

The theses of the doctoral dissertation

**A CORE/PERIPHERY APPROACH TO THE
FUNCTIONAL SPECTRUM OF DISCOURSE MARKERS
IN MULTIMODAL CONTEXT**

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1 OBJECTIVES OF THE DISSERTATION

1.1 Introduction, previous research

The dissertation studies the **functional, sequential and nonverbal properties of multifunctional discourse markers** (henceforth DMs) in multimodal context as well as explains their roles in the management of interaction from a **discourse-pragmatic perspective**. As argued in Chapter 1 (Introduction), the relatively high number of the occurrences of seemingly meaningless “small words”, often called “fillers” (referred to as DMs in this dissertation), such as *mondjuk* (~‘say’), *ugye* (~‘is that so?’), and *amúgy* (~‘otherwise’) and their common simultaneous co-occurrence with gestures in spontaneous interaction show that they form an integral part of our speech production and communication. DMs are commonly defined as “sequentially dependent elements which bracket units of talk” (Schiffrin 1987: 31), or metalinguistic items that provide information about the segmentation and operation of a discourse (Fraser 1999). In short, DMs are multifunctional pragmatic elements of heterogeneous word classes expressing various metacommunicative and cognitive functions.

From the perspective of **communication modelling**, successful communication requires the ability to infer the intended meaning of ambiguous communicative signals such as multifunctional DMs. It is argued in the dissertation that a multimodal, corpus-based approach is indispensable in dialog modelling in order to disambiguate the actual meaning or function of polysemous communicative signals such as DMs.

There are a great number of theoretical issues that are still **unresolved** in the literature such as uncertainty regarding DMs’ defining features, the lack of a widely accepted **terminology, functional taxonomy, annotation scheme and methodological guidelines** for their systematic description.

A **functional DM annotation system** is proposed in this dissertation as the result of a predominantly data-driven multi-step method. The proposed taxonomy was self-reflectively and continuously modified taking the **following approaches: (1) literature-based, (2) questionnaire-based, and (3) corpus-based**.

In what follows (1.2-1.4) the objectives of the theoretical and empirical research will be described in detail.

1.2 Theoretical issues

Chapter 2 of the dissertation provides an overview of the theoretical landscape my dissertation is rooted in. Theoretically, this work is grounded in functional approaches to both gesture studies and linguistics such as Conversation Analysis, Multimodal Discourse Analysis, Relevance Theory, Computational Pragmatics, Coherence Models of Discourse, Speech Act Theory and Pragmaticalization Theories.

Chapter 2.1 has a threefold goal: (1) to **critically overview a number of definitions and taxonomies of gestures** as well as three **major assumptions about the speech-gesture relationship**: the communicative, or listener-oriented view (McNeill 1992, Kendon 2004); the non-communicative, or speaker-oriented view (Krauss, Chen & Gottesmann 2000, So, Kita & Goldin-Meadow 2009); and the trade-off hypothesis (de Ruiter 2003, 2012); (2) to **provide methodological guidelines** on how to study gestures, that is, how to collect natural behavioural data; and (3) to briefly **describe influential standardization efforts** in multimodal corpus annotation to uniformly code speech and gesture, therefore, supporting the interoperability of language resources in the framework of research projects.

Chapter 2.2 focuses on the **role of DMs in interaction** and attempts to answer the following three sets of questions: (1) In what ways are the functions of DMs categorized by different authors and their discourse models? (2) How is the multifunctionality of DMs explained in different theories? (3) What processes account for the development of the new functions and the changes in the meaning of the selected lexical items?

1.3 Research questions concerning the interpretation of the role of DMs

Apart from the overview of various theories in the DM literature as well as the dictionary entries of the selected lexical items (*mondjuk*, *amúgy*, and *ugye*), my aims also include mapping average language users' intuitions about the meaning/function and necessity/optionality judgement of these three pragmalinguistic items in an explicit way. I specifically designed two types of questionnaires to check my seven assumptions, (1)-(7) outlined below. First of all, it was presumed that (1) informants feel the difference between the two parts of minimal pairs where one does not involve one of the three selected DMs, while the other part does.

Furthermore, I postulated that the three lexical items under scrutiny significantly **differ** from each other in terms of:

- (2) their **functional spectra**
- (3) the degree of **multifunctionality** they display
- (4) their degree of **optionality** and contribution to the discourse; that is, they add subtlety to the utterance with varying extent.

It was also assumed that (5) discourse functions and coherence relations are usually expressed or implicitly conveyed by other means, modalities, or semiotic channels as well (e.g. intonation, temporal aspects, facial expression, hand movement); therefore I expected to find a **relationship between the duration of an item and the degree of its perceived optionality.**

Moreover, it was also presumed that (6) **independently of the gender** of the informant, (7) responses confirm the **validity of the core/periphery model** of DMs (Bell 1998); consequently, one or two functions of each DM will be found considerably more frequent than other, peripheral functions in the opinion of the informants.

1.4 Research questions of the corpus-based multimodal analyses

The major goal of the analysis of DMs in the multimodal HuComTech corpus is to uncover the role of DMs in performing textual and interpersonal functions, expressing cognitive states, information states and interactional moves. The **multimodal analyses and corpus queries** were designed to answer the following three sets of questions (1.4.1, 1.4.2, 1.4.3) concerning the **discourse-pragmatic status**, sequential properties and prosodic features of the scrutinised DMs as well as the accompanying nonverbal behaviour of the speaker:

1.4.1 Sequential and functional properties of DMs

1. What common **lexical bundles, DM clusters** or patterns do the selected DMs form? What is the relative distribution of the **lexical co-occurrences** (preceding DMs and connectives) of the selected DM? Do the co-occurring DMs and/or connectives perform similar or contrasting functions?
2. What are the most **salient functions** of each of the DMs analysed?
3. Are their uses **genre-dependent**? Do their functions typically differ in political discourse and informal conversations?

1.4.2 Prosodic features of DMs

I also aimed to investigate if the different versions of a DM expressing different functions are **suprasegmentally marked**. In particular, is there a statistically significant relation between the **discourse function** of a DM and the

1. the presence of **preceding silence** in the utterance
2. the **mean F0** of the realization of a DM independent of each other
3. the **duration** of the realization of a DM?

Furthermore, is there a statistically significant relation between the **pitch movement** in the host unit of a DM and

4. the **position** of the DM in the **utterance**
5. the **position** of the DM in the **clause**?

1.4.3 Nonverbal-visual behaviour of the speaker during and around uttering the selected DMs

I also examined and systematically coded the nonverbal behaviour of the speakers at the time of uttering DMs. I wanted to identify if there is a statistically significant relation between certain **discourse functions** of a DM and

1. the simultaneous **gaze direction**
2. the simultaneous **facial expression**
3. the simultaneous **manual gesticulation** of the speaker.

I expected to find a relation between all of the factors outlined above in 1.3.2 and 1.3.3, and planned to design decision trees along these lines to automatically or semi-automatically distinguish the different uses and functional categories of DMs from each other based on physical, machine-detectable features (listed in 1.4.2 and 1.4.3), such as silence, gaze direction, manual gestures or facial expressions (by means of silence detector, eye tracking, hand tracking or emotion recognizer software).

1.5 Major objectives of empirical research

The ultimate purpose of the corpus analyses is to identify common patterns in DM use in my corpus, and describe the relationship between observed phenomena (DMs, speaker changes) and objective, physical machine-detectable and measurable features (e.g. duration of silences and certain lexical items, variations in pitch, intensity and gesticulation). Consequently, the identification of the most commonly co-occurring feature sets and their

modelling in decision trees will contribute to the semi-automatic disambiguation of discourse functions.

As a conclusion of both theoretical and empirical work, the ultimate aim of my research is to model an annotation system (proposed in Chapter 4) that entirely and systematically describes the functional spectrum of DMs in all domains of discourse.

2 RESEARCH METHODS

The dissertation attempts to answer the above listed research questions through the collection and in-depth analysis of empirical data. My corpus analysis **methodology** combines **quantitative and qualitative methods** in the **multimodal analysis** of both audio and video contents of the recordings as well as descriptive and inferential **statistical tests** during the interpretation phase of the questionnaire and corpus query results.

The **data** is taken from a variety of corpora, including 50 dialogues (approximately 14 hours of talk, wordcount: 129307 tokens) of the multimodal HuComTech Corpus (Hunyadi & al. 2012), a collection of mediatised interviews (7,5 hours of talk), and the relevant parts of a historical corpus, the Historical Corpus of Hungarian (Kiss & al. 2004) including texts written since 1772. The entire collection of the selected parts of the above mentioned corpora contains altogether 550 tokens of *mondjuk* (~‘say’), 313 tokens of *ugye* (~‘is that so?’), and 134 tokens of *amúgy* (~‘otherwise’).

Corpus collection and analysis is complemented with **diachronic analysis** so as to describe the historical development of certain lexical items into DMs as well as **questionnaire** work in order to map average language users’ intuitions about the present-day use, optionality and functions of the selected DMs. My aim is to discover the most salient function (or core instruction, cf. Bell 1998: 515–541) of each marker, and the contextual factors which may allow it to indicate peripheral functions and relations beyond its core. I designed two types of questionnaires, one with open-ended questions and one with multiple choice questions. As for the material of the tasks in the questionnaires, I used 42 example utterances and adjacency pairs, (taken from the HuComTech corpus, each involving one of the three selected DMs because I wanted to use naturally-occurring talk in context rather than made-up, artificial sentences given in isolation. Altogether 54 informants (university students) participated in the study and shared their intuitions about the role of the selected DMs in the randomly chosen utterances. The findings of the questionnaires enabled me to lay the groundwork for the framework of the annotation scheme.

The **tools** used in the course of the empirical stage of the research include: (1) the ELAN 4.5.1 annotation software (Brugman & Russel 2004: 2065–2068), (2) the Praat software (Boersma & Weenink 2007) for acoustic analysis, (3) the Simple Concordance Program for concordance searches, (4) Microsoft Excel for entering the answers of informants in questionnaires, and (5) SPSS 19.0 for the statistical analysis of the questionnaire and query results.

The **corpus queries** target the systematic and data-grounded description of the contextual environment, position, prosodic features, nonverbal-visual markers and stylistic properties of the three lexical items. The queries are aimed at identifying the cues and their thresholds (e.g. minimal duration of silence) or parameters (e.g. direction of gaze and type of facial expression) to distinguish various pragmatic uses of the same lexical item in order to model them in a decision tree. Figure 1 outlines the multimodal empirical **research process** in a flowchart with the stages on the left and the corresponding tasks on the right.

Figure 1 *Stages of the empirical research*

| | |
|----------------------------|--|
| Preliminary stage | <ul style="list-style-type: none"> •pre-recording and recording phases •task design, corpus design, speaker recruitment -> corpus building |
| Corpus annotation stage | <ul style="list-style-type: none"> •audio and video annotation design, recruiting and training annotators •organizing regular annotators meetings -> cross-checking annotations |
| Pre-pilot stage | <ul style="list-style-type: none"> •qualitative analysis of 120 APs involving DMs •selecting and cutting 42 APs and DMs --> questionnaire design |
| Pilot stage | <ul style="list-style-type: none"> •questionnaire A and B with open-ended questions -> questionnaire C with multiple choice Qs •statistical analysis -> testing the findings on 100 DMs |
| DM segmentation stage | <ul style="list-style-type: none"> •manual segmentation of DMs in the software ELAN |
| Feature extraction stage | <ul style="list-style-type: none"> •exporting transcriptions and annotation into Praat -> automatic annotation of silences and prosodic features-> queries in ELAN |
| Statistical analysis stage | <ul style="list-style-type: none"> •descriptive and inferential statistical tests of queries in SPSS 19.0 |
| Interpretation stage | <ul style="list-style-type: none"> •attempts at semi-automatic disambiguation of salient discourse functions -> designing and testing decision trees |
| Comparative stage | <ul style="list-style-type: none"> •analysis of the uses of the scrutinised DMs in further genres: mediated political interviews and TV shows |
| Conclusions stage | <ul style="list-style-type: none"> •drawing conclusions of both theoretical and empirical research |

3 RESEARCH FINDINGS

3.1 Theoretical issues (Answers to research questions listed in 1.2)

To account for the multifunctionality of DMs and to explain the changes in their scope, meaning and functions, I turned to the theory of *pragmaticalization* (Aijmer 2002, Traugott & Dasher 2002) and the methodology of historical pragmatics. In order to find traces of the ***pragmaticalization process*** of the analysed DMs, I used as data the Hungarian Historical Corpus (Kiss & al 2004) and in several etymologic (Benkő 1967–1984), historical (Ballagi 1872, Czuczor & Fogarasi 1862, Szarvas & Simonyi 1893) and general contemporary dictionaries (Ittész 2006, Pusztai & al. 2003).

Based on dictionaries and historical corpus material, I have traced the following **historical development of the meanings of *mondjuk* as a DM:**

verb with propositional and conceptual meaning (declarative and imperative *mondjuk*) → frequent use in matrix clause/embedded clause (*hogy úgy mondjuk; mondjuk ki, hogy*) → semantically bleached parenthetical expression (*mondjuk*) → discourse marker with non-conceptual and non-propositional meaning, including the potential to express subjectivity and politeness as well.

The historical development of the meanings of ***ugye* as a DM** was found to evolve as follows:

simultaneous uses of various compound forms: *úgy van-é? / úgy van-e? / úgy-é? / úgy é? / úgy-e?* → merging and phonological reduction → *ugye*: interrogative adverb → question expecting positive reply and/or reassurance → marker of evidentiality expecting the confirmation of the validity of the content of the host utterance of the DM.

Thirdly, the historical development of the meanings of ***amúgy* as a DM** can be outlined as follows:

merge of two sentence words, *a* and *m* → *am/ám* (allophones) → *am(a) + úgy* → *amúgy* adverb → *amúgy* sentence adverb → *amúgy* DM.

In short, I have found that *mondjuk* is currently at a later stage of pragmaticalization than *ugye* and *amúgy*. In other words, *ugye* and *amúgy* retained more of their conceptual meaning.

3.2 Findings of the questionnaires (Answers to research questions listed in 1.3)

As far as **average language users' intuitions** are concerned about the use of selected DMs, five of my seven hypotheses are confirmed, while two had to be rejected. Concerning my **first hypothesis**, 86.65% of the informants do feel the **difference** between the two parts of minimal pairs where one does not involve one of the three selected items, while the other part does; therefore, my first hypothesis is confirmed since DMs were predominantly interpreted by my respondents to modify or **change the propositional content** of the utterance. According to the results of questionnaires A, B and C, my **second hypothesis** is also confirmed since all three scrutinised Dms are found to have **multiple meanings**, and their **functional spectra** significantly differ from each other. However, my **third hypothesis** that they display different **degrees of multifunctionality** is **rejected** since instances of *mondjuk* were assigned 1.23 functions on average, each *amúgy* instance was labelled 1.26 functions, and each *ugye* instance was assigned 1.24 functions on average. The difference among these values is not significant. My **fourth hypothesis** that the three items differ in term of **optionality** is also confirmed by the responses of the informants since the mode scores of the three items are different. *Mondjuk* (~'say') is considered to be the most necessary item/ the least likely item to be omitted (with a mode score of 3), and *ugye* is considered to be the most optional item/ the most likely item to omit (with a mode score of 1). The reason for this is probably that the most salient function of *mondjuk* is the expression of the relation of *contrast and concession*, and this coherence relation is rarely marked in other modalities. On the other hand, the most typical function of *ugye* is *explanation* which is marked by other means (usually by hand gesticulation) as well. My **fifth hypothesis** concerning the **correspondence between the duration of an item and the degree of its perceived optionality** must be rejected. I found that the duration of an item does not influence the degree of optionality in the judgements of the informants. The shorter the DM, the more optional/omittable it is. Furthermore, male and female informants did not assign significantly different functions to any of the three DMs. It only looked suggestive but did not prove to be significant that male informants are more likely than female informants to judge certain items as fillers. Therefore, my **sixth hypothesis** concerning the **lack of gender differences** in the judgements is also confirmed by the questionnaire results. It can be concluded that responses of the informants confirm the **seventh hypothesis**, the **validity of the core/periphery approach** to the multifunctionality of DMs (Bell 1998) since each selected item has distinctly separable prototypical core functions and peripheral roles.

Contrasted with existing dictionary entries of the selected lexical items, several **new functions** of the DMs were identified, such as the ability of *mondjuk* to express *contrastive* or *concessive* relation. It was found that *mondjuk*, *ugye* and *amúgy* are all interpreted to express *emphasis* and introduce *commentaries*. The importance and relevance of highlighting the *example marking* and *approximation* roles of *mondjuk*, the *question marking* use of *ugye* and the *contrastive* use of *amúgy* in dictionary entries is supported by my results as well.

3.3 Findings of the corpus-based multimodal analyses (Answers to research questions listed in 1.4)

The **corpus queries** addressed the **discourse-pragmatic description** of the scrutinised DMs in terms of their sequential, prosodic and visual features. Concerning the multimodal description of DMs, some of my hypotheses were supported and most of them were rejected.

3.3.1 Sequential and functional properties (of the analysed DMs) (Answers to 1.4.1)

My first goal was to find out what common **lexical bundles**, **DM clusters** or patterns the selected DMs form. → I found that there are often DM clusters in the analysed material, where the individual DMs either strengthen each other's function or sometimes create a completely new function. First, the frequent co-occurrence of *mondjuk* (~'say') with the connectives *de* (~'but'), *hát* (~'well') and *meg* (~'and') is not simply the result of a coincidence; instead, these systematic, recurring patterns also prove the DM membership of *mondjuk*. Second, *ugye* (~'is that so?') was preceded by a DM or a connective in approximately 40% of the cases in the interviewees' talk, while in the interviewer's speech *ugye* followed a DM or a connective in approximately 43% of the cases. Most of these *ugye-clusters* (*meg* (~'and'), *hát* (~'well') and *hogy* (~'that') + *ugye* (~'is that so?')) are used in explanations. Third, *amúgy* (~'otherwise', 'by the way') is followed by a smaller set of connectives than the other two analysed DMs. Its relatively common co-occurrence (38,46%) with the subordinating connective **mer* (~'cause') strengthens its role in explanations, while its co-occurrence (19,23%) with the coordinating connective *de* (~'but') either indicates the relation of contrast or concession between the linked segments or it is typically used to introduce a new topic.

My second question addressed the identification of the most **salient functions** of each of the DMs analysed. → Firstly, the most frequent and **salient functions** of *mondjuk* (~'say') involve contrast/concession and giving example. Secondly, *ugye* serves various functions to a similar extent/degree with explanation, question, background information and emphasis being

the top ones. Thirdly, the most frequent and salient functions of *amúgy* (~'otherwise') are commenting and explanation.

My third question was if their uses are **genre-dependent**, and if their functions typically differ in mediatized political discourse and informal conversation. → Regarding the **comparison of the frequency of use of the DMs in two different discourse genres**, I found *mondjuk* (~'say') to be more common in informal conversations than in political interviews. The reason for the difference most probably has to do with the conversational, colloquial nature of this DM. Concerning the frequency of *ugye* (~'is that so?'), I found a different tendency as it is significantly more frequent in my corpus of political interviews than in informal conversations. This finding is most probably related to the fact that there are two different frames of interaction: one between the IR and the IE and one between the first-frame participants and the audience. The difference in the available background information and the degree of shared knowledge between the IR and the audience is explicitly expressed by *ugye* (~'is that so?') in order to let the first-frame participants know that the speaker is aware that they are familiar with the facts under discussion. It is also important to mention that I did not find significant cross-genre differences in the frequency of use of *amúgy* (~'otherwise'), although it is somewhat more commonly used as a DM in informal conversations than in political interviews. Further research might prove that political interviews are characterized by more formal counterparts of *amúgy*, such as *egyébként*, (~'otherwise', 'furthermore') or *mellesleg* (~'besides').

3.3.2 Prosodic features (Answers to 1.4.2)

Running prosodic queries, I aimed to find out if the different versions of a DM expressing different functions are **suprasegmentally marked**.

A **statistically significant relation was not found** between the **direction of pitch movement** in the host unit of a DM and the position of the DM in the utterance. Surprisingly, defined at clause-level, significant relationship was identified between the two variables in the case of *mondjuk* (~'say') and *ugye* (~'is that so?'). I did not find a relation either between pitch movement in the host unit and the discourse function of the DM, **except for** two core functions of *ugye* (~'is that so?') where rising intonation is typically used in questions, while stagnant intonation is the most common in explanations.

Similarly, no significant relation was found between the discourse function of a DM and the presence of **preceding silence** in the utterance, **except for** *mondjuk* (~'say'). When *mondjuk* (~'say') operates in the discourse space of exchange structure and introduces a

dispreferred second pair part, usually marking disagreement, it appears in utterance-internal position preceded by silence.

Surprisingly, the correspondence between discourse-pragmatic function and the **mean F0 of the realization of a DM** is not significant in the language use of both male and female speakers. The majority of the female speakers pronounce *ugye* in question function with relatively higher pitch than in explanatory sequences in assertions. This is not surprising since Gussenhoven & Chen (2000) claim that high pitch, as a suprasegmental feature, universally marks dependence and questioning. However, it is surprising that the F0 data of male speakers do not reflect this tendency.

As a result of the queries, **significant difference was found** between the **mean durations** of the realizations of *mondjuk* (~'say') in its two most salient functions, since its lexical search or approximation function is typically uttered longer (0.295 s) than its contrast/concession functions (0.208 s) ($p < 0.05$). Both the segment duration of *mondjuk* and preceding silence also seem to play a role in the production and interpretation of its function. On the other hand, the difference between the relative distribution of the durations of the two most salient functions of *ugye* (~'is that so?') and *amúgy* (~'otherwise') was not proven to be significant by independent samples t-test.

3.3.3 Nonverbal-visual behaviour of the speaker at the time of uttering the selected DMs (Answers to 1.4.3)

Regarding accompanying visual features, I found that **there is a relation between certain discourse functions** of a given DM **and** the:

- simultaneous **gaze** direction of the speaker (in the case of certain functions of the DMs, *mondjuk* and *ugye*)
- simultaneous **facial expression** of the speaker (only in the case of recalling facial expression and the lexical search or approximation functions of *mondjuk*)
- simultaneous **manual gesticulation** of the speaker (only in distinguishing two major functions of *mondjuk*).

In detail, when the primary role of a DM is thematic control, and its meaning can be glossed as 'well', 'yes but', or 'on the other hand', the speaker typically displays upward or sideways **gaze**. Furthermore, when the function of *mondjuk* (~'say') is to mark the coherence relation of contrast and to express alternative viewpoints or disagreement in the action structure, the nonverbal behaviour of the speaker can be described by one or more of the following features: looking aside (averted gaze), headshake, lifting eyebrows up and/or scowl.

In contrast, operating during lexical search, *mondjuk* is often preceded by and simultaneous with upward gaze direction and a contemplating, recalling facial expression of the speaker. On the one hand, explanatory sequences (marked by *ugye*) are typically accompanied by the shifting gaze of the speaker where the distribution of gaze direction types during explanations is rather varied and balanced. On the other hand, during tag questions (checking information or asking for reassurance), the overwhelmingly most frequent gaze direction type is forward, or eye contact in other words, which marks giving the floor over to the listener.

There is a considerable difference among the distribution of the *recall* **facial expression** types. As mentioned before, the vast majority of recall expressions are made during lexical search and with this, *recall* is the second most frequent expression type after *natural* during lexical search.

Concerning **manual gesticulation**, when specification and providing example is introduced by *mondjuk* (*~'say'*) in the discourse domain of information state, hand gestures are performed during topic elaboration. When the speaker emphasizes and marks the introduction of new information, the gesture is usually simultaneously performed with uttering *mondjuk*, or sometimes precedes it (with 100–2000 ms), in a way that either or both palms look upward. Contrary to my expectations, the verbal expressions of contrast and concession are more typically accompanied by hand movements than lexical search and approximation (especially by bimanual hand movements to either side). If, however, *mondjuk* expressing lexical search and approximation is used simultaneously with hand movements, the manual gesture involves the circular movement of only one of the hands. There is a highly significant relation ($p < 0,01$) between different discourse functions and accompanying, overlapping manual gesticulation in the case of *mondjuk* (*~'say'*) ($\chi^2(1) = 12,442$) and *ugye* (*~'is that so?'*), ($\chi^2(1) = 14,528$) which means that the feature of simultaneously performed hand gestures may contribute to the disambiguation of their meaning. The difference in the frequency and extent of hand gestures is even more considerable in the case of *ugye* (*~'is that so?'*) where explanations are frequently, while questions (asking for reassurance or checking information) are very rarely performed with simultaneous manual gesturing.

3.4 Ultimate findings: decision trees and a DM annotation scheme (Answers to 1.5)

The **results of corpus queries** suggest that the **machine-detectable defining features** distinguishing different functions are the position, duration of the DM, the simultaneous performance or cessation of manual gesticulation and the gaze direction of the speaker. These observations have led to the development of two **decision trees** which can distinguish

between two salient functions (1. lexical search versus 2. concession or contrast marking) of *mondjuk* (~'say') (see Figure 2) and the major functions (1. checking information / assumptions or asking for reassurance versus 2. marking explanation) of *ugye* (~'is that so', 'isn't it?', 'right?') each (see Figure 3), and may later be implemented as an algorithm. The further down we move in the decision tree (that is, the more criteria the token passes), the higher reliability values we have (that is, the more tokens fall into the indicated category, between 80–100%, depending on the end node of the decision).

The review of the literature, the findings of the questionnaires and the corpus queries jointly contributed to the refinement of my proposed annotation model that entirely and systematically describes the functional spectrum of DMs. I created a new classification scheme which covers all the domains of discourse, and then, within these domains I offered mutually exclusive categories. Therefore, a single DM can be described in several domains of discourse by using the new scheme. It was important that the category labels within a tier must be mutually exclusive so that the annotator can attach only one label/tag at one functional discourse level, but may attach a label at any number of the large functional categories. The DM annotation scheme proposed involves the segmentation and labelling of DMs along the following aspects and domains of interaction:

1. **Own Speech / Communication Management Functions (Speech_M):** *lexical search, reformulation, giving example, explanation*
2. **Attitudinal Functions / Attitude Marking (Attitudinal_F):** *approximation, emphasis, PFM_booster¹, PFM_hedge* (usually involving mitigation and politeness), *rhetorical question*
3. **Interpersonal Functions (Interpersonal_F):** *agreement, emphasis, asking for reassurance, expressing sympathy* (involving face management and politeness)
4. **Structural Conversation Management (Conversation_M):** *turn-take* (distinction of *preferred second pair parts* and *dispreferred second pair parts*), *turn-keep*, *turn-give (end-of-turn)*, *(listener's) backchannel*
5. **Thematic Control (Thematic_C):** *introducing topic initiation, topic elaboration, topic change, marking concession*

¹ The abbreviation PFM stands for pragmatic force modifier (Nikula 1996).

6. **Communicative Acts (CA):** *constative* (including explanations), *directive* (including questions: checking information, asking for reassurance), *acknowledgment*, *commissive*, *indirect acts* as the host unit of a DM

7. **Information Management (Information_M):** signalling *new information*, *evidentiality marker* (marking the evidentiality of the information, signalling *given/known information*).

The categories to be labelled should be seen as prototype categories; therefore, the labels reflect their core functions. However, there are no sharp boundaries between categories. In contrast, these categories should rather be considered as fuzzy sets which might be overlapping. Most importantly, the annotation tool, ELAN 4.6.1 enables tagging multiple functions to a single DM, which is necessary because most DMs simultaneously perform multiple functions.

All in all, the dissertation primarily contributes to the **methodological considerations** in discourse analysis in general and DM research in particular, emphasizing the study of the role of nonverbal modalities both in the production and interpretation of social interaction. The research provides insight into the largely unexplored field of the interplay of verbal discourse markers and nonverbal (visual and acoustic) behavioural cues. What I hope to have illustrated is that DMs and their accompanying nonverbal features make an important contribution to the interpretation of various discourse transitions; and that a **multimodal**, primarily **discourse-pragmatic, corpus-driven perspective** on the functional spectra of individual DMs is a more fruitful approach than semantic-taxonomic methods, often adopted in the pertinent DM literature.

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List of publications related to the dissertation

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16. Bódog A., **Abuczki Á.**, Németh T.E.: A multimodális pragmatikai annotáció jelentősége a számítógépes nyelvészetben.

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