Identifying the User's Intentions: Basic Illocutions in Modern Greek

Maria Chondrogianni

Abstract—**This paper presents a comprehensive classification of basic illocutions in Modern Greek, extracted following the linguistic choices speakers make when they formulate an utterance, provided such choices form part of a language's grammar. Our approach lies on the interface between Morphosyntax, Pragmatics and Phonology and allows for basic illocutions to be established depending on the particular verb mood, particle, number, person, aspect and segmental marker, as well as the prosodic contour used when an utterance is realized. Our results show that Indicative uses, for example, are mostly associated with propositional illocutions, consisting of declarative uses, including assertions, miratives, and assertions in disguise; interrogative uses, including polar and content interrogatives; and behavioral illocutions i.e. exhortations (expressed in first person plural only). Secondary sentence types, (involving additional segmental marking) include requests for confirmation, wondering, expression of uncertainty and proffer. In this paper we discuss propositional uses only. Such a theoretical approach can have a direct impact on applications involving Human-Computer Interaction, including intention-based dialogue systems' modeling, natural language interfaces to Data Bases and Intelligent Agents as well as Belief, Desire and Intention systems, which require the computer to be able to interpret what a user's objective (intention) is, so that the users' needs can be best served.**

Index Terms—**Pragmatics, basic illocutions, Modern Greek.**

I. Introduction

THE ability of machines to communicate with humans (or even to provide content in a co-operative way), in a manner that reflects or mimics human communication has been at the core of AI research for some decades. As natural languages are viewed as the input of choice for a series of soon to appear applications (including user interfaces to Data Bases, e-commerce systems, and gaming applications among others) the need to improve the way computers communicate with humans is ever more pertinent. Fundamental to this quest is to come up with techniques which will allow for the user's goals to be identified, based on greater interaction and collaboration between theoretical linguists and natural language engineers.

In the theoretical linguistics-focused research below, we take the position that, whether for dialogue modeling applications or natural language user interfaces, the user's intentions can be identified based on a Pragmatics analysis of the linguistic input provided by the user themselves. Earlier attempts, where illocution was considered, can be seen in Allen [1] or the DDML team's work [11], who married XML with Pragmatics and provided the opportunity for personalized human-computer interaction. Our analysis can form the basis for a computer implementation of users' intentions. The linguistic choices users make to express/phrase their query, for example, and the particular verb forms and particles they use are crucial in identifying their intention.

The focus of our research is on the way illocution is codified in a Speaker's message, through the grammatical/phonological choices a Speaker makes. The natural language of application for our research is Modern Greek (MG), a language with rich morphology. The outcome of our research consists of a comprehensive classification of the basic illocutions of MG, based on markers that have an illocutionary impact, such as the verb mood, the negation, the clitic placement, the intonation patterns and any additional segmental strategies used by MG speakers.

In our approach we share a similar perspective with Steuten [10], who undertook a linguistic analysis of business conversations; we share her fundamental view that a conversation consists of a series of communicative acts [7], expressed through basic illocutions, connected with each other, 'with the purpose of defining a goal and reaching that goal'. We are interested in the basic illocutions, which form part of a grammatical system that a speaker (and their addressee) have at their disposal, which will allow them to reach their goal. We consider phonology as being part of a language's grammatical system, hence the prosodic contour (intonation patterns) described below is crucial in identifying basic illocutions.

II. Criteria for the Identification of Basic Illocutions: Intonation Patterns

Crucial to the identification of MG basic illocutions is the specification of intonation patterns that speakers adopt [2] in specific instances of utterances at *Utterance* level (as per the layered structure of the FDG Phonological component [8]. We distinguish among 5 MG intonation patterns [4], briefly described below.

A. Intonation Pattern 1 (INT1)

The characteristic of this pattern is its broad focus and a high level of the accented syllable. Its Fundamental Frequency (FO) includes a heightening of the pitch starting at the first accented syllable, followed by a small dip and a fall for the last word. The boundary is low. Schematically, the tonal structure of our INT1 pattern is illustrated in Fig. 1 below. The nucleus

Manuscript received June 25, 2011. Manuscript accepted for publication August 20, 2011.

Maria Chondrogianni is with the School of Electronics and Computer Science, University of Westminster, 115 New Cavendish Street, London, W1W 6UW, UK (e-mail: M.N.Chondrogianni@westminster.ac.uk).

might create variations on this pattern; in some cases it can be used interchangeably with INT2, when focality affects the way an utterance is expressed. INT1 characterizes broad focus.

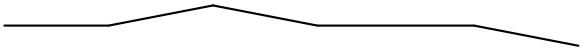

Fig. 1: Intonation Pattern 1 (INT1).

B. Intonation Pattern 2 (INT2)

INT2 starts with a plateau followed by a rise on the nucleus, followed by a fall from the post-nuclear syllable onwards. Schematically, INT2 tonal structure is illustrated in Fig. 2 below. It characterizes narrow focus.

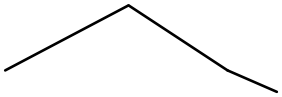

Fig. 2: Intonation Pattern 2 (INT2).

C. Intonation Pattern 3 (INT3)

This is the typical pattern for content interrogatives. It starts high, with the first accented syllable and it starts dropping immediately after it, with a potential slight rise at the end. Although typical questions are expected to finish with rising intonation, the question word here provides the key to the addressee on how the utterance is to be interpreted, hence a variation with a slightly rising, level or slightly falling end syllable is not unexpected. INT3 can schematically be illustrated in Fig. 3 below.

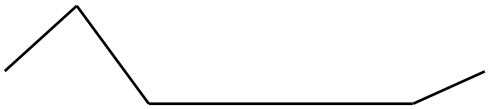

Fig. 3: Intonation Pattern 3 (INT3).

D. Intonation Pattern 4 (INT4)

This is the typical polar question intonation pattern. The pick is on the last stressed syllable of the final word. Following a gradual fall, we have a low plateau followed by a rise (with a possible slight fall at the end). The boundary is Rise-fall. Schematically we present its tonal structure in Fig. 4 below.

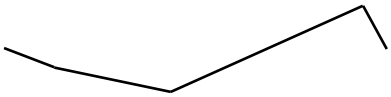

Fig. 4: Intonation Pattern 4 (INT4).

E. Intonation Pattern 5 (INT5)

This pattern starts with a small fall, followed by a rise (and possibly a high plateau), and followed by a fall (and a potential small rise at the end). The boundary is low-high. It is the typical prosodic contour for curses. Schematically we are illustrating INT5 in Figure 5 below.

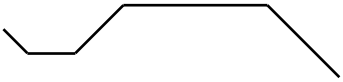

Fig. 5: Intonation Pattern 5 (INT5).

III. Basic Illocutions of Modern Greek

Each illocutionary function included below is described in terms of:

- The grammatical mood used; in propositional uses, we encounter the Indicative, optionally introduced by the future marker *θα* (tha); the Subjunctive, introduced by the subjunctive particle *να* (na); and the Hortative, introduced by the hortative particle *as* (as); in behavioral uses, which are not covered in the present paper, we encounter the Indicative, the Subjunctive, the Imperative, the Hortative and the Prohibitive verb moods.
- The prosodic contour it is expressed with; the five intonation patterns identified in section 2 are used as part of each illocutions' characteristics.
- The associated negation i.e. *δε(ν)* ('de(n)') for Indicative and *μη(ν)* ('mi(n)') for Subjunctive and Hortative.
- Potential segmental markers which provide cues to the addressee on how a certain utterance is to be interpreted such as *ίσως* ('isos') for uncertainty and *άραγε* ('araye') for wondering.
- Grammatical tense restrictions, for example the choice of tense in wishes, which characterizes the fufillability of a wish.
- Aspectual restrictions (where appropriate); for example, the sole possibility of imperfective aspect with past in wishes.

In addition, where appropriate, we refer to number and person restrictions and to frequent lexical additions. All basic illocutions are associated with their relevant intonation patterns, as distinguished in section 2.

A. Propositional uses

Following the basic illocution classification proposal in [9], we present the MG propositional illocutions, consisting of assertive uses, mirative uses, wishes and curses, expressions of wondering, uncertainty and estimating. The verb forms used for propositional uses include the Indicative, the Subjunctive, and the Hortative moods.

B. Assertions

Assertions are signaled by the use of the Indicative [3],[6]. Although we demonstrate that there is no one-to-one relationship between the Indicative mood and the Declarative sentence type, since Indicative presents a rich variety of uses, we maintain that the reverse presents a one-to-one relationship:

the declarative sentence type can only be expressed in Indicative. Intonation Patterns INT1 and INT2 apply (depending on the broadness or narrowness of focus).

Type	Propositional
Function	Assertion
Grammatical Mood	Indicative (optional particle *θα*, optional negation *δε(ν)*)
Tense	Present/Past/Future
Aspect	Perfective and Imperfective
Person	Any
Number	Singular or Plural
Intonation Pattern	INT1/INT2

C. Assertions in disguise-contrastive statements

The unique character of assertions in disguise-contrastive statements is based on the use of the 1st person as well as the fact that a tag question is used as a compulsory element of the utterance's structure; alternatively, this illocution is marked by the compulsory use of the segmental marker *μήπως* ('mipos', perhaps), usually followed by the Indicative negation *δε(ν)*.

Type	Propositional
Function	Assertions in disguise- contrastive statements
Grammatical Mood	Indicative (optional particle *θα*, optional negation *δε(ν)*)
Tense	Present/Past/Future
Aspect	Perfective and Imperfective
Person	1st
Number	Singular or Plural
Segmental Marker	Tag or μήπως (usually followed by negation)
Intonation Pattern	INT2 + INT4 with tag INT4 with μήπως

D. Requests for confirmation

Requests for confirmation also involve the compulsory use of a tag; through such utterances the Speaker seeks to confirm the truth of the State of Affairs described. Requests for confirmation are expressed in indicative, with the optional use of particle *θα* and negation *δε(ν)*, usually in the 2nd person (3rd person uses are also possible), using INT2 for the assertion and INT4 for the tag.

Type	Propositional
Function	Request for Confirmation
Grammatical Mood	Indicative (optional particle *θα*, optional negation *δε(ν)*, use of tag question)
Tense	Present/Past/Future
Aspect	Perfective and Imperfective
Person	Usually 2nd, 3rd possible
Number	Singular or Plural
Intonation Pattern	INT2 + INT4

E. Miratives

Mirative uses are a very interesting category of basic illocution, in that the Speaker expresses a qualitative view on a State of Affairs, and the positivity or negativity of their stance is formally expressed through the use of a particular grammatical element (verb mood). Mirative uses of approval are expressed in Indicative, whilst those of disapproval are expressed in Subjunctive [4].

Type	Propositional
Function	Mirative uses
Grammatical Mood	-Indicative (approval, optional particle *θα*, optional negation *δε(ν)*) -Subjunctive (disapproval, particle *να*, optional negation *μη(ν)*)
Tense	Present (also Past is possible but unusual; Future is common in the Indicative)
Aspect	Perfective/Imperfective
Person	2nd /3rd (1st possible)
Number	Singular or Plural
Intonation Pattern	INT3

F. Wishes

MG Wishes are expressed either in Subjunctive or in Hortative [5]. A Subjunctive use is introduced by the particle *να*, while a Hortative one by the particle *ας*. In Subjunctive wishes are potentially preceded by the segmental marker *μακάρι* ('makari'); the negation *μη(ν)* might optionally apply to either uses. Any person and number might be used, while aspectual and tense (present or past) differences affect a wish's fulfillability or unfulfillability. Intonation pattern INT1 and INT2 apply.

Type	Propositional
Function	Wishes
Grammatical Mood	-Subjunctive (particle *να*, optional negation *μη(ν)*, optional segmental marker *μακάρι*) -Hortative (particle *ας*, optional negation *μη(ν)*)
Tense	Present (fulfillable) Past (unfulfillable)
Aspect	Imperfective Present, Past) Perfective (Present only)
Person	1st, 2nd and 3rd
Number	Singular or Plural
Intonation Pattern	INT1 (INT2 when introduced by *μακάρι*)

G. Curses

Curses are expressed in the Subjunctive. They are introduced by the Subjunctive particle *να*; the optional Subjunctive negation *μη(ν)* might be used, while a speaker might opt to use the segmental marker *που* at the beginning of a curse. Present tense with perfect aspect characterizes their most common uses, which are expressed in the 2nd or 3rd person. In the 1st person, they are similar to an oath. They are expressed using a dedicated intonation pattern, INT5.

Type	Propositional
Function	Curses (Negative Wishes)
Grammatical Mood	Subjunctive(particle *να*,optional negation *μη(ν)*, optional segmental marker *που*).
Tense	Present (fulfillable)
Aspect	Perfective (imperfective not excluded, But uncommon)
Person	2nd /3rd (1st not excluded)
Number	Singular or Plural
Intonation Pattern	INT5

H. Wondering

MG wondering is expressed in the Indicative or in the Subjunctive. In the Indicative the use of the wondering particle *άραγε* (araye) is compulsory. The wondering particle's placement in the clause is not fixed i.e. it might precede or it might follow the verb. Wondering in Subjunctive can be expressed without the use of a specific segmental marker (other than the subjunctive marker *να*); or by the combination of *άραγε* + *να* (which strengthens the wondering illocution). Here again *άραγε* might precede the subjunctive marker, or it might follow the verb.

Type	Propositional
Function	Wondering
Grammatical Mood	-Indicative (segmental marker *άραγε*, optional negation *δε(ν),* optional particle *θα*) -Subjunctive (particle *να*, or combination of *άραγε* and *να*, optional negation *μη(ν), question word with INT3*)
Tense	Present/Past (also Future in Indicative)
Aspect	Perfective/Imperfective
Person	3rd
Number	Singular or Plural
Intonation Pattern	INT4 (also INT3 in Subjunctive)

I. Uncertainty

Uncertainty is a built-in characteristic of MG Subjunctive, similar to other languages. In many ways, wondering in Subjunctive expresses the Speaker's uncertainty about the validity of the described State of Affairs; such an uncertainty forms the impetus behind the Speaker's wondering. In addition to pragmatically relatively ambiguous uses (i.e. implying wondering as well as uncertainty), MG uncertainty is expressed through the use of particle *ίσως* ('isos', maybe), which might be followed by Indicative or by Subjunctive (the latter use expresses reinforced uncertainty). *Ισως* is most likely to be placed ahead of the Indicative verb, although it is not uncommon for it to follow the verb. Its position in a Subjunctive utterance is fixed, always preceding the subjunctive marker.

Type	Propositional
Function	Expression of uncertainty
Grammatical Mood	-Indicative (uncertainty particle *ίσως*, optional particle *θα*, optional negation *δε(ν)*, usually precedes the verb but position after the verb acceptable) -Subjunctive (particle *να*, uncertainty particle *ίσως*, optional negation *μη(ν)*)
Tense	Present/Past (Future in indicative acceptable by some speakers)
Aspect	Perfective/ Imperfective
Person	Any
Number	Singular or Plural
Intonation Pattern	INT1 (Subjunctive) INT2 (Indicative)

J. Polar and Content Interrogatives

MG Questions are expressed in Indicative. Polar interrogatives are differentiated by assertions because of the combination of the Indicative mood with intonation pattern INT4 and the expectation that the addressee will confirm or reject the validity of the proposition through a positive or a negative response. A response denoting consent to a polar interrogative would be inappropriate.

In content interrogatives a question word is involved (such as who, when, where among others) to identify the particular information the speaker is seeking. The question word might be introducing the content interrogative, or might be placed in different positions in the utterance depending on focality, which affects their intonation pattern; more than one element of the utterance can be questioned. INT3 applies to content interrogatives. The speaker's expectation is that the addressee will provide information on the slot denoted by the question word.

Type	Propositional
Function	Interrogatives
Grammatical Mood	Indicative (optional particle *θα*, optional negation *δε(ν)*) Question word(s)
Tense	Present/Past/Future
Aspect	Perfective and Imperfective
Person	Any
Number	Singular or Plural
Intonation Pattern	INT3 (content interrogatives); INT4 (polar interrogatives)

IV. Conclusions

We described above an original classification of the MG propositional basic illocutions, based on the functions' formal characteristics, which form part of the grammatical system and we placed the focus on function, rather than form.

All indicative uses are marked by the optional particle *θα* and the optional negation *δε(ν)*. Assertions are distinguished by the use of the Indicative and the use of intonation patterns INT1/INT2 (based on whether a broad or narrow focus applies). Mirative uses of approval are distinguished by the use of the Indicative, the use of intonation pattern INT3, and the lack of a question word related response from the addressee (when compared with the content interrogatives, also uttered in INT3). Content interrogatives are distinguished by the use of

Indicative mood, a question word (such as who, what, when where, how), the use of intonation pattern INT3 and the expectation that the addressee's response will provide information on the questioned element of the utterance. Polar interrogatives are distinguished by the use of Indicative mood, the intonation pattern INT4, and the expectation that a positive or negative response (or a response expressing a degree of certainty or uncertainty) will be provided by the addressee. Mitigated questions/proffer are expressed in Indicative, introduced by the segmental marker *μήπως,* expressed in INT4, in the 2nd person. Wondering uses are distinguished by the use of Indicative, the segmental marker *άραγε*, and the most common use of 3rd person (also the use of 1st person in deliberative questions). Assertions in disguise-contrastive statements are expressed in Indicative, they include either a compulsory tag (when their intonation involves intonation patterns INT2 for the assertive part and INT4 for the tag) or by *μήπως,* in the 1st person. When in the second or third person (excluding *μήπως* uses), the use expresses a request for confirmation.

Subjunctive propositional uses are marked by the Subjunctive particle *να* and the optional negation *μη(ν)*. Wishes are marked by the use of Subjunctive, the optional use of the segmental marker *μακάρι* and the intonation pattern INT1. Curses are marked by the distinct intonation pattern INT5 and the optional use of the segmental marker *που*. Uncertainty in Subjunctive is marked by the segmental marker *ίσως* and the intonation pattern INT1. Wondering uses in Subjunctive are optionally introduced by the segmental marker *άραγε*, marked by intonation INT4 and the use of 3rd person; 1st person deliberative uses require the compulsory presence of *άραγε*. Mirative uses (of disapproval) are marked by intonation. Hortative wishes are marked by the Hortative particle *άς* and intonation INT1/INT2; they exclude 1st person plural uses, which characterize expressions of exhortation.

REFERENCES

[1] J. Allan, "Recognizing intention from natural language utterances," in Brady, M. Berwick, R. (eds.) *Computational Models of Discourse*, Cambridge MA: MIT Press, 1983, pp.107–186.

[2] A. Arvaniti, & Baltazani, M., "Intonation analysis and prosodic annotation of Greek spoken corpora," in Sun-Ah Jun (ed.) *Prosodic Typology: The Phonology of Intonation and Phrasing*, Oxford: Oxford University Press, 2005, pp. 84–117.

[3] M. Chondrogianni, "Basic illocutions of the MG Indicative," in *10th International Conference on Greek Linguistics*, Komotini, Greece, (forthcoming[a]) September 2011.

[4] M. Chondrogianni, "Basic Illocutions of the MG Subjunctive (to appear in the Selected papers volume of ISTAL 20)," in *20th International Symposium on Theoretical and Applied Linguistics*, Thessaloniki, Greece, April 2011.

[5] M. Chondrogianni, "The Pragmatics of Prohibitive and Hortative in MG," in Kitis E., Lavidas N., Topintzi N. & Tsangalidis T. (eds.) *Selected papers from the 19th International Symposium on Theoretical and Applied Linguistics* (19 ISTAL, April 2009), Thessaloniki: Monochromia, 2011, pp. 135–142.

[6] M. Chondrogianni, "The Indicative in Modern Greek," in Tsangalidis A, (ed.) *Selected papers from the 18th International Symposium on Theoretical and Applied Linguistics* (18th ISTAL, May 2007), Thessaloniki: Monochromia, 2009, pp. 123–130.

[7] J. Habermas, *The theory of communicative action, London,* Beacon Press, 1981.

[8] K. Hengeveld and J. L. Mackenzie, *Functional Discourse Grammar: A typologically-based theory of language structure*, Oxford: Oxford University Press, 2008.

[9] K. Hengeveld, E. Nazareth Bechara, R. Gomes Camacho A. Regina Guerra, T. Peres de Oliveira, E. Penhavel, Goreti E. Pezatti, L. Santana, E. R. F. de Souza, & M. L. Teixeira, "Basic illocutions in the native languages of Brazil," in Mattos Dall'Aglio M. Hattnher, & K. Hengeveld, (eds) *Advances in Functional Discourse Grammar.* Special issue of Alfa-Revista de Lingüística 51 (2) 73–90, 2007.

[10] A.A.G. Steuten, R.P. van de Riet & Dietz, J.L.G., "Linguistically based conceptual modeling of business communication," *Data Knowledge Engineering* 35 (2) 121–136, 2000.

[11] W. Zadrozny, M. Budzikowska, J. Chai, N Kambhatla, S. Levesque, & N. Nicolov, "Natural Language Dialogue for Personalized Interaction", *Communications of the ACM* (CACM) 43 (8) 116–120, 2000.