test items).


Procedure

Participants completed Experiment 1 using their personal computer or smart device. After reading the instructions and filling in a questionnaire regarding their sociolinguistic background, they started the main task. Participants were

presented with different randomized versions of the list of materials. All experimental items consisted of an audio file containing a short dialogue and a rating scale. An example of what participants saw on their screens, translated into English, is given below.

(19) [Ti exis mesa sto plindirio? Tin kuverta ti xondri.] 

‘What do you have in the washing machine? The blanket the thick.’

katholu fisiki  apolita fisiki

‘totally unnatural’ ‘absolutely natural’

The median duration of the experiment was 15' 27".

Results

The results of Experiment 1, as a function of Definiteness (monadic, polydefinite), Restrictiveness (restrictive, non-restrictive) and Position (subject, object), are summarized in Figure 1. A set of dotted-contour violin plots show the underlying distribution of the data and the location of the median value. The two levels of Definiteness are specified on top of the graph, the two Restrictiveness values appear in the x-axis and the two values of Position are depicted as two different tones of grey.

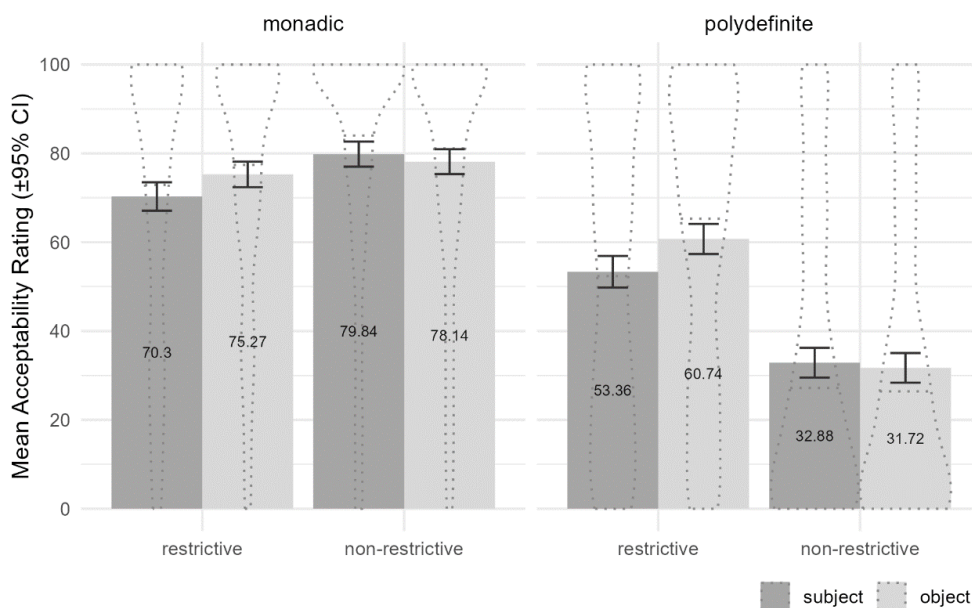


Figure 1. Results: Definiteness × Restrictiveness × Position (Tsiakmakis et al. 2021a: 165, FIGURE 1)

Figure 1 shows that native Greek speakers have a general preference for monadic over polydefinite DPs: while monadics have a mean acceptability rate around 75%, the mean rating of polydefinites is $\leq 60\%$. Restrictiveness seems to play a role only in the case of polydefiniteness. Restrictively modified polydefinite DPs are strongly preferred over non-restrictively modified ones. Finally, Position appears to have an unclear role, maybe relevant only for those DPs that contain restrictive modifiers.

The *glmmTMB* package in R was used for the analysis of the data obtained from the experiment. A generalized linear mixed-effects model was run, with the speakers' judgment as the dependent variable. The independent variables Definiteness, Position, Restrictiveness, and all their possible interactions were set as fixed factors. Concerning the random factors, the model included a random slope for Definiteness and Restrictiveness by subject, a random slope for Position by subject, and a random intercept for Item. Model selection was performed by means of the package *performance* in R; in this way, it was made sure that the inferential results are not affected by critical individual differences but reflect the general behavior of all subjects.

No fixed effect in which Position was implied was found to be significant, but significant effects for Definiteness and Restrictiveness, as well as for the paired interaction Definiteness \times Restrictiveness, were found. The main effect of Definiteness, $\chi^2(1) = 68.152$, $p < .001$, suggests that monadic structures were better evaluated than polydefinite structures overall (Cohen's $d = 1.36$, $p < .001$). The main effect of Restrictiveness, $\chi^2(1) = 9.951$, $p = .002$, suggests that restrictive contexts were better evaluated than non-restrictive contexts overall ($d = 0.40$, $p = .002$).

The paired interaction Definiteness \times Restrictiveness, $\chi^2(1) = 34.135$, $p < .001$, can be interpreted as such that polydefinites were better evaluated in restrictive contexts than in non-restrictive ones ($d = 1.08$, $p < .001$), whereas restrictiveness did not play a significant role when using monadic structures ($d = 0.27$, $p = .117$). The other way to interpret this finding would indicate a preference for monadic structures for both restrictiveness levels, though this

preference would be larger for non-restrictive contexts ($d = 2.03, p < .001$) than for restrictive ones ($d = 0.68, p = .001$).³²

Discussion

The main results of Experiment 1 that are of relevance to our discussion can be summarized in the following three generalizations: (i) Participants showed a significant preference for monadic over polydefinite DPs, (ii) Participants showed a significant preference for polydefinites involving prototypically restrictively interpreted modifiers over those involving non-restrictive modifiers, and (iii) Participants did not completely reject polydefinite DPs featuring non-restrictive modifiers. Let us look closer into these findings one by one.

The fact that polydefinite DPs received significantly lower naturalness ratings than monadics could relate to the interaction between Kolliakou's (2004) Polydefiniteness Constraint and our experimental design. Concretely, Experiment 1 introduced polydefinite DPs as answers to *who*-, *which*- and *what*-questions. However, if polydefinites are non-monotone anaphoric expressions in the sense indicated by Kolliakou, only *which*-questions would presumably create the right discourse conditions for polydefiniteness. Under such reasoning, *who*- and *what*-question items could have dragged the naturalness of polydefinite DPs lower.

Entertaining the possibility above, further analyses were run assessing the role of the specific *wh*-word with respect to the naturalness ratings that speakers attributed to the test-DPs. As regards restrictively modified DPs, those that responded to *what*-questions were significantly preferred over those that responded to *which*-questions ($d = 0.30, p < .001$). Within the non-restrictively modified ones, responses to *what*-questions received significantly higher ratings than responses to *who*-questions. Importantly, the additional analyses could not confirm the correlation between the speakers' preference for monadic DPs and the Polydefiniteness Constraint. In the absence of a more convincing alternative, this result is speculatively

³² See Tsiakmakis et al. (2021a) for complementary item analyses for adjectives and *wh*-words.

attributed to the colloquial status of polydefinite DPs (Manolessou 2000). It needs to be clarified, though, that Experiment 1 did not test for colloquiality.

Moving on to generalization (ii), the fact that native Greek speakers provided significantly higher ratings for restrictively modified polydefinites than for non-restrictively modified ones is at the heart of the research question that Experiment 1 addressed. This result brings for the first time experimental support to the view that the modifiers that make parts of Greek polydefinite DPs are interpreted restrictively, which is shared by most of the researchers who have worked on this topic (Kolliakou 1995, 2004; Alexiadou & Wilder 1998; Campos & Stavrou 2004; Lekakou & Szendrői 2012; Alexiadou 2014; Guardiano & Stavrou 2019, among others). In light of this finding, any grammatical description of Greek polydefinite DPs needs to derive in some way or another the restrictive interpretation of the modifiers involved.

And what about the examples of non-restrictively modified polydefinites reported in the literature (Manolessou 2000; Panagiotidis & Marinis 2011)? This brings us to the third main finding of Experiment 1, namely that native Greek speakers did not fully reject polydefinite DPs that involved prototypically non-restrictively interpreted modifiers; in fact, the latter triggered mean naturalness ratings higher than 30%. There are two ways to interpret this result.

One way to go is to take the non-zero ratings of non-restrictively modified polydefinites to reflect the relatively high interpretability of these phrases; non-restrictive polydefinites are not acceptable but can still be assigned an interpretation and are, therefore, rated as marginally natural. This rationale is supported by psycholinguistic research showing that speakers can ascribe systematic interpretations to ungrammatical constructions (Beltrama & Xiang 2016; Wellwood et al. 2018; Etxeberria et al. 2018) or can even learn ungrammatical constructions (Kaschak & Glenberg 2004; Ivanova et al. 2012). Note that under this interpretation of the experimental results, it appears that Experiment 1 has nothing to say about the existence of Greek polydefinite DPs with non-restrictively interpreted modifiers.

Alternatively, the higher than 30% naturalness ratings of non-restrictive polydefinites can be considered as indicative of the type of relation between polydefiniteness and restrictive interpretation of the modifier. Concretely, the

literature has suggested a causal link between the polydefinite construction and restrictive modification. The results of Experiment 1, however, can be viewed as indicating that restrictiveness concerns a major part of Greek polydefinite DPs, but the grammar of Greek also allows the generation of non-restrictively modified polydefinites. Under this line of interpretation, the often-cited polydefinite examples with non-restrictive modifiers are to be considered as stemming from a different grammatical structure than standard restrictive polydefinites, pace Lekakou & Szendrői (2012) and Alexiadou (2014) for instance. Ideally, though, the analyses proposed for the two types of polydefinites should be for the most part parallel.

The issue above is explored further in Section 3.5, which is devoted to the formal analysis of Greek polydefiniteness. Now it is time to move to the second experiment and dive deeper into the characteristic properties of polydefinite DPs.

3.4.2 Experiment 2: On polydefiniteness as an informal register construction

Experiment 1 addressed and provided evidence in support of the property attributed to Greek polydefinites that has received the most attention in the literature, i.e., the restrictive interpretation of the modifier(s) involved. Experiment 2 on the other hand fell on the other end, focusing on the most understated polydefiniteness property, that is the colloquial status of the latter (Mackridge 1985; Manolessou 2000; Panagiotidis & Marinis 2011; Guardiano & Stavrou 2019). Specifically, the aim of this second experiment was to gather evidence in favor or against the view that Greek polydefinite DPs belong to a spoken, informal register of Greek; in other words, that they are part of that variety of the language that is used among people of similar social status in non-standardized communicative situations to discuss everyday topics.

To the above aim, the monadic vs. polydefinite distinction was checked for two different types of nouns (common vs. proper) against formal vs. informal register contexts. Similarly to Experiment 1, participants were again

presented with recorded question-answer pairs performed by native Greek speakers and they were asked to evaluate the naturalness of each answer as a reaction to the respective question. This survey was administered via SurveyGizmo, too.

Participants

Experiment 2 was completed voluntarily by 59 native speakers of Greek (19 male, 40 female; mean age 28.92 years, SD = 9.51) recruited via Facebook and other social media platforms.

Materials

For the materials of Experiment 2, 5 proper name DPs consisting of a first name and a last name (*o Alexis Tsipras*, *i Eleni Adoniu*, *o Anestis Papadhopoulos*, *i Lidhia Koniordhu*, *o Vasilis Ioanu*) and 5 common noun DPs consisting of a restrictive adjective and a common noun (*to aromatiko rizi* ‘the aromatic rice’, *to ble pukamiso* ‘the blue shirt’, *to xriso aghalma* ‘the golden statue’, *i ksilini porta* ‘the wooden door’, *o ksanthos dhaskalos* ‘the blond teacher’) were used. All 10 DPs appeared both in their monadic and their polydefinite version (e.g., *o Alexis o Tsipras*, *to rizi to aromatiko*), creating a set of 20 test-DPs. The constituent ordering of polydefinite DPs was kept consistent: determiner + first name + determiner + last name for proper name DPs, and determiner + noun + determiner + adjective for common noun DPs. Each one of the 20 DPs was presented as a short answer to one *who-*, *which-* or *what-*question phrased in formal register and one *who*, *which*, or *what-*question phrased in informal register, finally giving rise to a total of 40 experimental items (see Appendix A1 for the complete list of items used for Experiment 2).

The (in)formality of register was controlled for by manipulating personal reference (second person singular vs. Greek plural of politeness) and the topic of discussion (everyday topic vs. official information), by including vocatives that revealed the level of social distance between the interlocutors, and by exploiting Greek *politypia* (Mackridge 1985): the choice of words from the scholarly and the folksy layer of Greek vocabulary (Anastadiadi & Fliatouras 2019) guaranteed further the informality and formality of the register,

respectively. Let us illustrate this with a couple of examples from the item list, translated into English for convenience.

(20)Q: Pxio aghalma mas klepsane?

‘Which statue did they steal from us?’

A: To aghalma to xriso.

the statue the golden.

(21)Q: Pxio aghalma pistevete oti ekfrazi sto meghisto vathmo tin kalitexniki sas taftotita?

‘Which statue do you believe expresses to the highest degree your artistic identity?’

A: To aghalma to xriso.

the statue the golden.

The polydefinite DP *to aghalma to xriso* ‘the golden statue’ appeared as an answer to both of the examples above. The discourse information in (20), the use of the inclusive first person plural (*mas*) and the folksy variant of the past form of the verb ‘steal’ (*klepsane* instead of *eklepsan*) contribute to its identification as an informal register question. On the contrary, (21) is understood to be part of an interview. The politeness plural (*pistevete, sas*) and the scholarly expression meaning ‘to the highest degree’ (*sto meghisto vathmo*) make it characteristically formal. Given Manolessou’s (2000) claim regarding the colloquial status of polydefiniteness, the polydefinite answer DP is expected to receive higher naturalness ratings in (20) than in (21). No significant difference is expected in similar pairs involving monadic answer DPs.

An additional set of 20 question-answer pairs were used as distractors in Experiment 2. These filler items had the form of *when-*, *where-* and *how-* questions answered by unmodified DPs of the sort determiner + noun or simple PPs of the type preposition + determiner + noun, exactly as in Experiment 1.

The following instructions were given to participants: “Now, you will listen to a set of mini-dialogues, which are divided into a question and an

answer. After listening to each mini-dialogue, a scale from 0 to 100 will appear on your screen. We ask you to use that scale to rate how natural each reply is to the respective question (0 = totally unnatural, 100 = absolutely natural).”

All participants rated the total of items, producing 60 ratings each. Leaving the fillers aside, a total of 2,360 responses (59 participants × 40 test items) were statistically analyzed.


Procedure

The procedure followed for Experiment 2 was similar to the one described for the previous experiment. Participants used their own computers to carry out the task. After reading the instructions, they were asked to answer a brief sociolinguistic questionnaire (see Appendix A1 for details). The task started right after the questionnaire was completed. Different randomized versions of the 60 question-answer pairs that constituted the materials of this experiment were presented to the subjects. Each question-answer item consisted of an audio and a 100-point rating scale. There follows an example of what the participants saw on their screens, translated here into English.

(22)[Pxia porta dierixthi simfona me tin katathesi, iparxiye? I porta i ksilini.]

‘Which door was broken into according to the report, officer? The wooden door.’



katholu fisiki  apolita fisiki
‘totally unnatural’ ‘absolutely natural’

The average duration of the experiment was 24' 50".

Results

Figure 2 shows the results to Experiment 2 as a function of Definiteness (monadic, polydefinite), Fomality (formal, informal), and Noun Type (common noun, proper name). The two values of Definiteness appear on top of the graph, whereas the two values of Formality appear in two grey colors. The two values of Noun Type are given in the abscissa.

The graph shows that monadic responses were preferred over polydefinite ones: monadics have a mean rate of acceptability $\geq 75\%$ whereas polydefinites have a mean rate $< 75\%$. Polydefinite constructions are rated higher in informal contexts than in formal ones, while monadic constructions tend to show no pattern regarding formality or, even, display the opposite one. Proper names generally display greater naturalness ratings compared to common nouns; however, monadic proper names are preferred in formal contexts, and polydefinite proper names are preferred in informal contexts. Concerning common nouns, monadics receive similar ratings in formal and informal contexts, whereas polydefinites are preferred in informal contexts.

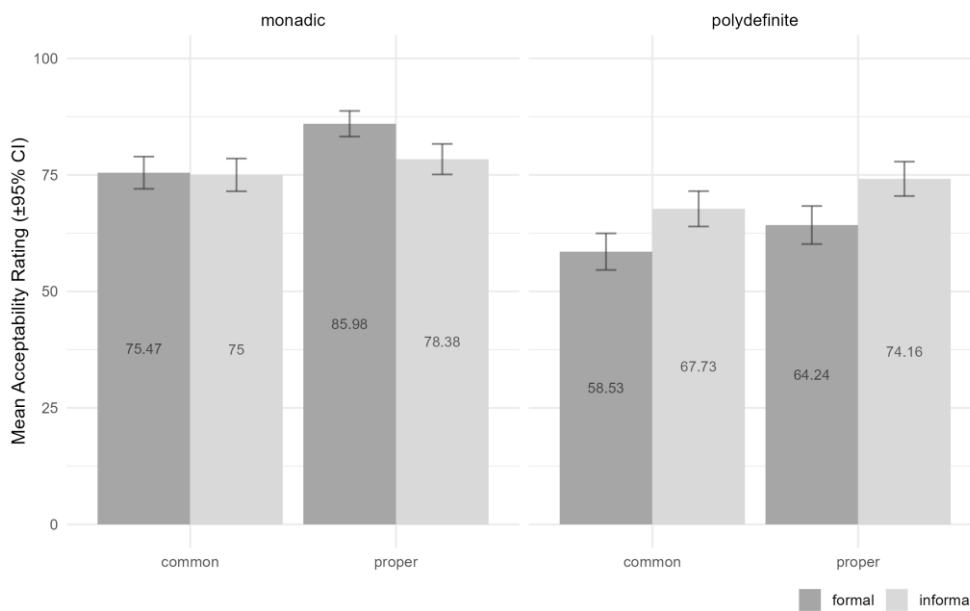


Figure 2. Results of Experiment 1: Definiteness \times Formality \times Noun Type

The data obtained from Experiment 2 were analyzed using the *glmmTMB* package in R. A series of linear mixed-effects models using different random effects structures were performed, from the most complex random effects structure to a model with only subject as a random intercept. All structures providing no model converge problems were compared using the function *compare_performance* from the *performance* package to identify the model that best fitted the data. In the reports below, the omnibus test results are provided plus the output of a series of pairwise tests performed with the

emmeans package, which include a measure of effect size by using Cohen's *d*.

For the analysis of the results of Experiment 1, Definiteness, Formality, Noun Type, and all their possible interactions were set as fixed factors. Random slopes for Definiteness, Formality, and Noun Type by Subject plus a random intercept for Item were included in the model.

Two main effects and one paired interaction were found to be significant: the main effects of Definiteness and Noun Type, and the interaction Definiteness \times Formality. The main effect of Definiteness, $\chi(1) = 14.024, p < .001$, suggests that monadic structures were more accepted than polydefinite structures (Cohen's $d = 0.54, p < .001$). The main effect of Noun Type, $\chi(1) = 11.628, p = .001$, suggests that proper names were more accepted than common nouns ($d = 0.28, p = .001$).

The paired interaction Definiteness \times Formality, $\chi(1) = 12.693, p < .001$, can be interpreted in two complementary ways. First, whereas in formal contexts monadic structures are preferred over polydefinite ones ($d = 0.83, p < .001$), the two structures are not found to be significantly different in informal contexts ($d = 0.25, p = .136$). Second, a stronger preference for polydefinite structures is found in informal contexts than in formal ones ($d = 0.41, p < .001$), though monadic structures are found to be similarly suitable for any formality level ($d = 0.17, p = .135$).

Discussion

Summing up, the main findings of Experiment 2 that are relevant for our purposes are the following: (i) Participants preferred monadic DPs to polydefinite ones, and (ii) Participants showed a significant preference for polydefiniteness in informal contexts over polydefiniteness in formal contexts. Regarding the latter, it relates directly to the specific goal pursued via Experiment 2. Manolessou's (2000) claim that polydefiniteness has a colloquial, informal status in the grammar of Greek, shared by Panagiotidis and Marinis (2011) and Guardiano and Stavrou (2019) among others, received experimental support for the first time.

As was suggested already in the discussion of the results of Experiment 1, the link between polydefiniteness and colloquiality may also explain the

general preference for monadic over polydefinite DPs –see the finding in (i)– obtained in both of the experiments described so far. Notice that, in Experiment 2, polydefinites received significantly lower ratings than monadics only in the formal register condition, not in the informal register one. In other words, if Greek speakers have the knowledge that polydefinites belong to lower registers of the language –and evidence has been provided that they do– they may have felt the need to rate them as less natural than monadics which belong also to standard and high registers.

The question coming up next is whether the link between Greek polydefinites and informal register is to be regarded simply as an aspect defining the sociolinguistic status of the phenomenon or it reflects some deeper interpretative property of polydefiniteness. Given the unavailability of sufficient evidence to either support or discard this latter alternative, a third experiment was carried out in search of an empirically motivated answer.

3.4.3 Experiment 3: On polydefiniteness and speaker-to-addressee closeness

Manolessou (2000: 167) claims that polydefiniteness “is more frequent in spoken language, where it often contains an affective meaning”. In the author’s view, this affection targets the referent of the polydefinite DP, as is evidently the case in (23) and (24) below:

- (23) to kakomiro to pedhi
the bad.fated the kid
‘poor kid’
- (24) to ghliko mu to skilaki
the sweet mine the dog.DIM
‘my sweet doggy’

There are two things worth noting regarding such examples. First, it is clear that in both cases the speaker’s affection towards the kid (23) and the dog (24) is not conveyed by the polydefinite construal but by the adjectives *kakomiro*

‘poor’ and *ghliko* ‘sweet’, respectively. This is supported further by the fact that no affection towards the plastic cup is expressed in (25) below.

(25) to plastiko to potiri
 the plastic the cup
 ‘the plastic cup’

Second, especially the polydefinite DP in (24) can be used as addressed not only to a person holding a cute dog but also to the dog itself.

Considering the above, it is hypothesized that the connection between polydefiniteness and affectiveness is not to be discarded, but it is to be rethought. If affectiveness is redefined as social or emotional closeness directed from the speaker not to the referent of the DP but to the addressee, then it is possible that this connection can be maintained. Most interestingly, it can be maintained under such terms that relate it causally to the informal register specification of polydefinites. Clearly put, if polydefiniteness conveys some kind of proximity between the speaker and the addressee, it is expected to arise mostly in spoken speech and informal communicative situations.

The aim of Experiment 3 was to test this very hypothesis. The distinction between monadic and polydefinite DPs was checked against what will be dubbed as familiar and unfamiliar situations. A situation was considered as familiar when a relation of social or emotional closeness between the speaker and the addressee could be inferred; it was understood as unfamiliar otherwise. The design of Experiment 3 was similar to the design of the previous two experiments in that the items had the form of short question-answer pairs. The main difference was that, in this case, the experimental items were presented as written stimuli instead of audio files, and that they were further preceded by brief situation descriptions. This survey was also administered via SurveyGizmo.

Participants

The results reported for Experiment 3 are based on the responses of 94 native speakers of Greek (30 males, 64 females; mean age 32.40 years, SD = 9.84),

who volunteered to take part in the experiment; they were recruited via Facebook and other social media platforms.

Materials

A set of 24 DPs consisting of a restrictive modifier and a common noun was used for the materials of Experiment 3 (e.g., *i kafetia skilitsa* ‘the brown dog’, *to mavro alogho* ‘the black horse’; see Appendix A1 for the complete list of items). Each DP, both in its monadic and its polydefinite variant, appeared as a response to the same *who*-, *which*- or *what*-question. Again, the order of constituents of polydefinite DPs was kept consistent: determiner + noun + determiner + adjective (e.g., *i skilitsa i kafetia*). Moreover, the *wh*-questions were phrased in a register as neutral as possible, to make sure that the effect found in Experiment 2 would not confound the results of the present experiment. Finally, the familiarity parameter was introduced. Half of the 24 *wh*-questions were preceded by the description of a familiar situation, while the other half were preceded by the description of an unfamiliar communicative situation.

The situation description that appeared before every question-answer pair either explicitly mentioned the relationship between the interlocutors or provided enough evidence for the participant to infer it easily. Those situations that involved social or emotional closeness between the speaker and the addressee were considered as familiar. Those that conveyed the absence of such closeness were regarded as unfamiliar. The following examples from the item list, translated here into English, make this clearer.

(26)[Dyo fili erghates se mia farma sizitun.]

‘Two friends, workers in a farm, are talking.’

Q: Pio alogho efiye apo to stavlo?

‘Which horse left the barn?’

A1: To	mavro	alogho.	A2: To	alogho	to	mavro.
the	black	horse	the	horse	the	black

(27)[I kathiyitria rota na mathi ya tin proodho tu fititi tis.]

‘The profesor asks about her student’s progress.’

Q: Pio arthro etimases ya parusiasi?

‘Which article did you prepare for presentation?’

A1: To efkolo arthro. A2: To arthro to efkolo.
the easy article the article the easy

The description in (26) exemplifies a familiar situation, as the interlocutors are friends or colleagues, whereas the one in (27) involves an unfamiliar situation, based on an asymmetric relationship between a professor and her student. If the hypothesis regarding the link between polydefiniteness and speaker-to-addressee closeness is on the right track, the polydefinite answer (A2) is expected to receive higher ratings in (26) than in (27). No significant difference is expected between the monadic answers (A1) in the two examples.

Participants were given the following instructions: “Now, you will read a set of small texts. Each text consists of a brief description of a situation, a question and two possible answers to this question. Below every answer, a rating scale from 0 to 100 will appear on your screen. We ask you to use this scale to show how natural each answer to the respective question sounds to you (0 = totally unnatural, 100 = absolutely natural).”

All participants rated all the 24 items, producing two ratings for each item –one for the monadic and one for the polydefinite answer in each case. A total of 4,512 responses (94 participants × 48 ratings) were used for the statistical analysis.

Procedure

The procedure followed for Experiment 3 was similar to the one described for the previous two experiments. After reading the instructions and filling in a sociolinguistic questionnaire (see Appendix A1), participants started the main task. The order of items, as well as the order of the monadic and the polydefinite variant of the answer within the items, was randomized. Each item consisted of a situation description that appeared in square brackets, a question and two alternative answers, each followed by a rating scale. An example of what the participants saw on the screen of their personal computers follows, translated into English for convenience.

(28)[Mia mitera milai sto telefono me tin kori tis pu ine ktiniatros.]

‘A mother is on the phone with her daughter, who is a vet.’

Q: Pia skilitsa yenise?

‘Which dog gave birth?’

A1: I kafetia skilitsa.

‘the brown dog’

totally unnatural: 0  absolutely natural: 100

A2: I skilitsa i kafetia.

‘The brown dog.’

totally unnatural: 0  absolutely natural: 100

The average duration of the experiment was 8' 51".

Results

The results of Experiment 3, as a function of Definiteness (monadic, polydefinite) and Familiarity (familiar, unfamiliar), are shown in Figure 3. The two values of Definiteness appear on the bottom of the figure, and for each one of them the two values of Familiarity are presented as two different shades of grey. The results show that monadic constructions are generally more accepted than polydefinite constructions, a result that is consistent with what was found in Experiment 1 and 2. Furthermore, the graph shows that monadics are slightly preferred in what could be conceived as conveying unfamiliarity. Familiar situations are more accepted than unfamiliar ones when using polydefinite constructions. Moreover, the familiar vs. unfamiliar distinction appears to be relevant for polydefinites but not for monadics.

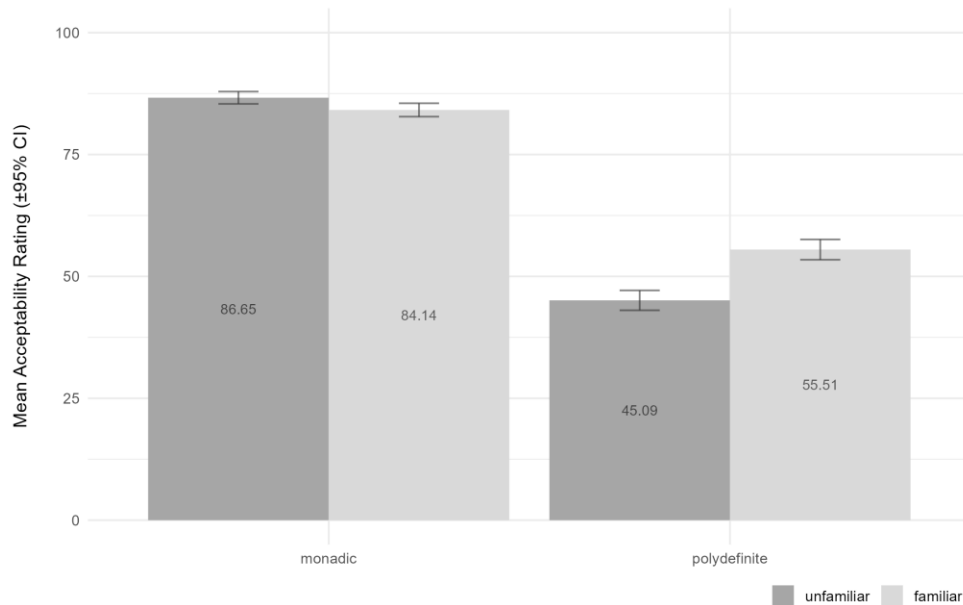


Figure 3. Results of Experiment 3: Definiteness × Familiarity

The responses of Experiment 3 were analyzed by the *glmmTMB* package in R (see the Results section of Experiment 1 and 2 for details). Definiteness, Familiarity and their paired interaction were set as fixed factors. A random slope for Definiteness by Subject plus a random intercept for Item were included in the model.

The main effect of Definiteness and the interaction Definiteness × Familiarity were found to be significant. The main effect of Definiteness, $\chi^2(1) = 95.443$, $p < .001$, indicates that monadic structures were generally preferred to polydefinite ones (Cohen’s $d = 1.58$, $p < .001$). A marginally significant result was found for Familiarity, $\chi^2(1) = 3.797$, $p = .0513$, with familiar situations in our data being more accepted than unfamiliar ones ($d = 0.18$, $p = .0497$).

The paired interaction Definiteness × Familiarity, $\chi^2(1) = 10.469$, $p = .001$, can be better interpreted by looking at Familiarity as the contrast field: within monadic constructions, no significant difference is found between familiar and unfamiliar situations ($d = 0.12$, $p = .367$), but within polydefinite constructions familiar situations are preferred over unfamiliar ones ($d = 0.48$, $p < .001$). When looking at Definiteness as the contrast field, the preference for monadic constructions is found for each familiarity condition (all $p < .001$), with a greater effect in unfamiliar situations ($d = 1.88$), compared to familiar ones ($d = 1.28$).

Discussion

Experiment 3 found that (i) native Greek speakers have a significant preference for monadic over polydefinite DPs, and (ii) polydefinite DPs are considered more natural in communicative interactions where the speech participants are emotionally/socially close than in interactions where no such closeness can be inferred. Consequently, the results of this experiment support the hypothesis that polydefinites are often interpreted as conveying some type of closeness between the speaker and the addressee.

But what is the relation between the *closeness* interpretation of polydefinites and their informal register specification? This is the point where the obtained preference for monadic over polydefinite DPs –found in all the three experiments– becomes relevant. In motivating Experiment 3, it had been implied that the colloquiality of polydefiniteness might be a side effect of its affective, in this case closeness-related interpretation. However, if this were indeed the case, one would expect the dispreference for polydefinite DPs to emerge only in the unfamiliar situation condition, contrary to fact. Experiment 3 found that speakers prefer monadics to polydefinites across conditions, a result once again attributable to the colloquial status of the latter. One can infer then that, although polydefiniteness can be related to both an informal register characterization and an expressive reading conveying speaker-to-addressee closeness, the former connection is tighter than the latter. In other words, there is evidence that the colloquiality of polydefinites is not caused by their affective interpretative component. Whether the reverse holds is something that was not investigated in the study presented in this chapter.

The three experiments presented in detail above allowed an empirically informed description of polydefiniteness. In the following section, the empirical generalizations drawn are translated into the formal description of the phenomenon, with the ultimate purpose of illuminating the grammatical status of the expletive determiners appearing in polydefinite DPs.

3.5 Greek polydefinite DPs: an analysis at the interfaces

In view of the results of Experiments 1, 2 and 3, and mostly in accordance with the previous literature on the topic, Greek polydefiniteness emerges as a grammatical construction limited mostly to spoken informal registers of the language, related tightly to restrictive as opposed to non-restrictive modification, and coinciding often with the expression of closeness towards the addressee on the part of the speaker. Nothing more will be said on the colloquiality of polydefinite DPs in this chapter. The goal of this section is to provide a thorough formal analysis of Greek polydefinites such that it can account for the restrictive (and non-restrictive) interpretation of the modifiers, the expletive interpretation of the additional determiners, and the occasional affective interpretation of the whole polydefinite DP.

3.5.1 The syntax of Greek polydefinites

The numerous syntactic accounts of Greek polydefiniteness that are found in the generative literature on the topic can be divided into three broad categories: (i) the bi-DP structure analyses (Lekakou & Szendrői 2007, 2012; Velegrakis 2011), (ii) the small-clause structure analyses (Campos & Stavrou 2004; Ioannidou & den Dikken 2006; Panagiotidis & Marinis 2011; Guardiano & Stavrou 2019), and (iii) the reduced relative clause structure analyses (Alexiadou & Wilder 1998; Cinque 2010; Alexiadou 2014; Giusti 2015). Each of these categories is reviewed by reference to an exemplary member. Ultimately, a novel structural analysis is presented that overcomes the empirical and theoretical shortcomings of its predecessors, while being most consistent with the experimental results reported above.

3.5.1.1 Greek polydefinites as DPs under sisterhood

Lekakou and Szendrői (2012) capitalize on the fact that polydefinite DPs in Greek show free order of constituents (see Section 3.2) and argue that they are derived in the same way as close appositions: two DPs merge under

sisterhood in either possible order and project a single DP. Notice, however, that the polydefinite DPs we have seen so far have roughly the form determiner + noun + determiner + adjective. In order to reconcile this fact with an apposition analysis, Lekakou and Szendrői (2012) hypothesize that, in the case of polydefinites, one of the two DPs involves nominal ellipsis.

The mechanics adopted for the composition of the two DPs taking part in the derivation of polydefiniteness is referential role identification à la Higginbotham (1985), which at the level of semantics translates into set intersection. Lekakou and Szendrői (2012) postulate that, for referential role identification to apply, it is further required that its output set be different from its two input sets. What does this mean in the case of polydefinites? If the two sets denoted by the two DPs are supposed to intersect and give rise to a distinct third set, then it must be the case that one DP –according to the authors, the one that involves ellipsis– modifies the other restrictively. Figure 4 displays the derivation of the polydefinite DP *to aghalma to xriso* ‘the golden statue’ from Experiment 1, in the spirit of Lekakou and Szendrői (2012).

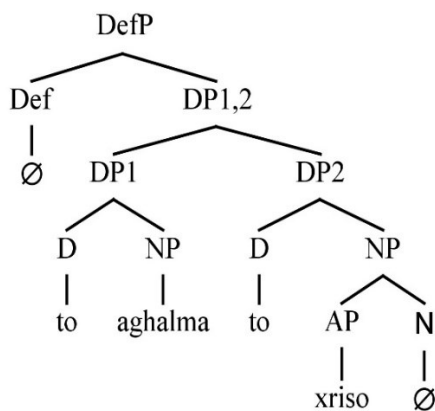


Figure 4. Greek polydefinites as close appositions

Before discussing the strengths and limitations of such a proposal, a clarification is in order. This whole study on Greek polydefinites was motivated by the observation that they involve at least one determiner that is expletive in the sense that it fails to introduce an iota function. Crucially, for Lekakou and Szendrői (2012), all Greek definite articles are expletive; they are merged as heads of a morphosyntactically active but semantically inactive

DP projection, while the iota or any definiteness-related semantics is attributed by the authors to a higher morphosyntactically inert but interpretatively active projection, namely Definiteness Phrase (DefP). For Lekakou and Szendrői Greek polydefinites project a single DefP.

Leaving the distinction between DP and DefP aside, the structural analysis of polydefiniteness put forth by Lekakou and Szendrői (2012) is very economical and makes use of a structural configuration found elsewhere in the language, namely appositions. Moreover, it can derive easily the different possible constituent orders in polydefinites since the sister DPs can be merged in any order. By postulating that all definite articles are expletive, the authors further predict that the multiple determiners of polydefinite DPs do not pick up independent discourse referents. Finally, by conditioning referential role identification on the requirement that the set denoted by the polydefinite be different from the sets denoted by its constituent DPs, Lekakou and Szendrői derive the restrictive interpretation of the modifiers involved.

Recall that Experiment 1 showed that native Greek speakers do not completely reject non-restrictively modified polydefinites. The analysis proposed by Lekakou and Szendrői (2012) has no way to derive polydefinite DPs with modifiers interpreted non-restrictively. If neither of the two sets denoted by the sister DPs restricts the other, then the set generated by their intersection will be identical with one of the initial sets, thus blocking the application of referential role identification. It needs to be noted, though, that the authors are not interested in accounting for non-restrictive polydefinites in Greek.

Looking closer, deriving restrictively modified polydefinites under such an apposition analysis is not without problems either. Lekakou and Szendrői (2012) build their analysis on the hypothesis that polydefiniteness involves nominal ellipsis. Crucially, the allegedly elided part can never be overtly realized:

- (29) a. to aghalma to xriso
 the statue the golden
 b. *to aghalma to xriso aghalma
 the statue the golden statue

‘the golden statue’

Following Giannakidou and Stavrou (1999), if (29a) involved ellipsis of the noun, (29b) would be marginal but still available, contrary to fact. Importantly, Lekakou and Szendrői have the way to rule out examples like (29b); in this case the set denoted by the resulting DP would be the same as the set denoted by the second DP (*to xriso aghalma* ‘the golden statue’), thus preventing referential role identification from applying. However, here a stipulation, namely the set-distinctness requirement, is used to save another stipulation, that is the existence of nominal ellipsis in Greek polydefinites. This makes the analytical proposal developed by the authors vulnerable to criticism for circularity.

In view of the above, and in lack of more compelling evidence to adopt an apposition account for polydefiniteness, this family of approaches is provisionally abandoned.

3.5.1.2 Greek polydefinites as small clause predication

The second category of polydefiniteness accounts is exemplified by Campos and Stavrou (2004, 2011, 2012; see also Guardiano & Stavrou 2019). Building on Demonte (1999) and Eide and Afarli (1999), the authors would derive the same golden statue polydefinite example from before as a DP projected over a predication substructure linking the statue to the predicate meaning ‘golden’. What has so far been regarded as a preadjectival definite article is, according to Campos and Stavrou, merely the spellout of the predicative head within a nominal environment, realizing overtly a definiteness feature obtained from the prenominal determiner via concord. It is worth highlighting that the problem of expletiveness of the determiner does not arise in Campos and Stavrou’s (2004) analysis. The additional definite articles of Greek polydefinite DPs do not introduce independent iota functions because they are not determiners; they are predication heads. The derivation of the polydefinite *to aghalma to xriso* ‘the golden statue’ under such an analysis is represented in Figure 5.

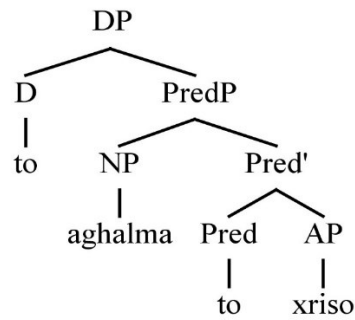


Figure 5. Greek polydefinites as small clauses³³

Campos and Stavrou (2004) take the order determiner + noun + determiner + adjective to be basic and derive the reverse one via focus movement of Pred' to the specifier of DP, independently argued to be a landing site for focused constituents in Greek (Horrocks & Stavrou 1987).

The small clause predication analysis presented above can derive the different constituent orders displayed by Greek polydefinite DPs and account for the fact that they do not pick more than one independent discourse referents; they only involve one real definite determiner, namely the prenominal one. The restrictive interpretation of the modifiers involved is derived only indirectly, by drawing a parallel between polydefinites in Greek and postnominal modification in Romance (see also Alexiadou et al. 2007; Guardiano & Stavrou 2019): Polydefiniteness allows the modifier to appear after the noun (see Section 3.2), a position that in Romance languages is usually reserved for restrictively interpreted modifiers (Bouchard 2002). Campos and Stavrou (2004) have been criticized for not being able to strictly rule out the existence of non-restrictively modified polydefinites (Alexiadou 2014). Crucially, though, this is considered as an advantage in light of the results of Experiment 1. Setting the technicalities of the proposal aside, there are two main concerns raised by Campos and Stavrou's (2004) account.

The first concern is theoretical and has to do with the postulation that the preadjectival definite articles emerging in Greek polydefinites are not really determiners. This hypothesis burdens the lexicon with a double homophonous entry corresponding to things as distinct as a definite article, on the one hand,

³³ This is a simplified version of the structure proposed by Campos and Stavrou (2004).

and a predication head, on the other. Tenable as it may be, such a proposal should be dismissed in the presence of more economical alternatives.

The second concern is empirical and, therefore, more pressing. It is based on the following minimal pair.

- (30)a. Efaye to fayito zesto.
 ate the food hot
 ‘She ate the food hot.’
- b. Efaye to fayito to zesto.
 ate the food the hot
 ‘She ate the hot food.’

Example (30a) includes the prototypical small clause (see den Dikken 2006) *to fayito zesto* and roughly translates into ‘She ate the food while it was hot.’. Example (30b), on the other hand, involves the minimally different polydefinite DP *to fayito to zesto* and can be paraphrased as ‘She ate the food which was hot.’. If polydefinite DPs are also derived via small clause predication, one has to explain why the *while*-interpretation is lost in the latter example and, most importantly, why the predication head is null in the small clause of (30a) but realized identically to a definite determiner in the polydefinite of (30b).

While Campos and Stavrou (2004) do not claim to provide an analysis for all instances of small clauses in Greek, their account seems most adequate for the structural representation of (30a), as simplified in Figure 6.

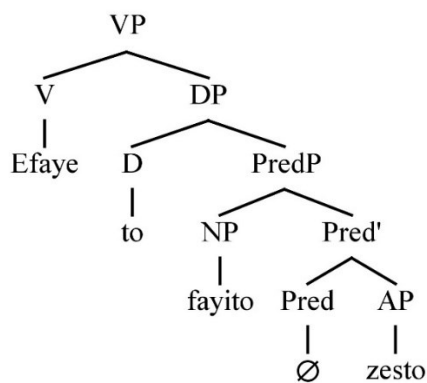


Figure 6. Greek small clauses

If the predication head in Greek small clauses can be realized as null, and if polydefinites involve a small clause structure, then it is surprising that the latter have an obligatorily overtly realized Pred^0 that coincides morphophonologically with the definite article. The problem could be easily solved with an independent stipulation, but that would weaken further the explanatory adequacy of Campos and Stavrou's (2004) proposal.

Given the theoretical and empirical objections that they raise, small clause analyses of Greek polydefiniteness are also provisionally dismissed.

3.5.1.3 Greek polydefinites as reduced relative clauses

The last family of syntactic approaches to polydefiniteness is characterized by the postulation of a relative clause substructure and will be presented using the example of Alexiadou (2014). Building on previous work (Alexiadou & Wilder 1998), the author proceeds to formulate one of the most complete accounts of Greek polydefinite DPs.

Alexiadou (2014) departs from both of the analyses described so far in taking the order determiner + adjective + determiner + noun as basic for Greek polydefinites. She derives polydefiniteness as a Kaynean (1994) restrictive relative clause: a definite determiner takes a reduced, i.e., tenseless, CP as its complement. Using the same golden statue example, which would now display the reverse word order (*to xriso to aghalma*), the definite article *to* 'the' selects for a reduced CP embedding a predication relation via which the property denoted by *xriso* 'golden' is predicated of the definite subject DP *to aghalma* 'the statue'. Finally, predicate fronting of *xriso* to the specifier of CP takes place, leading to the surface word order. Figure 7 represents the derivational process schematically. Figure 8 provides the derivation of the alternative word order, that is *to aghalma to xriso*, which according to Alexiadou (2014) results from (focus) movement of the whole Inflection Phrase (IP) to the specifier of DP applying after the fronting of the predicate.

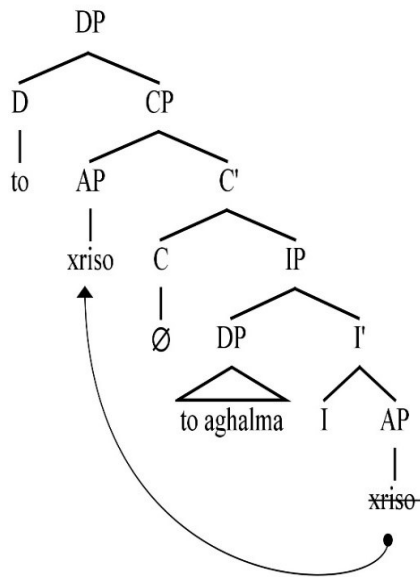


Figure 7. Polydefinites as reduced relatives

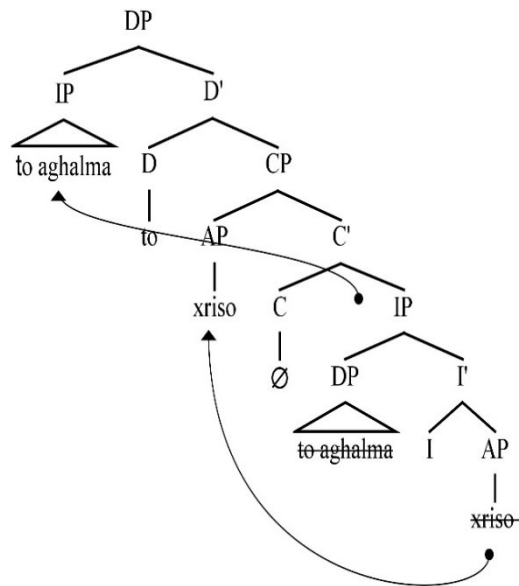


Figure 8. Inverted polydefinites

Alexiadou's (2014) proposal can derive the different constituent orders available in Greek polydefinites, as can its predecessors. Moreover, it exploits an existing syntactic configuration to account for the phenomenon, thus avoiding the need to introduce an ad hoc polydefiniteness derivational pattern. Interestingly, the adopted structure allows her to get for free the restrictive interpretation of the involved modifiers; polydefinites are born within a reduced restrictive relative clause construal. Evidently, the latter means that Alexiadou (2014) has nothing to say about the syntax of non-restrictively modified polydefinites, but this is not in her agenda in the first place.

The reduced restrictive relative clause account for polydefiniteness presented above is admittedly complex, but this complexity is legitimate within the framework of generative syntax. Its main weak spot has to do with the question that is at the center of this chapter, namely the expletiveness of polydefinite determiners. Under Alexiadou's (2014) account, Greek polydefinites seem to involve only standard determiners: one that heads the whole relative clause and one that precedes the nominal in the subject position of the embedded predication. Crucially, the author makes no specific claim regarding the interpretation of these instances of definite determiners. The reader can infer that the preadjectival article contributes an iota function semantics. This may sound counter-intuitive but it is definitely possible. However, the definite article that appears before the noun seems to be interpretatively inactive. It could be the case that the prenominal article is somehow referentially dependent on the external one that heads the whole polydefinite construction, but Alexiadou (2014) does not make explicitly any such claim.

It seems that the relative clause approach to Greek polydefiniteness is on the right track. Nevertheless, it cannot be adopted in exactly the way formulated in Alexiadou (2014), which is not enlightening as to the interpretation of polydefinite determiners. A new reduced relative clause analytical variant, that overcomes the problems identified in the previous analyses, is presented in the following subsection.

3.5.1.4 Greek polydefinites as resumed reduced relative clauses

The novel syntactic account of polydefinites in Greek proposed in this chapter is based not only on the gathered insight of all the previous researchers that have worked on the topic but also on a very strong intuition regarding the interpretative and structural affinity between the members of (31) and (32) below, which exemplify restrictive and non-restrictive modification, respectively.

(31)a. to aghalma pu ine xriso
 the statue COMP is golden
 ‘the statue which is golden’

b. to aghalma to xriso
 the statue the golden
 ‘the golden statue’

(32)a. to topio, pu ine ekpliktiko
 the landscape COMP is amazing
 ‘the landscape, which is amazing’

b. to topio to ekpliktiko
 the landscape the amazing
 ‘the amazing landscape’

Looking at each example separately, the similarity in the interpretation of its members is evident. The structural parallelism between them, to be advocated here, is somewhat more difficult to see. The full relative clause constructions (31a, 32a) involve an overt relative complementizer *pu* ‘that’ and a null relative operator.³⁴ Their polydefinite variants, on the other hand, lack both a relative complementizer and a relative operator. Instead, they display something morphophonologically identical to the Greek definite article, which is absent from the standard relative examples. While this determiner-like element is glossed as a definite article throughout the present chapter, there is good reason to assume that it is something different. For this reason to become obvious, one needs to investigate full relative clauses.

Alexopoulou (2006) draws attention to Greek restrictive (33) and non-restrictive relatives (34) that display resumption.

³⁴ In Greek, there is the possibility that a relative clause is introduced by a null relative complementizer and an overt relative operator.

(i) to aghalma to opio ine xriso
 the statue the REL.OP is golden
 ‘the statue which is golden’

(ii) to topio, to opio ine ekpliktiko
 the landscape the REL.OP is amazing
 ‘the landscape which is amazing’

This alternative is not discussed further. Crucially, it has zero consequences on the way the parallel between full relative clauses and polydefinites in Greek is fleshed out here.

(33) o_i kirios pu tu_i erikses ton kafe
 the man COMP RES.P dropped the coffee
 ‘the man whose coffee you dropped’

(34) i_i roz fusta, pu tin_i pira apo to Zara
 the pink skirt COMP RES.P got from the Zara
 ‘the pink skirt, which I got from Zara’

It is easily noticeable that the resumptive pronouns *tu* and *tin* in examples (33) and (34), respectively, are morphologically identical to the Greek definite article (Anagnostopoulou 1994). This is considered as key in understanding the relationship between standard Greek relative clauses and polydefinite DPs. Resumption may apply not only in full relatives but also in reduced, tenseless relative clauses. What has been so far regarded as a preadjectival article in polydefinites is argued to be a resumptive clitic, standing as evidence of the existence of relative clause substructure in instances of Greek polydefiniteness.³⁵

The next step is to identify the conditions under which resumption applies in standard and reduced relatives. As regards the former, the following main insights from Alexopoulou (2006) are adopted: (i) resumption is triggered by formal requirements, such as successful agreement and, under minimalist terms, deletion of uninterpretable features, and (ii) the presence of resumption or its lack thereof is dependent on the featural specification of the complementizer introducing the relative clause (see also Alexopoulou 2010). The application of resumption in the reduced relative clauses of the polydefinite type can be accounted for on the same general grounds.

The formal proposal developed here adopts a head external analysis of relative clauses in the spirit of Jackendoff (1977) and Demirdache (1991) – see also Giusti (2015). Polydefiniteness is argued to arise whenever a definite DP is modified by a reduced restrictive or non-restrictive relative. Greek

³⁵ Giusti (2015) is the first to relate the additional determiners of polydefinite DPs to relative pronouns. Franco et al. (2015) assign a pronominal role also to the preadjectival article of the Albanian equivalent of polydefiniteness.

reduced relatives are assumed to be introduced by a phonologically null relative complementizer *C*. This null *C* differs from its overt equivalent *pu* in that it bears no [Wh] feature. On the other hand, similarly to *pu* (Roussou 1994; Alexopoulou 2006), the polydefiniteness *C* is specified for definiteness. Specifically, it is postulated to bear an unvalued definiteness feature [uDef] that triggers AGREE/MOVE.

In the structural background laid out above, the null *C* introducing the reduced relative clauses of the polydefiniteness kind triggers obligatory resumption –grammatical resumption in the sense of Alexopoulou (2010). A resumptive clitic with an interpretable definiteness [iDef] feature enters the derivation as subject of the predicative structure embedded under the null *C*. The [uDef] feature on the latter causes *C* to enter an AGREE relation with the closest and unique appropriate goal in the structure, that is the resumptive clitic. In this way, the [uDef] feature on *C* is valued and checked. Parasitic on this AGREE is the movement of the clitic to the specifier of CP, possibly for the satisfaction of an EPP feature. This last movement completes the derivation of a Greek polydefinite DP.

A couple of clarifications are due before moving to the demonstration of how specific polydefinite examples are derived. The first clarification has to do with the absence of an uninterpretable [uWh] feature on the relative complementizer of Greek polydefinites. Notice that there is no evidence whatsoever for the presence of such a feature since no *wh*-word can appear in polydefinite environments. Importantly, the role that is played by the [uWh] feature in full relatives is under the present account undertaken by definiteness, i.e., [uDef]. This is welcome in light of the fact that definiteness has been independently argued to take up additional roles in the absence of the relevant features, in order to allow the derivation to converge (e.g., Delfitto et al. 2009).

The second clarification concerns the status of the resumptive clitic, which is a source of debate in the literature (see Rouveret 2011 for an overview). The alternative offered by Doron (2011) is adopted for the present purposes, according to which resumptive pronouns are not like gaps but similar to standard pronouns. This suggests that there is no need for a relative operator to bind the resumptive clitic. Besides, no such operator is postulated

in the current analysis. On the contrary, the clitic can be simply bound anaphorically by an antecedent. But what is the antecedent that binds the resumptive pronoun in the case of polydefinites?

The answer to the question above is inspired in Espinal and Cyrino's (2017) analysis of the allegedly expletive determiners featured in inalienable constructions (Vergnaud & Zubizarreta 1992) and long weak definites (Poesio 1994; Barker 2005), exemplified by (35) and (36), respectively.

(35) Les enfants ont levé la main. *French*
the children have raised the hand
'The children raised their hand.'

(Vergnaud & Zubizarreta 1992: 596, ex. (1a))

(36) La mano del bebé cogía el dedo del cirujano. *Spanish*
the hand of.the baby took the finger of.the surgeon
'The hand of the baby grasped the finger of the surgeon.'

(Espinal & Cyrino 2017: 2, ex. (2a))³⁶

The definite articles *la* in (35) and *el* in (36) do not introduce an iota function; there are more than one hands and more than one fingers in the respective cases. In this sense, they can be both considered as expletive. Espinal and Cyrino (2017) capitalize on the fact that the existence of the entities denoted by *la main* and *el dedo* is dependent on the referents of *les enfants* and *la mano*, respectively. They proceed to propose that the apparently expletive *la* (35) and *el* (36) are c-commanded by and referentially dependent on the standard determiners projecting the higher DPs.

Applying Espinal and Cyrino's (2017) insight to Greek polydefiniteness, it is suggested that the resumptive clitic of the polydefinite relative clause substructure is c-commanded and bound by the definite article that precedes the modified noun. Following Jackendoff (1990: 63), this anaphoric relationship is represented below as sharing of a referential superscript α

³⁶ The example is inspired in Barker (2005).

between the [iDef] feature of the prenominal definite article and the [iDef] feature of the resumptive pronoun. This co-superscription ensures that both determiners have the same referential index and, therefore, do not pick up independent discourse referents, as has been repeatedly mentioned to be the case with Greek polydefinites.³⁷

With all the necessary tools finally in place, let us move to the golden statue example and represent visually the derivation of the polydefinite DP *to aghalma to xriso* under the view of polydefiniteness as resumed reduced relative clause modification, with the help of Figure 9.

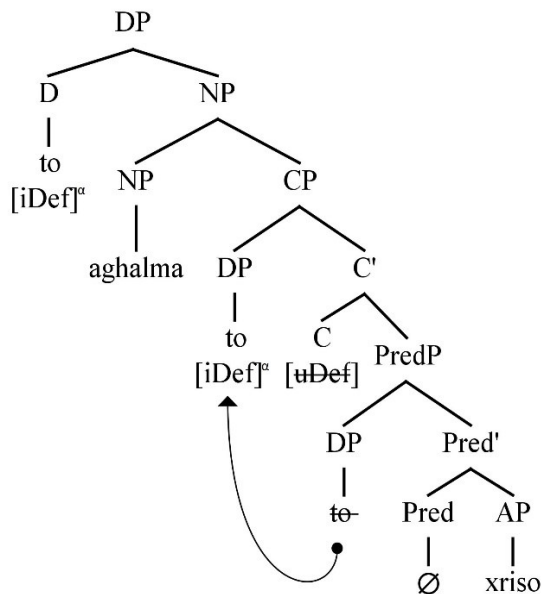


Figure 9. Greek polydefinites as resumed reduced relative clauses

Along the lines of the derivational process described earlier, Figure 9 shows that the noun *aghalma* ‘statue’ is modified by a reduced relative CP headed by a null C with a [uDef] feature. A resumptive clitic with an [iDef] feature is merged as the subject of the PredP embedded under the relative CP. C enters an AGREE relation with the clitic, which subsequently moves to SpecCP to satisfy an EPP feature. Thus, the order determiner + noun + determiner + adjective is derived, which is here considered as basic (pace Campos & Stavrou 2004). Finally, a definite determiner selects the modified

³⁷ It is worth noting that, for Jackendoff (1990), this cosuperscription takes place at the conceptual level. However, Espinal and Cyrino’s (2017) analysis of inalienable possession constructions and long weak definites, as well as its extension to Greek polydefinites, base cosuperscription on a c-command relation between the binder and the bindee, thus indicating that it is relevant also at the syntactic level of LF.

nominal and projects the highest DP. This outermost definite determiner introduces an iota function. Moreover, it c-commands and referentially binds the resumptive clitic, in this way guaranteeing that the two determiners are necessarily coreferential –note the α superscript.

Concerning the inverted polydefinite variant *to xriso to aghalma*, a focus movement of the whole CP to the specifier of the higher DP is postulated in the spirit of Campos & Stavrou (2004). This is represented schematically in Figure 10. It needs to be clarified that, while the prenominal definite article does not c-command the clitic under this configuration, it still c-commands its trace and, therefore, it can still bind it.

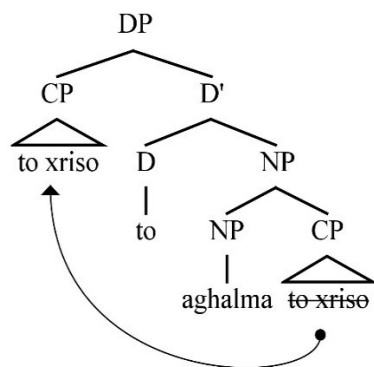


Figure 10. Inverted polydefinites

Under an account of Greek polydefinite DPs as resumed reduced relative clauses, the existence of non-restrictively modified polydefinites is in principle predicted, given that resumption applies to both restrictive and non-restrictive full relatives in Greek (Alexopoulou 2006, 2010). It is proposed that the derivation of non-restrictively modified polydefinites such as *to topio to ekpliktiko* ‘the amazing landscape’ is at least available in Greek grammar. Its structure is parallel to the one proposed in Figure 9 for the restrictively modified *to aghalma to xriso* ‘the golden statue’, modulo the fact that non-restrictive relative clauses involve DP-adjunction (Demirdache 1991), not NP-adjunction. Figure 11 represents schematically the proposal.

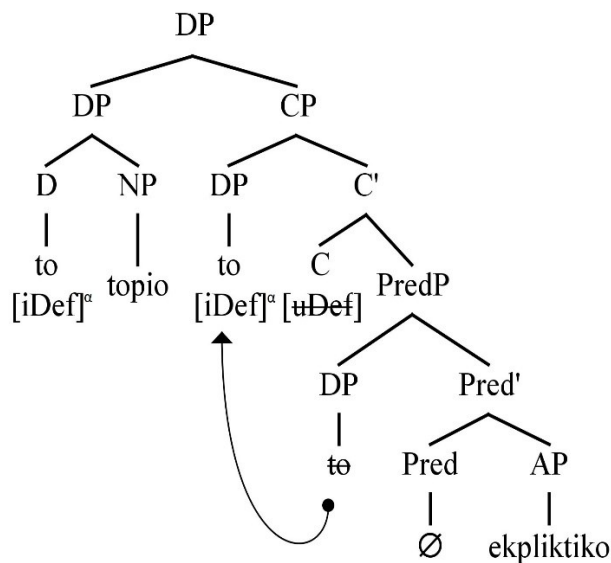


Figure 11. Non-restrictively modified polydefinites

In Figure 11, the pronominal definite article does not c-command the resumptive clitic. It is claimed that the referential index contributed by the former percolates by principle up to the highest DP projection and binds the clitic from there, thus ensuring that both DPs cannot but refer to the same entity. Notice that, since the derivation of non-restrictively modified polydefinites involves DP-adjunction, the different possible constituent orders are derived without the need to postulate any additional movements.

Before evaluating this novel syntactic proposal on Greek polydefiniteness, a small detour is worth taking. The proposal boils down to the claim that the emergence of polydefiniteness, i.e., the appearance of a single modified DP with more than one coreferential definite determiners, is triggered by the presence of a [uDef] feature on the null C introducing the reduced relative. Crucially, polydefiniteness arises when this feature is valued positively. One can imagine the possibility that [uDef] is valued negatively. In that case, the resumption analysis would predict that an indefinite resumptive clitic is merged in subject position of the embedded predication. Intriguingly, Panagiotidis (2002) argues that indefinite clitics in Greek are phonologically null. Ultimately, the analysis predicts the existence of indefinite modified DPs with postnominal adjectives in Greek, what Alexiadou (2014) dubs as ‘polyindefiniteness’. The prediction is indeed born out. The structure of (37) is given in Figure 12.

- (37) ena aftokinito mavro
 one car black
 ‘a black car’

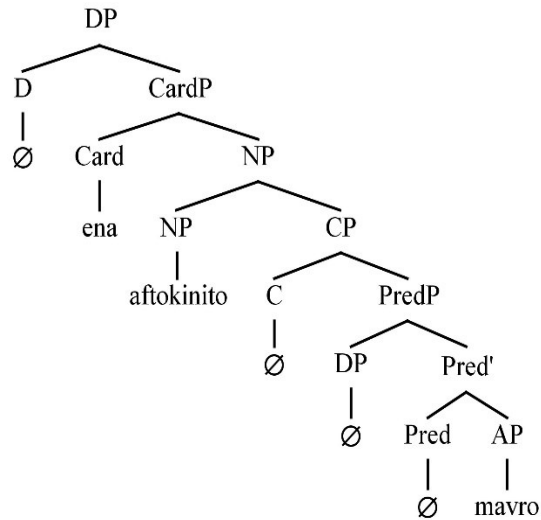


Figure 12. Polyindefinites

As all its predecessors, the resumed reduced relative clause analysis of Greek polydefinites can derive the different word order patterns. Furthermore, it makes use of mechanisms that are independently shown to be active in Greek grammar, namely AGREE and MOVE triggered by relative complementizers and resumption. It also makes clear claims regarding the status of the determiners involved in Greek polydefinite DPs, suggesting that the referent of the whole phrase is fixed only by the definite article that emerges as the prenominal determiner. Last but not least, the resumption-based analysis accounts for the restrictive interpretation of polydefinite modifiers by postulating a restrictive relative clause substructure, at the same time readily offering a parallel derivation for non-restrictively modified polydefinites. In this sense, this syntactic account is the most complete, considering the experimental results presented in the previous section.

3.5.2 The semantics of polydefinites

The novel syntactic analysis of polydefinite DPs put forth in Section 3.5.1.4 makes certain predictions regarding the way such DPs are interpreted.

Concretely, it predicts that the part of the polydefinite that corresponds to the reduced relative will have the same semantics as its full relative clause counterpart. According to Montague (1973), relative clauses correspond to “sentential adjectives” and, thus, denote properties of the $\langle e,t \rangle$ type. For the reduced relatives of the polydefiniteness type, this means that the denotation of the embedded predicate will be the same as the denotation of the whole relative CP. Consequently, the semantic contribution of the polydefinite resumptive clitic must be an identity function over properties, as shown in (38).

$$(38) \quad \text{Polydefinite clitic: } \llbracket \text{to} \rrbracket = \lambda P_{\langle e,t \rangle}. P_{\langle e,t \rangle}$$

Under this view, the step-by-step semantic derivation of our reference polydefinite example *to aghalma to xriso* ‘the golden statue’ can be represented as follows:

$$(39) \quad \begin{aligned} \llbracket [\text{AP } xriso] \rrbracket &= \lambda x. \text{golden}(x) \\ \llbracket [\text{CP } to \ xriso] \rrbracket &= (\lambda P_{\langle e,t \rangle}. P_{\langle e,t \rangle})(\lambda x. \text{golden}(x)) = \lambda x. \text{golden}(x) \\ \llbracket [\text{NP } aghalma \ to \ xriso] \rrbracket &= \lambda x. (\text{golden}(x) \ \& \ \text{statue}(x)) \\ \llbracket [\text{DP } to \ aghalma \ to \ xriso] \rrbracket &= \iota x. (\text{golden}(x) \ \& \ \text{statue}(x)) \end{aligned}$$

The derivation in (39) correctly predicts that the polydefinite DP *to aghalma to xriso* identifies the (contextually) unique entity that is both golden and a statue.

While the example used for exposition above instantiates restrictive modification, there is nothing in the syntactic or semantic analysis of Greek polydefinites proposed here that rules out the possibility of a non-restrictively interpreted modifier. This appears to be a welcome consequence, considering that the native Greek speakers that took part in Experiment 1 did not fully reject non-restrictive polydefinites. At the same time, they did display a robust preference for restrictively modified polydefinite DPs, as was predicted by the biggest part of the literature on the topic (Kolliakou 1995, 2004; Alexiadou & Wilder 1998; Campos & Stavrou 2004; Lekakou &

Szendrői 2012; Alexiadou 2014; Guardiano & Stavrou 2019, among others). I acknowledge that the resumption analysis of polydefiniteness cannot account for this preference.³⁸

3.6 Polydefinite determiners and expressivity

It is now time to (re)turn to the central question of this chapter, namely what polydefinites can teach us about expletive determiners, in particular, and expletiveness, in general. According to the novel syntactic account of polydefiniteness put forth in Section 3.5, Greek polydefinite DPs involve a standard definite determiner, that emerges always before the noun and introduces an iota function semantics, and a resumptive clitic, that appears before the modifier and has been considered as expletive because it does not introduce an independent iota function.

Interestingly, the present study has revealed that there is more to the resumptive clitic than the lack of iota function semantics. Notice first that the polydefinite clitic has been identified as a definite determiner that stands in a local syntactic relationship with another c-commanding determiner, i.e., the pronominal article, with respect to which it encodes a redundant semantic property, i.e., definiteness. Moreover, it has been argued to have a semantic import defined as an identity function over properties. Both of these findings are welcome in view of the conclusions drawn in the previous chapter regarding Greek expletive voice. The expletiveness of Greek anticausative voice was broken down into (i) an identity function semantics and (ii) a syntactically local dependency on an element with respect to which the expletive encodes some redundant meaning. This chapter showed that the expletiveness of Greek polydefinite determiners can also be captured in the same way.

Importantly, though, the interpretative contribution of the polydefinite resumptive clitic is arguably richer than the one found for Greek expletive

³⁸ Pending further research on the topic, I speculate that the experimentally confirmed dispreference for non-restrictively interpreted modifiers as parts of polydefinite DPs may reflect a non-homogeneous set of low acceptability triggers, each related to different subtypes of modifiers.

voice. Recall that Experiment 3 provided evidence that Greek polydefinites weakly but systematically convey the speaker’s social or emotional closeness towards the addressee. The expression of such closeness is considered as a secondary meaning import that should be attributed to the expletive resumptive clitic which is characteristic of Greek polydefiniteness.

But what is the status of this affective, closeness-related meaning of Greek polydefinite DPs? The first thing that comes to mind in pursuing such a question is Potts’ (2004, 2007) criteria for expressive content. Intriguingly, 5 out of 6 of them, namely *independence*, *non-displaceability*, *perspective dependence*, *descriptive ineffability*, and *immediacy*, are fulfilled. The following example is used for discussion:

- (40) I kupa i yalini espase.
 the mug the glass broke
 ‘The glass mug broke.’

The expression of speaker-to-addressee closeness is arguably *independent* of the asserted proposition, i.e., *The glass mug broke*. It is also *non-displaceable* since it predicates something not of the mug or the breaking event, but the utterance situation itself. Moreover, this closeness is *perspective dependent* as it is targeted from the speaker to the addressee. The oddness of the example in (41) suggests that *descriptive ineffability* also applies in this case.

- (41) #I kupa i yalini espase ke se theoro
 the mug the glass broke and you I.consider
 filo mu.
 friend my
 ‘The glass mug broke, and I think of you as my friend.’

Furthermore, the expression of closeness can be considered as *immediate* in the sense that it is not offered as negotiable content, but it is established upon uttering the sentence containing the polydefinite.

(42)A: I kupa i yalini espase.

the mug the glass broke

‘The glass mug broke.’

B: #Dhen ghnorizomaste ki apo xtes!

not know.REFL and from yesterday

‘We don’t know each other that well!’

In light of the above, Greek polydefinites can be considered as expressive variants of their monadic counterparts, expressing the speaker’s social or emotional closeness to the addressee. In fact, I would like to suggest that this expressive content, with the properties previously listed, can be accurately captured in terms of an additional speech act in the commitment-based framework by Cohen and Krifka (2014) and Krifka (2017, 2019, 2021a, 2021b). The general idea would be that, upon uttering (42A) for example, the speaker performs two separate acts: they assert that the glass mug broke and they further express that they experience some kind of closeness towards the addressee (see also Tsiakmakis et al. 2022a). The second act is postulated to be triggered by the presence of polydefiniteness and, concretely, by the expletive resumptive clitic involved in polydefinite DPs. It is noted that attributing speech act potential to a DP-like constituent is found also in Cohen and Krifka (2014), Onea and Ott (2022), among others.

Let us now try to work out the details of this proposal. As shown in Chapter 1, Krifka’s framework deals mostly with assertions and questions. The expression of speaker-to-addressee closeness is arguably not a question; the speaker does not ask the addressee to commit to anything. Instead, it looks a lot like an assertion. Upon expressing closeness, the speaker commits publicly to holding that emotive stance towards the addressee and will be criticized if they do not behave accordingly.

However, the expression of closeness differs from assertions in two important respects. Firstly, the private judgment to which the speaker commits publicly in the closeness case does not concern the truth of a proposition; it is an emotive judgment that describes the speaker’s emotive state at the moment of utterance. Secondly, the addressee cannot object to the speaker’s commitment being admitted in the common ground, as is the case

with run-of-the-mill assertions, exactly because the object of this commitment is a private emotive judgment. Considering the above, I propose that the expression of speaker-to-addressee closeness related to the expletive resumptive clitic of Greek polydefinites can be captured as an expressive speech act, projected via a speech act operator *EXPRESS*, that publicly commits the speaker to holding a private emotive stance. In an adaptation of Krifka’s (2021b) framework, the abstract structural representation of such an act would be as follows:

(43) [ActP [Act EXPRESS] [ComP [Com †] [JP [J J:EMOTIVE] [TP *p*]]]]

The operator *J:EMOTIVE* is introduced as a variant of the default *J*- specifying that the private judgment is not truth-related but emotion-related. It is further postulated that *J:EMOTIVE* comes in as many different guises as there are emotions (Goodwin et al. 2012). Specifically for the case of polydefinites, a *J:CLOSENESS* operator is introduced that captures the specific expressive content of Greek expletive determiners.

With all the details in place, we can return to example (42A), repeated below for convenience.

(44) I kupa i yalini espase.
the mug the glass broke
‘The glass mug broke.’

According to the expressive speech act hypothesis introduced here, the full interpretation of (44) is reflected in the representation given in (45).

(45)i. [ActP [Act ASSERT] [ComP [Com †] [JP [J J-] [TP i kupa i yalini espase]]]] &
ii. [ActP [Act EXPRESS] [ComP [Com †] [JP [J J:CLOSENESS] [TP i kupa i yalini espase]]]]

In prose, (45) states that, upon uttering (44) which involves the polydefinite DP *i kupa i yalini* ‘the glass mug’, the speaker performs two conjoined speech acts. The first one is an assertion via which the speaker commits publicly to

the private judgment that the proposition corresponding to *The glass mug broke* is true. The second one is an expressive act via which the speaker commits publicly to holding a private emotive stance that can be described as closeness towards the addressee at the moment of utterance.

The reader is reminded that Experiment 3 supported the existence of only a weak link between polydefiniteness and expressivity. Therefore, evaluating the adequacy of the novel speech act analysis of expletive determiners fleshed out in the present section requires additional evidence. What is rather solid is the claim that the expletiveness of the resumptive clitic that appears in Greek polydefinites can be broken down into (i) the dependency on a definite determiner with respect to which it encodes a redundant definiteness meaning, (ii) the identity function semantics, and (iii) the occasional presence of an expressive meaning specified as speaker-to-addressee closeness.

3.7 Conclusions

This chapter resumed the investigation of expletiveness by turning to the nominal domain. Specifically, it focused on the expletive determiners that appear in so-called Greek polydefinite DPs. A novel empirical study consisting of three experiments provided evidence in support of the following generalizations: (i) Native Greek speakers have a strong preference for restrictively over non-restrictively interpreted modifiers as parts of polydefinite DPs (pace Kolliakou 1995, 2004; Alexiadou & Wilder 1998; Campos & Stavrou 2004; Lekakou & Szendrői 2012; Alexiadou 2014), but do not completely reject non-restrictive modifiers in the same environment, (ii) Greek polydefinites belong to informal spoken registers of Greek (pace Manolessou 2000), and (iii) Greek polydefiniteness is weakly associated with the expression of social/emotional closeness towards the addressee on the part of the speaker.

Taking into account the results of the experimental study and the insight gathered by the previous research on Greek polydefinites, a new syntactic analysis of polydefiniteness was put forth according to which the latter arises whenever a definite DP is modified by either a restrictive or a non-restrictive

reduced relative clause that displays obligatory resumption. What superficially emerges as a preadjectival article is argued to be a definite resumptive clitic that (i) enters the syntactic derivation in order to check the uninterpretable definiteness feature [uDef] on the null complementizer that introduces the reduced relative, (ii) stands in a c-command relationship with a definite determiner with respect to which it encodes a redundant definiteness meaning, (iii) contributes an identity function semantics, and (iv) sometimes conveys an additional expressive meaning the content of which can be characterized as speaker-to-addressee closeness.

On a first level, the study presented in this chapter contributes an account of Greek polydefiniteness that overcomes the theoretical and empirical shortcomings of its predecessors and manages to derive the characteristic properties of the phenomenon. It predicts that polydefinite DPs can display different constituent orders, that these DPs pick out one discourse referent despite their multiple determiners, and that, although polydefinites preferably involve modifiers interpreted intersectively and restrictively, non-restrictively modified polydefinites are also available in Greek syntax. Most importantly, the proposed analysis suggests that the very emergence of polydefiniteness boils down to the application of resumption in reduced relative clauses under circumstances parallel to those that necessitate resumption in full relatives (see Alexopoulou 2006, 2010). It is noted for the sake of completeness that nothing is said here regarding the structure of proper name polydefinite DPs and the multiply stated relationship between Greek polydefiniteness in the nominal domain and clitic doubling in the verbal domain (Campos & Stavrou 2004; Alexiadou 2014). These are left for future research.

On a second level, the present study of polydefinites has revealed that the expletiveness of the definite determiners, i.e., resumptive clitics, involved in this kind of DPs can be decomposed into the syntactically local dependency on an element with respect to which they encode some redundant semantic property, an identity function semantics, and the occasional development of an additional expressive meaning possibly captured in terms of an expressive speech act. Notice that the first two ingredients also came up in the study of expletive voice in the previous chapter.

4 Expletiveness in the nominal domain II: Greek plural mass nouns and expletive number³⁹

4.1 Introduction

The study of Greek polydefinite DPs revealed that the expletiveness of the definite determiners these constructions involve can be associated with a set of independent properties: (i) structural proximity to an element encoding some redundant meaning, (ii) an identity function semantics, and (iii) an expressive meaning component. The aim of this chapter is to test whether these properties are parochially related to Greek polydefiniteness or they can be promoted to generalizations regarding nominal expletive categories altogether. In pursue of this goal, the grammatical category of number and, concretely, the allegedly expletive instantiations of plural number on Greek mass nouns (Tsoulas 2006) are placed under the magnifying glass.

The distinction between count and mass nouns goes back to at least Jespersen (1924), under different terminology, and has led to a prolific production of scientific works; see Doetjes (2017) for a recent overview. While this distinction has been known to be elastic in the sense of Chierchia (2010) and with fuzzy boundaries, there is relative consensus that mass nouns can be characterized by reference to two properties, namely the lack of atoms (Link 1983) or stable atoms (Chierchia 2010) in their denotation domain and their cumulative reference (Quine 1960; Link 1983; Krifka 1989). Cumulativity, in particular, is formally captured by Krifka (1989) in the following way:

³⁹ This chapter is an elaboration of the study published as Tsiakmakis et al. (2021b).

- (1) $\forall P[\text{CUM}_s(P) \leftrightarrow \forall x \forall y [P(x) \wedge P(y) \rightarrow P(x \cup_s y)]]$
 (Krifka 1989: 78, (D 12))

In words, a type variable P applying to entities in the extension of a predicate S has cumulative reference if and only if, for every entity x and every entity y , if P applies to x and P applies to y , then P applies also to the result of the join operation of x and y .

Let us try and explicate the theoretical claims above via reference to a specific example.

- (2) There was blood on the kitchen floor. There was blood in the bathroom, too.

The English mass noun *blood* in each of the sentences in (2) is understood to refer to an unspecified quantity of the vital red liquid, not to the smallest conceivable part of blood nor a sum of such smallest parts –the latter interpretation may be available to a physicist but not intended by the everyday speaker. It is in this sense that mass nouns are considered to not include (stable) atoms, that is well-defined countable smallest pieces, in their denotation (Chierchia 2010). Notice further that, if one puts the blood on the kitchen floor together with the blood in the bathroom, their sum can still be referred to as *blood*. In other words, the nominal *blood* in (2) has cumulative reference. In light of the above, *blood* in English is considered a prototypical mass noun.

Since at least Link's (1983) seminal paper, mass nouns have been considered to behave similarly to plural count nouns. The extent to which the affinity between the two holds is debated –see Chierchia (1998; 2010), Lasnik (2011), among others. However, there is general agreement that pluralized count nouns also have cumulative reference (Link 1983). Let us demonstrate this with another example.

- (3) There are kids in school building A. There are kids in school building B, too.

If the principal asks both the kids of building A and the kids of building B to gather in school building C, then the sum of the two groups of kids can still be referred to as *kids*. Therefore, the English plural count noun *kids* has cumulative reference; see (1). It is mentioned merely for clarity that this is not the case for the singular equivalent *kid*. If a *kid* from building A and a *kid* from building B meet in building C, their sum will not be referred to as *kid* anymore.

If both mass specification and plural number bring about cumulativity, then the pluralization of a mass noun is in principle predicted to be redundant (Link 1983).⁴⁰ This is consistent with the crosslinguistic tendency of mass denoting nominals to resist pluralization (Chierchia 1998, 2010). If plural morphology does emerge on a mass noun, the denotation of the latter is usually shifted to count; specifically, it receives a *measure-* or *standard serving-*reading or a *sort/make/brand-*reading –see Rothstein (2017) on the so-called universal packager.

- (4) a. We will have two juices, please.
 b. This new bar sells at least twenty different wines.

The plural noun *juices* in (4a) most likely refers to glasses of juice. As for *wines* in (4b), it probably makes reference to distinct brands of wine.

Intriguingly, Tsoulas (2006, 2009) draws attention to instances of pluralized mass nouns that receive a real mass interpretation. Let us have a look at the following minimal pair from Greek.⁴¹

⁴⁰ Chierchia (2010) takes singular and plural number to function as cardinality checks. Under such a view, the pluralization of mass nouns is not redundant but an operation doomed to crash; mass nouns do not have countable stable atoms in their denotation and fail any cardinality test. The argumentation developed in this chapter is compatible with any standard theory of grammatical number, as long as a semantic difference between singular and plural is assumed. This becomes relevant in light of analyses that reduce this difference to an implicature (Spector 2007; Kane et al. 2015; Renans et al. 2018, among others). See Grimm (2011) for arguments against such analyses.

⁴¹ Tsoulas (2009) observes that Greek plural mass nouns with true mass interpretation appear also in idioms.

(i) *Es pasan ta nera tis Elenis.*
 broke.3PL the water.PL of.the Eleni
 ‘Eleni’s waters broke.’

Such examples are not addressed in the present thesis. For discussions on the relationship between idioms and compositionality, the reader is referred to Espinal and Mateu (2007) and Gehrke and McNally (2019), among others.

- (5) a. Bike pali nero apo to parathiro.
 entered.SG again water.SG from the window
- b. Bikan pali nera apo to parathiro.
 entered.PL again water.PL from the window
- ‘Water came in through the window again.’

Examples (5a) and (5b) differ only in that the noun meaning *water* is morphologically singular in the former (*nero*) but morphologically plural in the latter (*nera*), triggering the respective number agreement on the verb. As suggested by the unique English translation provided, both sentences can be uttered under the same circumstances, that is whenever there is something wrong with the window frame and rainwater ends up inside the house.

Considering that plural number on *nera* ‘waters’ in (5b) does not coerce a *measure/serving*-reading, a *brand/sort*-reading, or any other count reading, and it does not contribute cumulativity to the inherently cumulative Greek noun for *water*, Tsoulas (2006) concludes that such instances of plural morphology in Greek are expletive; they do not have the interpretative import standardly associated with plural number. Therefore, Greek plural mass nouns offer themselves as a most appropriate case study of expletiveness in the nominal domain. This chapter undertakes this very task.

The structure of the chapter is as follows: Section 4.2 summarizes the existing wisdom on the phenomenon of mass noun pluralization in Greek and elaborates on the analytical challenges this phenomenon raises. In Section 4.3, an experimental study on the interpretation that native Greek speakers attribute to plural morphology on Greek mass nouns is described, which aims to address some of these challenges. Section 4.4 introduces a novel empirically motivated analysis of Greek pluralized mass nouns, and Section 4.5 explores what this analysis of Greek mass plurals can teach us about expletiveness. Section 4.6 concludes the chapter.

4.2 Greek plural mass nouns: insights and puzzles

The plural mass noun uses exemplified by (5b) above are not discussed in traditional grammars of Greek. However, contemporary linguistic research has made insightful attempts to pin down this grammatical phenomenon and provide an answer to the more general puzzles it creates concerning these plural mass instances in particular, as well as the status of the category of number in general.

4.2.1 Distinctive properties of Greek mass plurals

Tsoulas (2006, 2009) points out that Greek mass plurals with real mass interpretation differ from instances of pluralized mass nouns that receive a count interpretation in that the former are incompatible with cardinals.

- (6) a. To balkoni yemise laspi.
 the balcony was.filled mud.SG
- b. To balkoni yemise laspes.
 the balcony was.filled mud.PL
 ‘The balcony got full of mud.’
- c. #To balkoni yemise dhio laspes.
 the balcony was.filled two mud.PL

The Greek noun for *mud* is morphologically marked for plural number in (6b) but it does not receive a *measure/serving*-reading or a *sort/brand*-reading. Example (6c) is infelicitous because the addition of the cardinal *dhio* ‘two’ coerces exactly one of these two readings, which are strongly disfavored by the sentential context. The unavailability of cardinal modification in uses of pluralized mass nouns in Greek such as the one exemplified by (6b) is the strongest piece of evidence in support of the view that these nouns are really mass-denoting (Tsoulas 2006, 2009).

Alexiadou (2011, 2019c) claims further that Greek mass plurals of the (6b) type are characterized by reduced productivity in two respects. First, she

considers the group of mass denoting nominals that can pluralize without a shift in their denotation as a semi-closed word group. In this sense, (7a) involving the noun *nera* ‘waters’ is more natural than (7b), which features the plural form of *ximos* ‘juice’.

- (7) a. Erikses nera sto patoma.
 you.dropped water.PL at.the floor
 ‘You spilled water on the floor.’
- b. #Erikses ximus sto patoma.
 you.dropped juice.PL at.the floor
 ‘You spilled juice on the floor.’

The distribution of mass plurals in Greek is also restricted, according to Alexiadou (2011, 2019c), by the verbal predicate they combine with. Specifically, the author considers them to be mostly compatible with verbs of the *load/spray*-type, that favor a large quantity reading of the mass noun.

- (8) a. To plindirio evghale pali nera.
 the washing.machine let.out again water.PL
 ‘Water came out of the washing machine again.’
- b. #Evrase nera ya na ftiaksi makaronia.
 boiled water.PL for to make pasta
 ‘He boiled water to make pasta.’

Examples (8a, b) involve the same plural mass noun, namely *nera* ‘waters’. However, (8b) is infelicitous. Alexiadou (2011) postulates that its infelicity stems from the fact that the verb *evrase* ‘boiled’, in contrast with *evghale* ‘let out’ from (8a), is allegedly not compatible with the inference that there was a large quantity of water.

The incompatibility with cardinals and the restricted productivity as described above presumably help distinguish the instances of Greek plurals that allegedly feature expletive plural number (Tsoulas 2006) from pluralized mass nominals that ultimately receive a count interpretation. The present study will focus exclusively on the first category since it is the one raising

intriguing questions. Before proceeding to elaborate on these questions and the answers they have received, it should be clarified that from this point on, the term *plural mass noun* and its equivalents will refer exclusively to mass nouns with plural morphology but truly mass interpretation.

4.2.2 Four challenges

The first major question raised by the very existence of Greek mass plurals is what Erbach (2019) labels as the *crosslinguistic challenge*: Why are mass denoting plurals possible in languages like Greek but not languages like English? The previous literature on the topic has addressed this challenge in two different ways. Some researchers consider the pluralization of mass nouns a grammatical phenomenon (Tsoulas 2009, Chierchia 2015). These are forced to derive its crosslinguistic (un)availability from the postulation that plural number can have different properties across languages. In this spirit, Tsoulas (2009) suggests that, while English plural has the standard Linkian (1983) semantics described as *closure of atoms under sum*, Greek plural is merely a modifier and does not need to apply to atomic entities.⁴² The latter can, therefore, appear with both count and mass nouns. Chierchia (2015) also dissociates Greek plural from atomicity, without characterizing the former as a modifying category.

An alternative way to address the crosslinguistic challenge is adopted by Alexiadou (2011, 2019c) and Kouneli (2019). The authors build on Acquaviva (2008) and propose that Greek plural mass nouns are lexical plurals, that is idiosyncratic and language-specific. If the morphological pluralization of mass nouns is not a grammatical but a lexical phenomenon, then it is expected that it will be randomly available in some languages but not others. No suggestive evidence has so far been provided to support this or the previous alternative take to the crosslinguistic challenge. It is merely noted here that if the restricted productivity of Greek plural mass nouns

⁴² Alexopoulou et al. (2013) argue that Greek number is the category that contributes argumenthood, and that the interpretative difference standardly associated with the singular vs. plural distinction has the status of an implicature.

(Alexiadou 2011, 2019c) were confirmed, the lexical approach would gain in credibility.

The second important question raised by the phenomenon under study has to do with the exact interpretation of Greek mass plurals. An answer to what could be dubbed as the *interpretation challenge* has also been pursued by previous studies. Tsoulas (2006, 2009) is the first to suggest that plural mass nouns differ from their singular equivalents in that the former necessarily trigger an *abundance* reading.

- (9) a. To kalorifer tripise ke vghazi nero.
 the radiator pierced and let.out water.SG
 ‘The radiator broke and there is water coming out of it.’
- b. To kalorifer tripise ke vghazi nera.
 the radiator pierced and let.out water.PL
 ‘The radiator broke and there is a lot of water coming out of it.’

Under Tsoulas’ view, the difference between (9a) and (9b) above is that only in the latter the speaker unambiguously conveys that there is a lot of water coming from the broken radiator. Recall that the same intuition is expressed by Alexiadou (2011, 2019c), in that case associated with the observation that Greek mass plurals co-occur mostly with *load/spray*-type predicates –see example (8).

The *abundance* interpretative import attributed to Greek plural mass nouns by Tsoulas (2006, 2009) and Alexiadou (2011, 2019c) is acknowledged also by Kane et al. (2015) and Renans et al. (2018). The latter additionally provide experimental evidence that the abundance reading does not arise under negation. In (10) below from Renans et al. (2018) that includes the mass plural *zahares* ‘sugars’, the speaker does not assert that the zebra did not drop a large amount of sugar; they assert that the zebra did not drop any sugar whatsoever.

- (10) Tis zebras dhen tis epesan zahares.
 the zebra not CL drop sugar.PL
 ‘The zebra didn’t drop sugar.’ (Renans et al. 2018: 5, ex. (17))

The observation that the abundance interpretation of mass plurals disappears in the scope of negation lead the authors to propose that this large quantity meaning is a cancellable conversational implicature.

Kouneli (2019) expresses an alternative intuition that casts doubt on the accuracy or at least the exhaustivity of the *abundance* generalization regarding mass plurals. She builds on minimal pairs similar to the following:

- (11) a. To sakulaki exi rizi.
the bag.DIM has rice.SG
b. To sakulaki exi rizia.
the bag.DIM has rice.PL
'There is rice in the bag.'

The sentence in (11a) featuring the singular mass noun *rizi* 'rice' is more likely to be used whenever there is a significant amount of rice in the bag, enough for somebody to cook for example. The minimally different (11b) which involves the plural form *rizia* 'rices', on the other hand, will be probably used to describe a situation where the bag merely has scattered rice grains in it or on it. Based on such asymmetries, Kouneli (2019) proposes that Greek plural mass nouns differ from their singular counterparts in that the former give rise to an *unorderly scattered* reading.

Notice that in (11) it is the small quantity reading that goes with the plural noun *rizia*. This suggests that the ideas put forth by Tsoulas (2009) and Alexiadou (2011, 2019c), on the one hand, and Kouneli (2019) on the other, either make contradictory predictions or are complementary in the sense that they account for different uses of Greek mass plurals. Under such a state of affairs, and given that neither of the alternatives above is supported by evidence stronger than the respective author's intuitions, the interpretation challenge has not been satisfactorily addressed.

Intriguingly, an idea with the potential to compromise the seemingly opposing *abundance* (Tsoulas 2006; Alexiadou 2011, 2019c) and *scatterdness* approaches (Kouneli 2019) is found in the literature. Concretely, Erbach (2019) builds on Chierchia (2015) and assumes that there is nothing compositionally special about mass nouns with plural morphology; there is

no ban on plural plus mass combinations, because the application of the pluralizing operator is not strictly conditioned by the prior application of an individuation operator guaranteeing access to atoms. According to Erbach (2019), plural always introduces a measure function. When it combines with a count noun, this measure function is translated into counting (see also Rothstein 2017). When it combines with a mass noun, which is exactly the case of interest to the present study, the measure function contributed by the plural number is translated into a context-sensitive function that measures *magnitude*, that is size or extent. Under this prism, Erbach (2019) proceeds to suggest that plural on Greek mass nouns indicates that the magnitude of the denoted mass exceeds a contextually supplied standard.

It is worth highlighting that, by making reference to magnitude, Erbach's (2019) proposal incorporates Kouneli's (2019) intuition regarding scatteredness. By claiming that the contextually supplied standard of this magnitude is exceeded, the same proposal can accommodate the large quantity inference reported by Tsoulas (2009) and Alexiadou (2011, 2019c), thus bringing together the *abundance* analyses with the *scatteredness* analyses. Crucially, Erbach (2019) does not take that extra step. Ultimately, by introducing context as a factor that interacts meaningfully with the use of plural mass nouns in Greek, Erbach raises a new research question: What is the exact type of context that triggers the emergence of plural morphology on Greek mass nouns? What Erbach (2019) calls the *contextual challenge*, which is evidently a part of the interpretation challenge, has not yet been addressed to my knowledge.

To the three challenges discussed above, I would like to add a fourth one, namely the *expletiveness challenge*. The reader is reminded that, according to Tsoulas (2006), Greek plural mass nouns feature instances of expletive plural. The aim of the present chapter is to identify the constitutive parts of the expletiveness of plural in Greek. Notice, however, that for the expletiveness challenge to be addressed, one needs to start from at least the interpretation challenge and its subordinate contextual challenge. This is exactly what is pursued in the immediately following section.

4.3 On the comprehension and production of Greek plural mass nouns

Going through the existing research on Greek mass nouns with plural morphology, it became evident that there are several interesting ideas but no definitive answer as to their interpretation and, specifically, as to how their interpretation differs systematically from the one attributed to their singular counterparts. This gap motivated the experimental study to be described in detail below, the first study to my knowledge that addresses the *interpretation challenge* in light of experimental results on both the comprehension and the production of plural mass nouns in Greek.

4.3.1 The working hypothesis

Under Tsoulas' (2009) proposal regarding *abundance*, the speaker's intending a large quantity reading of a mass noun is the main factor that will determine the emergence of plural morphology on the mass noun. Under Kouneli's (2019) counterproposal building on *scatteredness*, a speaker will use a morphologically plural mass denoting noun if they intend its unorderedly scattered interpretation. The two proposals independently offer themselves as working hypotheses for an experimental study on the interpretation of mass plurals in Greek. However, there are both theoretical and empirical reasons to search for an alternative. Concerning the former, it was mentioned already in the previous section that the two proposals sometimes make contradictory predictions. If a unified analysis of plural mass nouns is to be pursued as theoretically more economical and therefore desirable, then the role of abundance and scatteredness should be taken with caution.

But let us move to the empirical reasons, which arguably raise more serious worries. The first one stems from the observation that abundance and scatteredness can be conveyed also by sentences involving singular mass nouns, by means different than plural number morphology.

(12)a. *Vulose* to *freatio* ke i *avli* *yemise*
 clogged the manhole and the yard was.filled
 nero.

water.SG

b. *Vulose* to *freatio* ke i *avli* *yemise*
 clogged the manhole and the yard was.filled
 nera.

water.PL

‘The manhole was clogged, and the yard was filled with water.’

(13)a. I *mikri* *efaye* *moni* *tis* ke *aliftike* me
 the small ate alone her and was.daubed with
saltsa.

sauce.SG

b. I *mikri* *efaye* *moni* *tis* ke *aliftike* me
 the small ate alone her and was.daubed with
saltses.

sauce.PL

‘The kid ate on her own, and she was daubed with tomato sauce.’

Notice that, in the examples in (12), the large quantity of the water can be inferred from the verb *yemise* ‘was filled with’. If the plural marking on *nera* ‘waters’ in (12b) also conveys abundance, then its interpretative import is in this case redundant. In the same vein, the use of the verb *aliftike* ‘was daubed’ in (13) suggests that the tomato sauce was spread all over the girl’s face and possibly body. If the meaning contributed by the plural morphology on *saltses* ‘sauces’ in (13b) is scatteredness, then the presence of plural is redundant under these circumstances.

The second empirical observation that casts doubt on the importance of abundance and scatteredness in the analysis of mass plurals is that the presence of either of these two interpretative components is not enough to license plural morphology on a mass denoting noun. Concretely, it seems that Greek plural mass nouns are not felicitous in utterances that describe

situations which do not cause the dislike of the speaker, irrespective of the quantity of the substance denoted by the mass noun or its distribution in space.

(14)a. Epitelous to idhraghoyio yemise ke pali
 at.last the aqueduct was.filled and again
 nero.
 water.SG

b. #Epitelous to idhraghoyio yemise ke pali
 at.last the aqueduct was.filled and again
 nera.
 water.PL

‘At last the aqueduct is full of water.’

(15)a. Alipsa to psomi me saltsa.⁴³
 I.daubed the bread with sauce.SG

b. #Alipsa to psomi me saltses.
 I.daubed the bread with sauce.PL

‘I daubed the bread with tomato sauce.’

Examples (14) and (15) do not admit the pluralized forms *nera* ‘waters’ and *saltses* ‘sauces’. Since they involve exactly the same verbal predicates and mass nouns as examples (12) and (13), respectively, the observed discrepancy must be attributed to the sentential context. Notice that this discrepancy cannot be predicted either by Tsoulas (2009) or Kouneli (2019), who narrowly associate plural morphology with the interpretation of the mass noun, not the sentence.

Intriguingly, the observation that the occurrence of plural mass nouns may be determined by context is compatible with the third alternative already alluded to, that is the proposal by Erbach (2019). Erbach is the first to highlight the role of context in the analysis of Greek mass plurals but remains agnostic as to the identity of this context. Looking closer into the asymmetry between (12) and (14) on the one hand, and (13) and (15) on the other, the

⁴³ Example (15) includes the same verb as (13), namely *alifo* ‘smear’.

speaker's dissatisfaction emerges as a good candidate for the exact contextual factor that regulates the presence of plural morphology on Greek mass nouns.

In view of the above, an extension of Erbach's (2019) hypothesis is adopted as a working hypothesis for the purposes of the present study: Greek plural mass nouns are associated with circumstances under which the speaker considers that the magnitude of the substance denoted by the noun exceeds a contextually supplied standard and, therefore, the speaker feels an emotion of dislike towards these particular circumstances. This hypothesis is superior to its predecessors in the following ways: (i) it incorporates both the *abundance*- (Tsoulas 2009) and the *scatteredness*-related insights (Kouneli 2019), (ii) it relates the occurrence of plural mass nouns to the broader context, not the narrow interpretation of the mass nouns, and (iii) it straightforwardly addresses the *contextual challenge* and, by extension the *interpretation challenge*.

4.3.2 The experimental study

A study consisting of a perception/interpretation experiment and a production experiment was designed and carried out in order to get evidence in support of the working hypothesis fixed above. Concretely, both experiments tested whether Greek plural mass nouns are preferred in contexts that can be described as dissatisfactory, that is situations that cause an emotion of dislike to the speaker. Bearing in mind the previous literature, the relevance of abundance (Tsoulas 2006, 2009; Alexiadou 2011, 2019c) and scatteredness (Kouneli 2019) in the speakers' preference for singular or plural mass nouns was also tested, as a secondary hypothesis.

4.3.2.1 Experiment 1

The first experiment was based on an acceptability judgment task. It tested the distinction between *singular* and *plural* number morphology on mass nouns against the *neutral* vs. *dissatisfactory* context distinction as well as the

abundance vs. *scatteredness* meaning distinction. Participants were faced with a number of small written texts, each consisting of the description of a situation and two alternative follow-ups. They were requested to rate the naturalness of each follow-up, bearing in mind its respective situation description. This survey was administered via the SurveyGizmo platform.

Participants

Experiment 1 was voluntarily completed by a total of 77 native speakers of Greek (28 males, 49 females; mean age 28.20 years, SD = 7.63), recruited via different social media platforms.

Materials

The materials for Experiment 1 were built around a list of 12 Greek mass nouns: *ladhi* ‘oil’, *sokolata* ‘chocolate’, *rizi* ‘rice’, *kafes* ‘coffee’, *alevri* ‘flour’, *laspi* ‘mud’, *nero* ‘water’, *ximos* ‘juice’, *zaxari* ‘sugar’, *xrisoskoni* ‘glitter’, *saltsa* ‘sauce’, *ghala* ‘milk’. Each noun, both in its singular and its plural morphological variant, formed part of a verbal reaction to one context that triggered a speaker dissatisfaction inference (dissatisfactory context) and one context that triggered no such inference (neutral context). This design led to a set of 24 experimental items. The Meaning parameter, taking the value of either abundance or scatteredness, was incorporated in the experiment in the following way: half of the dissatisfactory contexts and half of the neutral contexts favored a large quantity reading of the mass noun, while the rest favored an unordered scattered reading.

The interplay between the Context and Meaning parameters gave rise to four distinct types of situations: (i) neutral-abundance, (ii) neutral-scatteredness, (iii) dissatisfactory-abundance, and (iv) dissatisfactory-scatteredness. Both Context and Meaning were controlled for by manipulating the provided lexical and contextual information. Specifically, a dissatisfactory context featured mainly negatively charged emotive expressions and psych-predicates, and/or the explicit statement of undesirable emotional states. Neutral contexts, on the other hand, were characterized by the absence of those; neutrality was sporadically reinforced by interjections expressing serenity and calmness. Adverbial modifiers meaning roughly ‘all over the place/in different places’ and *spread*-type predicates were used to

favor a scatteredness interpretation, while the abundance meaning was inferred on the basis of quantity or measure expressions meaning ‘a lot’ and *fill*-type predicates.

Let us clarify the statements above via reference to concrete examples from the item list, translated into English for the reader’s convenience.⁴⁴

(16) Dissatisfactory-scatteredness

[Pernis ti salata pu etimases ya vradhino ke kathese anapaftika ston kanape na apolafsis tin aghapimeni su tenia. Tendonese na piasis to tilekondrol. To metanionis amesos yati kapios to exi ladhosi se dhiafora simia. I iremia su katastrafike.]

‘You take the salad you prepared for dinner and sit comfortably on your sofa to enjoy your favorite movie. You stretch to reach the remote. You instantly regret it because somebody has stained it with oil in different spots. Your tranquility is gone.’

Tranquility is gone in (16), making it explicitly a dissatisfactory situation. The adverbial *se dhiafora simia* ‘in different spots’ conveys further that an unorderedly scattered reading of the oil is intended.

(17) Dissatisfactory-abundance

[Eitelus eftases spiti apo to super market. San na to parakanes. Su kopikan ta xerya. Ala tora ola entaksi...i etsi nomizes mexri pu idhes oti to enamisi litro ntomatoximu xithike mesa stin panini tsanda. I psixremia pai peripato.]

‘You are finally home from the market. You overdid it this time. The bags were too heavy. But everything is fine now...or so you thought until you saw that 1,5 liter of tomato juice was spilled inside the tote bag. There goes serenity.’

⁴⁴ The list of experimental items used for Experiment 1 as well as the sociolinguistic information gathered on the participants can be accessed at <https://ars.els-cdn.com/content/image/1-s2.0-S0378216621001971-mmcl.pdf>.

Serenity disappears in (17), rendering it a dissatisfactory situation in a similar fashion to (16). Specifying the quantity of the spilled tomato juice as 1,5 liter favors an abundance reading of the mass noun.

(18) Neutral-scatteredness

[Meta tin teleftea sezon tu mastersef, esi ke o filos su nomizete oti borite na anaparaghayete ena miselenato piato. To proto thima sas ine ena ghliko sufle. Exi ftasi i ora tis dhiakosmisis tu piatu me liomeni kuvertura.]

‘After the last season of Masterchef, you and your friend think that you can reproduce any Michelin dish. Your first victim is a sweet tart. It is time to decorate the plate with melted dark chocolate.’

Arguably, no dissatisfaction can be inferred from (18), which describes a fun and creative moment between friends. It is, therefore, considered as a neutral situation. The fact that chocolate is used to decorate a plate suggests that a scatteredness rather than an abundance reading of the mass noun is favored in this situation.

(19) Neutral-abundance

[To meghalo sindrivani pu aghorases apo to kenuryo Feng Sui maghazi ine idhi brosta apo anatoliko parathiro. Kathese sto eneryiaka katharo pia saloni su ke apolamvanis.]

‘The big fountain you bought from the new Feng Shui store is already in front of an eastern window. You sit in your now energy-cleansed living room and enjoy.’

Finally, (19) involves a *big* fountain that is being *enjoyed*. This makes it an exemplary instantiation of a neutral situation favoring an abundance reading of *nero* ‘water’.

Recall that, according to the working hypothesis adopted in the present study, Greek plural mass nouns are more felicitous in situations such that cause the dislike of the speaker. Therefore, the mass plurals included in the experimental items were predicted to elicit higher naturalness ratings as parts

of reactions to dissatisfactory contexts, such as (16-17), than to neutral contexts, such as (18-19). No significant differences were predicted when comparing (16) to (17), or (18) to (19), since scatteredness and abundance were hypothesized to play a secondary role in the distribution of Greek plural mass nouns, if any.

The participants of Experiment 1 were given the following instructions: “In what follows, you will read a set of small texts. Each text consists of a brief description of a situation and two possible verbal reactions to this situation. Under every reaction, a scale from 0 to 100 will appear on your screen. We ask you to use that scale to rate how natural each reaction seems, given the respective situation (0 = totally unnatural, 100 = absolutely natural).”

All 77 participants rated the total of the experimental items producing 48 ratings each (2 Numbers [singular, plural] × 2 Contexts [neutral, dissatisfactory] × 2 Meanings [abundance, scatteredness] × 6 communicative situations). The reported results are based on the statistical analysis of 3,696 responses (77 participants × 48 ratings).

Procedure

Participants first read the instructions, then filled in a sociolinguistic questionnaire, and then started with the main task. The latter consisted in reading a situation description followed by two sentences and rating the naturalness of each of the two sentences, always considering the respective situation. It is worth highlighting that this was not a forced-choice task. Participants did not have to choose between the two verbal reactions that were provided in each case; they could find only one of them good, both of them natural, or neither.

The order of the items, as well as the relative order of the verbal reaction involving the singular mass noun and the reaction involving the plural one, were randomized. In each item, the situation description appeared in square brackets. The two reactions followed, each accompanied by its own rating scale. An example of what participants saw on their screen, here translated into English for expository purposes, is given below.

(20)[Telioses epitelus to katharizma tis kuzinas ala, prin xaris, to sxedhon adhyo sakulaki me to rizi xinete sto patoma. Apognosi.]

‘You are finally done with cleaning the kitchen but, before you can enjoy the moment, the almost empty pack of rice falls on the floor. Despair.’

a. Oxi re file! Tora prepri na mazepto ke to rizi apo to patoma.

‘Damn it! Now I also have to pick up the rice from the floor.’

totally unnatural: 0  absolutely natural: 100

b. Oxi re file! Tora prepri na mazepto ke ta rizia apo to patoma.

‘Damn it! Now I also have to pick up the rices from the floor.’

totally unnatural: 0  absolutely natural: 100

The median duration of the experiment was 10' 20".

Results

Figure 1 shows the results of Experiment 1 as a function of Number (singular, plural), Context (neutral, dissatisfactory), and Meaning (abundance, scatteredness). The two values of Number appear on top of the graph, whereas the x axis presents the neutral vs. dissatisfactory contextual division. For each Number and Context combination, the graph provides the mean acceptability ratings for the two potential readings available, either scatteredness or abundance.

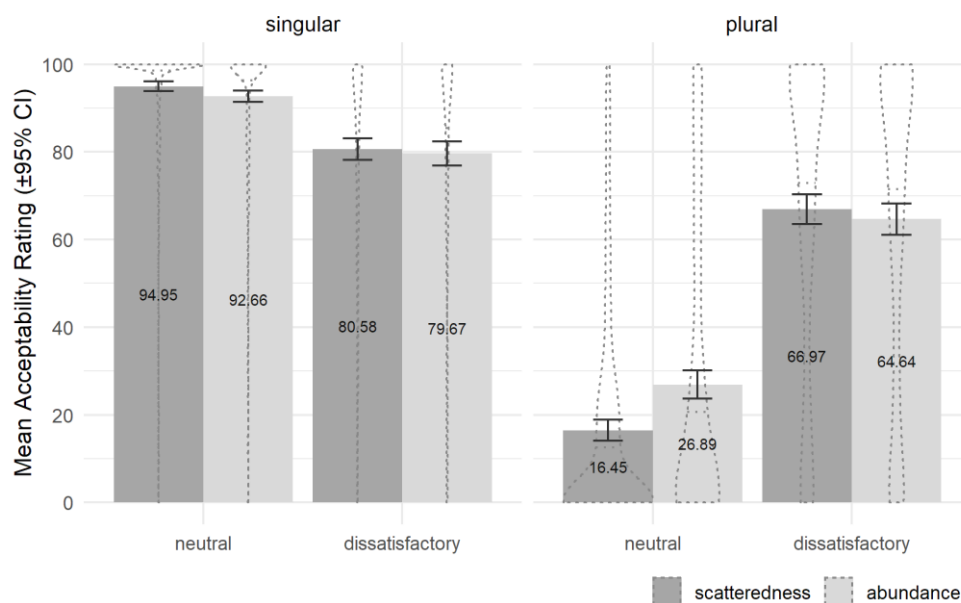


Figure 1. Results of Experiment 1: Number × Context × Meaning (Tsiakmakis et al. 2021b: 217, Fig. 1)

Each bar represents the mean acceptability rating, which is also displayed numerically, and error bars display the confidence interval at 95%. In addition, a set of dotted-contour violin plots show the underlying distribution of the data and the location of the median value. This figure shows that singular responses received higher ratings than plural responses overall. Plural mass nouns are preferred in dissatisfactory contexts, whereas singular mass nouns are preferred in neutral contexts. Few differences regarding Meaning are observed, with an apparent effect only for plural constructions in neutral contexts, which was proved to be not significant after running a statistical analysis.

The data obtained were analyzed using the *glmmTMB* package in R. A series of linear mixed-effects models using different random effects structures were performed, from the most complex random effects structure to a model with only subject as a random intercept. All structures providing no model converge problems were compared using the function *compare_performance* from the *performance* package to identify the model that best fitted the data. In the reports below, the omnibus test results are provided plus the output of a series of pairwise tests performed with the *emmeans* package, which include a measure of effect size by using Cohen's *d*.

For the analysis of the results Number, Context, Meaning and all their possible interactions were set as fixed factors. Random slopes for both Context and Meaning by Subject plus a random intercept for Item were included in the model.

Two main effects and one paired interaction were found to be significant: the main effects of Number and Context, and the interaction Number \times Context. The main effect of Number, $\chi^2(1) = 186.716, p < .001$, indicates that singular constructions were generally preferred to plural ones (*Cohen's d* = 1.79, $p < .001$). The main effect of Context, $\chi^2(1) = 21.907, p < .001$, is related to the fact that dissatisfactory contexts were generally more accepted than neutral ones ($d = 0.64, p < .001$).

The paired interaction Number \times Context, $\chi^2(1) = 82.873, p < .001$, can be better interpreted looking at Context as the contrast field: when singular constructions are used, neutral contexts are preferred to dissatisfactory ones ($d = 0.55, p = .003$), whereas, when plural constructions are used,

dissatisfactory contexts are preferred to neutral ones ($d = 1.83, p < .001$). When looking at Number as the contrast field, singular constructions are preferred against plural ones in the two contexts analyzed, though the effect is greater in neutral contexts ($d = 2.98, p < .001$) than in dissatisfactory ones ($d = 0.60, p = .001$).

No effect concerning Meaning was found to be significant. A final glimpse to the pairwise contrasts found for the non-significant triple interaction would indicate that the preference for singular constructions over plural ones would not be equally found for any combination of Context and Meaning. Neutral-scatteredness situations would display a great difference ($d = 3.24, p < .001$), followed by neutral-abundance situations ($d = 2.72, p < .001$); the effect would be clearly smaller for dissatisfactory-abundance situations ($d = 0.63, p = .016$) and for dissatisfactory-scatteredness situations ($d = 0.56, p = .031$). Though visible in the bar graph above, the difference regarding Meaning in neutral plural constructions was not found to be significant ($d = 0.42, p = .107$).

Discussion

Experiment 1 tested native Greek speakers' comprehension of plural mass nouns. There are two main findings that bear direct relevance to the research question addressed by the experiment. First, participants preferred the sentences featuring mass plurals that were embedded in dissatisfactory contexts over their counterparts embedded in neutral contexts. Second, neither abundance interpretations nor scatteredness interpretations correlated significantly with a preference for morphologically plural mass denoting nouns. These two findings are instructive on a first level because they provide empirical support to the working hypothesis adopted in this study, according to which plural mass nouns are used in circumstances that cause the dislike of the speaker. On a second level, they show that the so far prominent role attributed to abundance (Tsoulas 2009; Alexiadou 2011, 2019c) or scatteredness (Kouneli 2019) as factors regulating the use of Greek mass plurals should be reconsidered.

4.3.2.2 Experiment 2

The second experiment pursued the very same goals as Experiment 1. It primarily aimed to get evidence in support of the hypothesis that Greek plural mass nouns convey that the magnitude of the substance denoted by the noun exceeds a contextually determined standard, thus causing to the speaker an emotion of dislike. On a second level, it meant to explore to what extent abundance and scatteredness interact with the emergence of plural morphology on mass nouns. Consequently, as in the first experiment, in this case too the singular vs. plural number distinction was tested against the neutral vs. dissatisfactory context distinction as well as the abundance vs. scatteredness meaning distinction.

However, Experiment 2 implemented a different methodology; it was a production experiment based on an elicitation task. Participants were shown different images displaying Internet chat conversations abruptly cut. They were asked to use a small number of words in order to complete each conversation in a reasonable way. This survey was administered via SurveyGizmo, too.

Participants

Experiment 2 was voluntarily completed by 142 participants (35 males, 107 females; mean age 34 years, SD = 10), all native Greek speakers, recruited via several social media platforms.

Materials

The materials used for this second experiment were designed in a way similar to Experiment 1 materials. Specifically, 12 neutral and 12 dissatisfactory contexts were created, giving rise to a set of 24 experimental items.⁴⁵ The neutral contexts were meant to elicit the singular form of the following mass nouns: *amos* ‘sand’, *kapnos* ‘tobacco’, *krasi* ‘wine’, *krema* ‘cream’, *ksidhi* ‘vinegar’, *skotadhi* ‘darkness’, *ema* ‘blood’, *alati* ‘salt’, *yaurti* ‘yoghurt’, *laspi/xoma* ‘mud’/‘soil’, *staxti* ‘ash’, *psomi* ‘bread’. The dissatisfactory

⁴⁵ The materials of Experiment 2 and the obtained sociolinguistic information regarding the participants can be found here:
<https://ars.els-cdn.com/content/image/1-s2.0-S0378216621001971-mmc1.pdf>.

contexts aimed at eliciting the plural forms of the same mass nouns. The Meaning parameter was introduced exactly as in Experiment 1; in half of the neutral contexts and half of the dissatisfactory contexts, an abundance reading of the mass noun was intended, while a scatteredness reading was favored by the rest of the contexts.

The interaction between the Context and Meaning parameters created the same four types of situations described for Experiment 1: (i) neutral-abundance, (ii) neutral-scatteredness, (iii) dissatisfactory-abundance, and (iv) dissatisfactory-scatteredness. It is worth highlighting that apart from manipulating the vocabulary and discourse information in order to convey neutrality, dissatisfaction, abundance and scatteredness, emojis were also used in Experiment 2 to make the situations suggestive of the speakers' emotional state.⁴⁶ Let us make this last thing clearer via reference to a couple of examples from the item list.

- (21)[Lipon to vrika! 😊 🙌 Tha ftiaksume Glühwein. Thimase? Afto pu piname persi sto Verolino. 😍 Exi 5 litra Mavrodhafni sto psiyio. Se 5 lepta ftano me ta mirodhika. Esi adyase stin katsarola]
'I have an idea! We will make Glühwein. Remember? The thing we drank in Berlin last year. There are 5 liters of Mavrodafni wine in the fridge. In 5 minutes, I will be there with the spices. You empty into the pot'
Target answer: *krasi* 'wine.SG'

The smiling and loving emojis clearly make the situation in (21) non-dissatisfactory and, thus, neutral. Notice further that the *5-liter* modifier strongly favors an abundance reading of the wine, in the same vein as in Experiment 1.

- (22)[Dhe mu les, to proi ksiristikis i sfaxtikis mes sto banio? 🤪🤪🤪 O kathreftis exi apo pano mexri kato]
'Tell me something, did you shave or just slaughter yourself in the bathroom this morning? All along the mirror there was/were'

⁴⁶ This was independently suggested by Andreas Trotzke and Joan Borràs-Comes.

Target answer: *emata* ‘blood.PL’

The screaming-in-fear emojis in (22) on the other hand, combined with the figurative use of the verb *sfaxtikēs* ‘were slaughtered’, characterize this as a dissatisfactory situation. It is noted in passing that the complex adverbial *apo pano mexri kato* ‘all along’ favors an interpretation according to which the blood was unorderly scattered.

If our working hypothesis is correct and Greek mass plurals are preferred in those cases where the speaker experiences dislike, we predict the following: Neutral contexts are expected to elicit morphologically singular mass nouns, while dissatisfactory contexts are expected to trigger a significantly higher number of plural mass noun responses. The abundance vs. scatteredness distinction is not expected to correlate significantly with the speakers’ production of a singular or a plural nominal form.

Participants were given the following instructions: “In what follows, a set of images will be presented to you. The images come from Internet chat conversations that were abruptly stopped. We ask you to use the space that you will find under each image to complete the stopped conversations, using in each case one to three words.”

All participants responded to the whole set of experimental items. A total of 3,408 responses (142 participants × 24 answers) were statistically analyzed.

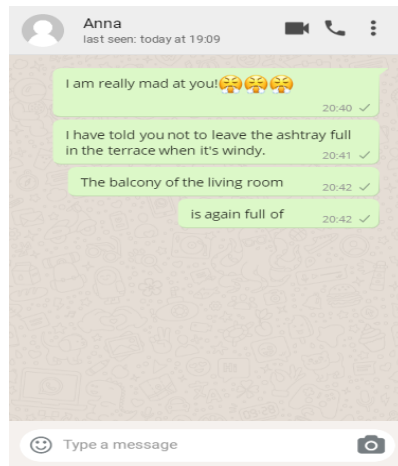
Procedure

The procedure for Experiment 2 was similar to the one followed for Experiment 1 in that participants completed the experiment using their personal computer or smart device, they filled in a sociolinguistic questionnaire before proceeding to the main task, and they were exposed to different randomized versions of the experimental item set. The task was significantly different to the one from the previous experiment. Participants were presented with a set of images depicting incomplete chat conversations.⁴⁷ Each image was followed by a blank space. They had to read

⁴⁷ The images were generated with the help of the free software provided in the platform <https://www.fakechatapp.com>.

the conversation fragment and type their answer in the blank space. For the statistical analysis, only the singular or plural form of the noun used as part of the participants' reply was considered. An example of what appeared on the computer screen during the experiment is given below, translated into English for the reader's convenience.

(23)



The median duration of Experiment 2 was 14' 13".

Results

The results of Experiment 2 are shown in Figure 2. Participants' responses were classified as shown in (24), based on the morphological number of the produced noun and its target or non-target status.

- (24) a. sands, tobaccos, wines, creams, vinegars, darknesses, bloods, salts, yoghurts, muds/soils, ashes, breads
- b. sand, tobacco, wine, cream, vinegar, darkness, blood, salt, yoghurt, mud/soil, ash, bread
- c. stains, sprinkles, particles, drops, pieces, crumbles, pebbles, seeds, leaves, cigarettes, garlics, and similar
- d. oil, lemon, night, flour, moisturizer, cement, anti-age cream, litter, butter, smell, lemon juice, filter, and similar
- e. smell (verb), candy, baking paper, bake, newspapers, help (verb), tablecloth, towel and other nonsensical answers

These different groups appear in different colours in the graph and are codified in the following way:

- (25)a. target-plural mass nouns (red)
- b. target-singular mass nouns (blue)
- c. plural nouns (light red)
- d. singular nouns (light blue)
- e. other (white)

Figure 2 shows the distribution of these answer-groups in the four conditions created by the interaction of Context (neutral, dissatisfactory) and Meaning (abundance, scatteredness), which are presented in the *x*-axis. The figure shows that the use of plural constructions is more frequent in dissatisfactory contexts compared to neutral contexts (columns 3-4 vs. 1-2). Singulars are preferred in almost all contexts, except for those dissatisfactory contexts that further convey scatteredness (column 4). Also, more plurals are used conveying scatteredness than abundance meanings (column 2 vs. 1, 4 vs. 3, 2-4 vs. 1-3). Sticking to target answers, while the production of mass singulars is higher in neutral contexts, the production of mass plurals is higher in dissatisfactory contexts (columns 1-2 vs. 3-4). In the case of neutral contexts, mass plurals are almost irrelevant, with the additional comment that more plurals are produced in those neutral contexts that favor a scatteredness interpretation than the ones favoring abundance readings (column 2 vs. 1).

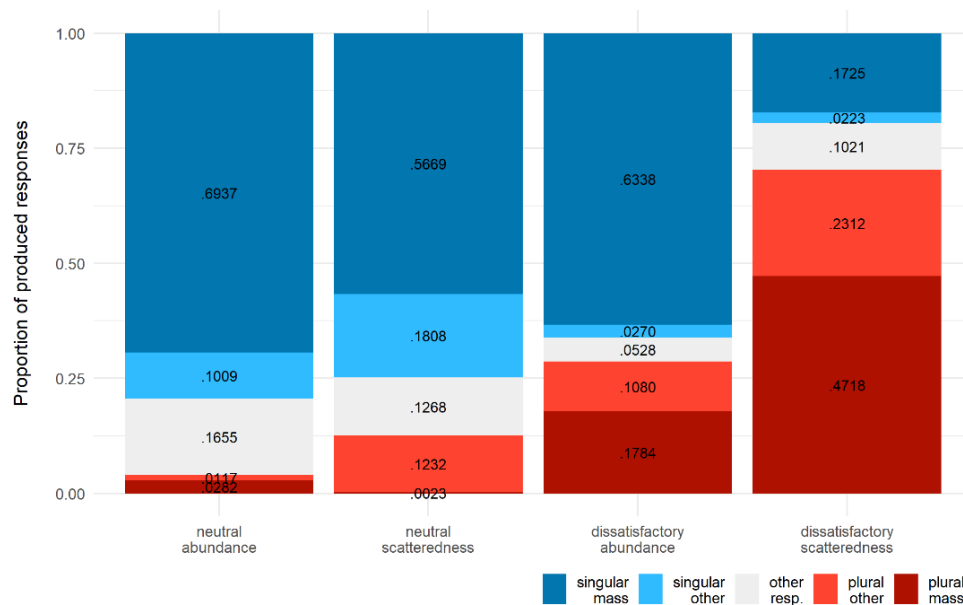


Figure 2. Results of Experiment 2: Number \times Context \times Meaning (Tsiakmakis et al. 2021b: 220, Fig. 2)

The *glmmTMB* package in R was used for the analysis of the participants' responses (see the results section of Experiment 1 for details). Two separate analyses were conducted. The first one included only those responses in which mass nouns were obtained (red and blue), and the second one included all responses classifiable in terms of grammatical number (red, blue, light red, light blue). In both analyses, the dependent variable was Plural, which follows a Binomial distribution (in which 0 indicates that a singular form had been produced and 1 indicates that a plural form had been produced).

As for the first level of analysis, Context, Meaning and their interaction were set as fixed factors. A random intercept for Subject plus a random intercept for Item were included in the model.

All fixed effects were found to be significant. The main effect of Context, $\chi^2(1) = 136.093$, $p < .001$, indicates that plurals are more produced in dissatisfactory contexts than in neutral contexts (*Cohen's d* = 5.35, $p < .001$). The main effect of Meaning, $\chi^2(1) = 37.468$, $p < .001$, indicates that plurals were more produced in association with scatteredness than with abundance readings ($d = 1.22$, $p = .008$).

The paired interaction Context \times Meaning, $\chi^2(1) = 40.203$, $p < .001$, can be interpreted in two complementary ways. First, the preference for producing plurals in dissatisfactory vs. neutral contexts is more than the triple when

scatteredness is involved ($d = 8.24, p < .001$) than when abundance is involved ($d = 2.46, p < .001$). Second, when looking at Meaning as the contrast field, in dissatisfactory contexts, mass plurals are again more frequent in association with scatteredness than with abundance ($d = 4.11, p < .001$); however, in neutral contexts, mass plurals are more frequent in association with abundance than with scatteredness ($d = 1.67, p = .033$).

On the second level of analysis, Context, Meaning and their interaction were set as fixed factors. A random intercept for Subject plus a random slope for Meaning by Item were included in the model.

All fixed effects were found to be significant. The main effect of Context, $\chi^2(1) = 257.886, p < .001$, indicates that plurals are more produced in dissatisfactory contexts than in neutral contexts (*Cohen's* $d = 3.41, p < .001$). The main effect of Meaning, $\chi^2(1) = 8.434, p = .004$, indicates that plurals were more produced in association with scatteredness than with abundance readings ($d = 2.20, p = .010$).

The paired interaction Context \times Meaning, $\chi^2(1) = 26.127, p < .001$, can be interpreted in two complementary ways. First, the preference for producing plurals in dissatisfactory vs. neutral contexts is almost the double for scatteredness ($d = 4.38, p < .001$) than the one that is found for abundance ($d = 2.44, p < .001$). Second, when looking at Meaning as the contrast field, in dissatisfactory contexts, plurals are more frequently associated with scatteredness than with abundance ($d = 3.17, p < .001$), though they are not significantly different in frequency in neutral contexts ($d = 1.23, p = .168$).

Discussion

Experiment 2 tested Greek speakers' production of plural mass nouns. Importantly, this experiment also found a general preference for mass plurals in dissatisfactory contexts. It thus provided additional support to the hypothesis that plural morphology emerges on mass nouns in the description of situations from which the speaker's dislike can be inferred. Moreover, similarly to Experiment 1, this second experiment could not detect any systematic link between an abundance interpretation of the mass nominal (Tsoulas 2009, Alexiadou 2011, 2019c) and the preference for plural morphological marking on the nominal. Crucially, however, the findings of

Experiment 2 diverged from those of Experiment 1 as regards the role of scatteredness (Kouneli 2019); an intended *unorderly scattered* interpretation of the mass noun did encourage speakers to produce its plural morphological variant. In the immediately following subsection, we take stock of the results of both experiments and see how much they can tell us with respect to the four plural mass noun challenges introduced in Section 4.2.2.

4.3.3 General discussion

The experimental study presented in this chapter was motivated primarily by the need to address the *contextual challenge* and its superordinate *interpretation challenge* raised by Greek plural mass nouns. To this aim, the following working hypothesis based on Erbach (2019) was formulated and tested: Greek plural mass nouns are associated with circumstances under which the speaker considers that the magnitude of the substance denoted by the noun exceeds a contextually supplied standard and, therefore, the speaker feels an emotion of dislike towards these particular circumstances.

Experiment 1 and Experiment 2 confirmed the native speakers' preference to associate Greek plural mass nouns with dissatisfactory situations. In this sense, both experiments provided evidence in support of the general working hypothesis and motivated empirically a solution to Erbach's (2019) contextual challenge: The specific aspect of context that triggers plural morphology on Greek mass denoting nouns is the dislike of the speaker.

Providing an answer to the contextual challenge has immediate consequences also for the interpretation challenge. If the factor regulating the use of plural mass nouns is the contextually inferred dissatisfaction of the speaker, what is the role of the *abundance* (Tsoulas 2009, Alexiadou 2011, 2019c) or *scatteredness* interpretation of the mass noun (Kouneli 2019), both highlighted as relevant in the previous literature? As far as abundance is concerned, neither of the experiments carried out managed to get an empirical reflex of its link to the emergence of plural morphology on Greek mass nouns. As for scatteredness, the situation turned out to be more complicated. Experiment 2, but not Experiment 1, found that an *unorderly scattered*

intended interpretation of the mass nominal increased the chances of the speaker realizing it as morphologically plural.

The obtained asymmetry between comprehension and production concerning the role of scatteredness in the study of Greek mass plurals requires further research. At this point, it is merely speculated that the scattered reading is an inference triggered by the central role of magnitude (Erbach 2019) in the interpretation of plural mass nouns. Specifically, the combination of the speaker's dissatisfaction and the fact that the size or extent of the substance denoted by the mass noun exceeds a standard favor an unordered, messy and ultimately scattered reading of the noun. Under this view, the answer to the interpretation challenge proposed here is the following: Plural morphology on a Greek mass noun conveys the speaker's dislike with the described situation. The dissatisfactory situation is always built around the status of the substance denoted by the mass noun, which is often inferred to be scattered in space.

Can the findings of the study presented in this chapter inform us regarding the crosslinguistic challenge? Given that Experiments 1 and 2 tested exclusively Greek examples, the immediate answer is negative. Under closer scrutiny, though, the results of the study can be argued to indirectly support grammatical (Tsoulas 2009; Chierchia 2015) over lexical approaches (Alexiadou 2011, 2019c; Kouneli 2019) to mass noun pluralization. Notice that, if Greek plural mass nouns are lexical plurals, they are expected to show restricted productivity, as is claimed by Alexiadou (2011). However, the experiments conducted involved a fairly wide set of mass denoting nouns and participants pluralized most of them without problems. Since Greek plural productively merges with mass nouns to convey the speaker's dislike, it can be argued *pace* Chierchia (2015) to be free from atomicity-related requirements, unlike the strictly atomic English plural for example. It is noted merely for reference that non-atomic plurals have been shown to appear also in at least Persian (Sharifian and Lotfi 2003), Hebrew (Lunn 2016), Halkomelem (Wiltschko 2008), and Blackfoot (Wiltschko 2012).

The experimental study on the comprehension and production of Greek plural mass nouns illuminated aspects of the phenomenon related to their interpretation and crosslinguistic status. In doing so, it offered insight

valuable also for pursuing an answer to the *expletiveness challenge*. The rest of the chapter attempts to determine further the status of the interpretative import borne by Greek mass plurals in order to, ultimately, decompose the expletiveness of Greek plural number in its constitutive parts.

4.4 Greek mass plurals are expressive plurals

The findings of the experimental study carried out on Greek plural mass nouns show that the latter are strongly associated with situations towards which the speaker holds an emotive stance that can be described as dislike. This empirical generalization can be accommodated under the pretheoretical claim that Greek mass plurals are expressive variants of their morphologically singular counterparts. Concretely, they express that the speaker is dissatisfied with the situation described by the utterance of which the mass noun is part. The question that immediately arises is at what level of interpretation this expression of dislike becomes relevant.

4.4.1 Dislike, at-issueness and speech acts

Let us take a closer look at the interpretation of utterances involving plural mass nouns in Greek. Example (26) from the item list of Experiment 1 will be used as a case study.

- (26) Trexun pali nera ap to psiyio.
run again water.PL from the fridge
'There is water coming from the fridge again.'

In light of the experimental results presented in the previous section, (26) is considered to carry two distinct pieces of information: (i) there is water coming from the fridge again, and (ii) the speaker feels dislike towards this leaking-fridge situation. Starting from (i), it is easily shown that it

corresponds to the asserted proposition since its entailment cannot be cancelled; example (27) below gives rise to a contradiction.

- (27) #Trexun pali nera ap to psiyio ala dhen iparxi nero
run again water.PL from the fridge but not exists water.SG
edho yiro.
here around
'There is water coming from the fridge again but there is no water
around here.'

Consequently, the information in (i) is arguably part of the at-issue meaning of (26) in Potts' (2007) terms.

But what is the status of the information in (ii), namely the expression of dislike? The sentence in (26) is true if there is indeed water coming from the fridge, irrespective of how the speaker feels about it. This suggests that the speaker's emotive stance does not affect the truth conditions of the sentence and is, therefore, not part of its descriptive content. Does this mean that (ii) represents non-at-issue content?

Let us explore the alternatives that non-at-issueness suggests. The expression of speaker dislike associated with the utterance of (26) cannot be considered as a conventional implicature because it cannot be tied to a specific lexical item (Grice 1989). The plural morpheme itself could be a candidate for building a conventional implicature account on. However, this would make the incorrect prediction that plural morphology triggers a dislike-reading in general, also when attached to count nouns. Intriguingly, the speaker's dislike cannot be a conversational implicature either as it cannot be cancelled:

- (28) #Trexun pali nera ap to psiyio ala mu aresi afto.
run again water.PL from the fridge but me likes this
'There is water coming from the fridge again, but I like it.'

Is the expression of speaker dislike associated with plural morphology on Greek mass nouns a presupposition, that is uncancellable pragmatically

implicated material, then? The answer is once again negative. The speaker's emotive stance does not constitute 'old' information in (26), it is not entailed by the common ground –the speaker's and addressee's shared beliefs (Stalnaker 2002)– and, most tellingly, it does not project; it disappears under negation. Notice for example that the speaker-oriented adverb *eftixos* 'fortunately', which is incompatible with the expression of speaker dislike, leads to infelicity in (29a) but not to its negated counterpart in (29b).

- (29) a. #Eftixos trexun pali nera ap to psiyo.
 fortunately run again water.PL from the fridge
 'Fortunately, there is water coming from the fridge again.'
- b. Eftixos dhen trexun pali nera ap to psiyo.
 fortunately not run again water.PL from the fridge
 'Fortunately, there is no water coming from the fridge again.'

It seems that we are out of options. The tests applied above indicate that the expression of the speaker's dislike via the utterance in (26) is not run-of-the-mill non-at-issue meaning. This must mean that we are actually dealing with at-issue meaning, although separate from the truth-conditional content of the sentence. The at-issueness view is supported by the fact that, upon hearing (26), the addressee cannot really challenge that the speaker is experiencing dislike, but they can advise the speaker to embrace the situation. Note the contrast between the infelicitous (30B) and the felicitous (30B') below.

- (30) A: Trexun pali nera ap to psiyo.
 run again water.PL from the fridge
 'There is water coming from the fridge again.'
- B: #Ala su aresi afto.
 but you like this
 'But you like it.'
- B': Kala iremise. Tha ta mazepsume.
 well calm.IMP will them pick.up.1PL
 'Ok, calm down! We will mop it.'

Considering all the above, an analysis oriented at speech acts (Austin 1962; Searle 1969; Krifka 2021b, among others) is ultimately proposed. Specifically, all utterances involving plural mass nouns in Greek are argued to carry at least two identifiable at-issue meaning components. The first one is the descriptive content and, in our example (26), it corresponds to the proposition *There is water coming from the fridge again*. The second component involves the proposition *I feel dislike towards the situation described by the asserted proposition*. While the former enters the speaker-and-addressee conversational universe via an assertion speech act and is therefore up for negotiation between the interlocutors, the latter is hypothesized to be introduced via an expressive speech act. Note that, if the expression of the speaker’s dislike is not asserted but performed, it is expected to be at-issue but non-negotiable, as shown in (30) –see also Potts (2007); Rett (2021).

If the proposal above is on the right track, the prediction is that both meaning components attributed to example (26) can be paraphrased by using overt performatives. Example (31) that follows shows that this is indeed the case.

(31)A: Ti eyine?

‘What happened?’

B: Dhio praghmata. Tha su po. Su dhilono oti trexun pali
 two things will you I.say you I.state that run again
 nera ap to psiyio ke su ekfrazo ti dhisareskia mu
 water.PL from the fridge and you I.express the dislike my
 pu trexun pali nera ap to psiyio.
 that run again water.PL from the fridge

‘Two things. I will tell you. I state to you that there is water coming from the fridge again and I express to you my dislike due to the fact that there is water coming from the fridge again.’

Summing up, there is robust evidence that (i) Greek plural mass nouns are associated with the expression of the speaker’s dislike towards the described situation, and (ii) the expression of this dislike is computed at the

level of utterance interpretation via an expressive speech act. The next important task to be taken up is the formalization of this novel and intriguing insight.

4.4.2 Formalizing dislike: on the representation of mass plural (utterances)

The experimental study that formed the main body of the present chapter and the theoretical discussion in the previous subsection motivated strongly the idea that the interpretative difference between morphologically singular and morphologically plural mass nouns in Greek becomes traceable not at the level of DP-interpretation but at the level of CP-interpretation. This interpretative difference can be defined formally within the extended version of Krifka's (2021b) commitment-based speech act syntactization framework laid out in detail in Chapter 1. Under an approach such that speech act information is represented in different syntactic projections along an extended CP-area, plural mass noun utterances can be shown to be more complex than their singular counterparts in that they involve a conjunction of speech acts.

Let us go step by step and take the following minimal pair, sticking to the previous water-under-the-fridge example:

- (32) a. Trexi pali nero ap to psiyio.
run again water.SG from the fridge
b. Trexun pali nera ap to psiyio.
run again water.PL from the fridge
‘There is water coming from the fridge again.’

Example (32a) features the singular mass noun *nero* ‘water.SG’ and is, therefore, interpreted simply as an assertion via which the speaker commits publicly to the judgment that the proposition corresponding to *There is water coming from the fridge again* is true. This is represented formally in (33).

- (33) [ActP [Act ASSERT] [Comp [Com \vdash] [JP [J J-] [TP trexi pali nero ap to psiyio]]]]

As for the minimally different (32b), that involves the mass plural *nera* ‘water.PL’, it can convey the same meaning as (32a). In this sense, (32b) is also interpreted as an assertion through which the speaker commits publicly to the truth of the expressed proposition. Crucially, however, it additionally conveys the speaker’s dislike. Therefore, it is postulated to involve an additional expressive speech act via which the speaker commits publicly to an emotive judgment of dislike towards the proposition corresponding to *There is water coming from the fridge again*.

In the previous chapter on Greek polydefinites, expressive speech acts were proposed to be projected by an EXPRESS operator in the head of ActP. Moreover, they were hypothesized to involve a *J:EMOTIVE* operator in the head of JP, which ensures that the expressed private judgment does not concern truth but the speaker’s emotive stance. Given the specific expressive content attributed to Greek plural mass nouns, *J:EMOTIVE* is realized as *J:DISLIKE* in the case of mass plural utterances. In accordance with the above, the formal representation of the utterance in (32b) is given in (34).

- (34)i. [_{ActP} [_{Act} ASSERT] [_{Comp} [_{Com} †] [_{JP} [_J J-] [_{TP} *trexun pali nera ap to psiyo*]]]] &
 ii. [_{ActP} [_{Act} EXPRESS] [_{Comp} [_{Com} †] [_{JP} [_J J:DISLIKE] [_{TP} *trexun pali nera ap to psiyo*]]]]

In view of (34), the main interpretative import of plural morphology on Greek mass nouns is captured as an expressive speech act that commits publicly the speaker to an emotive stance broadly understood as dislike towards the situation described by the expressed proposition. With this formal account of the interpretation of plural mass nouns in Greek at hand, we can finally proceed to address what was dubbed as the *expletiveness challenge*.

4.5 Addressing the expletiveness challenge

In one of the first studies that drew attention to Greek plural mass nouns, Tsoulas (2006) claimed that they involve instances of expletive plural

number. This rendered them as an excellent candidate for the research agenda pursued by the present thesis. This section aims to explore how the study of Greek expletive plural relates to the two previous studies on expletive voice (Chapter 2) and expletive determiners (Chapter 3) and, ultimately, how much it can teach us about expletiveness in general.

The experimental study on the comprehension and production of Greek plural mass nouns led to the conclusion that the expletive plural number featured in these nominals is strongly linked with a particular expressive content, best described as the speaker's dislike towards the situation of utterance. The subsequent theoretical discussion provided arguments that this expressive content can be captured in terms of an expressive speech act. This speech act can, therefore, be considered a fundamental component of the expletiveness of the plural featured in Greek mass nouns.

Intriguingly, an expressive dimension potentially with the status of a separate speech act was identified in the previous chapter also in relation to the expletive determiners included in Greek polydefinite DPs. However, the evidence provided both for the existence of the link between polydefiniteness and expressivity and for capturing this expressivity in speech act terms was admittedly weak. The study of Greek plural mass nouns turned out to be enlightening in this respect. The experimental confirmation of a robust association between expletive plurals and expressive content, together with sufficient argumentation in support of a speech act analysis of this expressive content, motivate satisfactorily the generalization that Greek expletive nominal categories occasionally develop an additional meaning computed at the level of utterance interpretation.

Crucially, the study of the expletive voice of Greek anticausatives and the expletive determiners of polydefinite DPs suggested two more properties as constitutive of expletiveness: (i) the syntactically local dependency on another category with respect to which the expletive encodes some redundant meaning, and (ii) the identity function truth-conditional semantics. Let us see how the plural emerging on Greek mass nominals fares with respect to these.

The plural morphology on Greek mass plurals is identical to number morphology on Greek plural count nouns. This suggests that we are dealing with number features within the DP-area –number morphology on the verb is

substantially different in Greek (Holton et al. 1997). In the linguistics literature, the category of number has been argued to head its own projection, adjoin to the head of D or even the nominalizer *n*, among other possibilities (Ritter 1992; Déchaine & Wiltschko 2002; Wiltschko 2008; Cyrino & Espinal 2020). Especially in relation to Greek, Alexiadou (2011, 2019c), building on Acquaviva (2008), and Kouneli (2019) have proposed that mass plurals are lexical plurals, postulating that plural morphology realizes the nominalizer *n* in these cases.

While the internal syntax of Greek mass plurals was not part of the present study, the syntactic analysis put forth by Alexiadou (2011) and Kouneli (2019) cannot be adopted here. The authors predict that mass plurals in Greek are of restricted productivity and form a closed word class, but this was not confirmed by the experimental results. On the contrary, mass pluralization was found to be productive in Greek. Considering this, a syntactic counterproposal inspired in Cyrino and Espinal (2020) is formulated: Nominal plural morphology in Greek always corresponds syntactically to a pluralizer PL carrying a cumulativity semantic feature. In the case of count nouns, this pluralizer is adjoined to the head of D. In the case of mass nouns that also bear the cumulativity feature, however, the pluralizer adjoins to the nominalizer *n*.⁴⁸ Under such a view, the internal structure of the plural mass noun *nera* ‘waters’ is as represented below.

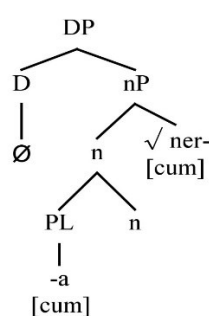


Figure 3. The syntax of Greek plural mass nouns

There are two things to highlight regarding the internal structure proposed for Greek mass plurals. Firstly, it is compatible with the

⁴⁸ Cyrino and Espinal (2020) show that the pluralizer can adjoin to the nominalizer *n* in marked cases also in Romance languages.

grammatical approaches to the pluralization of mass nouns (Chierchia 2015; Erbach 2019), adopted also in relation to the crosslinguistic challenge. Secondly, under this approach, the expletive plural of mass nouns in Greek stands in a local syntactic relationship with a mass root and redundantly encodes cumulativity with respect to this root. In other words, Greek expletive plural appears to behave on a par with expletive voice and expletive polydefinite determiners.

Let us now turn to the truth-conditional import of the expletive plural morphology emerging in Greek mass nouns. In Figure 3, the pluralizer adjoined to *n* and spelled out as *-a* was postulated to bear a cumulativity semantic feature. Crucially, though, the root \sqrt{ner} - for ‘water’ is already specified for cumulative reference. Since water cannot be made any more cumulative, the plural ends up being interpreted as an identity function over the property denoted by the mass noun at the level of truth-conditional meaning. This identity function semantics explains why utterances featuring plural mass nouns have the same descriptive content as their singular equivalents and also why Greek mass plurals were claimed to feature expletive plural number in the first place (Tsoulas 2006). The semantic derivation of the mass plural *nera* ‘waters’ is given in (35) below.

$$(35) \text{ Mass plural: } \llbracket_{\text{PL}} -a_{\text{CUM}} \rrbracket = \lambda P_{\langle e,t \rangle [\text{cum}]} . P_{\langle e,t \rangle [\text{cum}]}$$

$$\llbracket_{ner} \rrbracket = \lambda x . \text{water}(x)$$

$$\llbracket_{ner-a} \rrbracket = (\lambda P_{\langle e,t \rangle [\text{cum}]} . P_{\langle e,t \rangle [\text{cum}]}) (\lambda x . \text{water}(x)) = \lambda x . \text{water}(x)$$

Taking stock of the above, the expletiveness of Greek plural morphology on mass denoting nouns can be broken down into the following three fundamental properties: (i) identity function semantics, (ii) syntactically local relationship with another element with respect to which the plural redundantly encodes some meaning component (e.g., cumulativity), and (iii) development of an additional meaning component computed at a higher level of interpretation, where speech act-related information becomes relevant. This is ultimately the response to the expletiveness challenge raised by Greek plural mass nouns. Reading this conclusion against the results of the studies presented in the previous two chapters, the generalization that properties (i)

and (ii) should be related to expletiveness in general emerges as rather strong. As for property (iii), it remains to be seen whether it concerns exclusively nominal expletiveness or is a more general tendency of expletives.

4.6 Conclusions

The investigation of the very essence of expletiveness in natural language grammar was in this chapter pursued via the study of expletive number. Specifically, in Greek there is the possibility that a mass denoting noun combines with plural morphology without any shift in its denotation. A plural mass noun features an instance of plural that neither brings about closure of atoms under sum (in the sense of Link 1983) –there are no atoms in the denotation of the mass noun in the first place– nor contributes cumulativity – the mass noun already has cumulative reference (Link 1983). Consequently, Greek mass plurals were argued to involve expletive plural number (Tsoulas 2006).

The previous linguistic literature related the presence of plural morphology on Greek nouns with mass denotation to either an *abundance* reading of the noun (Tsoulas 2006, 2009; Alexiadou 2011, 2019c) or a *scatteredness* reading of the noun (Kouneli 2019). Intriguingly, an experimental study on both the comprehension and production of Greek mass plurals found no evidence in support of the link between the latter and abundance, and only partial evidence for the significance of scatteredness in the analysis of the phenomenon under discussion. Instead, the experimental study provided for the first time strong empirical motivation for the claim that, pace Erbach (2019), the use of Greek plural mass nouns is regulated by context. Specifically, Greek mass plurals were found to occur in situations such that cause the dislike of the speaker. Therefore, it was proposed that they be analyzed as expressive variants of their singular counterparts.

The expressive dimension of plural mass nouns in Greek was shown to be most effectively captured as an additional speech act via which the speaker commits publicly to holding an emotive stance of dislike towards the situation described by the utterance including the mass noun. This speech act was

argued to be triggered by a plural that (i) is syntactically adjoined to the nominalizer *n* and, thus, stands in a proximal relationship with a nominal root with respect to which it redundantly encodes cumulativity, and (ii) is interpreted semantically as an identity function. All this is what the expletiveness of the plural featured in Greek plural mass nouns consists of.

Reading the results of the study on Greek mass plurals in tandem with the conclusions derived from the investigation of Greek anticausatives and Greek polydefinite DPs, a strong generalization emerges according to which expletiveness across different functional categories can be broken down into (i) syntactic dependency on an element with respect to which the expletive category encodes some redundant meaning, and (ii) an identity function semantics. This chapter suggested strongly the emergence of additional meaning computed at the level of utterance interpretation as a third optional component of expletiveness. The relevance and accuracy of the latter is explored further in what follows.

A peripheral comment is in order before closing off this section. The present study managed to provide an in-depth analysis of Greek mass denoting nouns with plural morphology. Importantly, it also provided indirect evidence related to the cross-linguistic challenge (Erbach 2019) that the existence of such nouns raises. Following the literature, the availability of mass plurals in some languages but not others can be attributed to (i) the different compositional restrictions that plural number bears in different languages (Chierchia 2015; Erbach 2019, among others), or (ii) the lexical nature of mass plurals that makes them idiosyncratic and, therefore, cross-linguistically unpredictable (Alexiadou 2011; Kouneli 2019). In the experiments carried out, participants were willing to pluralize a fairly large set of mass denoting nominals. This finding suggested that mass pluralization is quite productive in Greek. This is taken as an argument against lexical approaches. More systematic research on the topic is of course necessary for one to take a motivated stance in this debate.

5 Expletiveness in the sentential domain: On Greek expletive negation, epistemic modality, and the left periphery⁴⁹

5.1 Introduction

The previous chapters presented original experimental studies on Greek expletive verbal (voice) and nominal (determiner, number) categories. The results of these studies suggested that the use of the term *expletive* in the linguistic literature coincides with (i) an identity function semantics, (ii) a syntactically local dependency on an element with respect to which the so-called expletive encodes some redundant meaning, and (iii) the occasional emergence of a secondary meaning, best captured in terms of speech act-related content. The present chapter attempts to obtain additional support for the generalizations above by investigating expletive instances of a category projected in the sentential domain of the clausal structure, namely expletive negation.

Sentential negation markers are standardly interpreted as reversing the truth conditions of the sentence in which they occur (Jespersen 1917; Horn 2001). Let us look at the pair of examples below.

- (1) a. It is snowing.
b. It is not snowing.

The sentence in (1a) is true if there is snow falling from the sky at the moment of utterance. The sentence in (1b) on the other hand, which is minimally different from (1a) in further involving the negative marker *not*, is true in exactly the reverse state of affairs, that is, whenever there is not any snow

⁴⁹ This chapter is based on the study published as Tsiakmakis et al. (2022b).

falling from the sky at the moment of utterance. In light of this, sentential negation markers can be defined as functions that take a proposition p as their argument and return its complementary proposition:

$$(2) \llbracket \text{not} \rrbracket = \lambda p. \neg p$$

Interestingly, occurrences of negative markers that do not bring about any truth-condition reversal are also found in natural languages, instantiating what is usually referred to as expletive negation (Jespersen 1917; Vendryès 1950; Muller 1991; Espinal 1992; Horn 2010; Krifka 2010; Greco 2019; Moeschler 2020, among many others). Expletive negative markers have been cross-linguistically related to two categories of environments. The first category can be broadly characterized as subsuming environments delimited by predicates, prepositions and quantifiers whose lexical meaning involves a negative component, such as predicates denoting fear or prohibition; for near-exhaustive lists of the members of this category within and across languages, see Espinal (1992), Makri (2013), Jin and Koenig (2019, 2020), Greco (2019), among others. The second category includes (a subset of) negative questions (Ladd 1981; Büring & Gunlogson 2000; Romero & Han 2004; Reese 2006; Reese & Asher 2009; Sudo 2013; Holmberg 2016; Krifka 2017, 2021a; Arnhold et al. 2020, among others).

Let us illustrate the first category of environments with the use of the following Catalan example.

- (3) Tinc por que no arribin.⁵⁰
 I.have fear that not come.SUBJ
 ‘I fear they {will not, might} come.’ (Fabra 1956: 103-104)

As suggested by the double translation provided, example (3) is ambiguous. The negative marker *no* ‘not’ can be interpreted standardly as a polarity reversal operator giving rise to a reading according to which the speaker is

⁵⁰ The subjunctive mood of the embedded verb is necessary for the reported ambiguity to arise (Fabra 1956). For a thorough description of expletive negation in Catalan, see Espinal (1992, 1997, 2000, 2002, 2007).

worried that her guests will not come. However, a non-negative interpretation of *no* is also available, with (3) conveying that the speaker actually fears the exact opposite, namely that her guests will arrive. In the latter case, *no* is considered as a prototypical instantiation of expletive negation (Espinal 1992; 2000).

As for the second category of expletive negation licensing environments, it can be represented by the English polar question in (4).

(4) Isn't Paolo in Paris?

Example (4) can be interpreted as a question by means of which the speaker seeks to confirm not the absence but the presence of Paolo in Paris (see Ladd 1981 for a first discussion). Evidently, the featured negative marker *n't* does not receive the interpretation standardly attributed to sentential negation markers in this case. Therefore, negative polar questions of this type have also been linked to so-called expletive occurrences of negative markers.

This chapter fleshes out a study on the phenomenon of expletive negation, as coarsely exposed above, that aims to uncover its characteristic properties and, thus, inform the general research on expletiveness to which the present thesis subscribes. The chapter is structured as follows: Section 5.2 identifies the Greek negative marker *min* as a most appropriate expletive negation candidate. Section 5.3 presents an experimental study focusing on the distribution and interpretation of expletive *min*. In Section 5.4, the results of this experimental study are used as a basis for the formulation of a novel semantic analysis of Greek expletive negation. The place of Greek expletive *min* within the study of expletive negation in particular, and the study of expletiveness in general, is sought in Section 5.5. Section 5.6 concludes the chapter.

5.2 Expletive negation suspect *min*...or how to not negate in Greek?

Traditional grammatical descriptions of Greek (Triantafyllidis 1941; Tzartanos 1989; Holton et al. 1997, among others) inform that the language displays two distinct sentential negative markers: *dhen* (5) and *min* (6).

(5) O Pavlos dhen irthe sto Parisi.
the Pavlos NEG₁ came to.the Paris
'Pavlos did not come to Paris.'

(6) Elpizo o Pavlos na min irthe sto Parisi.
I.hope the Pavlos SUBJ NEG₂ came to.the Paris
'I hope Pavlos did not come to Paris.'

The pair of examples above suggests that the choice between *dhen* and *min* is regulated by mood selection; *dhen* seems to be the indicative negation, whereas *min* appears to be its subjunctive equivalent. While this generalization is sometimes reproduced by grammars (Holton et al. 1997), it turns out to be theoretically problematic and/or empirically inaccurate (see Tzartanos 1989).

Exhaustively determining the distribution of the negative markers *dhen* and *min* is outside the scope of the present chapter. For the sake of completeness though, Giannakidou's (1997, 1998; see also Chatzopoulou 2018) view is adopted here, according to which *min*, unlike *dhen*, is a polarity item and, consequently, always needs to occur in the scope of a non-veridical operator. Under this prism, the presence of *min* in (7) above is licensed not by the subjunctive mood, but by the desiderative predicate *elpizo* 'hope'.

5.2.1 The intriguing data

Interestingly, it has been observed that the Greek negative marker *min* has some non-negative uses (Makri 2013; Roussou 2015; Chatzopoulou 2018;

Giannakidou & Mari 2019).⁵¹ Concretely, when *min* occurs in the complement of predicates denoting fear (7) or in the beginning of root (8a) or embedded polar questions (8b), it does not reverse the truth conditions of the proposition it embeds.

(7) Fovame min irthe sto Parisi.
 I.fear MIN came to.the Paris
 ‘I fear he maybe came to Paris.’^{52,53}

(8) a. Min irthe sto Parisi?
 MIN came to.the Paris
 ‘Did he maybe come to Paris?’

b. Kita min irthe sto Parisi.
 look.IMP.2SG MIN came to.the Paris
 ‘Check if he maybe came to Paris.’

Notice that *min* in (7) and (8) above can still be considered as a polarity item (Chatzopoulou 2018) since both fear-predicate complements and questions involve the presence of a non-veridical operator (Giannakidou 1997, 1998). However, the English translations provided witness that *min* is not interpreted as a standard sentential negation marker in these environments.

An additional argument in favor of the lack of negativity in fear- and question-*min* comes from Negative Concord Item (NCI)-licensing (Makri 2013; Chatzopoulou 2018). Specifically, Greek is considered a Strict Negative Concord language (Giannakidou 1997, 1998; Zeijlstra 2004) and, thus, negative markers like *min* in example (6) above license NCIs, such as the emphatic *KANENAS* ‘nobody’.

⁵¹ The negative marker *dhen* can also be argued to have non-negative occurrences. This is the topic of Chapter 6.

⁵² To avoid confusion, negative uses of *dhen* are glossed as NEG₁, negative uses of *min* are glossed as NEG₂, and non-negative uses of *min* are glossed as MIN.

⁵³ The translation of non-negative *min* as *maybe* is merely a notational convention. Its exact interpretation, as revealed by the results of the experimental study, is provided towards the end of the chapter.

- (9) Elpizo na min irthe KANENAS sto Parisi.
 I.hope SUBJ NEG₂ came nobody to.the Paris
 ‘I hope nobody came to Paris.’

Non-negative occurrences of *min* on the other hand, such as those exemplified by (7) and (8), fail to license *KANENAS*.

- (10) *Fovame min irthe KANENAS sto Parisi.
 I.fear MIN came nobody to.the Paris
- (11)a. *Min irthe KANENAS sto Parisi?
 MIN came nobody to.the Paris
- b. *Kita min irthe KANENAS sto Parisi.
 look.IMP.2SG MIN came nobody to.the Paris

The ungrammaticality of (10) and (11) suggests that these instances of *min* do not represent negative markers and, therefore, do not fulfill the licensing requirements of NCIs.⁵⁴

The last empirical reason to treat *min* in fear-complements and polar questions as non-negative is the fact that it can co-occur with the complementary Greek negative marker *dhen* (Chatzopoulou 2018), importantly without giving rise to a double negation reading.⁵⁵

⁵⁴ It is noted at the side that the corresponding Negative Polarity Item (NPI) non-emphatic *kanenas* ‘anybody’ is licit in both (10) and (11). However, in these cases I hypothesize that the NPI is not licensed by *min*, but by the non-veridical operator introduced by the fear-predicate and the question operator, respectively (Giannakidou 1997, 1998).

- (i) Fovame min irthe kanenas sto Parisi.
 I.fear MIN came anybody to.the Paris
 ‘I fear somebody maybe came to Paris.’
- (ii) a. Min irthe kanenas sto Parisi?
 MIN came anybody to.the Paris
 ‘Did anybody maybe come to Paris?’
- b. Kita min irthe kanenas sto Parisi.
 look.IMP.2SG MIN came anybody to.the Paris
 ‘Check if maybe somebody came to Paris.’

⁵⁵ For the sake of completeness, it is mentioned that the negative marker *dhen* can co-occur also with negative *min*, in which case both markers contribute a single negative operator.

- (i) Apokliete na min dhen erthi!
 is.excluded SUBJ NEG₁ NEG₂ comes
 ‘No way he is not coming!’

(12) Fovame min dhen irthe sto Parisi.
 I.fear MIN NEG₁ came to.the Paris
 ‘I fear he maybe didn’t come to Paris.’

(13)a. Min dhen irthe sto Parisi?
 MIN NEG₁ came to.the Paris
 ‘Did he maybe not come to Paris?’

b. Kita min dhen irthe sto Parisi.
 look.IMP.2SG MIN NEG₁ came to.the Paris
 ‘Check if he maybe didn’t come to Paris.’

In this case the interpretation does involve propositional negation, which is however contributed by *dhen* and not *min*. This is attested by the fact that the NCI *KANENAS* ‘nobody’, rejected in the absence of *dhen*, is available when *dhen* is present.

(14) Fovame min dhen irthe KANENAS sto Parisi.
 I.fear MIN NEG₁ came nobody to.the Paris
 ‘I fear maybe nobody came to Paris.’

Taking stock of the data exposed, there are interpretational as well as semantico-syntactic arguments in support of the view that the Greek negative marker *min* has some non-negative uses.⁵⁶ This makes it an excellent expletive negation candidate and, consequently, a most appropriate object of study. Even though all the above has been enlightening as to what non-negative *min* does not do, little has been said about what it actually does.

This phenomenon, which is not part of the grammar of Standard Greek, is understudied and is not equally available across environments and across speakers. The interested reader is referred to Makri (2013) and Lekakou (to appear) for preliminary discussion.

⁵⁶ Konstantina Olioumtsevits (p.c.) observes that non-negative *min* occurs also in the preadjacent of conditionals:

(i) Min aghoraso eghe kati, amesos na zilepsis.
 MIN I.buy I something immediately SUBJ you.be.jealous
 ‘If I buy something, you will immediately get jealous.’

This understated use, which does not belong to the expletive negation paradigm as shaped in the existing linguistic literature, is left for future research.

5.2.2 The background puzzle

While studying *min* in Greek fear-predicate complements, Makri (2013) makes an important observation that helps define the interpretative import of *min* not only negatively, i.e., by contrasting it with negative *min*, but also positively. Concretely, she notices that non-negative *min* is incompatible with certain epistemic adverbs. Let us take a look at the minimal pair below.

- (15)a. Fovame min (#malon) irthe o Pavlos.
I.fear MIN probably came the Pavlos
'I fear Pavlos maybe came.'
- b. Fovame oti (malon) irthe o Pavlos.
I.fear that probably came the Pavlos
'I fear that Pavlos probably came.'

The complements of fear-denoting predicates in Greek can be introduced either by non-negative *min* (15a) or by *oti* (15b; see Roussou 2010). Makri (2013) observes that epistemic adverbs like *malon* 'probably' are infelicitous in the case of the former, but acceptable in the case of the latter. The complementary distribution of *min* with adverbs such as *malon* suggests that *min* may have an epistemic import itself.

Makri (2013) proceeds to develop an explicit proposal in this spirit. In line with Roussou (2010), she takes *oti*-complements to convey positive speaker bias. Using the example in (15b), the speaker is assumed to consider the proposition corresponding to *Pavlos came* as more likely to be true than its complementary proposition, that is *Pavlos did not come*. As for *min*-complements, Makri builds on their incompatibility with epistemics like *malon* 'probably' to suggest that they convey either positive speaker bias or lack of bias. Using (15a) for reference, the speaker is hypothesized to either consider that it is more likely that Pavlos has come, or to be completely ignorant as to whether Pavlos is here or not. If both *oti*- and *min*-complements can encode positive bias, choosing *min* over *oti* is predicted to give rise to an absence-of-bias reading via Gricean (1989) reasoning (Makri 2013).

Intriguingly, a different and seemingly opposite meaning is attributed to non-negative *min* by Giannakidou and Mari (2019), who however do not study fear-predicate complements but polar questions:

- (16)a. *Min* irthe o Pavlos?
MIN came the Pavlos
'Did Pavlos maybe come?'
- b. Irthe o Pavlos?
came the Pavlos
'Did Pavlos come?'

The authors propose that *min*, which in this case is contrasted with its very absence and not *oti* for example, has the effect of weakening the polar question it appears in. Following Giannakidou and Mari (2019), a speaker uttering (16a) is less certain about the expected answer to the question than the speaker uttering (16b), if expecting an answer in the first place.

Putting together the gathered insight, one is faced with a layered puzzle. It is obvious that the Greek marker *min* has both negative and non-negative manifestations. Are the non-negative manifestations homogeneous? Makri's (2013) and Giannakidou and Mari's (2019) proposals hint at a negative answer since they attribute different interpretations to different *min*-embedding environments. The presence of more than one non-negative *min* is theoretically plausible but uneconomical. Going past the number of distinct *min* lexical entries, what is the actual interpretation of non-negative *min*? With the whole positive bias – absence of bias – negative bias continuum already on the market, the need for a more restrictive answer emerges rather pressing. This need is addressed in the following section.

5.3 The experimental study: localizing *min* on the bias continuum

It was shown in the preceding section that non-negative *min* has been associated with distinct and, in a way, conflicting interpretations. Crucially,

none of the alternative analyses proposed has received substantial empirical support. With the aim of filling this gap in the literature and taking a motivated stance as to the exact epistemic import of non-negative *min*, a study consisting of three experiments was conducted. Concretely, the study addressed the following two-tier research question:

- (17)i. Does Greek non-negative *min* convey speaker bias in polar questions and fear-predicate complements?
- ii. If so, does it convey positive or negative speaker bias?

The experiments via which an answer to the question above was pursued are described in detail below.

5.3.1 Experiment 1: Non-negative *min* and propositional alternatives

The first experiment focused on (17i) and sought a linguistic reflex of the claim that non-negative *min* conveys speaker bias (see Makri 2013; Giannakidou & Mari 2019). Pope (1976) was one of the first to observe that the presence of bias in polar questions is incompatible with the presence of alternative polar propositions $\{p, \neg p\}$. The same would hold for fear-predicate complements, as fear-verbs –like questions– also introduce doxastic alternatives (Anand & Hacquard 2013; Makri 2013). It follows from the above that, if *min* conveys speaker bias, then it is predicted to rule out the overt realization of polar propositional alternatives in both questions and complements of fear-predicates.

Designed with this rationale in mind, Experiment 1 tested the presence vs. absence of *min* against the presence vs. absence of polar alternative propositions within the same utterance, in the complements of predicates denoting fear and in root polar questions. The experiment was based on an acceptability judgment task. Participants were asked to rate the naturalness of a set of sentences presented in isolation. This study was administered via Alchemer.

Participants

Experiment 1 was completed voluntarily by 63 native Greek speakers (18 males, 45 females; mean age 29.40 years, SD = 7.97), recruited via different social media platforms.

Materials

A set of 16 critical items with the abstract form *p or not p* was used for Experiment 1, divided into 8 polar questions and 8 assertions embedded under fear-predicates. Each of the two sentence type subsets was further divided into 4 items that included *min* and 4 items from which *min* was absent. This design gave rise to four distinct types of items, as illustrated below.⁵⁷

(18) Question with *min*

Min kimithike to pedhi i dhen kimithike?
MIN slept the kid or NEG₁ slept
'Did the kid maybe sleep or not?'

(19) Question without *min*

Perase telika to mathima i dhen to perase?
passed finally the course or NEG₁ it passed
'Did he finally pass the course or not?'

(20) Fear-predicate complement with *min*

Fovate min ekapse to fayito pu anelave i
fears MIN burnt the food that took.over or
dhen to ekapse.
NEG₁ it burnt
'He fears that he may have burnt the food he was responsible for or not.'

⁵⁷ The complete list of materials used for Experiment 1, as well as sociolinguistic information concerning the participants, can be found at https://static-content.springer.com/esm/art%3A10.1007%2Fs11049-022-09565-y/MediaObjects/11049_2022_9565_MOESM1_ESM.pdf.

- (21) Fear-predicate complement without *min*
- | | | | | | | | |
|-----------|------------------|----|---------|-----|--------|-----|----------|
| Fovunde | oti | i | eskise | to | savano | i | Pinelopi |
| they.fear | that | or | ripped | the | sheet | the | Pinelopi |
| i | dhen | to | eskise. | | | | |
| or | NEG ₁ | it | ripped. | | | | |
- ‘They fear that either Pinelopi ripped the sheet or not.’

It is worth noting that the fear-predicate complement items (20-21) differed from their question counterparts (18-19) in three significant respects: (i) the presence of embedded vs. unembedded disjunction, (ii) the contrast of *min* with *oti* in fear-complements but with its very absence in questions, and (iii) the choice of the double exclusive disjunction *i...i* ‘either...or’ only for the fear-complement items without *min*. The differences in (i) and (ii) were imposed simply by Greek grammar. The third one was necessitated by the fact that, as already mentioned, *oti* conveys high speaker certainty (Roussou 2010). The use of the double exclusive disjunction was meant to rescue the co-occurrence of *oti* with polar propositional alternatives, by disfavoring a logically trivial or contradictory reading according to which the subject is highly certain of both *p* and $\neg p$. Using example (21) for reference, an interpretation whereby the subjects were highly certain that Pinelopi had ripped the sheet and that she had not had to be ruled out.

Note that, if non-negative *min* conveys bias and therefore rules out the realization of polar propositional opposites, then (18) and (20) are predicted to trigger significantly lower naturalness ratings than their *min*-free equivalents in (19) and (21), respectively. Moreover, if *min* conveys speaker bias in both of the tested sentence types, no significant difference between *min*-questions and *min*-complements of fear-verbs is expected.

A set of 16 control items, divided into 8 root questions and 8 embedded assertions, was added to the item list of Experiment 1. The control items featured alternative propositions, but not polar alternatives; they had the abstract form *p or q*. These were introduced in the design to ensure that any obtained effect was due to the co-occurrence of *min* with polar propositional alternatives and not simply due to the complexity brought about by the presence of alternative propositions. Two examples from the list of criticals

are given below for reference. Notice that, in this case too, questions such as (22) differed from assertions such as (23) also in that the latter included an embedded disjunction.

(22) Irthan me ta podhya i irthan
 they.came with the feet or they.came
 me to amaksi?
 with the car
 ‘Did they come on foot or by car?’

(23) Pistevi oti i tu ipes psemata i
 believes that or him you.said lies or
 tu ipes ti misi alithxia.
 him you.said the half truth
 ‘He believes that either you lied to him or you told him half the truth.’

Lastly, 16 fillers complemented the set of items used for this first experiment. These also had the form of questions or embedded assertions that either did not include more than one proposition or added the polar alternative in a separate utterance, as shown below:

(24) Min eprepe na tu to pume?... I dhen
 MIN should SUBJ him it we.say or NEG₁
 eprepe?
 should
 ‘Maybe we should have told him?...Or not?’

Since they did not involve alternative propositions in the scope of the same utterance, the filler items were irrelevant to the specific question addressed by Experiment 1.

The following instructions were given to participants: “In what follows you will be presented with a set of sentences. Every sentence is followed by a scale from 0 to 100. We ask you to use this scale to show how natural, in


your opinion, each of these sentences is (0 = totally unnatural, 100 = absolutely natural).”

Each participant produced 48 ratings (16 critical items + 16 control items + 16 filler items). Putting the fillers aside, the reported results are based on the statistical analysis of 2,016 responses (63 participants × 32 ratings).

Procedure

Participants used their personal computer or smart device to take part in Experiment 1. After reading the instructions and filling in a questionnaire concerning their sociolinguistic background, participants read isolated sentences and were asked to evaluate their naturalness.

The items were randomized. Each item included a sentence and a rating scale. An example of what participants saw on their screens, translated into English for the reader’s reference, is given below.

(25) Min teliose i tenia i dhen teliose?
MIN finished the movie or NEG₁ finished
‘Is the movie maybe over or not?’
katholu fisiki  apolita fisiki
‘totally unnatural’ ‘absolutely natural’

The median duration of Experiment 1 was 9' 52".

Results

The results related to the control items of Experiment 1 are shown in Figure 1. The graph provides the mean acceptability rating for the two Sentence Type values, which appear in the *x* axis: questions and assertions. All in all, the results show that participants had no serious problems accepting disjunction over propositional alternatives (mean acceptability higher than 69% for both sentence types), although such disjunction was dispreferred in assertions.

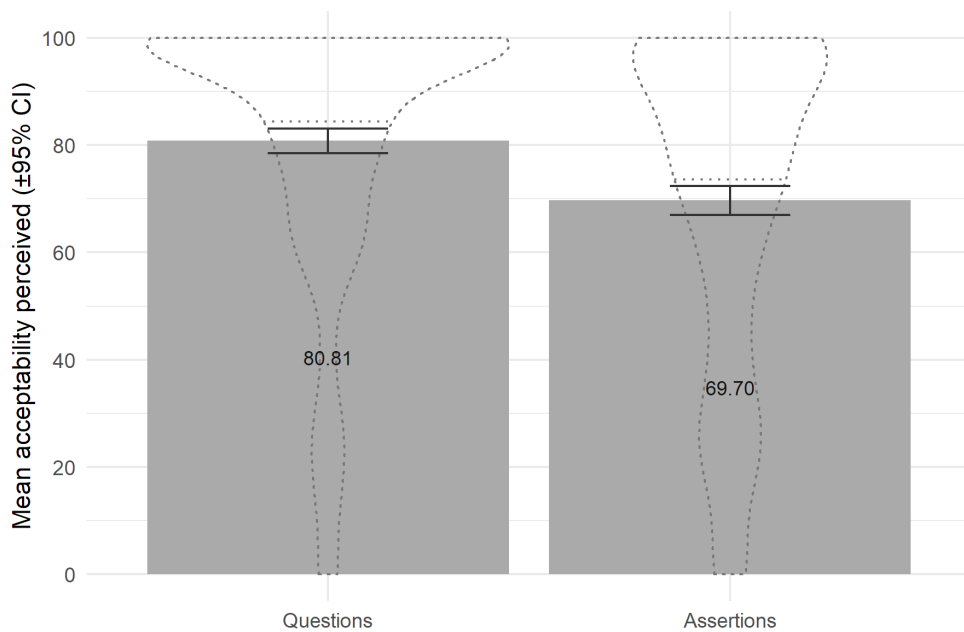


Figure 1. Results of Experiment 1 – Controls (Tsiakmakis et al. 2022b: 10, Fig. 1)

A beta mixed-effects model was run with acceptability as the dependent variable. To fulfill the requirements of a model based on a beta regression, the response values were first divided by 100 (to obtain a 0-1 distribution), and then the two ends were replaced by very close values (0.0000001 for 0, and 0.9999999 for 1). Sentence Type (question, assertion) was the fixed factor. A random slope for Sentence Type by Subject, and a random intercept for Item were included in the model.

Sentence Type was found to be significant, $\chi^2(1) = 17.314$, $p < .001$, indicating that questions were globally rated as more acceptable than assertions ($d = 0.571$, $p < .001$).

As regards the critical items, the results of Experiment 1 are shown in Figure 2, as a function of Sentence Type (question, fear-verb assertion) and the *Min* condition (with *min*, without *min*). The two values of Sentence Type appear in the x axis, while the *min*-related values are depicted as different tones of grey. The figure provides the mean acceptability rating for the four categories of items created via the interaction of Sentence Type and the *Min* condition. It shows that questions without *min* were rated as far more acceptable than their equivalents with *min*. On the contrary, fear-verb assertions received very low ratings, regardless of the presence or absence of

min. Finally, there seems to be no difference in acceptability between questions with *min* and fear-verb assertions with *min*.

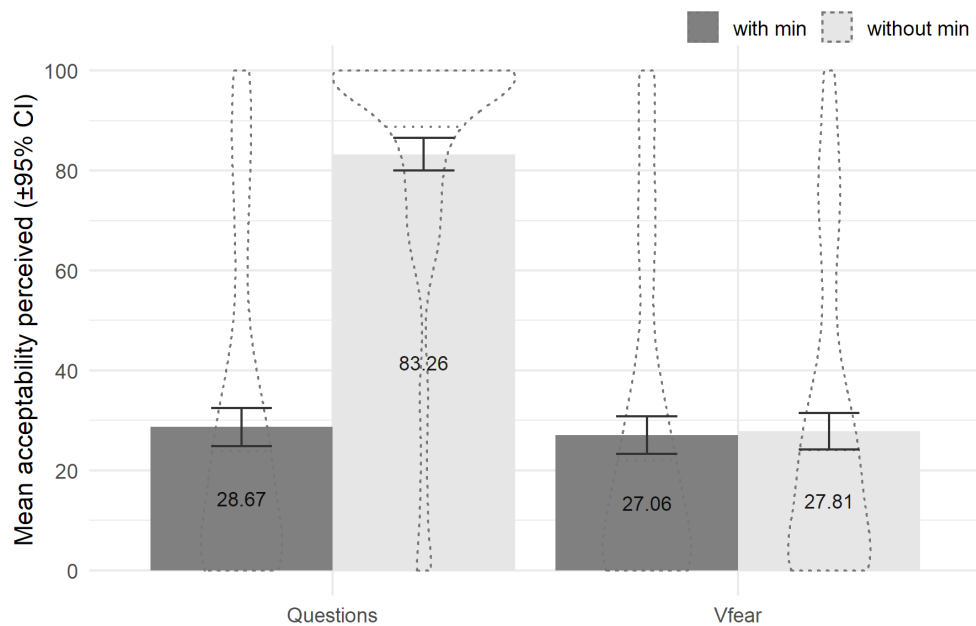


Figure 2. Results of Experiment 1 – Criticals: Sentence Type \times *Min* condition (Tsiakmakis et al. 2022b: 11, Fig. 2)

A beta mixed-effects model was run with acceptability as the dependent variable. Sentence Type (question, fear-verb assertion), the *Min* condition (with *min*, without *min*), and their paired interaction were the fixed factors. A random slope for Sentence Type \times *Min* condition by Subject, and a random intercept for Item were included in the model.

A significant effect was found for the three fixed factors, though the results of the two main effects are just a consequence of the ones obtained from their interaction. The main effect of Sentence Type, $\chi^2(1) = 25.378, p < .001$, indicated that questions were globally rated as more acceptable than fear-verb assertions ($d = 1.276, p < .001$), and the main effect of the *Min* condition, $\chi^2(1) = 20.324, p < .001$, indicated that the absence of *min* led to higher acceptability ($d = 1.208, p < .001$). However, the results of the interaction Sentence Type \times *Min* condition, $\chi^2(1) = 105.152, p < .001$, lead to a more specific scenario, i.e., questions without *min* received higher acceptability rates than the other three structures. First, questions received higher acceptability rates than fear-verb assertions in the structures without

min ($d = 2.476, p < .001$), but not in those with *min* ($d = 0.077, p = .667$). Second, whereas the absence of *min* in questions led to higher acceptability ($d = 2.407, p < .001$), it had no significant effect in fear-verb assertions ($d = 0.008, p = .948$).

Discussion

The results of Experiment 1 appear to support partly the conclusion that the presence of non-negative *min* precludes the linguistic realization of polar propositional alternatives in polar questions and complements of fear-predicates. Concretely, (i) questions without *min* were indeed rated significantly higher than their equivalents with *min*, and (ii) the naturalness ratings attributed to questions with *min* and fear-predicate complements with *min* showed no significant difference. However, fear-complements with *min* did not elicit significantly lower ratings than their *min*-free counterparts. This last finding merits further discussion.

It is worth highlighting that the lack of difference between the two fear-complement conditions, i.e., the one with *min* and the one without, was not due to an unexpected preference for the former but because of a dispreference also for the latter. In other words, this result shows that Greek fear-verb complementation is not an appropriate contrast field to test the relationship between *min* and overt propositional alternatives. There are at least three different reasons why this might be. First, the presence of embedded disjunction in the fear-predicate complement items made them inevitably more complex than their question counterparts from a structural perspective. Such an explanation is further favored by the results pertaining to the control items (see Figure 1), where embedded assertions again received significantly lower ratings than questions. Second, if the embedded disjunctions were interpreted as inclusive despite the employed manipulation –double instead of single disjunction– its co-occurrence with the high certainty *oti* (Roussou 2010) may have given rise to non-sensical readings with the speaker being certain of two mutually exclusive propositions; see Gajewski (2009) and Del Pinal (2019) on the relationship between logical triviality and reduced acceptability. Third and most likely, the mere presence of a fear-predicate could encode bias and thus rule out the realization of polar propositional

opposites. This is expected under a doxastic analysis of verbs denoting fear (Anand & Hacquard 2013).

Considering all the above, the results of Experiment 1 are taken to provide empirical support to the view that *min* rejects the overt realization of polar alternative propositions. Consequently, these results are consistent with the claim that non-negative *min* conveys speaker bias, thus pointing to a positive answer to the research question in (17i).

5.3.2 Experiment 2: Non-negative *min* and speaker certainty

Experiment 1 motivated empirically the claim that Greek non-negative *min* encodes bias, an insight already found in the existing literature (Makri 2013; Giannakidou & Mari 2019). Experiment 2 built on the findings of the former and tried to determine the direction of the encoded bias, thus addressing research question (17ii).

Recall that non-negative *min* –like the negative one– is a polarity item and occurs always in the scope of a non-veridical operator (Giannakidou 1997, 1998; Chatzopoulou 2018). Interpretation-wise, this translates into the fact that in the presence of *min* a speaker believes both the expressed proposition p and its polar alternative $\neg p$ to be possible (Giannakidou 1997, 1998; Giannakidou & Mari 2021). In light of the results of Experiment 1, we can already assume that a person uttering a *min*-question or a *min*-complement of fear will not be ignorant in the sense of Farkas (2020; see also Giannakidou 2013), that is clueless as to whether p or $\neg p$ is more probable. This leaves open two possibilities: either the speaker is confident with respect to the truth of the expressed proposition p , or the speaker is not confident and believes the complementary proposition $\neg p$ as more likely to be true. The first alternative would hint at a positive bias interpretation of *min*, whereas the second one would point to a negative bias interpretation. Experiment 2 pursued an empirically supported choice between the two.

For the purposes of the present experiment, the speaker's confidence concerning the truth of a proposition is dubbed as *certainty*. Notice that,

understood as such, certainty is stronger than bias, which arises even in the presence of a simple hunch or weak belief. The use of certainty over bias was dictated by two main considerations. Firstly, the term *bias* is traditionally related to questions (Pope 1976; Ladd 1981, among others) and not assertions, but both sentence types were tested by the experiment. Secondly, providing judgments regarding bias demanded a metalinguistic knowledge on the part of the participants that could not be taken for granted. Using certainty instead solved both of these problems.

Experiment 2 tested the presence vs. absence of *min* in questions and fear-complements against speaker's certainty as defined above. It was based on an interpretation task. Participants were presented with sentences in isolation and requested to rate how certain the speaker was with respect to the expressed proposition in each case. This study was also administered via Alchemer.

Participants

A total of 65 volunteers (19 males, 45 females, 1 other; mean age 32.72 years, SD = 9.93), all native speakers of Greek, completed Experiment 2, after being recruited via Facebook and other social media platforms.

Materials

Experiment 2 involved 20 critical items. Similarly to Experiment 1, the criticals were divided into 10 root polar questions and 10 fear-predicate embedded assertions, with each sentence type item group equally subdivided into 5 items that featured *min* and 5 items from which *min* was absent. The four distinct types of experimental items created by this design are exemplified below.⁵⁸

(26) Question with *min*

Min vulose o neroxitis?

MIN clogged the sink

'Is the sink maybe clogged?'

⁵⁸ The set of items used in Experiment 2, together with the obtained sociolinguistic information regarding the participants, can be accessed at https://static-content.springer.com/esm/art%3A10.1007%2Fs11049-022-09565-y/MediaObjects/11049_2022_9565_MOESM1_ESM.pdf.

(27) Question without *min*

Ine etimo to fayito?
is ready the food
'Is the food ready?'

(28) Fear-predicate complement with *min*

Fovame min ksexase na aplosi ta ruxa.
I.fear MIN forgot SUBJ hang the clothes
'I fear he may have forgotten to hang the clothes.'

(29) Fear-predicate complement without *min*

Fovame oti miname apo venzini.
I.fear that we.stayed from gas
'I fear that we have run out of gas.'

Each item was followed by a question roughly paraphrased as “How certain is the speaker that *p*”, with *p* representing the expressed proposition in each case. It must be noted that, once again, fear-complement items differed from their question counterparts in that they contrasted *min* with *oti*, not with its absence.

If *min* encodes positive speaker bias, questions with *min* like (26) and fear-predicates complements with *min* like (28) are expected to convey at least medium speaker certainty. If on the other hand it encodes negative bias, the same item types will elicit extremely low certainty ratings. As regards questions without *min* such as (27) and fear-complements without *min* such as (29), some secondary predictions could be derived from the more general literature: Polar questions without *min* are associated with completely ignorant speakers (Farkas 2020) and are thus expected to trigger low certainty ratings. As for *oti*-complements of verbs of fear, participants are predicted to provide high certainty ratings due to the interpretative import of *oti* (Roussou 2010; Makri 2013).

The design of Experiment 2 was based on the premise that participants interpret speaker certainty as gradient. In order to make sure of this, the set of experimental items was complemented with 20 embedded and unembedded

assertions that functioned as controls; half of them (10 items) involved *doubt*-type epistemic adverbials or predicates and were meant to elicit medium certainty ratings, while the other half (10 items) included *know*-type epistemics and would convey high speaker certainty. Two examples from the control item list follow for illustration.

(30) Pithanos i paragelia paradothike se lathos
 possibly the order was.delivered to wrong
 meros.
 place
 ‘The order was possibly delivered to the wrong place.’

(31) Ksero oti kathisterisameti dhosi tu Ianuariou.
 I.know that we.delayed the payment of.the January
 ‘I know we delayed the payment for January.’

The following instructions were given to participants: “In what follows a set of sentences will be presented to you. Every sentence is followed by a scale from 0 to 100. We ask you to use that scale to show how certain the speaker seems to be with respect to the content of each sentence (0 = not certain at all, 100 = absolutely certain).”

Each participant produced 40 ratings (20 critical items + 20 control items). The reported results are based on the statistical analysis of a total of 2,600 responses (65 participants × 40 ratings).

Procedure

For Experiment 2, participants followed a procedure very similar to the one described for Experiment 1. They read the instructions and filled in the same sociolinguistic questionnaire before the main task began. The major difference between the two experiments was that the items of Experiment 2 consisted of a sentence, a question regarding the speaker’s certainty with respect to the content of the sentence and a rating scale. An example of what participants were presented with is provided below, along with its English translation.

(32) Min perase apo to maghazi i Maria?
 MIN passed from the shop the Maria
 ‘Did Maria maybe pass by the store?’

Poso veveos ine o omilitis oti i Maria perase apo to maghazi?

‘How certain is the speaker that Maria passed by the store?’

katholu veveos  apolita veveos
 ‘not certain at all’ ‘absolutely certain’

The median duration of the experiment was 9' 38".

Results

Figure 3 shows the results obtained from the control items of Experiment 2, as a function of Category (predicate, adverb) and Confidence (*doubt-type*, *know-type*). The two Category values are represented in the x axis, while the values related to Confidence are depicted as different shades of grey. The figure provides the mean perceived certainty rating for the four distinct Category and Confidence combinations. It shows that participants did perceive speaker certainty as gradient, attributing medium certainty to *doubt-type* items and high certainty to *know-type* items, with Category apparently playing no role.

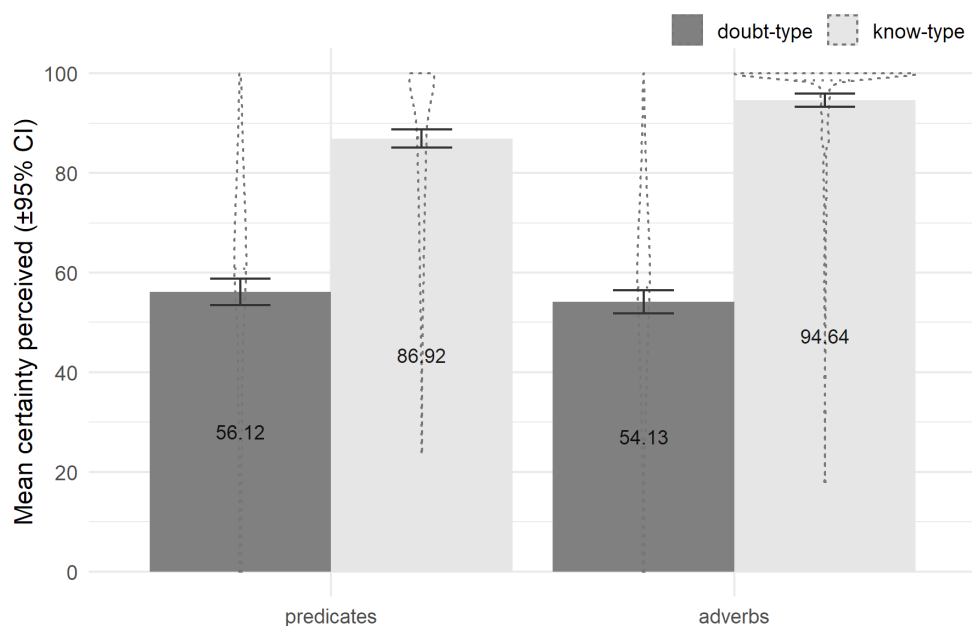


Figure 3. Results of Experiment 2 – Controls (Tsiakmakis et al. 2022b: 15, Fig.3)

A beta mixed-effects model was run with perceived certainty as the dependent variable. Category (predicate, adverb), Confidence (*doubt*-type, *know*-type), and their paired interaction were the fixed factors. A random slope for Confidence by Subject, and a random intercept for Item were included in the model.

Confidence was the only effect found to be significant, $\chi^2(1) = 95.536$, $p < .001$, indicating that *know*-type items were globally perceived with a higher degree of certainty than *doubt*-type ones ($d = 1.092$, $p < .001$). Category was not found to be significant, $\chi^2(1) = 1.756$, $p = .185$, and neither was the paired interaction, $\chi^2(1) = 2.238$, $p = .135$, although pairwise contrasts indicated that adverbs were globally perceived with a higher degree of certainty than predicates in the *know*-type condition ($d = 0.275$, $p = .046$).

Moving on to the critical items, the results, as a function of Sentence Type (question, fear-verb subordinate clause) and the *Min* condition (with *min*, without *min*), are shown in Figure 4. The two values related to Sentence Type appear in the x axis and the two values of the *Min* condition are represented as different tones of grey. The figure provides the mean perceived certainty rating for the four types of items created by the interaction of Sentence Type and the *Min* condition. It shows that questions with *min* were rated as showing higher speaker certainty than questions without *min*. It also shows that the situation is the reverse for fear complements: fear-verb sentences with *min* convey lower certainty than their counterparts without *min*. Finally, the graph shows that *min* conveys medium speaker certainty regarding the expressed proposition, in both questions and fear-verb sentences.

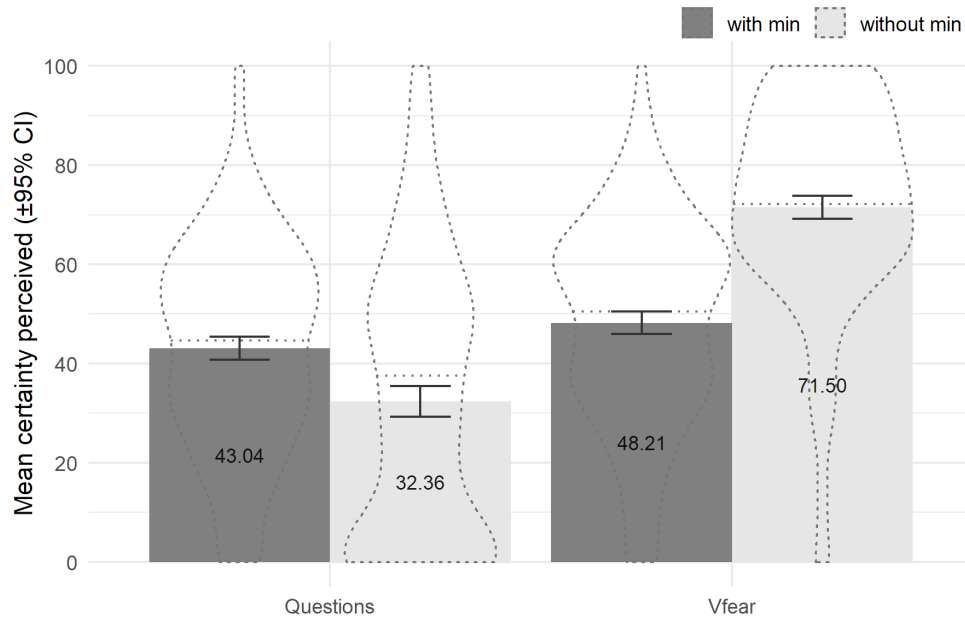


Figure 4. Results of Experiment 2 – Criticals: Sentence Type \times *Min* condition (Tsiakmakis et al. 2022b: 16, Fig. 4)

A beta mixed-effects model was run with the perceived certainty as the dependent variable. Sentence Type (questions, fear-verb embedded assertions), *Min* condition (with *min*, without *min*), and their paired interaction were the fixed factors. A random slope for Sentence Type \times *Min* condition by Subject, and a random intercept for Item were included in the model.

A significant effect was found for Sentence Type and for the paired interaction. The main effect of Sentence Type, $\chi^2(1) = 16.536, p < .001$, indicates that fear-verb assertions were globally perceived with a higher degree of certainty than questions ($d = 0.415, p < .001$). The main effect of the *Min* condition was not found to be significant, $\chi^2(1) = 0.323, p = .570$. The results of the interaction Sentence Type \times *Min* condition, $\chi^2(1) = 12.666, p < .001$, can be read in two complementary ways. First, fear-verb assertions received significantly higher certainty rates than questions in the items without *min* ($d = 0.767, p < .001$), but not in those with *min* ($d = 0.064, p = .634$). Second, whereas the presence of *min* in questions led to higher certainty rates ($d = 0.308, p = .028$), it was the absence of *min* that led to higher certainty rates in fear-verb assertions ($d = 0.395, p = .004$).

Discussion

The results of Experiment 2 are in support of the view that non-negative *min* uniformly encodes positive speaker bias, as it was found to convey medium speaker certainty in both polar questions and fear-predicate complements, with no significant difference between the two. The rest of the experimental findings are consistent with the literature. Concretely, questions without *min* received significantly lower certainty ratings than their *min*-counterparts, confirming the view that they reflect ignorant speakers (Giannakidou 2013; Farkas 2020). Fear-complements with *oti*, on the other hand, conveyed higher speaker certainty than *min*-complements, providing empirical support to Roussou's (2010) claim. Put differently, the four types of items tested could be represented as occupying different spaces on a certainty continuum: questions without *min* were interpreted as showing low speaker certainty, questions with *min* and fear-complements with *min* conveyed medium certainty, and fear-complements with *oti* were rated as expressing high speaker certainty.

Experiment 2 offered illuminating evidence regarding the research question in (17ii), that is whether *min* encodes positive or negative speaker bias. However, part of its findings contrasted sharply with the literature. While Giannakidou and Mari (2019) propose that *min* has a weakening effect in polar questions, the results of this second experiment clearly indicate the opposite. Before dismissing their proposal, a third experiment focusing only on the interpretation of *min* in questions was deemed necessary to further clarify the situation.

5.3.3 Experiment 3: Non-negative *min* and positive speaker bias

Given its very motivation, Experiment 3 was meant to test directly the hypothesis that Greek non-negative *min* is interpreted as conveying positive bias in polar questions. To this aim, three types of polar questions (positive questions, negative questions and *min*-questions) were tested against the three possible types of bias (positive bias, negative bias, no bias). Experiment 3 was based on a forced-choice task. Participants were asked to read a set of

sentences and choose, out of the three available options, the statement that was most compatible with the interpretation of each sentence. Experiment 3 was administered via Alchemer, too.

Participants

A total of 421 native speakers of Greek (31 males, 388 females, 2 others; mean age 31.45 years, SD = 7.02) voluntarily completed Experiment 3. All of them were recruited via various social media platforms.

Materials

The critical items used for Experiment 3 consisted of 6 positive polar questions, 6 negative polar questions and 6 questions that were introduced by *min*, giving rise to a total of 18 items. Each question type is demonstrated below via reference to an appropriate example from the item list.⁵⁹

(33) Positive polar question

Valame nera sto psiyio?
we.put water.PL in.the fridge
'Did we put water bottles in the fridge?'

(34) Negative polar question

Dhen riksate ksidhi sto neroxiti?
NEG₁ you.spilled vinegar in.the sink
'Didn't you spill vinegar in the sink?'

(35) *Min*-question

Min ferate lathos paghoto?
MIN you.brought wrong ice-cream
'Did you maybe bring the wrong ice-cream flavor?'

All questions were followed by three alternative statements corresponding to the positive bias reading, the negative bias reading and the no-bias reading of

⁵⁹ The complete list of experimental items and the obtained sociolinguistic information on the participants of Experiment 3 are available at https://static-content.springer.com/esm/art%3A10.1007%2Fs11049-022-09565-y/MediaObjects/11049_2022_9565_MOESM1_ESM.pdf.

the question. The experimental item in (35) is given in its complete form in (35').

- (35') Min ferate lathos paghoto?
 MIN you.brought wrong ice-cream
 'Did you maybe bring the wrong ice-cream flavor?'
- a. O omilitis nomizi oti eferan lathos paghoto. *Positive bias*
 'The speaker thinks that they brought the wrong ice-cream flavor.'
- b. O omilitis nomizi oti dhen eferan lathos paghoto. *Negative bias*
 'The speaker thinks that they didn't bring the wrong ice-cream flavor.'
- c. O omilitis nomizi oti i eferan lathos paghoto i oxi. *No bias*
 'The speaker thinks that either they brought the wrong ice-cream flavor or not.'

Note that the main hypothesis tested by Experiment 3 only made a prediction regarding the interpretation of *min*-questions; participants were expected to systematically associate this group of items with the positive bias option. As in Experiment 2, secondary predictions could be formulated on the basis of the more general literature. Positive questions were most likely to elicit no-bias responses (Farkas 2020) and negative questions were predicted to receive either negative or positive bias responses (Ladd 1981; Buring & Gunlogson 2000; Reese & Asher 2009; Sudo 2013, among others).⁶⁰

In order to exclude an artificial effect of a one-to-one correspondence between the three types of questions tested and the three bias options offered, the materials of Experiment 3 were complemented with 6 distractors. The distractors had the form of polar questions introduced by the particle *mipos* 'perhaps'. This choice was inspired on the fact that *mipos* is considered to have a very similar interpretation to non-negative *min* but a different distribution –see Roussou (2015) for details.

- (36) Mipos xisate sokolata sto patoma?
 perhaps you.spilled chocolate on.the floor

⁶⁰ The interpretation of negative questions in Greek and other languages is discussed thoroughly in the following chapter.

‘Did you perhaps spill chocolate on the floor?’

The instructions provided for Experiment 3 were the following: “In what follows you will be presented with a set of sentences. Each sentence is followed by another explanatory sentence with three possible versions. We ask you to choose the version that, in your opinion, describes each situation in the best possible way.”

Each participant produced 24 responses (6 positive questions + 6 negative questions + 6 *min*-questions + 6 *mipos*-questions). The reported results are based on the statistical analysis of 10,104 responses (421 participants × 24 ratings).

Procedure

Participants completed Experiment 3 using their personal smart device. They read the instructions and filled in the same sociolinguistic questionnaire used for the previous two experiments. Then they started the main task, which consisted in reading a sentence and three alternative follow-ups and choosing, out of the latter, the one that was most compatible with the interpretation of the preceding sentence.

The order of items and the order of the alternative options within the items was randomized. An idea of what participants saw on their screens is given in (37). English translations are provided for the reader’s convenience.

(37) Min pighate se akriva maghazya?

MIN you.went to expensive shops

‘Did you maybe go to expensive shops?’

a. O omilitis nomizi oti pighan se akriva maghazya.

‘The speaker thinks that they went to expensive shops.’

b. O omilitis nomizi oti dhen pighan se akriva maghazya.

‘The speaker thinks that they didn’t go to expensive shops.’

c. O omilitis nomizi oti i pighan se akriva maghazya i oxi.

‘The speaker thinks that either they went to expensive shops or not.’

The median duration of the experiment was 7' 57".

Results

Figure 5 shows the results to Experiment 3 as a function of Question Type (negative, positive, *mipos*, *min*) and Bias (negative bias, no-bias, positive bias). The different Question Type values appear in the *x* axis, while the values of Bias are shown as different tones of grey. The graph provides the percentage of negative bias, no-bias, and positive bias options chosen for each type of question. Negative questions favored a reading attributing a negative bias to the speaker, and positive questions were found to correlate with the absence of bias. As for the other two, while *mipos*-questions favored either a positive bias or a no-bias interpretation, *min*-questions were strongly associated with the positive bias option.

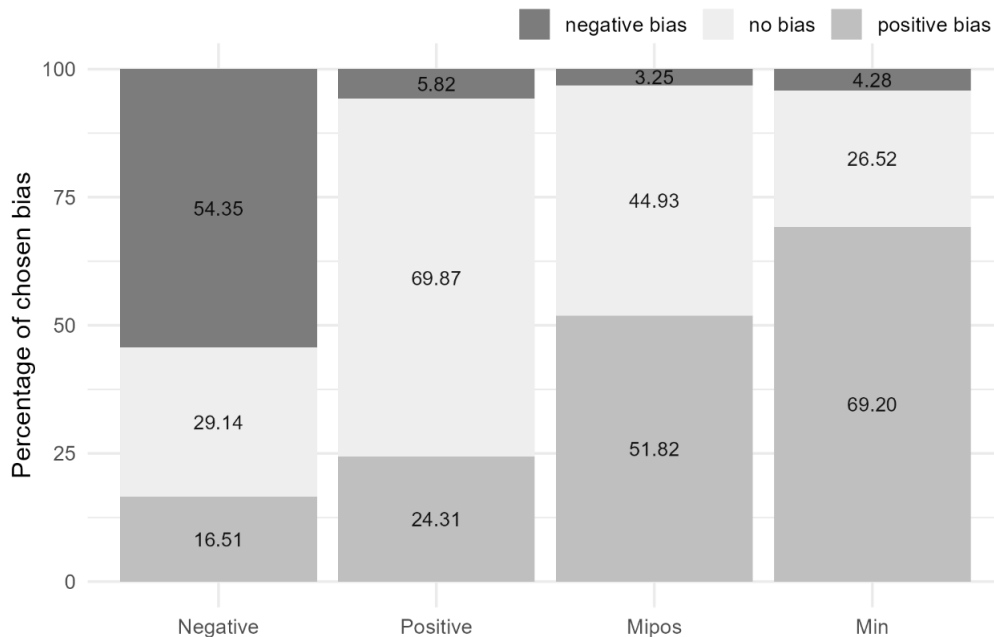


Figure 5. Results of Experiment 3: Question Type \times Bias (Tsiakmakis et al. 2022b: 19, Fig. 5)

A zero-inflated Poisson mixed-effects model was run with the number of each chosen bias as the dependent variable, with Bias, Question Type, and their paired interaction as fixed factors. A random intercept for Subject was included in the model.

All fixed factors were found to be significant. The main effect of Bias, $\chi^2(2) = 133.296, p < .001$, indicated a global preference for declaring a bias such that no-bias ($n = 4,306$) > positive bias ($n = 4,088$) > negative bias ($n =$

1,710) (all $p < .001$). The main effect of Question Type, $\chi^2(3) = 25,881$, $p < .001$, is related to the results of the paired interaction and suggests that the two least preferred bias options in the case of negative questions (namely, no-bias and positive bias) were chosen with higher frequency than the least preferred bias types in the cases of positive, *min*, and *mipos*-questions (in all three cases at $p < .001$), with no significant difference between the latter. In other words, negative questions present higher variation in bias ascription than the other three types of questions. This can also be interpreted as suggesting that negative questions have a less clear bias preference than the rest.

The results of the paired interaction Bias \times Question Type, $\chi^2(6) = 1768.053$, $p < .001$, can be discussed in two complementary ways: which bias is more often ascribed to each question type or which question type encodes most frequently each bias. On the one hand, negative questions show a preference such that negative bias $>$ no-bias $>$ positive bias (all $p < .001$), positive questions show a preference such that no-bias $>$ positive bias $>$ negative bias (all $p < .001$), and both *min* and *mipos*-questions show a preference such that positive bias $>$ no bias $>$ negative bias (all $p < .001$, except for positive bias vs. no-bias for *mipos*-questions, in which $p = .003$). On the other hand, negative bias is more generally conveyed via negative questions (all $p < .001$), with no difference between *min*-questions and either positive or *mipos*-questions ($p = .106$; $p = .347$). A preference for positive questions over *mipos*-questions was found regarding the expression of negative bias ($p < .001$). A no-bias response was more frequently chosen for positive and *mipos*-questions compared to the other two question types (all $p < .001$), with no difference between negative and *min*-questions ($p = .477$); lastly, the positive bias encoding tendency can be represented via the following rank: *min*-questions $>$ *mipos*-questions $>$ positive questions $>$ negative questions (all $p < .001$).

Discussion

Let us take stock of the results of Experiment 3, starting from the findings that do not bear direct relevance to the specific research question addressed by it. Positive questions were systematically linked to the no-bias responses,

thus providing additional support to the complete ignorance analysis of standard polar questions (Giannakidou 2013; Farkas 2020). As for negative questions, they were the type with the most opaque bias ascription preference, a result reflecting their notorious ambiguity (Ladd 1981; Romero and Han 2004; Sudo 2013; Krifka 2017, among others). That said, a significant preference for the negative bias option was obtained, suggesting that in the absence of context the negative question items were interpreted as inside negation questions in the sense of Ladd (1981).

Moving to *min*-questions, which were the focus of Experiment 3, they showed a significant preference for the positive bias option. Interestingly though, as shown in Figure 5, participants also gave responses corresponding to the negative bias and the lack of bias options. The percentage of the former (4.28%) is scant and can therefore be ignored as residual. It is the 26.52% of no-bias responses that calls for at least some discussion.

Makri's (2013) proposal that *min* conveys either the lack of bias or positive bias comes up first as a straightforward explanation of the obtained results. The author proposed this with reference to *min* in fear-predicate complements, but one could easily extend it to the occurrences of non-negative *min* in polar questions. There are two reasons to abstain from such an analytical move. The first is theoretical. Under Makri's (2013) account, *min*-questions are predicted to be only sometimes synonymous to positive polar questions and, consequently, *min* is predicted to have zero interpretative import but only in an undefined part of its occurrences. Such a state of affairs is grammatically possible but theoretically undesirable.

The second and most pressing reason to seek an alternative explanation of the obtained results is empirical. Recall that non-negative *min*, just like its negative counterpart, is licensed only in the scope of a non-veridical operator (Giannakidou 1997, 1998); in other words, an operator conveying that the speaker is unbiased and considers both the expressed proposition p and its polar alternative $\neg p$ to be possible (Giannakidou & Mari 2021). If the interpretative contribution of *min* were to be identified as the absence of bias, why would it need to occur within the scope of a non-veridical operator in the first place?

The solution to the problem emerges beautifully through the discussion of the concerns raised by the proposal in Makri (2013). Greek non-negative *min* encodes positive speaker bias both in fear-complements and in questions. This is consistent with the systematic link between *min*-questions and positive bias responses obtained in Experiment 3. As for the no-bias responses, they do not reflect any aspect of the interpretation of *min*, but merely the non-veridicality of its licenser; in this case, the question operator. This rationale is further supported by the finding that the no-bias option was chosen also for negative questions 29.14% of the times.

One last comment is in order before wrapping up this section. *Mipos*-questions were introduced as fillers as they were not relevant to the research question at the center of the present experimental study. It is interesting that they showed a preference for positive bias options and no-bias options, without a significant difference between the two. In this sense, *mipos* appears to play exactly the role that Makri (2013) predicts for non-negative *min*.

5.3.4 Summary

The experimental study presented in this section has gathered evidence in support of the research hypothesis according to which Greek non-negative *min* is interpreted as introducing positive speaker bias in both polar questions and fear-verb complements. Specifically, it showed that: (i) *min* is incompatible with the overt realization of polar propositional alternatives, (ii) *min* conveys medium speaker certainty with respect to the truth of the expressed proposition, and (iii) *min* encodes positive speaker bias in initial position of root polar questions. In the following section, the empirically motivated but theoretically underspecified answer to the problem of the interpretation of non-negative *min* is formalized.

5.4 Non-negative *min* is a positively biased epistemic modal

The main claim running through this chapter, motivated empirically by the results of the experimental study presented in Section 5.3, is that Greek non-negative *min* encodes positive speaker bias. In the linguistics literature the term *bias*, understood as that mental state where one of the possible alternatives is considered as more likely to be true than others, has been primarily related to questions (Pope 1976; Ladd 1981; Büring & Gunlogson 2000; Romero & Han 2004; Reese & Asher 2009; Sudo 2013; Krifka 2017, 2021a; Goodhue 2019, 2022, among many others).

Let us take the following minimal pair.

- (38)a. Is *min* a negative marker in Greek?
b. Isn't *min* a negative marker in Greek?

After reading this far, the reader does have expectations about the answers to the questions above. However, in the absence of context, the positive polar question in (38a) is considered as a canonical information seeking question attributed to an ignorant speaker (Farkas 2020), that is a speaker who has no epistemic preference for either the expressed proposition corresponding to *Min is a negative marker in Greek* or for the complementary *Min is not a negative marker in Greek*. Question (38b) on the other hand is usually regarded as a biased question. In this case the speaker is assumed to believe that one of the alternative propositions introduced by the question is more likely than the other. Keeping things simple for the moment, and assuming that (38b) corresponds unambiguously to what Ladd (1981) would call an outside negation question, the speaker believes that it is more likely that *min* is a negative marker in Greek than that it is not.

Giannakidou and Mari (2021) suggest that bias is relevant not only for questions but for all the linguistic environments encoding that the speaker considers complementary alternative propositions p and $\neg p$ to be possible; in other words, non-veridical environments (Giannakidou 1997, 1998).

(39) Maybe *min* is a negative marker in Greek.

Notice that this case is, interpretation-wise, parallel to the question in (38b). The presence of the epistemic modal *maybe* conveys that the speaker does not know whether p or $\neg p$ is true but has an epistemic preference for the former; they believe that *min* is more likely to be a negative marker in Greek than not.

Considering the above, the effect of introducing positive bias attributed to *min* points towards its analysis as a positively biased epistemic modal (cf. Makri 2013; Giannakidou & Mari 2019). In order to prove the adequacy of this proposal, one needs to check how *min* fits in the formal study of epistemic modality and the formal study of bias.

According to Giannakidou and Mari (2017, 2021), epistemic modals are objectively non-veridical because they do not entail the truth of the proposition p that appears in their scope. They are also subjectively non-veridical because they do not even entail that the speaker believes the proposition p to be true. We are only left with a state of affairs such that what these authors call the speaker's modal base –that is the set of the possible worlds compatible with what the speaker knows, believes or expects– contains worlds where the proposition p is true and worlds where its polar alternative $\neg p$ is true. As already mentioned, this is exactly the interpretative reflex of non-veridicality (Giannakidou 1997, 1998; Giannakidou & Mari 2017, 2021). Non-veridicality, in turn, is exactly the factor that determines the distribution of non-negative *min*. Recall that the latter is considered prototypically a polarity item because it is only licensed in the scope of non-veridical operators, the question operator and the operator introduced by fear-predicates.

The part of the proposal that treats *min* as an epistemic modal checks out. What about the positive bias part? Following again Giannakidou and Mari (2017, 2021), biased modals do not entail the truth of p , they do not entail the truth of *The speaker believes that p*, but they do entail that p is true in the *Best* worlds, that is the subset of possible worlds that are closest to what the speaker knows, expects or believes. The entailment of the truth of p in *Best* is theoretically captured via the introduction of an ordering source (Kratzer 1981, ff; Portner 2009, among others), a function that derives *Best* by ordering

the set of worlds making up the speaker's modal base from best (closest) to worst (farthest). This also fits perfectly with the behavior of Greek non-negative *min*, in the presence of which it was experimentally shown that the expressed proposition p is always closer to what the speaker believes, expects or knows.

Having checked that the behavior of *min* is indeed representative of what the linguistic literature has identified as a biased epistemic modal, it is time to proceed with the formalization of the novel insight. Building on the framework of Giannakidou and Mari (2017), M_s is set as the modal base relativized to a speaker or judge s (Laserson 2005; Stephenson 2007).

(40) $M_s = \lambda w'.w'$ is compatible with what is known by the speaker s in w_0 .

An ordering source g over worlds w compatible with what the speaker s knows in w is also adopted, defined as follows in the spirit of Kratzer (1981) and Portner (2009).

(41) Ordering source $g(w^{M_s})$
 For any set of propositions X and any worlds $w, w' \in M_s$: $w \leq_X w'$ iff
 for all $p \in X$ if $w' \in p$ then $w \in p$

In words, \leq_X represents the order generated by a set of propositions X . The world w is at least as good as world w' with respect to the ordering source in X if, and only if, for every proposition p that belongs to X , if p is true in w' , then it is also true in w (see also Kratzer 1991). Note that better worlds appear towards the left. In (41) w is more highly ranked or ranked the same as w' .

The set of *Best* worlds is defined based on the ordering source in (41) in the following way:

(42) $\text{Best}_{g(w^{M_s})(X)}: \{w' \in M_s : \forall p \in X (w' \in p)\}$

Best is thus the output of the ordering source identifying the set of worlds w' in the epistemic modal base of the speaker M_s such that for every proposition p that belongs to X , p is true in w' .

Finally, all the necessary formal tools are in place. Greek non-negative *min* can be formally defined as follows:

$$(43) \quad \llbracket \text{min} \rrbracket^{M_s, g(w)} = \lambda p_{\langle s, t \rangle}. \forall w' \in \text{Best}_{g(w)}^{M_s}: p(w')$$

Making things more verbal, the interpretation of *min* is relativized to the modal base of a speaker or judge and an ordering source. *Min* takes a proposition *p* as its argument and ensures that *p* is true in all of the possible worlds *w'* that belong to the set of *Best* worlds in the speaker's epistemic modal base *M_s*.

It is an ordering of possible worlds such that *p* worlds are *Best*, i.e., epistemically preferred over worlds that entail $\neg p$, that triggers the positive bias inference imposed by *min*, reflected in the results of the experimental study presented earlier. Looking closer, it could be said that *min* is exactly the Spell-Out of this ordering source.⁶¹ While non-veridicality is a precondition for its interpretation (pace the predictions by Giannakidou & Mari 2017), it is morphosyntactically disembodied from *min*, which always needs to occur in the scope of another non-veridical operator.

Let us now move on to build the meaning of the constructions that formed part of the experiments. From (43), (44) follows:

$$(44) \quad \llbracket \text{min } p \rrbracket^{M_s, g(w)} = 1 \text{ iff } \forall w' \in \text{Best}_{g(w)}^{M_s}: p(w')$$

After the derivational step in (44), the derivation of questions and fear-complements goes separate ways. Starting from the former, a modeling of polar questions in the spirit of Krifka (2011) is adopted for the current purposes:

$$(45) \quad \llbracket \text{Q} \rrbracket = \lambda w \lambda f_Q \in \{\lambda p. p, \lambda p. \neg p\} [f_Q(p_w)]$$

⁶¹ See Tahar (2021) for the view that the expletive negative marker in the complement of French fear-predicates is the instantiation of a desirability ordering source, not an epistemic one.

Considering the above, the interpretation of the *min*-question in (46) is derived as shown in (47).

- (46) Min xalase to plindirio?
 MIN broke the washing.machine
 ‘Did the washing machine maybe break?’

- (47) $[[Q \text{ min } xalase \text{ to } plindirio]]^{Ms(w_0)}$
 $= \lambda w [\lambda f_Q \in \{\lambda p.p, \lambda p.\neg p\} [f_Q(\text{min } xalase_w \text{ to } plindirio)]^{Ms(w_0)}]$

In words, the presence of the question operator ensures that the non-veridicality precondition for the interpretation of *min* is satisfied by introducing both *p* and $\neg p$ worlds. Then *min* takes these worlds and orders them in such a way that *Best* worlds are *p* worlds.

What about fear-predicate complements? Following Anand and Hacquard (2013; see also Makri 2013), fear-verbs have a doxastic component introducing doxastic alternatives and an emotive component ordering these alternatives in terms of undesirability. The experimental results presented in Section 5.3 suggest that only the doxastic component is relevant for the interpretation of Greek non-negative *min*. The simplified denotation of the Greek fear-verb *fovame* is provided in (48).

- (48) $[[fovame]] = \lambda w \lambda f_{FEAR} \in \{\lambda p.p, \lambda p.\neg p\} [f_{FEAR}(p_w)]$

Consequently, the interpretation of the fear-embedded assertion in (49) is derived as shown in (50).

- (49) Fovame min irthan i kenuryi yitones.
 I.fear MIN came the new neighbors
 ‘I fear the new neighbors may have come.’

$$\begin{aligned}
(50) \quad & \llbracket \text{fovame } \textit{min} \textit{ irthan} \textit{ i} \textit{ kenuryi} \textit{ yitones} (x) \rrbracket^{Ms(w_0)} \\
& = \lambda w [\lambda f_{\text{FEAR}} \in \{\lambda p.p, \lambda p.\neg p\} [f_{\text{FEAR}}(\textit{min} \textit{ irthan}_w \textit{ i} \textit{ kenuryi} \textit{ yitones})]^{Ms} \\
& \quad (x)(w_0)]
\end{aligned}$$

In words, leaving the emotive component of *fovame* aside, the interpretation of *min*-complements of predicates of fear is predicted to be parallel to the one of polar *min*-questions: The fear-predicate secures the interpretability of *min* by introducing both *p* and $\neg p$ worlds. Then *min* kicks in to order these worlds in a way that *Best* worlds always entail *p*.

A clarification is due regarding a notational matter, which however can have more important repercussions. So far *p* has been used to represent the expressed proposition in each case and $\neg p$ has been used as standing for its polar propositional alternative. Importantly, the distinction between a proposition of positive polarity and a proposition of negative polarity is absolutely orthogonal to this. The major proposal made here on the interpretation of *min* suggests that it is always the expressed proposition that is epistemically favored by this biased modal. In (51) below, where the expressed proposition has negative polarity, the speaker is predicted to consider more likely that the washing machine is not broken.

$$\begin{aligned}
(51) \quad & \text{Min} \quad \text{dhen} \quad \text{xalase} \quad \text{to} \quad \text{plindirio?} \\
& \text{MIN} \quad \text{NEG}_1 \quad \text{broke} \quad \text{the} \quad \text{washing.machine} \\
& \text{'Is the washing machine maybe not broken?'}
\end{aligned}$$

With such loose ends now tied, it would be helpful to discuss briefly the structures without *min* that also formed part of the experiments. Let us take *min*-free questions first. These were shown to convey lower speaker certainty than questions with *min*. This follows directly from the discussion above: Questions without *min* involve a question operator which introduces both *p* and $\neg p$ worlds, but no element to order these worlds and create an epistemic preference. In the absence of context, the utterer of a *min*-free polar question is predicted to be not simply less certain about the truth of the expressed proposition than the person asking a question with *min*, but absolutely clueless (Giannakidou 2013; Farkas 2020).

When it comes to fear-complements without *min*, which were found to express higher speaker certainty than their counterparts with *min*, the situation gets more complicated. The interpretative asymmetry between the two types of fear-complements is not due to the lack of an element that orders the doxastic alternatives introduced by the fear-verb; it stems from the very presence of *oti* which, in accordance with Roussou’s main insight (2010), can be argued to introduce an assertion conveying that the speaker is CERTAIN_{*d,⟨s,t⟩*} to a specific degree of the truth of *p*.⁶² We thus have the following:

- (52) Fovame oti paretithike o proedhros tis
 I.fear that quit the president of.the
 eterias.
 company
 ‘I fear that the CEO of the company quit.’

- (53) $[[\text{fovame } oti \text{ paretithike } o \text{ proedhros } tis \text{ eterias } (x)]]^{Ms(w_0)}$
 $= \lambda w[\lambda f_{FEAR} \in \{\lambda p.p, \lambda p.\neg p\} [f_{FEAR}(oti \text{ paretithike}_w \text{ o } proedhros \text{ tis } eterias)]^{Ms(x)}(w_0)]$

In words, the fear-predicate introduces *p* and $\neg p$ worlds in this case too, thus shaping an objectively non-veridical environment. It then composes with an *oti*-complement, which entails that the speaker believes that the expressed proposition corresponding to *The CEO of the company quit* is true; it is subjectively veridical (Giannakidou & Mari 2017). The asymmetry between the subjectively veridical *oti*-complement and the subjectively non-veridical *min*-complement explains the result obtained in Experiment 2, namely that the former conveys higher speaker certainty with respect to the expressed proposition.

This section is concluded with a note on the relationship between non-negative *min* and other Greek biased epistemic modals. Strikingly, the

⁶² For the status of the degree component, see Kennedy and McNally (2005), Castroviejo (2019), among others.

interpretation provided for *min* in (43) coincides with the one that Giannakidou and Mari (2017) give for the Greek epistemic *prepi* ‘must’ (also the epistemic future marker *tha* ‘will’). While the interpretative affinity between the two elements is intuitive, their distribution is intriguingly asymmetrical.

Firstly, as stated multiple times throughout the chapter, *min* needs to occur in the scope of a non-veridical operator. *Prepi* on the other hand does not come with such a restriction; if anything, the latter seems to behave as a non-veridical licenser itself:

- (54)a. **Min* xalase to plindirio.
 MIN broke the washing.machine
- b. *Prepi* na xalase to plindirio.⁶³
 must SUBJ broke the washing.machine
 ‘The washing machine must have broken down.’

Secondly, and even more intriguingly, *min* seems to be in complementary distribution with epistemic *prepi*:

- (55)a. *Min* xalase to plindirio?
 MIN broke the washing.machine
 ‘Did the washing machine maybe break?’
- b. #*Prepi* na xalase to plindirio?⁶⁴
 must SUBJ broke the washing.machine

Notice that, if non-negative *min* and epistemic *prepi* occur in complementary environments and in those environments –i.e., not in (55)– they receive the same interpretation, it can be soundly suggested that the former is the polar

⁶³ Here the presence of *na* is imposed by the modal verb *prepi* ‘must’.

⁶⁴ The question is interpretable as ‘Does it have to be the case that the washing machine broke?’, but it cannot receive the interpretation relevant to the present discussion.

variant of the latter. *Prepi* can be considered as the default, which will be realized as *min* in the scope of another, external non-veridical licenser.⁶⁵

5.5 On the expletiveness of non-negative *min*

The experimental study carried out on the distribution and interpretation of Greek non-negative *min* provided evidence that the latter expresses positive speaker bias. In other words, it conveys that the proposition encoded by its complement is considered more likely to be true than its polar propositional alternative. This insight was formalized in the modality framework developed by Giannakidou and Mari (2017, 2021) in Section 5.4. Recall that non-negative *min* was successfully identified as an appropriate expletive negation candidate. The goal of this section is to explore how the novel insight on *min* fits with the more general insight on expletiveness gathered throughout the present thesis.

The first property associated with expletiveness based on the findings of the previous chapters is the identity function semantics. Can this be argued to hold also for Greek expletive *min*? The proposed formal definition of *min*, advanced in (43), is repeated below for ease of reference.

$$(56) \quad \llbracket \text{min} \rrbracket^{Ms, g(w)} = \lambda p_{\langle s, t \rangle}. \forall w' \in \text{Best}_{g(w)}^{Ms}: p(w')$$

The above makes clear that the interpretative contribution of *min* is epistemic. It can also be shown to be non-at-issue (Potts 2004), that is non-negotiable (see also Murray 2010):

- (57)Q: Min irthe o Pavlos apo to Parisi?
 MIN came the Pavlos from the Paris
 ‘Did Pavlos maybe come from Paris?’

⁶⁵ It is worth noting that the analysis of Greek non-negative *min* put forth in this section, as well as its comparison with epistemic *prepi* ‘must’, bring in the foreground the possibility that an ordering source can be morphosyntactically separated from the non-veridical licenser that introduces the possible worlds to be ordered. This may have interesting consequences for the global analysis of modals in the framework of Giannakidou and Mari (2017, 2021) and other related frameworks.

- A1: Oxi, dhen irthe.
no NEG₁ came
‘No, he didn’t.’
- A2: #Oxi, theoris pio pithano na min
no you.consider more probable SUBJ NEG₂
irthe.
came
‘No, you think it is more likely that he didn’t.’

Moreover, note that non-negative *min* is a type-preserving function. In (57Q) for example, it takes the proposition corresponding to *Pavlos came from Paris* and returns the same proposition. The ordering of the alternatives introduced by the external question non-veridical operator belongs to a higher level of interpretation and does not interfere directly with the truth conditions of the sentence. Considering the above, one can argue that Greek non-negative *min* is interpreted as introducing an identity function as far as the truth-conditional semantics of *min*-sentences is concerned, thus behaving similarly to the other expletive categories investigated so far.

The local dependency on an item with respect to which the expletive category encodes some redundant meaning has been identified as a second constitutive property of expletiveness. When it comes to expletive negation, Espinal’s work on Catalan (1992, 1997, 2000, 2002, 2007) is highly relevant. Let us go back to example (3) from the introduction, repeated below for the reader’s convenience.

- (58) Tinc por que no arribin.
I.have fear that not come.SUBJ
‘I fear they {will not, might} come.’ (Fabra 1956: 103-104)

Only the expletive negation reading, according to which the speaker fears that her guests will come, is relevant to our discussion. Espinal (1992) proposes that expletive *no* is semantically dependent on the fear-predicate *Tinc por* ‘have fear’ (see also Tubau et al. 2018). Both the fear-predicate and the negative marker encode a negative feature. The dependency of the latter on

the former allows the lower negative feature to be logically absorbed (Higginbotham and May 1981; May 1985) and a non-negative interpretation of the whole utterance to arise.

The idea above extends easily to the Greek fear-complementation data. One could assume that both *fovame* and *min* in (59) encode some negative meaning component. The local syntactic relationship between the two allows the negative component of *min* to be absorbed by *fovame* and triggers a reading whereby the speaker fears that the cake is destroyed.

- (59) Fovame min ekapsa to keik.
 I.fear MIN I.burnt the cake
 ‘I fear I may have burnt the cake.’

It needs to be noted that the negative component attributed to fear-predicates is not a truth-condition reversal operator, but it mostly corresponds to an undesirability component (Anand & Hacquard 2013). In light of this, approaching the Greek data from the angle indicated above would be in principle consistent with Tahar’s (2021) analysis of French expletive negation as introducing an undesirability ordering source, as well as Yoon’s (2011) analysis of Greek expletive negation as contributing an evaluative conventional implicature.

Unfortunately, capturing the distribution of expletive negation in terms of a negative evaluative component redundancy cannot account for the whole range of the Greek data. Recall that Greek non-expletive *min* occurs also in initial position of polar questions. No negative evaluation whatsoever can be traced in (60). If anything, the hungry speaker will be delighted to receive a positive answer.

- (60) Min ine etimo to fayito?
 MIN is ready the food
 ‘Is the food maybe ready?’

Looking back to the obtained experimental results, the interpretation of Greek non-negative *min* was found to be sensitive not to evaluativity, but to the

presence of doxastic alternatives. This, combined with the empirical observation that *min* is a polarity element that needs to occur in the scope of a non-veridical operator, helps identify the local syntactic dependency and the resulting redundancy in the case of Greek expletive *min*.

It is argued here that non-negative *min* enters a local syntactic relationship with a non-veridical licenser that introduces alternatives and, specifically, doxastic alternatives: either a question operator or a predicate denoting fear. *Min*, shown to be interpreted as a biased epistemic modal, is also primarily expected to introduce doxastic alternatives and then order them (as is arguably the case for epistemic *prepi* ‘must’). Under such a state of affairs a redundancy of doxastic alternative sources emerges. It is worth noting that a link between expletive negation and epistemic modality has been argued for also for languages significantly different from Greek, such as Korean and Japanese (Choi & Lee 2017).

The analytical take suggested above has a battery of welcome consequences. First, it predicts that Greek non-negative *min* needs to occur in the scope of an external non-veridical operator since the described redundancy cancels its independent alternative-introducing capacity. Second, it derives the distribution of expletive negation in Greek. According to Jin and Koenig (2020; see also Horn 2010), expletive negative markers across languages appear in a long list of distinct environments ranging from *fear-*, *regret-* and *forbid-*predicates to *avoid-* and *prevent-*predicates to comparative constructions. Since Greek does display the expletive negation marker *min*, why does it only grant it such a narrow distribution? If the relevant property for the expletiveness of *min* is not its negative but its doxastic component, then its occurring in a small subset of the typologically frequent expletive negation environments follows. The last consequence that reinforces the descriptive adequacy of an epistemic analysis of expletive *min* is that its occurrence in conditionals (see footnote 56) is predicted. To my knowledge, conditionals have not been reported to license expletive negation markers. However, they have been shown to be compatible with the expression of bias (see Liu et al. 2021).

Let us lastly explore how expletive *min* behaves with respect to the third characteristic property of expletiveness, namely the occasional emergence of

secondary meaning best captured in terms of illocutionary content. The reader may notice that *min* has already been shown to display this property; Sections 5.3 and 5.4 motivated sufficiently its definition as a positively-oriented biased epistemic modal. The rest of this section is devoted to showing how the study of Greek non-negative *min* justifies further the use of Krifka's (2021b) speech act syntactization framework for the formalization of the non-truth conditional meaning developed in expletive categories. To this aim, we need to dive into the syntax of *min*.

Going back to the point of departure, standard Greek negative markers *dhen* and *min* are usually considered to merge in the head of a NegP (but see Lekakou to appear). Crucially, this cannot be the merge site for non-negative *min* which, as already shown, can co-occur with sentential negation (Makri 2013; Chatzopoulou 2018).

- (61) Fovame min dhen ine etimo to fayito.
 I.fear MIN NEG₂ is ready the food
 'I fear the food may not be ready.'

Example (61) suggests not only that expletive *min* is not syntactically located in Neg⁰ but also that it merges higher.⁶⁶

Could non-negative *min* be in the head of a higher projection than NegP, such as MoodP (Cinque 1999)? Note that subjunctive mood is treated by Giannakidou and Mari (2021) as a polarity item that conveys a speaker unable to commit to the truth of the expressed proposition (see also Giannakidou 1997, 1998; Quer 1998, for practically the same insight). This brings subjunctive quite close to expletive *min* as far as their interpretation is concerned. Since the Greek verb is not morphologically marked for

⁶⁶ It is intriguing that non-negative *min* cannot co-occur with its negative counterpart. This is probably due to the fact that the non-veridical licensors of expletive *min*, i.e., fear-predicates and the question operator, are different from the non-veridical operators licensing negative *min*, such as the directive speech act operator. Notice, for example, that the negative marker emerging in Greek fear-predicate complements is always *dhen* and never *min*.

(i) Fovame oti dhen/ *min ine etimo to fayito.
 I.fear that NEG₁ NEG₂ is ready the food
 'I fear that the food is not ready.'

subjunctive mood, the only way to test the hypothesis above is to compare *min* to the subjunctive marker *na*.

(62) a. Fovame min fiyi to afendiko.
 I.fear MIN leaves the boss
 ‘I fear the boss may leave.’

 b. Fovame na fiyi to afendiko.
 I.fear SUBJ leaves the boss
 ‘I fear the possibility that the boss leaves.’

(63) a. Min efiye to afendiko?
 MIN left the boss
 ‘Did the boss maybe leave?’

 b. Na efiye to afendiko?⁶⁷
 SUBJ left the boss
 ‘Did the boss maybe leave?’

The members of each pair above display a striking interpretative similarity, thus suggesting that the relation between non-negative *min* and *na* may be tight. However, Makri (2013) makes a sharp observation which illustrates that the two elements are functionally distinct in specific contexts.

(64) a. *Fovame na efiye to afendiko.
 I.fear SUBJ left the boss
 b. Fovame min efiye to afendiko.
 I.fear MIN left the boss
 ‘I fear the boss may have left.’

The asymmetry in (64) shows that *na* imposes restrictions on the sequence of grammatical tenses between the matrix and the embedded predicate that *min* does not. If *na* is more or less directly related to subjunctive, the verb following expletive *min* is in indicative mood (Makri 2013). Importantly, this

⁶⁷ On the interpretation of subjunctive questions in Greek, see Oikonomou (2021).

suggests that there is no evidence to associate *min* with a projection such as MoodP.

There is a last piece of syntactic evidence showing not only that expletive *min* is higher than MoodP, but also that it is merged in the highest CP-domain.⁶⁸ In the case of fear-complements, when the *min*-sentence is embedded, no subject can intervene between the embedding verb and *min*.⁶⁹

- (65) #Fovame to afendiko min efiye.⁷⁰
 I.fear the boss MIN left
 ‘I fear the boss may have left.’

The empirical picture laid out above can be accommodated under the theoretical proposal that Greek non-negative *min* is merged in the speech act-related part of the CP-domain and, specifically, in the head of Krifka’s (2021b) JP. Recall that this phrase is by definition responsible for the encoding of epistemic and evidential attitudes and, thus, a great fit for *min* which has been experimentally confirmed to behave as a biased epistemic modal. The structural representation of the *min*-question in (66a) and the fear-predicate embedded assertion in (67a) is given in (66b) and (67b), respectively. In the case of the latter, only the internal structure of the embedded utterance is relevant to the present discussion.

- (66)a. Min xtipise to tilefono?
 MIN rang the telephone
 ‘Did the telephone maybe ring?’

⁶⁸ It should be noted that at least for some speakers, a *na min* variant of Greek non-negative *min* exists with the same distribution and interpretation:

- (i) Fovame na min efiye to afendiko.
 I.fear SUBJ MIN left the boss
 ‘I fear the boss may have left.’

The very existence of *na min* suggests that the marker *na* is merged higher. However, the relative order of elements in the *na min* construct is taken to reflect a historical process, irrelevant to the synchronic analysis of Greek expletive *min*. See Chatzopoulou (2018) for a diachronic study on the Greek negation system. As for the possibility of a *min na* ordering, this sequence is ungrammatical in Greek.

⁶⁹ The same observation is made regarding Catalan in Espinal (1992), who takes it as an important argument in support of the logical-absorption analysis of expletive negation.

⁷⁰ The sentence improves if the subject is focused.

b. [_{ActP} [_{Act} REQUEST] [_{ComP} [_{Com} †] [_{JP} [_J min] [_{CP} [_{TP} xtipise to tilefono]]]]]]

(67) a. Fovame min xtipise to tilefono.
 I.fear MIN rang the telephone
 ‘I fear the telephone may have rung.’

b. fovame [_{ActP} [_{Act} ASSERT] [_{ComP} [_{Com} †] [_{JP} [_J min] [_{CP} [_{TP} xtipise to tilefono]]]]]]

The syntactic proposal put forth above, which is partly advanced in Tsiakmakis and Espinal (2022), offers a merge site for Greek expletive *min* high enough to account for its interaction with sentential negation markers, mood markers and embedded subjects. Most importantly, it does so while making the correct predictions regarding the interpretation of utterances featuring *min*. What (66b) states in words is that the polar question in (66a) is a speech act via which the speaker requests that the addressee commits publicly to the judgment that the proposition corresponding to *The telephone rang* is true. The presence of the modalizing element *min* in the head of JP additionally conveys the non-at-issue information that the speaker considers this proposition as more likely to be true than its complement, namely that *The telephone did not ring*.

The situation is for the most part parallel as regards (67). The main difference is that in this case the matrix verb *fovame* embeds an assertion, not a request act.⁷¹ This embedded assertion is an act via which the speaker abstains from committing publicly to the truth of the embedded proposition corresponding to *The telephone rang*, but further communicates in a non-at-issue manner that they consider this more probable than its polar alternative. All in all, the readings derived from the formal representations provided above capture satisfactorily the conversational dynamics shaped by the corresponding utterances.

⁷¹ On the possibility of embedding speech acts and the conditions under which such embedding is licit, see Krifka (2012).

This subsection took pains to show that the expletiveness of Greek non-negative *min* mirrors the fundamental properties of the other expletive functional categories studied so far; and it managed. It can be safely argued that (i) *min* is interpreted as merely introducing an identity function at the strictly truth-conditional level, (ii) it is locally dependent on a non-veridical licenser with respect to which it redundantly encodes the presence of doxastic alternatives, and (iii) it has developed a secondary meaning, best captured as the non-at-issue expression of positive speaker bias. This bias effect is postulated to be encoded in syntax as a JP projected by the biased epistemic modal *min*, thus providing additional justification for the link between expletiveness and the left periphery of the clause advocated for in the present thesis.⁷²

5.6 Conclusions

This chapter set out to test how far the expletiveness generalizations motivated in the previous chapters reach by investigating Greek expletive negation and, specifically, non-negative instances of the negative marker *min* (Makri 2013; Chatzopoulou 2018; Giannakidou & Mari 2019). After successfully identifying *min* as an appropriate expletiveness candidate, a study consisting of three experiments was designed and carried out in order to pin down its interpretative import.

The experimental findings can be summarized in the following: (i) the presence of non-negative *min* excludes the overt realization of polar propositional alternatives, (ii) non-negative *min* conveys medium speaker certainty with respect to the truth of the expressed proposition both in initial position of polar questions and in complement position of predicates denoting fear, and (iii) non-negative *min* expresses positive speaker bias in questions. The combination of the above is taken as sufficient evidence to support the

⁷² I would like to tentatively propose that Greek non-negative *min* shares with negative *min* a minimal meaning component that can be defined as “ordered alternatives”. The fundamental interpretative difference between the two is that epistemic *min* brings about an ordering of epistemic alternatives such that $p > \neg p$ whereas negative *min* encodes an ordering of propositional alternatives such that $\neg p > p$. I postulate that this difference could be attributed to their different syntax, i.e., merge in the head of JP vs. merge in the head of NegP.

view that expletive *min* is interpreted as a positively biased epistemic modal (cf. Makri 2013; Giannakidou & Mari 2019); it conveys that all the possible worlds that are closest to what the speaker knows, believes or expects are worlds where the expressed proposition is true.

Having identified satisfactorily the interpretative contribution of non-negative *min*, it was now possible to explore how it fares with respect to other expletives. *Min* was found to behave as the previous categories studied in this thesis in that (i) it introduces an identity function semantics at the truth conditional level, (ii) it stands in a local relationship with an element with respect to which it encodes some redundant meaning, and (iii) it has developed an additional meaning component best captured as speech act-related content, namely the positive speaker bias effect.

This study of *min* revealed an underexplored link between expletive negation and epistemic modality (see also Choi & Lee 2017), showing that evaluativity (Yoon 2011; Tahar 2021, among many others) is not the only meaning dimension that this phenomenon connects with. In the next chapter, allegedly expletive instances of the second Greek negative marker, namely *dhen*, are put under the magnifying glass, in the hope that they can illuminate the situation further.

6 Outside negation and response patterns: A follow-up study on Greek expletive negation

6.1 Introduction

The previous chapter left two broad issues wide open, a situation that any thorough study on Greek expletive negation should try to remedy. The first one has to do with the realization of sentential negation in Greek. While a significant insight has been gathered regarding the interpretation of *min*, nothing has been said about the complementary negative marker *dhen* exemplified again for reference below.

- (1) I Xristina dhen irthe sto parti.
the Hristina NEG₁ came to.the party
'Hristina didn't come to the party.'

Given that *min* was shown to display uses that are not only devoid of negative meaning but also enriched with modal meaning, the hypothesis that the negative marker *dhen* may have at least non-negative instances cannot be discarded without being properly tested first.

The second issue has to do with the types of linguistic environments that have been associated with expletive negation across languages. It was mentioned already that these are prototypically defined by a predicate or operator encoding some negative meaning. Concretely, Horn's (2010) and Jin & Koenig's (2020) lists contain verbs meaning fear, worry, danger, doubt, denial, regret, criticism, complaint, blame, forgetting, delay, miss, refusal, disruption, avoidance, prevention, prohibition, as well as *before*-clauses, *without*-clauses, *unless*-clauses, and comparatives. Crucially, the linguistics

literature has identified a second parallel set of environments that allegedly license non-canonically interpreted negative markers in the absence of a lexically realized licenser. It is now time to look into those in more detail.

Already in the early seventies, Sadock (1971) drew attention to negative rhetorical questions such as the following one from English.

(2) After all, didn't I come to your party?

It is commonly agreed upon that the purpose of a question like (2) is not to request information, but instead to assert a proposition, most usually of the opposite polarity to the proposition expressed (Sadock 1971; Han 2002; Rohde 2006; Reese & Asher 2009; Delfitto & Fiorin 2014, among others). By uttering (2), the speaker means to remind the hearer that she did go to the hearer's party. Negative rhetorical questions have been analyzed as question-assertion hybrids (Sadock 1971; Reese & Asher 2009) or pure questions that call for the most probable/less informative answer (Rohde 2006; Delfitto & Fiorin 2014). What is important at this point of the discussion is that the negative marker *n't* in (2) is ultimately not interpreted as standard negation, thus making negative rhetorical questions a potential expletive negation host.

A decade after Sadock, Ladd (1981) is onto stumbling upon a similar but distinct non-negative negation host, discussing minimal pairs similar to the one below:

- (3) a. Is Cristina not coming to the party?
b. Isn't Cristina coming to the party?

According to Ladd, (3a) is used whenever the speaker wants to confirm the recently inferred proposition corresponding to *Cristina is not coming to the party*. In this case, a negative proposition $\neg p$ is up for negotiation, suggesting that the negative marker *not* is interpreted canonically within the propositional domain. Therefore, Ladd (1981) considers the type of questions exemplified by (3a) as *inside* negation questions. However, it is (3b) that is most relevant to the present discussion. Following again Ladd, the latter would be used by a speaker who believes the positive proposition *Cristina is*

coming to the party to be true and wants to confirm it with the addressee. Here *n't* is not a standard negative marker as it is arguably interpreted outside the domain of the proposition (Ladd 1981). The negative markers featured in these *outside* negation questions have been analyzed as taking scope over epistemic operators (Romero & Han 2004; Repp 2013; Goodhue 2019, 2022, among others) or other illocutionary operators (Krifka 2015; 2017; 2021a). Again, what matters most to our discussion for the moment is that questions of this type are suspicious for involving instances of expletive negation.

In what was this close to being a decade after Ladd's seminal paper, Espinal (1992) turns fleetingly the reader's attention to the third type of environment suspicious for hosting non-negative markers similar to the ones featured in negative rhetorical questions and outside negation questions:

- (4) ¡No será imbécil!
not will.be idiot
'What an idiot he is!' (Espinal 1992: 334, fn. 1, ex. (ia))

Example (4) illustrates that, at least in some languages, exclamative sentences can host negative markers that are clearly interpreted non-negatively, just like *no* above. Among many different analyses of the phenomenon in various languages, Espinal (1997) proposes that in this case the negative operator is logically absorbed by an abstract Intensifier Phrase, Portner and Zanuttini (2000) suggest that the presence of negation widens the set of alternative propositions the exclamative is associated with, while Delfitto and Fiorin (2014) argue that the non-negatively interpreted negative marker reverses the informativity/probability scale in which these alternative propositions are ordered. Picking one over the alternative analyses is not the goal of this introduction. Suffice it to say here that exclamatives are another potential expletive negation host.

The aim of the present chapter is to cover the topics exposed above which, in a fortunate coincidence, fully overlap; the closest Greek parallels to what has been identified as negative rhetorical questions, outside negation questions and negative exclamatives in other languages all feature the negative marker *dhen*, not *min*. The structure of the chapter is the following:

Section 6.2 investigates whether *dhen* has non-negative uses and, if so, of what sort. An experimental study aiming at facilitating this only partly conclusive investigation is described in detail in Section 6.3. Section 6.4 takes stock of the experimental findings and explores how much they can teach us about *dhen* and expletive negation. Section 6.5 concludes the chapter.

6.2 Expletive negation suspect *dhen*

The preceding introduction listed three distinct environments that have been shown to license non-canonically interpreted negative markers in various languages: (i) negative rhetorical questions, (ii) outside negation questions, and (iii) negative exclamatives. This section aims to test how Greek, and specifically the Greek negative marker *dhen*, relates to this crosslinguistic observation. Let us unconventionally start at the end and look into exclamative sentences first.

6.2.1 Greek negative exclamatives

Exclamative sentences in Greek are in principle compatible with the negative marker *dhen*. Crucially, in this case they are ambiguous in the fashion shown below:

- (5) Ti oreá piata dhen efiakse i Xristina!⁷³
what nice dishes not made the Hristina
'What nice dishes Hristina didn't make!'/ 'What nice dishes Hristina made!'

A speaker may use (5) to convey their surprise (Michaelis 2001; Rett 2011; Castroviejo 2019, among others) at the dishes that Hristina did not make, in which case *dhen* is interpreted as standard sentential negation. However, this

⁷³ For the purposes of this chapter *dhen* is glossed as *not*, pending a definitive answer to whether it has non-negative uses or not.

reading is dispreferred. In fact, the restricted compatibility of propositional negation with exclamatives is a crosslinguistic tendency, attributed by Villalba (2004) to the combination of factivity and extreme degree semantics found in the latter. The preferred interpretation of (5) is one where the speaker is amazed at the dishes that Hristina did prepare. In this case, *dhen* does not seem to contribute any negative meaning and is, therefore, a good expletiveness candidate.

Researchers interested in negative exclamatives, by which from now on reference will be made only to those that receive a non-negative interpretation, usually compare them to other sentence types that transparently feature standard negative markers (Delfitto & Fiorin 2014; Greco 2019) in an attempt to show in what ways the negation involved in the former is somehow defective or divergent. Here a different take on the issue is suggested. Concretely, a comparison between negative exclamatives and their positive equivalents is considered more instructive than, for instance, the comparison between negative exclamatives and negative assertions.

When comparing example (5) to its affirmative counterpart in (6), interesting asymmetries are revealed.

- (6) Ti orea piata eftiakse i Xristina!
 what nice dishes made the Hristina
 ‘How nice dishes Hristina made!’

First, while (6) is compatible with the complementizer *pu* ‘that’, (5) does not admit *pu* under the non-negative reading of *dhen*.⁷⁴

- (7) a. Ti orea piata (pu) eftiakse i Xristina!
 what nice dishes that made the Hristina
 ‘How nice dishes Hristina made!’
 b. Ti orea piata (*pu) dhen eftiakse i Xristina!
 what nice dishes that not made the Hristina

⁷⁴ See Castroviejo (2006) for a similar observation regarding Catalan exclamatives and the complementizer *que*. On the status of the Greek complementizer *pu*, see Roussou (1994, 2010); Holton et al. (1997); cf. Trotzke and Giannakidou (2021).

‘What nice dishes Hristina made!’

Moreover, (7a) conveys the speaker’s surprise at the extreme degree of the niceness of the dishes, as would be the case of a prototypical exclamative (Michaelis 2001; Rett 2011). Example (7b), on the other hand, expresses that the speaker is surprised at the number of nice dishes that Hristina prepared, rather than how good they tasted.⁷⁵ Last but not least, (7a) would work fine with a singular *wh*-phrase, whereas the same singular *wh*-phrase in (7b) is necessarily coerced into a plural reading.⁷⁶ Note the contrast in (8), below.

- (8) a. Ti oreo piato (pu) eftiakse i Xristina!
what nice dish that made the Hristina
‘What a nice dish Hristina made!’
- b. Ti oreo piato (*pu) dhen eftiakse i Xristina!
what nice dish that not made the Hristina
#‘What a nice dish Hristina made!’/ ‘Hristina made all nice dishes!’

Summing up, contrasting an affirmative Greek exclamative with its non-negative *dhen* counterpart, one observes three striking discrepancies: (i) the availability vs. non-availability of the complementizer *pu* ‘that’, (ii) the degree vs. non-degree reading, and (iii) the compatibility vs. incompatibility with singular count *wh*-phrases. None of the above is easily accounted for under the view that (7a) and (7b) are both instances of an exclamative, differing only in the absence vs. presence of a non-negatively interpreted *dhen*. The observed asymmetries rather indicate that so-called Greek negative exclamatives and Greek positive exclamatives belong to different sentence types.

Concretely, it is suggested here that the three differences previously listed follow directly from the assumption that Greek negative exclamatives are negative rhetorical questions uttered as exclamations and, specifically, as

⁷⁵ The same asymmetry is reported for at least German (Meibauer 1990), Hebrew (Eilam 2007), and Italian (Delfitto & Fiorin 2014).

⁷⁶ See Espinal (2000) for the observation that Spanish negative exclamatives are incompatible with singular count nouns.

encoding surprise (Michaelis 2001).⁷⁷ The question component of this proposal derives the incompatibility of negative exclamatives with the complementizer *pu* on the syntactic level (Holton et al. 1997), and the absence of a degree reading of the *wh*-phrase on the semantic level –see the minimal pair in (7). The rhetorical component of the proposal predicts that negative exclamatives will be interpreted by reference to their semantic complement (Sadock 1971; Rohde 2006; Reese & Asher 2009; Delfitto & Fiorin 2014). This explains why in (7b) the speaker is surprised at the dishes that Hristina actually prepared, not the ones she did not. It also explains how singular count nouns like *piato* ‘dish’ in (8b) end up receiving a plural interpretation: the complement set of the set including that one dish contains all the possible or contextually relevant dishes. Finally, the exclamation component of this tentative proposal predicts the speaker surprise conveyed by negative exclamatives. It is merely speculated at this point that this component could be identified as a surprise intonational pattern (see Arvaniti & Baltazani 2005).

The idea that Greek negative exclamatives are better described as negative rhetorical questions uttered as exclamations is very much in line with the fact that the only example I could find in the literature supporting the very existence of negative exclamatives in this language involves the *wh*-word *posus* ‘how many’ instead of *ti* ‘what’, does not include the complementizer *pu* and clearly conveys surprise towards some quantity rather than some degree:

- (9) Posus anthropus dhen kseyelase sta niata tu!
 how.many men not cheated in.the youth his
 ‘He cheated so many people in his youth!’

(Espinal 1997: 76, ex. (2b))

Crucially, though, treating Greek negative exclamatives as exclaimed negative rhetorical questions does not provide an answer to whether *dhen* is

⁷⁷ For the purposes of this chapter, the term *exclamative* is used to refer to a specific sentence type while the term *exclamation* is taken to comprise in general expressive utterances, that may instantiate different sentence types –see Michaelis (2001).

a good expletiveness candidate or why it appears to be interpreted non-negatively. It merely indicates that the instances of *dhen* in so-called negative exclamatives should be studied together with their counterparts in negative rhetorical questions, to which we move next.

6.2.2 Greek negative rhetorical questions

Negative rhetorical questions in Greek (Holton et al. 1997; Veloudis 2018) can have the same form as information seeking questions. For the sake of clarity though, let us adapt Sadock's (1971) *after all*-diagnostic and provide an unambiguously rhetorical example.

- (10) Sto kato kato, dhen eftiakse oreá piata i
at.the down down not made nice dishes the
Xristina?
Hristina
'After all, didn't Hristina make nice dishes?'

The question in (10) corresponds conversationally to an assertion of the proposition with the opposite polarity to the proposition expressed, namely *Hristina made nice dishes*, as the general literature on rhetorical questions unanimously predicts (Sadock 1971; Han 2002; Rohde 2006; Reese & Asher 2009; Delfitto & Fiorin 2014, Veloudis 2018).

This description of the interpretation of (10) above does not necessarily mean that the assertive power of rhetorical questions is grammatically hardwired, as Sadock (1971) or Reese and Asher (2009) for example suggest. Intriguingly, Veloudis (2018) states with special reference to Greek that rhetorical questions admit answers, sometimes even from the speakers themselves:

- (11) Sto kato kato, dhen eftiakse orea piata i
 at.the down down not made nice dishes the
 Xristina? Eftiakse.
 Hristina made
 ‘After all, didn’t Hristina make nice dishes? She did.’

The answerability of negative rhetorical questions, even though restricted, can be taken as an argument for their analysis as questions. Under this view, they would be distinguished from their canonical (Farkas 2020), information seeking counterparts in that rhetorical questions always call for the least informative answer, and their goal is to merely synchronize the speaker and addressee’s beliefs about the world (Rohde 2006; Veloudis 2018).

Solving the debate around the pure or impure question status of negative rhetorical questions is outside the scope of this chapter. What is relevant to the present study is that *dhen* in (10) is not interpreted as a standard negative marker. This is corroborated further by (11), where the juxtaposition of the positive proposition corresponding to *Hristina made nice dishes* with the *dhen*-question does not give rise to any kind of clash or anomaly. If negative rhetorical questions –and negative exclamatives– feature non-negatively interpreted instances of *dhen*, then they may well be additional expletive negation hosts in Greek.

Before rushing to such a conclusion though, one needs to evaluate the importance of two empirical facts highlighted by Rohde (2006). The first one is that the negative marker of a negative rhetorical question can be interpreted canonically if the context favors such a reading (Rohde 2006). Imagine a conversation between a mother and her son, with the former trying to gain the latter’s trust. The mother utters the following:

- (12) Sto kato kato, pxios dhen se plighose POTE?
 at.the down down who not you hurt never
 ‘After all, who never hurt you?’

Notice that here the mother’s intention is to assert that she is the only one who did *not* hurt her son. In this sense, *dhen* is interpreted negatively in (12), as

suggested further by the fact that it can license the emphatic *POTE* ‘never’ which is a Negative Concord Item (NCI). The possibility that a negative rhetorical question interpretatively correspond to a negative assertion is a first indication that the rhetoric effect can be independent from the presence of an allegedly expletive negative marker (cf. Delfitto & Fiorin 2014).

Rohde’s (2006) second empirical observation concerns the existence of positive rhetorical questions.

- (13) Sto kato kato, irthe i Xristina sto parti?
 at.the down down came the Hristina to.the party
 ‘After all, did Hristina come to the party?’

In the absence of a concrete context, the question in (13) is preferably interpreted as the speaker’s attempt to assert or remind the hearer that *Hristina did not come to the party*. In this sense, positive rhetorical questions mirror the behavior of negative rhetorical questions. Now, if the polar-complementarity effect of rhetorical questions emerges in both positive and negative rhetorical questions, it cannot be causally related to the existence of a negative marker in the latter but not the former. Providing a different analysis for the two types of rhetorical questions is a theoretical possibility, which however violates economy considerations and, most importantly, the native speakers’ intuitions.

Considering the above, Rohde’s (2006) empirical observations lead to the following conclusion: The presence vs. absence of negation is in principle orthogonal to rhetoricity, the latter meant as the interpretative effect according to which some questions end up functioning as assertions in the conversational game. There is, however, an undeniable tendency for rhetoricity to go hand in hand with polarity reversal (see Rohde 2006). Unless one is willing to postulate the existence of a null expletive positive polarity operator in positive rhetorical questions, we are forced to admit that it is rhetoricity that actually causes the non-negative interpretation of *dhen* in Greek negative rhetorical questions and not the other way around.

If the above is on the right track, Greek negative rhetorical questions – and by extension Greek negative exclamatives – feature instances of the

standard negative marker *dhen*. This *dhen* is interpreted as a true negative marker at the level of truth-conditional semantics. In other words, it brings into the computation its canonical interpretative import. However, this import seems to disappear in the end only due to effects applying at the level of utterance interpretation. If *dhen* cannot be accused of expletiveness for showing up in Greek negative exclamatives and negative rhetorical questions, the only place to keep on searching for incriminating evidence is outside negation questions.

6.2.3 Greek outside negation questions

In order to explore the last potential expletive *dhen* host, we need to return to example (3), repeated below for convenience.

- (14)a. Is Cristina not coming to the party?
b. Isn't Cristina coming to the party?

Recall that, following Ladd (1981), (14a) corresponds to an inside negation question, whereas (14b) exemplifies an outside negation question. The latter is thus likely to feature an expletive negative marker *n't*. Interestingly, Romero and Han (2004) argue that Greek displays the same negative polar question distinction; they cite the following minimal pair:

- (15)a. O Yanis dhen ipie kafe?
the Yanis not drank coffee
‘Did Yanis not drink coffee?’
b. Dhen ipie o Yanis kafe?
not drank the Yanis coffee
‘Didn't Yanis drink coffee?’

(Romero & Han 2004: 614, ex. (14))

Capitalizing on word order, Romero and Han (2004) consider (15b) an outside negation question and, therefore, predict that it conveys the speaker's

belief that Yanis did drink coffee (see Ladd 1981), an interpretative effect not necessarily present in the inside negation question (15a).

The idea that the English negative question pattern is mirrored in Greek is theoretically welcome. Nevertheless, there are two empirical problems with Romero and Han's (2004) claim. The first one is that (15a) is not a very natural way to form a polar question in Greek, where the verb –or the negation + verb cluster– usually comes first (Holton et al. 1997). Even more problematic for the authors' proposal is that (15a) is more likely to express the speaker's positive bias, i.e., the belief that Yanis drank coffee, than (15b). Importantly, these two empirical counterarguments do not mean that the question in (15b) cannot have the reading that the authors attribute to it. They do suggest however that, if Greek does have inside and outside negation questions, they will both look like (16) below.⁷⁸

- (16) Dhen ipie kafe o Yanis?
not drank coffee the Yanis
'Didn't Yanis drink coffee?'

If surface syntax and specifically word order does not provide any evidence for an inside vs. outside negation question distinction in Greek, then one is forced to dig deeper. A diagnostic introduced already by Ladd (1981) is based on the licensing of polarity items. Concretely, Ladd observes that his inside negation questions license NPIs like *either*, while his outside negation questions license Positive Polarity Items (PPIs) like *too*. However, the validity of this criterion has been put to doubt by AnderBois (2019) and Goodhue (2022) among others, on the basis that the interpretative difference between an *either*-licensing and a *too*-licensing negative question might not stem from the different scope of the negative marker but from the polarity item itself. Be that as it may, Greek does not have equivalent polarity terms in the first place, so this diagnostic is inapplicable to the study of *dhen*.

⁷⁸ According to Ladd (1981), English questions in the shape of (14b) are also ambiguous between an inside negation reading and an outside negation reading. Holmberg (2013) and Goodhue (2022), among others, suggest that the existence of such an ambiguity may be subject to dialectal variation.

Inspired on the above and combining it with the observation that Greek is considered a Strict Negative Concord language (Giannakidou 1997, 1998; Zeijlstra 2004), one could think of another possibly informative test. Giannakidou (1997, 1998, ff.) observes that Greek NCIs differ from polarity items in that the latter can be licensed long-distance while the former cannot. Consequently, if Greek displays both inside and outside negation questions, they are predicted to behave differently as regards NCI-licensing. Specifically, inside negation questions, that feature standard sentential negative markers, are expected to license NCIs, such as the emphatic *TIPOTA* ‘nothing’ (17a). Outside negation questions on the other hand, featuring an outside, non-negatively interpreted *dhen*, are expected to license only the non-emphatic NPI *tipota* ‘anything’ (17b), merely by virtue of being questions (Giannakidou 1998).

- (17)a. Dhen ipie TIPOTA o Yanis?
 not drank nothing the Yanis
 ‘Didn’t Yanis drink anything (at all)?’
- b. Dhen ipie tipota o Yanis?
 not drank anything the Yanis?
 ‘Didn’t Yanis drink anything?’

As suggested by the English translations provided, the two examples above do show a fine interpretative asymmetry. In fact, the asymmetry is such that a speaker uttering (17a), the hypothetically inside negation variant, is more likely to expect a positive answer (for example, *Yanis drank something*) than the one uttering (17b), postulated to involve outside negation. Crucially, the difference between (17a) and (17b) is due to the different semantic contribution of the NCI *TIPOTA* and the corresponding NPI *tipota*, not the potentially different scope of *dhen*. In other words, this criterion is also vulnerable to the criticism put forth by AnderBois (2019) and Goodhue (2022) and, thus, does not contribute any relevant insight.

Goodhue (2022) suggests a couple of additional diagnostics for the existence of outside negation in negative polar questions. The first one could be dubbed as the *again*-diagnostic. The assumptions that (i) *again* bears the

presupposition that the event described by its complement has happened before (von Stechow 1996), and (ii) non-at-issue content projects (Rett 2020) are adopted. Under this view, *again* is expected to convey the repeating of a negative event in an inside negation question, but the repeating of a positive event in an outside negation question, as illustrated in (18a) and (18b) respectively.

(18)a. Did John not drink coffee again?

presupposition: John has not drunk coffee at least once before.

b. Didn't John drink coffee again?

presupposition: John has drunk coffee before.

Let us try to adapt the test above in Greek, using the adverb *pali* 'again'.

(19) Dhen ipie kafe o Yanis pali?

not drank coffee the Yanis again

'Did Yanis not drink coffee again?'

As the English translation indicates, the obtained presupposition in (19) is that *Yanis has stayed decaffeinated at least once before*. In this sense, the *again*-test does not provide evidence for an inside vs. outside negation question ambiguity. The English pattern in (18) can be reproduced in Greek only if we move *pali* around:

(20)a. Pali dhen ipie kafe o Yanis?

again not drank coffee the Yanis

'Did Yanis not drink coffee again?'

b. Dhen ipie pali kafe o Yanis?

not drank again coffee the Yanis

'Didn't Yanis drink coffee again?'

The translations provided for (20) above are merely to illustrate the intended parallel with the question pair in (18). In fact, both (20a) and (20b) are ambiguous between a reading according to which Yanis has not drunk coffee

at least once before and a reading according to which Yanis has drunk coffee before –the two interpretations can be favored by manipulating intonation.

Considering the above, the relative surface position of *pali* ‘again’ with respect to *dhen* is not informative. No solid evidence for the distinction between inside and outside negation can be drawn from interpretation, either. The pattern displayed by (20) suggests that the two readings available do not stem from the different scope possibilities of *dhen*, but the different scope possibilities of *pali* at the level of logical form, reflected in the surface structure in (20a) and (20b) respectively. All in all, the *again*-test also fails to provide evidence for a dual distinction of the negative marker featured in Greek polar questions.

Goodhue’s (2022) second diagnostic builds on the fact that the presence of propositional negation turns punctual predicates, which are incompatible with *until*-adverbials, into durative predicates, which are compatible with *until*-adverbials. This effect is expected to arise in inside negation questions, that feature standard propositional negation, but not outside negation questions:

- (21)a. Did John not find the hidden coffee until the evening?
b. #Didn’t John find the hidden coffee until the evening?

The adverbial *until the evening* is infelicitous in question (21b) because the outside negation cannot modify the aspect of the predicate *find the hidden coffee* into durative.

Applying the test above in Greek, one is faced with the following:

- (22) Dhen vrike o Yanis ton krimeno kafe mexri
not found the Yanis the hidden coffee until
to apoyevma?
the evening
‘Didn’t Yanis find the hidden coffee until the evening?’

In contrast with what is reported for English (Goodhue 2022), the Greek example (22) is felicitous. One could think that this is because the form of

(22) could correspond to either an outside negation question, which would reject the *mexri to apoyevma* adverbial, or an inside negation question, which would admit it. Importantly, the felicity of (22) is maintained even under the reading that the speaker believes that Yanis has found the hidden coffee, which following Ladd (1981) would be linked to an outside interpretation of negation. Consequently, we have yet to find solid evidence in support of postulating the existence of an outside *dhen* in Greek negative polar questions.

The last diagnostic proposed by Goodhue (2022), and one's last hope for establishing an inside vs. outside negation distinction in Greek, is based on response patterns. Since Pope (1976), it has been noted that positive polar questions display a different polar particle response pattern from negative polar questions; see also Holmberg (2013, 2016), Krifka (2013), Roelofsen and Farkas (2015), Claus et al. (2017), Wiltschko (2017), Goodhue and Wagner (2018), Farkas and Roelofsen (2019), among others. This asymmetry is illustrated for Greek with the help of the following examples:

(23)Q: Ipie kafe o Yanis?
 drank coffee the Yanis
 'Did Yanis drink coffee?'

A1: Ne.
 'Yes.' = Yanis drank coffee.

A2: Oxi.
 'No.' = Yanis did not drink coffee.

(24)Q: Dhen ipie kafe o Yanis?
 not drank coffee the Yanis
 'Did Yanis not drink coffee?'

A1: Ne.
 'Yes.' = Yanis drank coffee. / Yanis did not drink coffee.

A2: Oxi.
 'No.' = Yanis did not drink coffee. / Yanis drank coffee.

Notice that, in the case of positive polar questions (23Q), the positive polarity particle *ne* ‘yes’ and the negative polarity particle *oxi* ‘no’ correspond unambiguously to the positive and the negative answer to the question, respectively (23A1, A2). In negative polar questions on the other hand (24Q), both *ne* and *oxi* are ambiguous and can each correspond to both the positive and the negative answer (24A1, A2).

Krifka (2013) and Goodhue (2022) take the pattern demonstrated in (24) to concern inside negation questions –see Holmberg (2013, 2016) for a different view. As for outside negation questions, the authors proceed to reason that, since their negative marker does not interact with the proposition expressed, they should display a polar particle response pattern similar to positive polar questions such as (23), not negative polar questions like (24). In the case of Greek, though, this prediction is not (easily) testable. It has been shown already that, if Greek has outside negation questions, they are homophonous to inside negation questions. Under such a state of affairs, bare response particle answers like (24A1) and (24A2) to a negative question can turn out to be ambiguous, either because the speakers accommodate an inside negation reading of the question or because Greek outside negation questions do not exist in the first place. Nevertheless, given that Krifka’s (2013) and Goodhue’s (2022) hypothesis is the last potential source of evidence for the existence of non-negative instances of *dhen* in Greek, it is considered worth exploring experimentally. This task is taken up in the immediately following section.

6.3 Doesn’t *dhen* have non-negative uses? Yes or no?

The extensive discussion in the previous section limited the potential hosts for non-negative instances of the Greek negative marker *dhen* to outside negation questions. It further showed that postulating the existence of this type of questions in Greek is, in turn, contingent on getting proof that Greek negative polar questions display different polar particle response patterns depending on whether their negative marker is interpreted as inside or outside negation (Ladd 1981). Concretely, extending Krifka’s (2013) and Goodhue’s

(2022) rationale and applying it to Greek, the following predictions were made: If a Greek negative polar question receives an inside negation reading, it will generally allow as a response all the possible combinations of particle and sentence polarity: *Yes p*, *Yes not p*, *No p*, *No not p*; see (24) in the previous section. If it is interpreted as an outside negation question, it will behave on a par with positive polar questions and disprefer *Yes not p* and *No p* responses.

An experimental study based on an acceptability judgment task was carried out in order to test the predictions above and possibly obtain evidence for the existence of outside instances of *dhen* in Greek. To this aim, the different interpretations of Greek negative polar questions (inside vs. outside negation reading) were tested against the polarity of the response particle (*ne* ‘yes’ vs. *oxi* ‘no’) and the polarity of the TP accompanying the particle (*p* vs. *not p*). Participants were presented with a number of short written texts. Each text consisted of the brief description of a situation, a trigger-utterance and a response. Participants had to rate the naturalness of each response to the respective trigger, taking into account the preceding situation description. The survey was administered via Alchemer.

Participants

A total of 74 native speakers of Greek (17 males, 57 females; mean age 29.10 years, SD = 9.03) voluntarily took part in the experiment. Participants were recruited via Facebook and other social media platforms.

Materials

While compiling the materials for the experiment, the initial thought was to restrict the critical items to negative polar questions interpreted either as inside negation questions or outside negation questions. Considering though that the same question form can even receive a rhetorical interpretation (see Section 6.2.2), the list of materials was complemented with rhetorical negative questions. In the end, a set of 12 critical items was created. Each item consisted of a brief context, a negative question initiated by the cluster negation + verb, and an answer that had one of the four following forms: *Yes p*, *Yes not p*, *No p*, *No not p*, with *p* representing the proposition expressed in the preceding question. The set of critical items was equally divided into three groups: 4 items whose context favored an inside negation question

interpretation of the trigger utterance, 4 items the context of which favored an outside negation question interpretation of the trigger utterance, and 4 items whose context led to a rhetorical reading of the question-trigger.

At this point, it is worth taking a moment to explain exactly how participants were assisted in inferring an inside negation, an outside negation or a rhetorical reading of the negative question. Building mainly on Buring and Gunlogson (2000; see also Ladd 1981; Romero & Han 2004), contexts uniformly introducing negative contextual evidence were featured in the inside negation question items. As for the outside negation question items, the insight offered by Ladd (1981) and, even more clearly, by Romero and Han (2004) suggested the use of contexts introducing negative contextual evidence but positive epistemic speaker bias.⁷⁹ Finally, an extreme version of positive epistemic bias characterized the contexts of the rhetorical negative question items; the speaker did not merely believe but knew that the proposition corresponding to the positive answer to the question was true (Sadock 1971; Rohde 2006; Reese and Asher 2009; Delfitto and Fiorin 2014).

With the details in place, let us provide some real examples used in the experiment, translated into English for the reader's convenience –see Appendix A2 for the full list items in their original form. The inside negation question (INQ) condition is exemplified in (25):

(25) Context: Anna returned home from the market and tripped on Stefanos' suitcase.

Anna: Dhen efiye o Stefanos?
 not left-3SG the Stefanos
 'Did Stefanos not leave?'

You: Ne, efiye. /Ne, dhen efiye./ Oxi, efiye./ Oxi, dhen efiye.
 'Yes, he did.'/ 'Yes, he didn't.'/ 'No, he did.'/ 'No, he didn't.'

The context in (25) suggests that Anna had negative contextual evidence with respect to Stefanos having left, namely his suitcase still in the house, and therefore it favored an INQ-reading of Anna's question.

⁷⁹ See Sudo (2013) for a different definition of the parameters favoring an outside negation interpretation.

The outside negation question (ONQ) condition included items like (26).

(26) Context: Alkis assured your mother that he would write the baptism invitations. However, your mother sees no invitations on the desk.

Mother: Dhen eghrapse prosklitiria o Alkis?
not wrote-3SG invitations the Alkis
'Didn't Alkis write any invitations?'

You: Ne, eghrapse./ Ne, dhen eghrapse./ Oxi, eghrapse. /Oxi, dhen eghrapse.
'Yes, he did./ 'Yes, he didn't./ 'No, he did./ 'No, he didn't.'

The context in (26) suggests that the speaker's mother had a positive epistemic bias towards Alkis' having written the baptism invitations, due to the latter's previous commitment, but also got negative contextual evidence, namely the empty desk. Therefore, an ONQ-reading of the question was favored in this case.

Lastly, the rhetorical negative question (RNQ) condition is exemplified below:

(27) Context: You just got out of the shopping mall with Andreas. You tell him that you need new shoes.

Andreas: Dhen imastan tosi ora sto eboriko?
not were-1PL so-much time at.the mall
'Weren't we at the mall all this time?'

You: Ne, imastan./ Ne, dhen imastan./ Oxi, imastan./ Oxi, dhen imastan.
'Yes, we were./ 'Yes, we weren't./ 'No, we were./ 'No, we weren't.'

The context in (27) conveys a strong positive epistemic bias; the speaker does not simply believe but actually knows that both of you have been at the mall all this time. Therefore, a RNQ-reading of Andreas' question was favored in this case.

Four different versions of the experiment were created, making sure that (i) each critical item included only one answer (out of the four possible ones) at a time, (ii) no participant saw the same question twice, and (iii) each participant had to evaluate all the four types of answers (*Yes p*, *Yes not p*, *No p*, *No not p*) in all of the three critical conditions.

The set of materials of the experiment was complemented with 12 control items that were structured in the same way as the criticals. The controls were also divided into three groups, featuring the types of utterances whose polar particle response patterns are well-defined and undisputable (Holton et al. 1997); they included 4 negative assertions (NAs), 4 positive polar questions (PPQs) and 4 positive assertions (PAs). In order to maintain uniformity across items, control items also featured a context.

Specifically, NA-items featured the same contexts as INQ-items since both types of triggers are considered to involve sentential negation. For the PPQ-items, the ONQ contexts were used, given that the two types of questions presumably involve a positive proposition and are therefore expected to behave similarly (see Krifka 2013; Goodhue 2022, for English). Lastly, bearing in mind that RNQs have been argued to involve an assertive component (Sadock 1971; Reese and Asher 2009), they were assigned the same contexts as PAs. We give an example of each control condition, translated into English, below (see Appendix A2 for the original items).

(28) Negative assertion

Context: Anna returned home from the market and tripped on Stefanos' suitcase.

Anna: Dhen efiye o Stefanos.
 not left-3SG the Stefanos
 'Stefanos didn't leave.'

You: Ne, efiye. /Ne, dhen efiye./ Oxi, efiye./ Oxi, dhen efiye.
 'Yes, he did.'/ 'Yes, he didn't.'/ 'No, he did.'/ 'No, he didn't.'

(29) Positive polar question

Context: Alkis assured your mother that he would write the baptism invitations. However, your mother sees no invitations on the desk.

Mother: Eghrapse prosklitiria o Alkis?
wrote-3SG invitations the Alkis
'Did Alkis write any invitations?'

You: Ne, eghrapse./ Ne, dhen eghrapse./ Oxi, eghrapse. /Oxi, dhen eghrapse.
'Yes, he did./ 'Yes, he didn't./ 'No, he did./ 'No, he didn't.'

(30) Positive assertion

Context: You just got out of the shopping mall with Andreas. You tell him that you need new shoes.

Andreas: Imastan tosi ora sto eboriko.
were-1PL so-much time at.the mall
'We were at the mall all this time.'

You: Ne, imastan./ Ne, dhen imastan./ Oxi, imastan./ Oxi, dhen imastan.
'Yes, we were./ 'Yes, we weren't./ 'No, we were./ 'No, we weren't.'

The following instructions were given to participants: "In what follows you will be presented with a set of small dialogues between you and an interlocutor. In each case, there will be a brief description of a situation and the dialogue will follow, consisting of an utterance from your interlocutor and a response from you. Bearing in mind the situation in each case, we ask you to show how natural you consider your response to each utterance, using the scale that you will find at the end of each dialogue."

All participants rated the total of items, producing 24 ratings each (12 controls + 12 criticals). A sum of 1,776 responses (74 participants × 24 ratings) were statistically analyzed.

Procedure

Participants used their personal computer or smart device to complete the experiment. After reading the instructions, they had to fill in a brief sociolinguistic questionnaire (see Appendix A2). Then, the main task started, which consisted in reading a number of short passages and evaluating the naturalness of the last sentence of each passage.

The items were randomized. Each item included a context sentence, an utterance, a response, and a rating scale. An example of what participants saw on their screens along with its English translation is given below.

(31) O Yanis molis ksipnise ke se akuse na paraponiese oti pinas.


‘Yanis just woke up and heard you complaining that you are hungry.’

Yanis: Dhen efayes proino?

‘Didn’t you have breakfast?’

You: Ne, efagha.

‘Yes, I did.’

katholu fisiki  apolita fisiki
‘totally unnatural’ ‘absolutely natural’

The median duration of the experiment was 7' 97".

Results

The data obtained from the experimental study were analyzed using the *glmmTMB* package in R. A series of linear mixed-effects models using different random effects structures were performed, from the most complex random effects structure to a model with only subject as a random intercept. All structures providing no model converge problems were compared using the function *compare_performance* from the *performance* package to identify the model that best fitted the data.

In the reports below, the omnibus test results are provided plus the output of a series of pairwise tests performed with the *emmeans* package, including a measure of effect size by using Cohen’s *d*.

Given that both the main and the combined effects of Proposition (*p*, *not p*) and Response Particle (*yes*, *no*) are of interest to the present discussion, the

two variables are modeled in interaction. The models that open subsections (i) and (ii) below include Utterance Type (NAs, PPQs, PAs, for controls; INQs, ONQs, RNQs, for criticals), Proposition, and Response Particle (plus the interactions between them) as fixed effects. Notwithstanding, contrasting the acceptability of “Yes p” and “No not p” responses on the one hand, and “Yes not p” and “No p” responses on the other, is also relevant for the present purposes. Therefore, Proposition and Response Particle are presented in a second model as a single variable, namely Response, with 4 different levels. In these two kinds of models, because of the complexity of the results output and the specific research question addressed by the experiment, the description of the pairwise contrasts is focused on the most complex interaction (found to be significant in all analyses that have been performed).

The results of the acceptability task as an effect of Utterance Type, Proposition, and Response Particle are presented first regarding the control items (i) and then regarding the criticals (ii).

(i) *Effect of utterance type, proposition, and response particle for controls*

Figure 1 shows the results of the acceptability (perception) task for control items. At first glance, negative assertions (NAs) show a preference for “No not p” responses, positive assertions (PAs) show a preference for “Yes p” responses, and positive polar questions (PPQs) show a preference for the two responses just mentioned over the other two possibilities, that is “No p” and “Yes not p” responses.

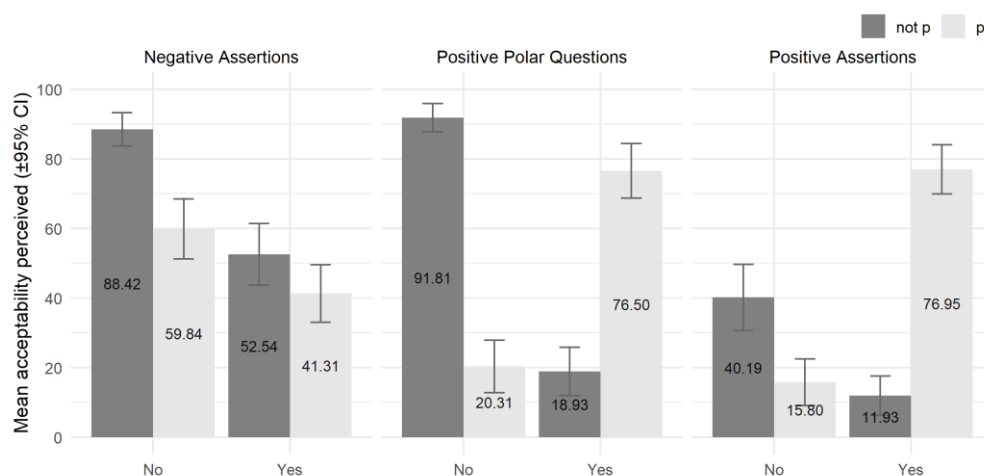


Figure 1. Results of the acceptability task for control conditions

The statistical model included random intercepts for Subject and Item. All fixed factors except the main effects of Proposition and Response Particle were found to be significant: Utterance Type, $\chi^2(2) = 34.060, p < .001$; Utterance Type \times Response Particle, $\chi^2(2) = 38.767, p < .001$; Utterance Type \times Proposition, $\chi^2(2) = 33.381, p < .001$; Response Particle \times Proposition, $\chi^2(1) = 205.015, p < .001$; Utterance Type \times Response Particle \times Proposition, $\chi^2(2) = 64.260, p < .001$. As for the triple interaction, all significant pairwise contrasts were found to display p -value $< .001$.

Concerning the effects of utterance type (in each combination of proposition and response particle), the pattern for “No not p” was found to be different from that of the other three responses. On the one hand, for “No not p”, PA items were less accepted than NA or PPQ items, with the latter two not being significantly different. On the other hand, “Yes not p”, “No p”, and “Yes p” responses displayed lower acceptability in the case of NA items than in PA or PPQ items, with no significant differences between the latter.

Concerning the effects of response particle (in each combination of utterance type and proposition), the three “not p” conditions (independently of the utterance type value) displayed a preference for the use of “No” as a response particle ($d = 3.075$ for NAs, $d = 5.841$ for PPQs, $d = 2.107$ for PAs); “p” conditions used with PPQs or PAs displayed a preference for “Yes” as a response particle ($d = 4.988$ and 5.375 , respectively), with no significant preference for any response particle for “p” conditions used with NAs.

Concerning the effects of proposition (in each combination of utterance type and response particle), analogous results as the ones just described are obtained. All responses containing the particle “No” (independently of the utterance type value) were more accepted with “not p” ($d = 2.715$ for NAs, $d = 5.778$ for PPQs, $d = 2.050$ for PAs), whereas the responses containing the “Yes” particle were preferred in “p” conditions in PPQs ($d = 5.051$) and PAs ($d = 5.432$), but not in NAs, in which case the acceptability of “p” conditions was not significantly different from that of “not p” conditions.

In the model performed with Utterance Type \times Response as fixed factors (which also included a random intercept for both Subject and Item), all fixed factors were found to be significant: Utterance Type, $\chi^2(2) = 34.060, p < .001$; Response, $\chi^2(3) = 190.870, p < .001$; Utterance Type \times Response, $\chi^2(6) =$

133.671, $p < .001$. For NAs, “No not p” was significantly preferred over the three alternatives, with no significant differences between any of the rest. For PPQs, both “Yes p” and “No not p” were significantly preferred over “No p” and “Yes not p”, with no significant differences found among the former or among the latter. For PAs, a preference scale for the different responses was found such that “Yes p” was significantly preferred over the three alternatives, and “No not p” was preferred over “No p” and “Yes not p”, with no significant differences between the latter.

(ii) *Effect of utterance type, proposition, and response particle for criticals*

Figure 2 shows the results of the acceptability (perception) task for critical items. At first glance, inside negation questions (INQs) and outside negation questions (ONQs) show a preference for “No not p” responses, whereas rhetorical negative questions (RNQs) show a preference for “Yes p” responses.

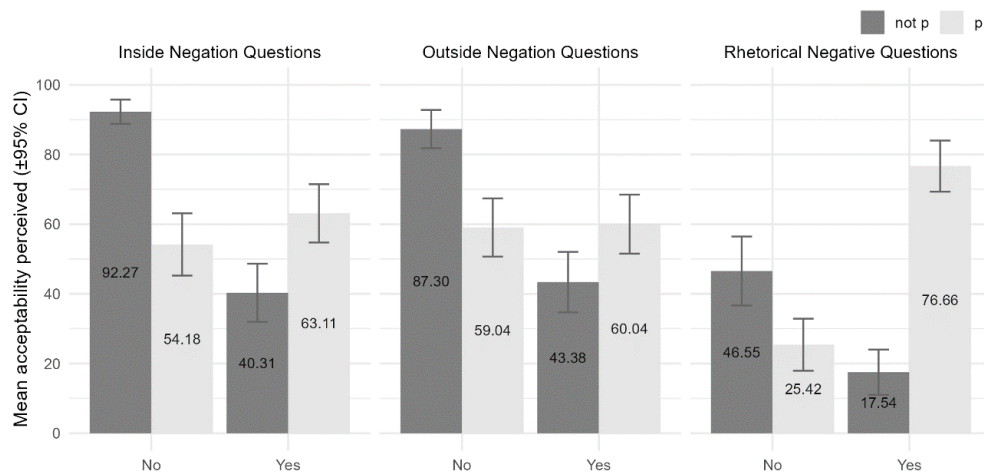


Figure 2. Results of the acceptability task for critical conditions

The statistical model included a random slope for Response Particle by Subject, plus a random intercept for Item. All fixed factors except the main effect of Proposition were found to be significant: Utterance Type, $\chi^2(2) = 61.791, p < .001$; Response Particle, $\chi^2(1) = 16.118, p < .001$; Utterance Type \times Response Particle, $\chi^2(2) = 44.598, p < .001$; Utterance Type \times Proposition, $\chi^2(2) = 16.932, p < .001$; Response Particle \times Proposition, $\chi^2(1) = 147.665, p < .001$; Utterance Type \times Response Particle \times Proposition, $\chi^2(2) = 6.310, p < .001$.

.001. As for the triple interaction, all significant pairwise contrasts were found to display p -value $< .001$ (except for one indicated below).

Concerning the effects of utterance type (in each combination of proposition and response particle), the pattern found for “Yes p” –whose acceptability was similar across the three utterance types– was found to be different from that of the three other responses (“No not p”, “Yes not p”, and “No p”), all of which showed a dispreference for RNQ items as opposed to INQ and ONQ items, with no significant differences between the latter two.

Concerning the effects of response particle (in each combination of utterance type and proposition), the three “not p” conditions displayed a preference for the use of “No” as a response particle, independently of the utterance type value (INQs: $d = 4.284$, ONQs: $d = 3.670$, RNQs: $d = 2.207$); “p” conditions displayed a preference for “Yes” as a response particle when used with RNQs ($d = 4.023$), with no significant preference for any response particle for “p” conditions used with INQs or ONQs.

Concerning the effects of proposition in each combination of utterance type and response particle, they act independently of the utterance type, which makes them differ only in terms of effect size. All responses containing the particle “No” received higher ratings in “not p” conditions (INQs: $d = 2.730$, ONQs: $d = 2.411$, RNQs: $d = 1.880$). All responses containing the particle “Yes” (independently of the utterance type value) were more accepted in “p” conditions (INQs: $d = 1.907$, ONQs: $d = 1.523$, RNQs: $d = 4.351$).

In the model performed with Utterance Type \times Response as fixed factors (which included a random intercept for both Subject and Item), all fixed factors were found to be significant: Utterance Type, $\chi^2(2) = 65.672, p < .001$; Response, $\chi^2(3) = 92.744, p < .001$; Utterance Type \times Response, $\chi^2(6) = 72.886, p < .001$. All three utterance types coincided in three significant preferences: “No not p ” over “No p ” (INQs: $d = 2.548$, ONQs: $d = 2.194$, RNQs: $d = 1.681$), “No not p ” over “Yes not p ” (INQs: $d = 3.989$, ONQs: $d = 3.349$, RNQs: $d = 2.008$), and “Yes p ” over “Yes not p ” (INQs: $d = 1.760$, ONQs: $d = 1.347$, RNQs: $d = 4.015$). INQs and ONQs preferred “No not p ” responses over “Yes p ” (INQs: $d = 2.229$, ONQs: $d = 2.002$), whereas RNQs displayed the opposite behavior ($d = 2.007$). A preference for “No p ” over “Yes not p ” was significantly found for INQs ($d = 1.441, p = .005$), near-

significantly found for ONQs ($d = 1.156, p = .050$), and non-significantly found for RNQs ($d = 0.326, p = 1.000$). Finally, a preference for “Yes p ” over “No p ” was significantly found for RNQs ($d = 3.689$), but not for either INQs or ONQs.

Discussion

Let us start the discussion of the experimental results from the control items. The general polar particle response patterns obtained for positive assertions, negative assertions and positive polar questions are the ones predicted by the general literature on response particles (Holmberg 2013, 2016; Krifka 2013; Roelofsen and Farkas 2015; Claus et al. 2017; Wiltschko 2017; Goodhue and Wagner 2018; Farkas and Roelofsen 2019, among others) as well as traditional grammars of Greek (Holton et al. 1997).

Concretely, PAs and PPQs admit only answers where the polarity of the response particle matches the polarity of the proposition that accompanies it, i.e., *Yes p* and *No not p* . For NAs on the other hand, all the four possible combinations of particle-polarity and proposition-polarity are acceptable: *No not p* , *No p* , *Yes not p* , *Yes p* . That said, the relative preferences among the available responses in each case probably reflect the contextual information and the commitment strength (Gunlogson 2008) of the trigger-utterance. The dispreference for *No not p* responses in PAs is stronger than that of PPQs because (i) the context of the former introduced a stronger positive epistemic bias than the context of the latter, and (ii) it is conversationally more costly to disagree with an assertion than a question (Krifka 2021a). In the same vein, the *No not p* response is the preferred one in NAs since it is the agreeing response, which further happens to be consistent with the negative contextual evidence introduced via context. Interesting as these results may seem, they are at least peripheral to the hypothesis at the center of the experimental study, which concerns strictly Greek negative polar questions. So let us turn to the results related to the critical items.

Out of the three negative polar question interpretations tested in the experiment, rhetorical negative questions stand out. They admit only matching polarity responses: *Yes p* and *No not p* . Specifically, they pattern not with PPQs but with PAs, with which they shared the same contexts. This

is absolutely unsurprising given the literature on rhetorical questions (Sadock 1971; Han 2002; Rohde 2006; Reese & Asher 2009; Delfitto & Fiorin 2014, Veloudis 2018). Crucially, though, this is the first time to my knowledge that the claim regarding the interpretative similarity between PAs and RNQs receives experimental confirmation.

RNQs admittedly display an interesting behavior. However, it has been argued already that their divergent interpretation is owed to the rhetoric effect itself, not some special instance of the negative marker *dhen*. Recall that it was the alleged distinction between the remaining two negative question types, that is inside negation questions and outside negation questions, that motivated this experimental study in the first place. And on that front, it seems that we have reached our departure point empty handed.

Specifically, the initial prediction regarding INQs, that is that they would allow for the four possible combinations of response particle and proposition polarity, was generally confirmed. However, the prediction that ONQs would behave differently and reject *Yes not p* and *No p* responses was not borne out. Intriguingly, the two sets of questions displayed similar polar particle response patterns. They admitted all possible responses, showing the same relative preferences among them: *No not p*, *Yes p*, *No p*, *Yes not p*.

According to the experimental design, INQs and ONQs differed in that the context of the former introduced negative contextual evidence while the context of the latter involved a clash between the negative contextual evidence and the positive epistemic speaker bias. The finding that the two types of questions displayed similar response patterns suggests, on a first level, that the epistemic bias was outweighed by the negative evidence in affecting the participants' evaluation of the offered responses. On a second level, it shows that what was meant to be interpreted as ONQs did not pattern with PPQs as regards response patterns (cf. Krifka 2013; Goodhue 2022), but with INQs. On a third level, it means that the application of the last diagnostic for the existence of an outside –and thus expletive– *dhen* in Greek has not been particularly enlightening.

6.4 Taking stock: comments, thoughts, and analytical speculations

The study presented in this chapter was fueled by the suspicion that the Greek negative marker *dhen*, like its complementary marker *min*, has non-negative instances when appearing in certain linguistic environments. Building on the relevant literature on other languages, these environments were identified as negative exclamatives, rhetorical negative questions, and outside negation questions. After a meticulous point-by-point examination of the data and an experimental study, the initial suspicion could not be confirmed.

Concretely, the following claims were motivated theoretically or empirically: (i) Greek negative exclamatives are not instances of the exclamative sentence type; they are rhetorical negative questions uttered as exclamations. (ii) The non-negative interpretation of *dhen* in Greek rhetorical negative questions and, by extension, negative exclamatives is an epiphenomenon brought about by the rhetoric effect, not the result of an expletive negative marker *dhen* entering the derivation. (iii) No evidence can be found for the existence of an outside, non-negative *dhen* in so-called (Ladd 1981) outside negation questions in Greek that is distinct from the negative *dhen* found in the Greek equivalents of Ladd's (1981) inside negation questions, even after an analysis of native speakers' response particle preferences regarding these two types of questions.

The claims above notwithstanding, it is a fact that the three utterance types investigated involve a negative marker but end up with no negation whatsoever in their interpretation. Since the hypothesis that they feature expletive instances of *dhen* could not be sufficiently supported, the alternative according to which the non-negative interpretation of *dhen* is brought about by factors external to the negative marker in these cases is pursued here. Specifically, this section seeks to motivate the generalization that *dhen* is not a good expletiveness candidate, by exploring analyses of rhetorical negative questions, negative exclamatives, and outside negation questions in Krifka's (2021b) commitment-based speech act syntactization framework that derive the interpretation of the respective utterance types from a standardly negative basis.

6.4.1 Interpreting Greek rhetorical negative questions

Let us begin with rhetorical negative questions. The RNQ example from (27) is repeated below for reference.

- (32) Dhen imastan tosi ora sto eboriko?
not were-1PL so-much time at.the mall
'Weren't we at the mall all this time?'

If *dhen* in (32) is a run-of-the-mill sentential negation marker, it is postulated to enter the syntactic derivation as a Neg^0 . The structural representation of the utterance in the speech act syntactization framework by Krifka (2021b) is predicted to be as follows:

- (33) [ActP [Act REQUEST] [ComP [Com †] [JP [J J-] [NegP [Neg dhen] [TP imastan tosi ora sto eboriko]]]]]]

In words, (33) says that (32) is interpreted as a speech act via which the speaker requests that the addressee commits publicly to the judgment that the proposition corresponding to *We were not at the mall all this time* is true. Following Büring and Gunlogson (2000), the projection of the NegP can be further argued to convey in a non-at-issue manner that negative evidence regarding the speaker and addressee's having been to the mall is available to the speaker.

Crucially, the above is too far away from what a native Greek speaker understands upon hearing the RNQ in (32). There is clearly something missing from the representation in (33) and this is obviously rhetoricity. Recall that the rhetoric effect is found both in positive and in negative questions (Rohde 2006) and, therefore, in our case needs to take scope over the NegP. Remember also that rhetoricity can be described as the requirement that a question is interpreted by reference to its most likely/least informative answer (Rohde 2006; Delfitto & Fiorin 2014).

Considering the above, it is suggested here that the rhetoric effect be theoretically captured by postulating a rhetoricity operator RH, which

introduces a likelihood ordering source (Kratzer 1989; Portner 2009, among others); it orders the alternative propositions/answers (Hamblin 1973; Karttunen 1977; Groenedijk & Stokhof 1984) associated with a question from most to least likely to be true, according to the shared knowledge of the speaker and the addressee. Unlike what was proposed for non-negative *min* in the previous chapter, the ordering source introduced by RH is thus not relativized to the speaker's modal base *Ms* but the common ground (see Stalnaker 2002):

(34) Ordering source $g(w^{CG})$

For any set of propositions X and any worlds $w, w' \in CG$: $w \leq_X w'$ iff
for all $p \in X$ if $w' \in p$ then $w \in p$

Since the RH operator interacts with the interlocutors' expectations and likelihood, it is postulated to merge as the head of JP.⁸⁰ The likelihood of alternatives is determined by context (in accordance with Kratzer 1989), so there is no way to predict the answer to a rhetorical question by looking solely at its form (see Rohde 2006). In the absence of determining context though, the answers to polar rhetorical questions become predictable: rhetorical positive questions pick the negative alternative proposition and rhetorical negative questions pick the positive one.⁸¹

Bearing in mind the above, the structural representation of (32) is revised as below:

(35) [_{ActP} [_{Act} REQUEST] [_{ComP} [_{Com} †] [_{JP} [_J RH] [_{NegP} [_{Neg} dhen] [_{TP} imastan
tosi ora sto eboriko]]]]]]

In words, the RNQ in (32) is predicted to be interpreted as a speech act via which the speaker requests that the addressee commits publicly to the

⁸⁰ This correctly predicts that Greek questions introduced by non-negative *min*, which is also merged in the head of JP, cannot receive a rhetorical interpretation.

⁸¹ This general tendency can be accommodated under the hypothesis that falsity (0) is less informative and therefore more likely than truth (1) and that, in default cases, polar rhetorical questions select for the complement of the proposition they overtly express.

judgment that, out of the relevant alternatives, the proposition considered as most likely on the basis of the interlocutors' shared knowledge is true.

The basis of the analysis in (35) may seem stipulative but, in fact, it has substantial empirical coverage. By attributing the rhetorical effect of RNQs to an abstract operator RH merged in the left periphery, it can jointly account for both negative and positive rhetorical questions. By loading RH with the introduction of a contextually informed likelihood ordering source, it correctly predicts that the conveyed meaning may but need not correspond to a proposition with polarity opposite to the expressed one (see Rohde 2006). Finally, by relativizing the ordering source to the common ground, the analysis gains the redundancy necessary to derive the assertion-like effect of RNQs via Gricean reasoning: If the speaker asks the addressee to commit to a proposition that they both know to be highly likely or even true, the quality implicature that the speaker is not seeking information but simply wants to keep tabs on or synchronize the speaker and addressee's joint beliefs is generated. Note that this is exactly the essence of rhetoricity (Rohde 2006; Veloudis 2018).

6.4.2 Interpreting Greek negative exclamatives

In the previous subsection, it was shown that the seemingly non-negative interpretation of RNQs could be attributed to a special rhetoricity operator RH. Consequently, it does not necessitate postulating a non-negative variant of the Greek negative marker *dhen*, evidence for the existence of which has turned out extremely hard to come by. Earlier in the chapter, it was argued that negative exclamatives (NEs) in Greek are a subtype of RNQs. If this is correct, the analysis proposed for the latter should be also applicable to the former.

The NE example (5) is repeated as (36) for ease of reference.

- (36) Ti orea piata dhen eftiakse i Xristina!
 what nice dishes not made the Hristina
 'What nice dishes Hristina made!'

If NEs are RNQs, the structural representation of (36) should be as follows:

(37) [ActP [Act REQUEST] [Comp [Com \vdash] [JP [J RH] [CP *ti orea piata* [NegP [Neg dhen] [TP *eftiakse i Xristina ti orea piata*]]]]]]]

In words, (37) predicts that the NE in (36) is interpreted as a speech act via which the speaker requests that the addressee commits publicly to the judgment that, out of the relevant alternatives, the proposition considered as most likely on the basis of the interlocutors' shared knowledge is true.

Crucially, (36) is not a polar question but a *wh*-question. Therefore, the relevant alternatives do not correspond to the set $\{p, \neg p\}$; they are given by the *wh*-phrase *ti orea piata* 'what nice dishes' that has moved to SpecCP. Let us assume for the present purposes that, based on the discourse information available, the alternatives include *none*, *spaghetti and meatballs*, *pizza*, and *hamburgers*. In the absence of context, and in accordance with the assumptions made previously regarding the interpretation of RNQs, the least informative and thus most likely answer is *none*. If both the speaker and the addressee know that there are *none* nice dishes that Hristina did not make, then they both know that she made all nice dishes, which fits perfectly with the way (36) is actually interpreted.

Looking closely, the interpretation derived for (36) already has two elements that bring it close to standard exclamatives (Michaelis 2001). First, the requirement that the proposition conveyed must be part of the speaker and addressee's shared knowledge can be conceived of as factivity. Second, if the conveyed proposition states that Hristina made all nice dishes, it describes an arguably extreme situation. Ultimately, if the rhetorical question in (36) is uttered as an exclamation, then it will be interpreted as conveying the speaker's surprise at the fact known to both interlocutors that Hristina made all nice dishes.

This last point is admittedly the least worked out part of the tentative analysis proposed here. Being *uttered as an exclamation* suggests that NEs, although not instances of the exclamative sentence type, share some external properties with exclamations (Michaelis 2001). These could be for example gestures (see Prieto & Espinal 2020), or a surprise intonational pattern as

identified for Greek by Arvaniti and Baltazani (2005). It is worth noting, however, that the results of a pilot study on the perception and production of Greek negative exclamatives did not corroborate empirically the latter alternative. While some participants intonationally distinguished NEs from RNQs, they did so in different and possibly random ways. Consequently, no intonational contour that sets apart the two types of utterances could be isolated. The issue is open to further research.

6.4.3 Interpreting Greek outside negation questions

It has been shown that Greek RNQs and NEs are at least compatible with an analysis according to which they involve a standard negative marker *dhen*, whose negative interpretative import often disappears as a result of the rhetoric effect present in both of these utterance types. It is finally time to turn to Greek outside negation questions and check whether their interpretation can also be derived without the otherwise unmotivated postulation that Greek displays a negative and a non-negative variant of *dhen*.

Let us repeat the ONQ example from (26) for the sake of discussion.

(38)Context: Alkis assured your mother that he would write the baptism invitations. However, your mother sees no invitations on the desk.

Dhen eghrapse prosklitiria o Alkis?
 not wrote-3SG invitations the Alkis
 ‘Didn’t Alkis write any invitations?’

The biggest part of this chapter has been devoted to the intense search for evidence in support of the existence of an outside *dhen* in ONQs. However, this search returned no positive results.⁸² Crucially, this does not mean that Greek negative polar questions cannot receive an ONQ-interpretation. As

⁸² The findings of an additional, pilot production study suggested (i) that Greek negative polar questions display a generally consistent bare particle response pattern, irrespective of whether the context favors an inside or outside negation reading, and (ii) that a bare *oxi* ‘no’ response is not really ambiguous; it mostly corresponds to the negative answer to the respective question.

made clear already in Section 6.2.3, questions like (38) can receive a reading according to which the speaker has a positive epistemic bias. In this specific case, the speaker is biased with respect to Alkis having written the invitations, as inferred from the context. What the results of the study of Greek negative questions do show is that there is no evidence for positive speaker bias being encoded semantico-syntactically via merge of a non-negative *dhen* outside the TP-domain of a Greek polar question. The negative marker *dhen* of Greek ONQs then is assumed to be merged in Neg⁰. The structural representation of (38) is given in (39).

(39) [ActP [Act REQUEST] [Comp [Com ʔ] [JP [J J-] [NegP [Neg *dhen*] [TP eghrapse prosklitiria o Alkis]]]]]

Notice that the representation above reflects the structure of an inside negation question. In words, it predicts that (38) is interpreted as a speech act via which the speaker requests that the addressee commits publicly to the judgment that the proposition corresponding to *Alkis did not write any invitations* is true. Taking into account the insight offered by Büring and Gunlogson (2000), (38) is further predicted to convey that the speaker has negative contextual evidence, i.e., evidence on the basis of which they infer the expressed negative proposition. Otherwise, the speaker would have chosen to request that the addressee commits to the positive propositional alternative.

Attributing an INQ structural analysis to Greek ONQs makes the prediction that no structural distinction applies to them, which is consistent with the main generalizations reached at during the present study. This of course raises the question regarding the level at which they differ. The conversational context comes to mind as a possible answer. The idea would be that a Greek negative polar question is interpreted as either an ONQ or an INQ depending on whether the context allows the inference of a positive epistemic speaker bias or not. Importantly, the results of the experimental study seem to go against this idea. Recall that the contexts preceding ONQ-items introduced positive speaker bias and the contexts preceding INQ-items did not. Even so, the two sets of items triggered similar responses from the

participants. Crucially, though, the ONQ and INQ contexts were different, so maybe it is not safe to make the previous comparison in the first place.

An alternative hypothesis is inspired on the previous subsection. Specifically, the difference between INQ and ONQ readings of a Greek negative polar question may be attributable to the same thing that was postulated to distinguish NRQs from NEs, that is a surprise intonational contour (Arvaniti & Baltazani 2005). If the speaker conveys the existence of negative contextual evidence concerning the proposition under discussion in a surprised manner, the addressee can infer that the speaker originally had a contradictory, positive epistemic bias. If INQ- and ONQ-interpretations of Greek negative questions are solely distinguished on the basis of intonation, it is only expected that the experiment described earlier –involving written stimuli– did not pick up on it. Notice that, under such a hypothesis, the speaker bias effect of ONQs is predicted to be merely a conversational implicature.

Once again, it is acknowledged that no evidence has been provided in support of the intonation-related component of the tentative analysis sketched above. Specifying further and testing the relevant hypothesis is also left for future research. It is worth simply mentioning at this point that, thinking in terms of the framework implemented in the present thesis, one could further explore the possibility that specific intonation, or an operator realized as such, could also project Krifka's (2021b) JP under certain circumstances.

6.4.4 Greek negative *dhen* and the study of expletiveness

The lack of evidence for the existence of non-negative instances of the Greek negative marker *dhen* was complemented with the demonstration of how the non-negative interpretation of outside negation questions, rhetorical negative questions and negative exclamatives could be derived from a truth-conditionally negative basis. Schematically, it was postulated that all these three allegedly expletive negation hosts stem from an inside negation question structure, which is interpreted as an ONQ if a surprise component (possibly surprise intonation) is added, as a RNQ if a rhetoricity operator is merged,

and as a NE if both the rhetoricity operator and the surprise component are added. The above deem feasible the claim that Greek *dhen* is always interpreted negatively at the truth-conditional level and does not have expletive instances.

Even if *dhen* turns out to be not a good expletiveness candidate, it offers a valuable insight on the study of the topic and, specifically, on the way the phenomenon of expletive negation is treated in the linguistic literature. Questions regarding the interpretative import or the licensing conditions of the latter have always been in the foreground (Jespersen 1917; Vendryès 1950; Muller 1991; Espinal 1992, 1997, 2000, 2002; Romero & Han 2004; Eilam 2007; Horn 2010; Yoon 2011; Makri 2013; Delfitto & Fiorin 2014; Choi & Lee 2017; Krifka 2017, 2021a; Greco 2019; Jin & Koenig 2020; Moeschler 2020; Tahar 2021; Goodhue 2022, among many others). In fact, these issues have been the focus of the expletive negation studies that formed part of the present thesis as well. Importantly, the question regarding the unified or non-homogeneous status of the phenomena subsumed under the term *expletive negation* has also been undertaken by some researchers.

Specifically, Delfitto et al. (2019) and Delfitto (2020) suggest and provide promising arguments in support of the view that all instances of allegedly expletive negation markers can receive a unified account: they can be analyzed as introducing a polarity reversal operator not at the truth-conditional level, but at the level of implicated meaning (Grice 1989), thus bringing about implicature denial. Theoretically desirable as such a unifying account may be, its cross-linguistic generalization stumbles upon quite strong empirical counterevidence gathered through the study of Greek *min* and *dhen*.

Let us start from the implicature-denial component. It is reported that nothing similar was found in the non-negative uses of the negative marker *min*. As for *dhen*, what could possibly be regarded as an implicature cancellation from a different angle, has been shown to be attributable to factors independent from the negative marker, i.e., rhetoricity or surprise. Moreover, pushing the load of the analysis of expletive negation to implicated meaning is not cross-linguistically tenable. Recall that *min*, in particular, was shown to take syntactic scope over the canonical negative marker *dhen* and the whole TP-domain. Lastly, and most importantly, the study of the Greek

expletiveness candidates *min* and *dhen* has shown that a unifying analysis of expletive negation phenomena is not only impossible but also undesirable. It obscures the empirical fact that the non-negative interpretation of an otherwise negative linguistic element may be caused by properties intrinsic to this very element –as is the case with *min*– or by properties borne by the linguistic environment in which the negative element is embedded –as appears to be the case with *dhen*.

6.5 Concluding remarks

Following up on the investigation of non-negative *min* in Chapter 5, Chapter 6 pursued to complete the study of Greek expletive negation by focusing on potentially non-negative instances of the complementary negative marker *dhen*. Building on the relevant literature on languages other than Greek, these instances were identified as the occurrences of *dhen* in negative exclamatives (Espinal 1997; Delfitto & Fiorin 2014, among others), in rhetorical negative questions (Sadock 1971; Han 2002; Rohde 2006; Reese & Asher 2009; Delfitto & Fiorin 2014, Veloudis 2018) and in outside negation questions (Pope 1976; Ladd 1981; Romero & Han 2004; Repp 2013; Krifka 2017, 2021a, 2021b; Goodhue 2019, 2022, among others).

The close examination of the data, combined with the results of an experimental study, motivated the following empirical claims: (i) Greek NEs are not instances of the exclamative sentence type; they are RNQs uttered as exclamations. (ii) The non-negative interpretation of *dhen* in Greek RNQs and, by extension, NEs is an epiphenomenon brought about by the rhetoric effect, not the result of an expletive negative marker *dhen* entering the derivation in a syntactic position higher than NegP. (iii) No evidence can be found for the existence of an outside, non-negative *dhen* in Greek ONQs.

In order to accommodate the three empirical claims above, a tentative theoretical proposal was sketched: Greek ONQs, RNQs and NEs involve a canonically interpreted *dhen* merged in the head of NegP. Concretely, all three types of utterances have the same basic structure as inside negation questions. Adding a surprise component to this structural basis gives rise to

an ONQ-reading of the question. Merging a rhetoricity operator RH in the same structural basis triggers a RNQ-interpretation. Lastly, by merging the RH operator and adding a surprise component, the NE-reading of Greek negative polar questions is derived.

Considering the above, there is neither evidence nor need to postulate the existence of a non-negative variant of the negative marker *dhen* in Greek. In other words, *dhen* always contributes negative semantics at the truth-conditional level and, therefore, it is not an appropriate expletiveness candidate. However, its study provides valuable insight on the topic of expletive negation in general. Contrasting the behavior of Greek non-negative *min* with the behavior of the seemingly non-negative *dhen*, it appears that a unifying analysis of expletive negation phenomena (in the spirit of Delfitto 2020) is not possible across languages (see also Greco 2019). The allegedly expletive interpretation of a negative marker might be primarily triggered by a subset of the intrinsic properties of this marker or by properties of the linguistic environments in which the negative marker is embedded.

7 Concluding remarks and future research

7.1 On semantic expletiveness and Full Interpretation

The present thesis aimed to get to the bottom of the phenomenon of expletiveness, which it approached via two broad research questions. Let us recall the first one (see Chapter 1):

- (i) *What does expletiveness mean for the relationship between syntax and interpretation in natural language grammar?*

The question above was raised in view of the consideration that the existence of expletive categories intuitively goes against Chomsky's (1986) Full Interpretation Principle, i.e., the requirement that every element that reaches PF and LF is interpretable at the respective interface. If expletive categories lack meaning and are thus uninterpretable at LF, they are potentially a reason to reconsider the traditional minimalist (Chomsky 1995) views on the syntax-interpretation mapping.

Syntactic expletives, that is expletive categories that are merged in a structure simply to satisfy some syntactic need (Tsiakmakis & Espinal 2022), have been reconciled with the FIP from the early stages of generative grammar (Chomsky 1981, 1986) via the postulation that they are deleted and replaced by a syntactic associate before reaching the point where syntax interfaces with the system responsible for interpretation. This left semantic expletives, that is the expletive categories that are characterized by some semantic dependency (Tsiakmakis & Espinal 2022), as the most appropriate field for the relationship between expletiveness and Full Interpretation to be tested.

The investigation of five allegedly semantically expletive categories –the voice of Greek anticausatives, the additional determiners of Greek polydefinites, the plural morphology on Greek mass nouns, the non-negative uses of the negative marker *min*, and the non-negative uses of the negative marker *dhen*– illuminated this relationship. The individual studies forming the main body of this thesis not only offered novel empirically motivated insight regarding the specific phenomena under consideration but also supported the view that the existence of semantic expletiveness is perfectly consistent with the FIP.

Concretely, all the semantic expletives tested were shown to parallel syntactic expletives in having not a syntactic but a semantic associate, thus confirming the hypothesis originally put forth in Tsiakmakis and Espinal (2022). However, it cannot be postulated that semantically expletive categories are deleted and replaced by their associate at the level of LF. If semantic expletives were not to reach the LF-interface, they would be predicted to be unable to make any type of interpretative contribution, contrary to fact. Recall that, based on the findings of the research described in this thesis, the investigated categories have been shown to introduce an identity function semantics at the truth-conditional level. Importantly, this is not equivalent to saying that expletive categories are semantically empty. Under the identity-function analysis, expletives are considered to facilitate the semantic composition by allowing the semantic type of the constituent they combine with to percolate one node up in the derivation. Assuming that they do take part in the derivational process is the only way to capture the fact that, despite receiving a non-canonical interpretation, semantic expletives appear in similar syntactic environments as their non-expletive counterparts. If they were simply ignored by LF, they would be expected to show a much wider and completely non-principled distribution.

Crucially, apart from the identity function semantics, most of the expletive categories studied were found to have developed also content computed at levels that are non-truth-conditional. In fact, this content was shown to best be captured in terms of speech act-related meaning. This finding motivates the generalization that semantic expletives carry

information readable not only at the level of LF but also beyond grammar and, specifically, at the speech act-information interpretation level.

A side-comment is worth making at this point. Why is it the case that the voice of Greek anticausatives was the only expletive for which no secondary meaning could be traced? There are two stipulative answers to this question. A first possibility is that some non-truth-conditional meaning is there, but the experimental study carried out did not get evidence for it. Another possibility capitalizes on the fact that Greek anticausatives were found to be the only case where the speaker does not have two syntactic variants, one with the expletive and one without it, equally available. The expletive voice morphology will necessarily appear if a certain verb asks for it. In other words, its emergence is lexically determined in this case. The situation is different for polydefinites, plural mass nouns, *min*-questions and *min* fear-complements, all of which have expletive-free counterparts. Notice that if the development of additional content in expletives is conditioned on the availability of alternative structures, there are chances that this content starts as an addressee inference based on Gricean (1989) reasoning. Importantly, whatever its origin, this inference appears to be grammaticized and, concretely, syntactized in the expletive categories studied here.

Summing up the above, this thesis provides evidence that semantic expletives are interpretable at LF and, thus, do not pose a threat to the FIP. Consequently, the existence of expletiveness does not change what is known—or better what is commonly assumed within the generative framework—regarding the relationship between syntax and interpretation in grammar. If anything, it reinforces the standard view by confirming that the FIP holds even in cases that could be considered marginal, that is in cases where the truth-conditional import of a category does not actually affect the truth conditions of the sentence the category occurs in.

7.2 So that is an expletive

The answer given in the previous section turns out to be informative also regarding the second broad research question formulated in Chapter 1, repeated here for the sake of discussion.

(ii) *What is or can be an expletive category?*

Let us consider what kind of insight the specific findings of this thesis can add to this matter. With the exception of the Greek negative marker *dhen* whose alleged expletiveness could not be supported by solid empirical evidence, the remaining four semantically expletive categories studied displayed a similar behavior. Specifically, semantic expletiveness was shown to coincide with (i) a syntactically local semantic dependency of the expletive category on an element with respect to which this category encodes some redundant meaning, (ii) an identity function semantics, and (iii) the tendency to develop additional speech act-related content. The conjunction of these three properties has been suggested as a definition of semantically expletive categories by Tsiakmakis and Espinal (2022). The individual studies that make up the present thesis provide additional empirical and theoretical support to this proposal.

The set of properties listed in the previous paragraph can be used as an answer to the research question in (ii), namely what is or can be an expletive. However, one cannot but notice two things. The first one is that what we have been led to is a purely descriptive definition of expletiveness: whenever the three identified properties converge on a single linguistic category, the term *expletive* appears. The second is that, as it turns out, expletiveness does not correspond to the presence of a form that is absolutely devoid of meaning. I would like to claim that the two observations are causally related. The findings of the present thesis, combined with the insight offered by the existing literature on the topic, suggest that expletiveness cannot be equated with the utter lack of interpretative import. Consequently, expletiveness is not a grammatically relevant specification. It is a metalinguistically useful label

to describe a certain behavior of a homogeneous set of categories found across languages. Therefore, it can only be defined as such.

A note on syntactic expletiveness is due for the sake of completeness. As anticipated already in Chapter 1, syntactic expletives were not included in the present study because, by standard assumptions, they do not give rise to open questions regarding the syntax-to-interpretation mapping in natural language grammar. Whether expletives of this type can be descriptively defined in the same way as semantic expletives requires further investigation.

7.3 Beyond expletiveness

The pursuit of a definition for expletiveness that determined the course of the present research coincidentally revealed a couple of intriguing but underexplored side-issues tangent on the syntax-interpretation interface that go beyond expletive categories. The thesis is concluded with a brief presentation of these issues that are left for future research.

7.3.1 On the encoding of bias in Greek

A first intriguing research topic is raised by the observation that Greek appears to have multiple encoders of positive speaker bias. Recall that in Chapter 5 non-negative *min* was shown to be interpreted as a positively biased epistemic modal. Consequently, a speaker uttering (1) is predicted to consider the expressed proposition corresponding to *The glass broke* as more likely to be true than its polar alternative, namely *The glass did not break*.

- (1) Min espase to potiri?
MIN broke the glass
‘Did the glass maybe break?’

In the same chapter, the Greek subjunctive marker *na* was reported to have a similar interpretation to non-negative *min* in those cases where their distribution overlaps:

- (2) Na espase to potiri?
 SUBJ broke the glass
 ‘Did the glass maybe break?’

Questions (1) and (2) are in principle predicted to be interchangeable.

To complicate things further, Chapter 6 showed that polar questions featuring the complementary to *min* Greek negative marker, that is *dhen*, can also be interpreted in such a way that the speaker is positively biased with respect to the expressed proposition.

- (3) Dhen espase to potiri?
 not broke the glass
 ‘Didn’t the glass break?’

While no evidence could be obtained that the bias effect of questions like (3) –whenever this effect arises– should be attributed to the presence of *dhen*, such questions do involve a bias encoding device, be it overt or covert.

The relationship between modal *min*, the subjunctive marker *na* and the negative marker *dhen* raises several questions. Examples (1-3) show that *min*, *na* and *dhen* can occur in exactly the same linguistic environment, namely polar questions and, specifically, positively biased polar questions. But how far does the interpretative affinity of the three questions reach? Specifically, do they all convey the same type of bias? Buring and Gunlogson (2000; see also Sudo 2013) show that different types of what could be described as biased questions may reflect different sources or bases for speaker bias. A speaker may use one question-type to express that they have an epistemic preference for the expressed proposition over its alternatives and another question type to convey that they have contextual evidence in support of the expressed proposition. It would be interesting to see if and how *min*-

questions, *na*-questions and *dhen*-questions interact with this epistemic vs. contextual bias distinction.

If the three distinct types of questions above are found to express the same kind of bias, then an additional question is raised: Do they all convey exactly the same degree of bias or they fall on different points of a speaker confidence continuum? *Min*-questions were argued to involve an ordering of polar epistemic alternatives. Determining whether *na*- and *dhen*-questions convey stronger or weaker bias will shed some light on the way the bias effect emerges in the latter two question types as well.

Related to the above is ultimately the question regarding the exact relationship between the expression of speaker bias and the functional categories *min*, *na* and *dhen*. Chapter 5 showed that the positive bias component should be specifically attributed to the presence of non-negative *min* in *min*-questions. However, the situation is not as clear regarding the remaining two categories. *Na* was not properly studied. As for *dhen*, Chapter 6 could not motivate sufficiently a causal relation between its presence and the expression of bias. Addressing all the issues raised above requires an experimental comparison of *min*-, *na*- and *dhen*-questions, which is passed on to the immediate future agenda.

If we move slightly away from questions, the epistemic modal verb *prepi* ‘must’, which also conveys positive speaker bias (see Chapter 5), becomes relevant to the present discussion and brings its own interesting questions to the table:

- (4) *Prepi na espase to potiri.*
 MUST SUBJ broke the glass
 ‘The glass must have broken.’

Notice that, although (4) is an assertion and (1-3) from before are questions, the circumstances under which a speaker would use the four utterances are not substantially different; see also Giannakidou (2013) and Giannakidou and Mari (2021).

Let us consider the relationship between Greek epistemic *prepi* ‘must’ and the three elements associated with positive bias in questions. The

existence of a meaning overlap between *prepi* and non-negative *min* is accommodated under the idea that the latter is a polar variant of the former, as put forth in Chapter 5. Since the two elements are in complementary distribution, it comes as no surprise that they receive a similar interpretation. If question-*na* (2) and non-negative *min* behave similarly, they are predicted to relate to epistemic *prepi* in a parallel way. However, I do not know of any study that has tested systematically the interpretative similarity between *prepi*-assertions on the one hand, and *min*- and *na*-questions on the other.

Epistemic *prepi* ‘must’ interacts in an intriguing way also with the negative marker *dhen*, as well as its complementary negative marker *min*, as shown in the following examples.

- (5) a. *Dhen prepi na espase to potiri.*
 not must SUBJ broke the glass
 b. *Prepi na min espase to potiri.*
 must SUBJ not broke the glass
 ‘It must be the case that the glass did not break.’

The members of the minimal pair above receive a single interpretation and, therefore, seem to convey the same speaker bias. In fact, (5a) seems to have emerged from (5b) via negation-raising (Collins & Postal 2014, 2018; Zeijlstra 2017; Crowley 2019; Horn 2020). If this is indeed so, a raised negation in Greek can be realized differently from its non-raised counterpart. Although further investigation of the topic is deemed necessary, this empirical fact does not add much to the research on speaker bias but opens a new line of argumentation in support of the semantic vs. syntactic nature of negation-raising.

7.3.2 On Greek response particles

Chapter 6 raises another interesting side-issue which is not strictly related to *dhen*; it has to do with the interpretation of the Greek polar response particles *ne* ‘yes’ and *oxi* ‘no’. The linguistics literature on polar particles in languages

other than Greek has identified them as propositional anaphors (Krifka 2013) or as the realization of (absolute or relative) polarity features (Holmberg 2013, 2016; Roelofsen & Farkas 2015; Farkas & Roelofsen 2019, among others). The findings of the experimental study that formed part of the sixth chapter indicate that a combination of the two insights may be desirable. Specifically, the results suggest that the native speakers' preference for the use of *ne* 'yes' or *oxi* 'no' does not correlate only with the absolute polarity of the TP following the particle or the agreement vs. disagreement with the previous utterance –that is its relative polarity (Roelofsen & Farkas 2015)– but also with the force of the commitment undertaken by this previous utterance.

In order to clarify the claim above, let us review the response patterns displayed by positive assertions, positive polar questions and negative assertions, as obtained via the experimental study presented in Chapter 6:

- (6) a. Positive assertions: *Yes p* > *No not p*
b. Positive polar questions: *No not p* = *Yes p*
c. Negative assertions: *No not p* > *No p*, *Yes p*, *Yes not p*

Starting from (6a) and (6b), they are both positive polarity utterances and, therefore, admit those answers where the polarity of the response particle matches the polarity of the accompanying TP (Holton et al. 1997), that is *Yes p* and *No not p*. While no difference is found between the two responses for positive polar questions, positive assertions show a significant preference for the agreeing answer. This is taken to reflect at least partly the fact that disagreement with an assertion is more costly than disagreement with a question (see also Krifka 2021a) since only the former involves a public commitment undertaken by the speaker. The same view is also supported by the results obtained for negative assertions. While all the four possible combinations of particle polarity and sentence polarity are admitted in this case (Holton et al. 1997), the agreeing response *No not p*, which happens to coincide with the immediately preceding public commitment of the interlocutor, is the preferred one.

Before rushing to conclusions, I must acknowledge that the experiment referred to above was designed with a rather different research question in mind and, consequently, any results regarding the interpretation of Greek polar response particles may be shadowed by uncontrolled confounds. However, some first evidence has been obtained that the polar particles *ne* ‘yes’ and *oxi* ‘no’ may correspond to commitment anaphors, picking up either independent or relativized speaker commitments, the latter understood as agreement and disagreement with the addressee.

Concretely, it is tentatively proposed here that Greek polar response particles are ambiguous (see also Roelofsen & Farkas 2015). The use of the positive polarity particle *ne* ‘yes’ can either convey the speaker’s independent public commitment to a proposition of positive polarity or express that the speaker shares the preceding commitment of their interlocutor. In a parallel fashion, the use of the negative polarity particle *oxi* ‘no’ can either convey the speaker’s independent commitment to a proposition of negative polarity or express that the speaker undertakes a public commitment different from the one undertaken by the interlocutor in the immediately preceding conversational step. Crucially, the polarity of the proposition to which the interlocutors commit is irrelevant in both cases of relativized commitment.

In the framework implemented throughout the thesis (Cohen and Krifka 2014; Krifka 2015, 2017, 2021b), the ambiguity described above can be captured as a syntactic ambiguity (see also Wiltschko 2017). When encoding independent speaker commitment, *ne* and *oxi* can be postulated to merge in the specifier of ComP. When the speaker’s commitment is relativized to the one of their interlocutor, that is when the response particles encode agreement or disagreement, they can be hypothesized to merge in the specifier of ActP. This tentative proposal is schematically represented below.

(7) a. Independent commitment to a proposition of positive polarity

[ActP [Act ASSERT] [ComP [ne] [Com' [Com †] [JP [J J-] [TP *p*]]]]]

b. Independent commitment to a proposition of negative polarity

[ActP [Act ASSERT] [ComP [OXi] [Com' [Com †] [JP [J J-] [NegP [Neg dhen] [TP *p*]]]]]]]

c. Relativized commitment – agreement with the addressee

[ActP [ne] [Act' [Act ASSERT] [ComP [Com †] [JP [J J-] [TP p]]]]]

d. Relativized commitment – disagreement with the addressee

[ActP [oxi] [Act' [Act ASSERT] [ComP [Com †] [JP [J J-] [TP p]]]]]

An account of *ne* and *oxi* along these lines correctly predicts the distribution and interpretation of these response particles, as well as the fact that they interact with the polarity of the embedded proposition only when encoding independent commitment – they are structurally closer to TP in this case. Importantly, though, its motivation and superiority to the alternative response particle accounts already on the market (Krifka 2013; Holmberg 2013, 2016; Roelofsen & Farkas 2015; Farkas & Roelofsen 2019, among others) remain to be tested.

Appendices

The following Appendices include the experimental materials that cannot be accessed via the links provided in the chapters.

A1 Appendix to Chapter 3

1. Sociolinguistic questionnaire, with English translations.

- 1) Ημερομηνία γέννησης Date of birth
- 2) Φύλο (άνδρας, γυναίκα) Gender (male, female)
- 3) Εκπαίδευση (πρωτοβάθμια, δευτεροβάθμια, τριτοβάθμια, κάτοχος μεταπτυχιακού τίτλου, κάτοχος διδακτορικού τίτλου) Education (primary school, high school, bachelor's degree, master's degree, PhD degree)
- 4) Τόπος διαμονής κατά το μεγαλύτερο μέρος της παιδικής ηλικίας Place of residence during the biggest part of childhood
- 5) Τόπος μόνιμης κατοικίας Place of permanent residence
- 6) Είσαι απόφοιτος-η ή φοιτητής-τρια γλωσσολογίας ή σχετικού τμήματος; (ναι, όχι) Are you a graduate or undergraduate student of linguistics or other relevant discipline? (yes, no)
- 7) Είναι η ελληνική η μητρική σου γλώσσα; (ναι, όχι) Is Greek your native language? (yes, no)
- 8) Σε τι ποσοστό χρησιμοποιείς την ελληνική γλώσσα καθημερινά; (λιγότερο από 50%, 50% - 75%, περισσότερο από 75%) What is the percentage of your daily use of Greek? (less than 50%, 50% - 75%, more than 75%)
- 9) Πόσο σίγουρος-η αισθάνεσαι για την ικανότητά σου στη χρήση της ελληνικής; (λιγότερο από 50%, 50% - 75%, περισσότερο από 75%) How confident are you about your command of the Greek language? (less than 50%, 50% - 75%, more than 75%)

2. Sociolinguistic information regarding the participants of Experiments 2 and 3.

		Exp 2		Exp 3	
Participants analyzed		59		94	
Age in years (M, SD)		28.92 (9.51)		32.40 (9.84)	
		<i>n</i>	%	<i>n</i>	%
Gender	Male	19	32.20	30	31.91
	Female	40	67.80	64	68.09
Educational level	Primary	0	0.00	0	0.00
	Secondary	7	11.86	13	13.83
	Tertiary	28	47.46	48	51.06
	Postgraduate	23	38.98	29	30.85
	Doctorate	1	1.69	4	4.26
Had studied linguistics, language, or translation	Yes	13	22.03	13	13.83
	No	46	77.97	81	86.17
Daily use of Greek	>75%	49	83.05	59	62.77
	50-75%	8	13.56	13	13.83
	<50%	2	3.39	22	23.40
Self-assessment in Greek	>75%	47	79.66	74	78.72
	50-75%	11	18.64	19	20.21
	<50%	1	1.69	1	1.06

3. Materials used in Experiment 2, with English translations.

Monadic answers

a. Proper names – Informal register

- 1 Ποιος πολιτικός είναι φίλος σου, ρε ψεύτη;
Ο Αλέξης Τσίπρας.

Which politician is a friend of yours, you liar?
The Alexis Tsipras
- 2 Ποια απ' τις δικιές μας είπες ότι ακύρωσε τελευταία στιγμή;
Η Ελένη Αντωνίου.

Which one from our group did you say that cancelled at the last minute?
The Eleni Adoniou
- 3 Ποιος σε έκανε πάλι αεροπλάνο και μου ήρθες με όρεξη;
Ο Ανέστης Παπαδόπουλος.

Who drove you mad and you came here in this mood?
The Anestis Papadopoulos.
- 4 Ποια φαγώθηκε να σε δει πριν την πρεμιέρα;
Η Λυδία Κονιόρδου.

Who was so eager to see you before the premiere?
The Lidia Koniordou.

- 5 Ποιον κουβάλησε πάλι μαζί;
Τον Βασίλη Ιωάννου.

Who did he bring along?
The Vasilis Ioannou.

b. Proper names – Formal register

- 6 Ποιον εμπιστευθήκατε με την ψήφο σας στις τελευταίες εκλογές;
Τον Αλέξη Τσίπρα.

Who did you trust with your vote in the last elections?
The Alexis Tsipras.

- 7 Ποια υπάλληλος έχει αιτηθεί άδεια νοσηλείας κατ'οίκον;
Η Ελένη Αντωνίου.

Which employee solicited a sick leave?
The Eleni Adoniu.

- 8 Τίνος την απόλυση ζητήσατε, κύριε διευθυντά;
Του Ανέστη Παπαδόπουλου.

Whose firing did you order, director?
Of the Anestis Papadopoulos.

- 9 Ποιος αναλαμβάνει το Υπουργείο πολιτισμού μετά τον ανασχηματισμό,
κύριε πρωθυπουργέ;
Η Λυδία Κονιόρδου.

Who takes over the Ministry of Culture after the reshuffle, prime
minister?
The Lidia Koniordu.

- 10 Ποιος, κατά τη γνώμη σας, διαδραμάτισε το σημαντικότερο ρόλο στην
αποτροπή της πτώχευσης της εταιρείας;
Ο Βασίλης Ιωάννου.

Who, according to you, played the most important role in saving the
company from bankruptcy?
The Vasilis Ioannou.

c. Common nouns – Informal register

- 11 Τι ξέχασες να πάρεις πάλι, βρε ερωτευμένε;
Το αρωματικό ρύζι.

What did you forget to buy again, you love-stricken?
The aromatic rice.

- 12 Τι σου έφερε τελικά η Ελένη;
Το μπλε πουκάμισο.

What did Eleni finally get you?
The blue shirt.

- 13 Τι ήταν αυτό που έπεσε, Παναγία μου;!
Το χρυσό άγαλμα.

What just fell, good Lord?!
The golden statue.

- 14 Ποια πόρτα ξέχασε πάλι ανοιχτή το ντουγάκι;
Την ξύλινη πόρτα.

Which door did he left open again that fool?
The wooden door.

- 15 Ποιος δάσκαλος ουρλιάζει έτσι ρε φίλε;
Ο ξανθός δάσκαλος.

Which teacher is yelling like that, man?
The blond teacher.

d. Common nouns – Formal register

- 16 Ποιο ρύζι ενδείκνυται για την καταπολέμηση του άγχους;
Το αρωματικό ρύζι.

Which rice is recommended for the treatment of stress?
The aromatic rice.

- 17 Ποιο κομμάτι αποτελούσε αναπόσπαστο τμήμα της παραδοσιακής
ενδυμασίας της περιοχής, σύμφωνα με την έρευνά σας;
Το μπλε πουκάμισο.

Which piece was an integral part of the traditional uniform of this area,
according to your research?
The blue shirt.

- 18 Τι πιστεύετε ότι πρέπει να προστεθεί στην έκθεση για να είναι άρτια η
αναπαράσταση της περιόδου, προϊσταμένη;
Το χρυσό άγαλμα.

What do you believe should be added to the exposition to accurately
represent the period, manager?
The golden statue.

- 19 Ποια από τις πόρτες παραβιάστηκε με λαστό διαμέτρου 5 χιλιοστών,
υπαστυνόμει;
Η ξύλινη πόρτα.

Which door was broken into with a 5 mm crowbar, officer?
The wooden door.

- 20 Ποιο από τα πρόσωπα του έργου σας ενσαρκώνει το σύνολο των
φόβων σας;
Ο ξανθός δάσκαλος.

Which one of the characters in your work incarnates the ensemble of

your fears?
The blond teacher.

Polydefinite answers

a. Proper names – Informal register

- 21 Ποιον ψήφισες ρε;
Τον Αλέξη τον Τσίπρα.

Who did you vote for?
The Alexis the Tsipras.
- 22 Ποια συμμαθήτριά μας σου έστειλε στο μέσεντζερ;
Η Ελένη η Αντωνίου.

Which classmate of ours texted you in messenger?
The Eleni the Adoniu.
- 23 Ποιος με ρώτησες αν ήρθε σήμερα για δουλειά;
Ο Ανέστης ο Παπαδόπουλος.

Who did you ask me if they came to work today?
The Anestis the Papadopoulos.
- 24 Ποια φίλη σου ηθοποιό είχαμε πάει να δούμε εκείνη τη μέρα στην
Επίδαυρο;
Τη Λυδία την Κονιόρδου.

Which actress and friend of yours had we gone to see that day to
Epidaurus?
The Lidia the Koniordu.
- 25 Ποιος νοίκιαζε το διπλανό διαμέρισμα εκείνα τα χρόνια στη Νικήτη;
Ο Βασίλης ο Ιωάννου.

Who rented the flat next to ours those years in Nikiti?
The Vasilis the Ioannou.

b. Proper names – Formal register

- 26 Ποιος διετέλεσε πρωθυπουργός της Ελλάδας από το 2015 έως το 2019,
σύμφωνα με το παράθεμα;
Ο Αλέξης ο Τσίπρας.

Who was the prime minister of Greece from 2015 to 2019, according to
the text?
The Alexis the Tsipras.
- 27 Ποια αξιωματικός εξετέλεσε χρέη κυβερνήτου, κατά την απουσία του
Πλωτάρχη;
Η Ελένη η Αντωνίου.

Which officer substituted for the captain, while the commander was
away?

The Eleni the Adoniu.

- 28 Ποιος είναι ο διευθυντής δημοσίων σχέσεων της εταιρείας σας, κύριε εκπρόσωπε;

Ο Ανέστης ο Παπαδόπουλος.

Who is the Public Relations manager of your firm, delegate?

The Anestis the Papadopoulos.

- 29 Ποια ηθοποιός κρίνετε πως είναι η πλέον κατάλληλη να διευθύνει το θίασο, μετά την παραίτησή σας;

Η Λυδία η Κονιόρδου.

Which actress do you consider as the most apt to manage the troupe, after you quit?

The Lidia the Koniordu.

- 30 Ποιος υπαξιωματικός αιτήθηκε την έκδοση φύλλου πορείας εξωτερικού, κύριε ανθυπασπιστά;

Ο Βασίλης ο Ιωάννου.

Which non-commissioned officer asked for an international travel permit, warrant officer?

The Vasilis the Ioannou.

c. Common nouns – Informal register

- 31 Ποιο ρύζι είπε η μαμά να πετάξω;

Το ρύζι το αρωματικό.

Which rice did mom say I should throw away?

The rice the aromatic.

- 32 Ποιο πουκάμισο έκαψες στο σίδερο βρε αχαΐρευτε;

Το πουκάμισο το μπλε.

Which shirt did you burn with the iron, you bubblehead?

The shirt the blue.

- 33 Ποιο άγαλμα μας κλέψανε;

Το άγαλμα το χρυσό.

Which statue did they steal from us?

The statue the golden.

- 34 Ποια πόρτα έβαψε ο μπαμπάς;

Την πόρτα την ξύλινη.

Which door did dad paint?

The door the wooden.

- 35 Ποιος σε μάλωσε, Γιαννάκη;

Ο δάσκαλος ο ξανθός.

Who told you off, Yannaki?

The teacher the blond.

d. Common nouns – Formal register

- 36 Καλημέρα σας, εσείς ποιο ρύζι χρησιμοποιείτε για την παρασκευή ριζότου;

Το ρύζι το αρωματικό.

Good morning, which rice do you use for making a risotto?

The rice the aromatic.

- 37 Ποιο πουκάμισο από τη νέα μας συλλογή θα θέλατε να δοκιμάσετε κύριε;

Το πουκάμισο το μπλε.

Which shirt from our new collection would you like to try on, sir?

The shirt the blue.

- 38 Ποιο άγαλμα πιστεύετε ότι εκφράζει στο μέγιστο βαθμό την καλλιτεχνική σας ταυτότητα;

Το άγαλμα το χρυσό.

Which statue do you believe expresses to the highest degree your artistic identity?

The statue the golden.

- 39 Ποια πόρτα διερρήχθη, σύμφωνα με την κατάθεση, υπαρχηγέ; Η πόρτα η ξύλινη.

Which door was broken into, according to the report, detective?

The door the wooden.

- 40 Ποιος από τους χαρακτήρες του μυθιστορήματος γίνεται στο τέλος εσωτερικός αφηγητής; Ο δάσκαλος ο ξανθός.

Which of the characters of the novel finally turns into the internal narrator?

The teacher the blond.

Fillers

- 41 Πότε έχεις εξεταστική; Το Σεπτέμβρη.

When are your exams?

The September.

- 42 Πότε θα κάνουμε το πάρτι; Την Παρασκευή.

When are we having the party?

The Friday.

- 43 Πότε στολίζουν δέντρο στην Ευρώπη;

Τα Χριστούγεννα.

When do they decorate the tree in Europe?
The Christmas.

- 44 Πότε σουβλίζετε αρνί στο χωριό;
Το Δεκαπενταύγουστο.

When do you impale the lamb in your village?
The 15th of August.

- 45 Πότε σχολάζ;
Το απογευματάκι.

When is your shift over?
The evening.

- 46 Πότε έφυγε και δεν πήραμε χαμπάρι;
Το χάραμα.

When did he leave without us noticing?
The dawn.

- 47 Πότε πήγες τελευταία φορά Ελλάδα;
Το καλοκαίρι.

When was the last time you went to Greece?
The summer.

- 48 Πού είσαι πάλι;
Στην πλατεία.

Where are you again?
At the square.

- 49 Πού είναι το συνέδριο;
Στη Φιλοσοφική.

Where is the conference?
In the Philosophy department.

- 50 Πού να κατέβω με το λεωφορείο;
Στην Καμάρα.

Where do I get off the bus?
At the Kamara.

- 51 Πού άφησες τα κλειδιά μου;
Στο τραπέζι.

Where did you leave my keys?
On the table.

- 52 Πού παρκάρατε το αμάξι;
Στην Ιπποδρομείου.

Where did you park the car?
At the Ipodromiou (square).

- 53 Πού έγινε η συναυλία;
Στο Παλατάκι.

Where was the concert?
At the Palataki.

- 54 Πού είναι η καφετέρια του Νίκου;
Στο κέντρο.

Where is Niko's café?
At the center.

- 55 Πώς το κόλλησες τόσο καλά;
Με την UHU.

How did you glue it so well?
With the UHU.

- 56 Πώς θα πας στα Τρίκαλα;
Με το ΚΤΕΛ.

How are you going to Trikala?
With the bus.

- 57 Πώς ήρθατε τελικά;
Με το αυτοκίνητο.

How did you get here finally?
With the car.

- 58 Πώς μετέφρασες ολόκληρο το κείμενο;
Με το λεξικό.

How did you translate the whole text?
With the dictionary.

- 59 Πώς ξέρατε την ώρα της δεξίωσης;
Από το προσκλητήριο.

How did you know the time of the reception?
From the invitation.

- 60 Πώς βρήκατε το δρόμο χωρίς φακούς;
Με τις λαμπάδες.

How did you find the way without a torch?
With the candle.

- 7 [Μια νεαρή πελάτισσα πιάνει κουβέντα με τον όμορφο σερβιτόρο.]
 Ποιος σε αλλάζει;
 Η ψηλή σερβιτόρα. Η σερβιτόρα η ψηλή.
 [A young client is chatting with the handsome waiter.]
 Who takes over after you?
 The tall waitress. The waitress the tall.
- 8 [Δύο πεντάχρονα ανταλλάζουν πληροφορίες για τις οικογένειές τους.]
 Ποιον αγαπάς περισσότερο;
 Τη χοντρή γιαγιά. Τη γιαγιά τη χοντρή.
 [Two 5-year-olds are exchanging information about their families.]
 Who do you love the most?
 The fat granny. The granny the fat.
- 9 [Δύο αδέρφια προσπαθούν να ρυθμίσουν το ζήτημα του μεσημεριανού.]
 Τι θα φας;
 Το χθεσινό φαΐ. Το φαΐ το χθεσινό.
 [Two siblings are trying to make their lunch arrangements.]
 What are you having?
 The yesterday food. The food the yesterday.
- 10 [Δύο φίλες ετοιμάζονται για το πάρτι.]
 Τι θα φορέσεις;
 Το κόκκινο φόρεμα. Το φόρεμα το κόκκινο.
 [Two friends are getting ready for the party.]
 What are you wearing?
 The red dress. The dress the red.
- 11 [Ο πατέρας ζητά τη βοήθεια του γιου.]
 Τι είπε η μαμά να βάλω για πλύσιμο;
 Το άσπρο τραπεζομάντιλο. Το τραπεζομάντιλο το άσπρο.
 [A father asks for his son's help.]
 What did mom say I should wash?
 The white tablecloth. The tablecloth the white.
- 12 [Ένας πρωτοετής φοιτητής ετοιμάζεται για κάμπινγκ με τον καλύτερό του φίλο.]
 Τι να φέρω;
 Τη μεγάλη σκηνή. Τη σκηνή τη μεγάλη.
 [A freshman is getting ready to go camping with his best friend.]
 What should I bring?
 The big tent. The tent the big.

A2 Appendix to Chapter 6

1. Sociolinguistic questionnaire, with English translations.

- 1) Ημερομηνία γέννησης Date of birth
- 2) Φύλο (άνδρας, γυναίκα, άλλο) Gender (male, female, other)
- 3) Εκπαίδευση (πρωτοβάθμια, δευτεροβάθμια, τριτοβάθμια, κάτοχος μεταπτυχιακού τίτλου, κάτοχος διδακτορικού τίτλου) Education (primary school, high school, bachelor's degree, master's degree, PhD degree)
- 4) Τόπος διαμονής κατά το μεγαλύτερο μέρος της παιδικής ηλικίας Place of residence during the biggest part of childhood
- 5) Τόπος μόνιμης κατοικίας Place of permanent residence
- 6) Είσαι απόφοιτος-η ή φοιτητής-τρια γλωσσολογίας ή σχετικού τμήματος; (ναι, όχι) Are you a graduate or undergraduate student of linguistics or other relevant discipline? (yes, no)
- 7) Είναι η ελληνική η μητρική σου γλώσσα; (ναι, όχι) Is Greek your native language? (yes, no)
- 8) Σε τι ποσοστό χρησιμοποιείς την ελληνική γλώσσα καθημερινά; (λιγότερο από 50%, 50% - 75%, περισσότερο από 75%) What is the percentage of your daily use of Greek? (less than 50%, 50% - 75%, more than 75%)
- 9) Πόσο σίγουρος-η αισθάνεσαι για την ικανότητά σου στη χρήση της ελληνικής; (λιγότερο από 50%, 50% - 75%, περισσότερο από 75%) How confident are you about your command of the Greek language? (less than 50%, 50% - 75%, more than 75%)

2. Sociolinguistic information regarding the participants of the experiment.

		Exp	
Participants analyzed		74	
Median time to complete the experiment		7.97 minutes	
Age in years (M, SD)		29.10 (9.03)	
		<i>n</i>	<i>%</i>
Gender	Male	17	22.97
	Female	57	77.03
Educational level	Primary	0	0.00
	Secondary	5	6.76
	Tertiary	40	54.05
	Postgraduate	25	33.78
Had studied linguistics, language, or translation	Yes	28	37.84
	No	46	62.16
Daily use of Greek	>75%	66	89.19
	50-75%	5	6.76
	<50%	3	4.05
Self-assessment in Greek	>75%	62	83.78
	50-75%	12	16.22
	<50%	0	0.00

3. Materials used in the experiment, with English translations.

Critical items

a. Inside Negation Questions

1 Ο Γιάννης μόλις ξύπνησε και σε άκουσε να παραπονιέσαι ότι πεινάς.

John woke up and heard you complaining that you are hungry.

Γιάννης: Δεν έφαγες πρωινό;

Yanis: Did you not have breakfast?

Εσύ: Ναι, έφαγα./Ναι, δεν έφαγα./Όχι, έφαγα./Όχι, δεν έφαγα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

2 Η Ιωάννα γύρισε νωρίς από τη δουλειά και είδε τα παπούτσια των παιδιών στην πόρτα.

Ioanna returned early from work and saw the kids' shoes by the door.

Ιωάννα: Δεν πήγαν βόλτα τα παιδιά;

Ioanna: Did the kids not go for a walk?

Εσύ: Ναι, πήγαν./Ναι, δεν πήγαν./Όχι, πήγαν./Όχι, δεν πήγαν.

You: Yes, they did./Yes, they didn't./No, they did./No, they didn't.

3 Ο Ανέστης ήρθε για δουλειά και σε είδε να χασμουριέσαι ασταμάτητα.

Anestis came for work and saw you yawning endlessly.

Ανέστης: Δεν ήπιες καφέ;

Anestis: Did you not drink coffee?

Εσύ: Ναι, ήπια./Ναι, δεν ήπια./Όχι, ήπια./Όχι, δεν ήπια.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

4 Η Άννα επέστρεψε στο σπίτι σας από το σούπερ μάρκετ και σκόνταψε στη βαλίτσα του Στέφανου.

Anna returned at your home from the market and tripped on Stefanos' suitcase.

Άννα: Δεν έφυγε ο Στέφανος;

Anna: Did Stefanos not leave?

Εσύ: Ναι, έφυγε./Ναι, δεν έφυγε./Όχι, έφυγε./Όχι, δεν έφυγε.

You: Yes, he did./Yes, he didn't./No, he did./No, he didn't.

b. Outside Negation Questions

5 Το πρωί ανέλαβες να σφουγγαρίσεις. Ωστόσο, η Ελένη βρίσκει το διάδρομο μέσα στις λάσπες.

This morning you declared yourself responsible for mopping the floor. However, Eleni finds the hallway full of mud.

Ελένη: Δεν σφουγγάρισες;

Eleni: Didn't you mop?

Εσύ: Ναι, σφουγγάρισα./Ναι, δεν σφουγγάρισα./Όχι, σφουγγάρισα./Όχι, δεν σφουγγάρισα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

6 Ο Νίκος υποσχέθηκε στον κοινό σας φίλο Φάνη ότι θα μαγειρέψει. Ωστόσο, ο Φάνης βλέπει το φούρνο άδειο.

Nikos promised your common friend Fanis that he would cook. However, Fanis sees the oven empty.

Φάνης: Δεν μαγείρεψε ο Νίκος;

Fanis: Didn't Nikos cook?

Εσύ: Ναι, μαγείρεψε./Ναι, δεν μαγείρεψε./Όχι, μαγείρεψε./Όχι, δεν μαγείρεψε.

You: Yes, he did./Yes, he didn't./No, he did./No, he didn't.

7 Δεσμεύτηκες ενώπιον του διευθυντή σας να ενημερώσεις τον κόσμο για την επερχόμενη εκδήλωση. Ωστόσο, ο διευθυντής διαπιστώνει ότι δεν υπάρχει τίποτα σχετικό στην ιστοσελίδα της εταιρείας.

You committed in front of your manager that you would inform people about the upcoming event. However, the manager finds out that there is nothing relevant in the company's website.

Διευθυντής: Δεν ενημέρωσες για την εκδήλωση;

Manager: Didn't you inform about the event?

Εσύ: Ναι, ενημέρωσα./Ναι, δεν ενημέρωσα./Όχι, ενημέρωσα./Όχι, δεν ενημέρωσα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

8 Ο Άλκης βεβαίωσε τη μητέρα σας ότι θα γράψει προσκλητήρια για τη βάφτιση. Ωστόσο, η μητέρα σας δεν βλέπει κανένα προσκλητήριο πάνω στο γραφείο.

Alkis assured your mother that he would write invitations to the baptism. However, your mother doesn't see any invitations on the desk.

Μητέρα: Δεν έγραψε προσκλητήρια ο Άλκης;

Mother: Didn't Alkis write invitations?

Εσύ: Ναι, έγραψε./Ναι, δεν έγραψε./Όχι, έγραψε./Όχι, δεν έγραψε.

You: Yes, he did./Yes, he didn't./No, he did./No, he didn't.

c. Rhetorical Negative Questions

9 Χθες πήγατε με τη Σοφία σινεμά. Σήμερα της εκφράζεις την επιθυμία σου να δεις μια ταινία.

Yesterday you went to the cinema with Sofia. Today you express your desire to watch a movie.

Σοφία: Δεν πήγες χθες σινεμά;

Sofia: Didn't you go to the cinema yesterday?

Εσύ: Ναι, πήγα./Ναι, δεν πήγα./Όχι, πήγα./Όχι, δεν πήγα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

10 Βγαίνεις από το εμπορικό κέντρο με τον Ανδρέα. Του λες ότι χρειάζεσαι καινούργια παπούτσια.

You are leaving the mall with Andreas. You tell him that you need new shoes.

Ανδρέας: Δεν ήμασταν τόση ώρα στο εμπορικό;

Andreas: Weren't we at the mall all this time?

Εσύ: Ναι, ήμασταν./Ναι, δεν ήμασταν./Όχι, ήμασταν./Όχι, δεν ήμασταν.

You: Yes, we were./Yes, we weren't./No, we were./No, we weren't.

11 Πέρυσι η Αναστασία σε κέρδισε στο τουρνουά scrabble. Την προκαλείς λέγοντας ότι δεν ξέρει να παίζει.

Last year Anastasia beat you at the scrabble tournament. You provoke her saying that she doesn't know how to play.

Αναστασία: Δεν έχασες πέρυσι;

Anastasia: Didn't you lose last year?

Εσύ: Ναι, έχασα./Ναι, δεν έχασα./Όχι, έχασα./Όχι, δεν έχασα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

12 Πριν μία εβδομάδα, καταθέσατε με τον Μιχάλη ένα άρθρο σε ένα περιοδικό. Παραπονιέσαι πως αυτό το άρθρο δεν σε αφήνει να κοιμηθείς τα βράδια.

A week ago, you and Michalis submitted an article to a journal. You complain that this article is keeping you up at night.

Μιχάλης: Δεν καταθέσαμε πριν μια εβδομάδα;

Michalis: Didn't we submit a week ago?

Εσύ: Ναι, καταθέσαμε./Ναι, δεν καταθέσαμε./Όχι, καταθέσαμε./Όχι, δεν καταθέσαμε.

You: Yes, we did./Yes, we didn't./No, we did./No, we didn't.

Control items

a. Negative Assertions

13 Ο Γιάννης μόλις ξύπνησε και σε άκουσε να παραπονιέσαι ότι πεινάς.

John woke up and heard you complaining that you are hungry.

Γιάννης: Δεν έφαγες πρωινό.

John: You didn't have breakfast.

Εσύ: Ναι, έφαγα./Ναι, δεν έφαγα./Όχι, έφαγα./Όχι, δεν έφαγα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

14 Η Ιωάννα γύρισε νωρίς από τη δουλειά και είδε τα παπούτσια των παιδιών στην πόρτα.

Ioanna returned early from work and saw the kids' shoes by the door.

Ιωάννα: Δεν πήγαν βόλτα τα παιδιά.

Ioanna: The kids didn't go for a walk.
Εσύ: Ναι, πήγαν./Ναι, δεν πήγαν./Όχι, πήγαν./Όχι, δεν πήγαν.
You: Yes, they did./Yes, they didn't./No, they did./No, they didn't.

15 Ο Ανέστης ήρθε για δουλειά και σε είδε να χασμουριέσαι ασταμάτητα.
Anestis came for work and saw you yawning endlessly.

Ανέστης: Δεν ήπιες καφέ.
Anestis: You didn't drink coffee.
Εσύ: Ναι, ήπια./Ναι, δεν ήπια./Όχι, ήπια./Όχι, δεν ήπια.
You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

16 Η Άννα επέστρεψε στο σπίτι σας από το σούπερ μάρκετ και σκόνταψε στη βαλίτσα του Στέφανου.

Anna returned at your home from the market and tripped on Stefanos' suitcase.

Άννα: Δεν έφυγε ο Στέφανος.
Anna: Stefanos didn't leave.
Εσύ: Ναι, έφυγε./Ναι, δεν έφυγε./Όχι, έφυγε./Όχι, δεν έφυγε.
You: Yes, he did./Yes, he didn't./No, he did./No, he didn't.

b. Positive Polar Questions

17 Το πρωί ανέλαβες να σφουγγαρίσεις. Ωστόσο, η Ελένη βρίσκει το διάδρομο μέσα στις λάσπες.

This morning you declared yourself responsible for mopping the floor. However, Eleni finds the hallway full of mud.

Ελένη: Σφουγγάρισες;
Eleni: Did you mop?
Εσύ: Ναι, σφουγγάρισα./Ναι, δεν σφουγγάρισα./Όχι, σφουγγάρισα./Όχι, δεν σφουγγάρισα.
You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

18 Ο Νίκος υποσχέθηκε στον κοινό σας φίλο Φάνη ότι θα μαγειρέψει. Ωστόσο, ο Φάνης βλέπει το φούρνο άδειο.

Nikos promised your common friend Fanis that he would cook. However, Fanis sees the oven empty.

Φάνης: Μαγείρεψε ο Νίκος;
Fanis: Did Nikos cook?

Εσύ: Ναι, μαγείρεψε./Ναι, δεν μαγείρεψε./Όχι, μαγείρεψε./Όχι, δεν μαγείρεψε.

You: Yes, he did./Yes, he didn't./No, he did./No, he didn't.

19 Δεσμεύτηκες ενώπιον του διευθυντή σας να ενημερώσεις τον κόσμο για την επερχόμενη εκδήλωση. Ωστόσο, ο διευθυντής διαπιστώνει ότι δεν υπάρχει τίποτα σχετικό στην ιστοσελίδα της εταιρείας.

You committed in front of your manager that you would inform people about the upcoming event. However, the manager finds out that there is nothing relevant in the company's website.

Διευθυντής: Ενημέρωσες για την εκδήλωση;

Manager: Did you inform about the event?

Εσύ: Ναι, ενημέρωσα./Ναι, δεν ενημέρωσα./Όχι, ενημέρωσα./Όχι, δεν ενημέρωσα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

20 Ο Άλκης βεβαίωσε τη μητέρα σας ότι θα γράψει προσκλητήρια για τη βάφτιση. Ωστόσο, η μητέρα σας δεν βλέπει κανένα προσκλητήριο πάνω στο γραφείο.

Alkis assured your mother that he would write invitations to the baptism. However, your mother doesn't see any invitations on the desk.

Μητέρα: Έγραψε προσκλητήρια ο Άλκης;

Mother: Did Alkis write invitations?

Εσύ: Ναι, έγραψε./Ναι, δεν έγραψε./Όχι, έγραψε./Όχι, δεν έγραψε.

You: Yes, he did./Yes, he didn't./No, he did./No, he didn't.

c. Positive Assertions

21 Χθες πήγατε με τη Σοφία σινεμά. Σήμερα της εκφράζεις την επιθυμία σου να δεις μια ταινία.

Yesterday you went to the cinema with Sofia. Today you express your desire to watch a movie.

Σοφία: Πήγες χθες σινεμά.

Sofia: You went to the cinema yesterday.

Εσύ: Ναι, πήγα./Ναι, δεν πήγα./Όχι, πήγα./Όχι, δεν πήγα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

22 Βγαίνεις από το εμπορικό κέντρο με τον Ανδρέα. Του λες ότι χρειάζεσαι καινούργια παπούτσια.

You are leaving the mall with Andreas. You tell him that you need new shoes.

Ανδρέας: Ήμασταν τόση ώρα στο εμπορικό.

Andreas: We were at the mall all this time.

Εσύ: Ναι, ήμασταν./Ναι, δεν ήμασταν./Όχι, ήμασταν./Όχι, δεν ήμασταν.

You: Yes, we were./Yes, we weren't./No, we were./No, we weren't.

23 Πέρυσι η Αναστασία σε κέρδισε στο τουρνουά scrabble. Την προκαλείς λέγοντας ότι δεν ξέρει να παίζει.

Last year Anastasia beat you at the scrabble tournament. You provoke her saying that she doesn't know how to play.

Αναστασία: Έχασες πέρυσι.

Anastasia: You lost last year.

Εσύ: Ναι, έχασα./Ναι, δεν έχασα./Όχι, έχασα./Όχι, δεν έχασα.

You: Yes, I did./Yes, I didn't./No, I did./No, I didn't.

24 Πριν μία εβδομάδα, καταθέσατε με τον Μιχάλη ένα άρθρο σε ένα περιοδικό. Παραπονιέσαι πως αυτό το άρθρο δεν σε αφήνει να κοιμηθείς τα βράδια.

A week ago, you and Michalis submitted an article to a journal. You complain that this article is keeping you up at night.

Μιχάλης: Καταθέσαμε πριν μια εβδομάδα.

Michalis: We submitted a week ago.

Εσύ: Ναι, καταθέσαμε./Ναι, δεν καταθέσαμε./Όχι, καταθέσαμε./Όχι, δεν καταθέσαμε.

You: Yes, we did./Yes, we didn't./No, we did./No, we didn't.

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