Thematisation and Prosodic Emphasis in Spoken French

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A Preliminary Analysis

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Abstract

This study aims at examining the links between thematic constructions and prosodic emphasis, and the way the two types of operations can be reinforced by gestures. It was conducted on a corpus of 1h30 of spoken French, involving three pairs of speakers in dialogues. Results show that although the tendency is for emphatic constructions as a whole not to be reinforced by gestures, there is still a higher proportion of gesture reinforcing with prosodic emphasis than with syntactic thematisation. The paper describes which eyebrow and head movements as well as hand gestures are more liable to accompany the two operations.

Index Terms: Multimodality, thematisation, prosodic emphasis

1. Introduction

Thematisation and focalization have been the object of quite a large body of research, either conjointly or independently, although with much variation in the terminology. They share the property of highlighting objects of discourse, using syntactic, prosodic and/or semantic devices. Without entering the various pragmatic subtleties of thematisation and focalization in their different uses by speakers, a short definition is however needed for both terms. Thematisation is a syntactic operation of fronting of an argument that is derived from the opposition between a "theme" and a "rheme". The theme-rheme structure of the sentence was proposed by Mathesius and his followers in the Prague School. They defined a theme as given information in the sentence as opposed to the rheme that corresponds to new information. The given-new distinction has been used since in works by Chafe [5] and Halliday [13] among others, and has served widely to explain some operations of thematisation and distinguish between different types of fronting. Other works (for instance [2]) based their distinction on the opposition between a "topic" and a "comment", the topic being "what one speaks about" and the comment "what is said about the topic". In this framework, studies define thematisation as a formally marked realization of the topic in an utterance [6]. Each of these two definitions is useful in the explanation of the different types of thematisation operations, yet, we had the feeling that each one also excluded some of the data that we felt were sharing common characteristics. We therefore propose the following definition for thematisation, which seems to account better for some occurrences we examine in this paper: we understand thematisation as the "highlighting of a referent that is (re)activated in discourse by way of its syntactic extraposition at the front of the matrix sentence, in topic position". This definition allows for the referent to be coreferentially linked with the subject or object of the matrix sentence, or even to be completely detached from this sentence. However, it excludes adverbials in initial position as they do not (re)activate a referent but rather offer a spatio-temporal frame to the referent as described in [16]. The syntactic operations of thematisation we analyzed in this paper are described in section 2.1. Focalization has also different meanings in the literature depending on the type of study. [16] summarizes (p. 99) the three main acceptions of the term as corresponding to some:

- "cognitive state", i.e. the element in focus is the most active element in the mental representation of the speaker,
- "informative state", i.e. the element in focus bears the new information in the utterance,
- "prosodic emphasis", i.e. the element that stands out prosodically speaking in the utterance.

In this paper, we retained the last definition and will call focalization a particular type of prosodic prominence which is fully described in section 2.2.

What is common to the works quoted so far is that they are all interested in the highlighting of some element in discourse. There are however other means of highlighting items if we consider speech from a multimodal perspective. For instance, [12], [18] and [19] studied the links, both from the production and perception point of view, between some gestures (eyebrow raises, hand beats and head nods) and acoustic prominence. They showed in experimental studies that these gestures facilitate the perception of prominence, but also that, when produced together with speech, they influence some acoustic parameters of speech. According to [1], “head-nods have been shown to be a stronger cue in the perception of prominence than eyebrows” (p. 303). In a pilot study [7], we also showed that some gestures play a role of reinforcement in spontaneous speech and found a link between gestural reinforcement and connectors, metaphorics and adverbs. No link could however be established between any accent type and gesture reinforcement at the time and this was probably due to the small size of the corpus. In this paper, we decided to develop the previous work and to study gesture reinforcement of thematic and prosodically emphatic utterances in a larger corpus of spoken French. The idea is to examine the gestures produced together with utterances which are already marked from the syntactic and prosodic point of view and to see whether there are differences in the gestural reinforcement of the two types of highlighting, as well as to look at the possible links between thematisation and prosodic emphasis.

2. Data

The corpus examined in this study consisted of a video recording of spontaneous conversations in French. It lasted 1h30 and involved 3 pairs of speakers. The total video recording lasts 3h and was recorded at Aix en Provence by R. Bertrand and B. Priego-Valverde. It was transcribed orthographically and has been used since in the nationally funded project OTIM for multimodal treatment. The details of the recording conditions were reported in [4].

2.1. Thematic structures

The thematic constructions were annotated in Anvil [11] on the transcription of the words only and we listened to the sound only in ambiguous cases (concerning mostly pronominal dislocation described below, that can be confused in writing with repetition of the pronoun due to hesitation). In order to be clear about what we understand by thematic structures, here is a list of the "traditional" operations taken into account in this paper, which are also summarized in [16]:

Left dislocation: detachment of an NP can be made at the beginning of the utterance. We noted this type of construction *Full NP dislocation* (FULL NP DS) when the dislocated element was a noun possibly followed by a relative clause, and *Pronominal dislocation* (PRO DS) when the dislocated element was a pronoun. The detached NP or Pro can be referred to in the matrix clause or not, we did not make this distinction. One must note that pronominal dislocation is much more frequent in spoken French than it is in spoken English, and that all personal pronouns may be detached. This type of dislocation is generally used in its contrastive value in written French. [10] made the same observation for English and even observed that this type of dislocation is also dependent on genre and familiarity. Examples from the corpus are:

- FULL NP DS: **Les ânes, c'**est vraiment insupportable. (*The donkeys, they make a terrible noise.*)
- PRO DS: Et **vous, vous** êtes prêts alors? (*And you, you are ready then?)*

We also noted the so-called pseudo-cleft and cleft constructions, knowing that we included structures of the type "It is true that…" in the cleft sentences although these structures constitute fossilized phrases.

- PSEUDO-C: **Ce qui me gênait**, ouais, **c'**était ça. (*Yes, what I didn't like was this.*)
- CLEFT: **C'est un truc qui** me dit rien du tout. (*It is something that I don't feel like doing.*)

We noted the presentative construction as well, which is always of the type "There was/were X that/who…".

- PRES: **Y avait ma sœur et des amis qui** étaient venus me rejoindre. (*There were my sister and some friends who came to visit me.*)

At last, we noted topicalizations, which are not very frequent in spoken French and are almost always introduced by a topic marker (like *concerning, about…*).

- TOP: **Au niveau animaux**, c'est tout ce qu'ils ont. (lit. *Concerning animals, it is all they have = These are the only animals they have.*)

Table 1. Number of thematic constructions studied in the corpus.

Syntactic constructions	Nb
FULL NP DS	81
PRO DS	116
CLEFT	36
PRES	58
PSEUDO-C	9
TOP	14
TOTAL	314

2.2. Prosodic emphasis

Perceived prosodic emphasis was noted on the sound only using Praat [3] and then imported in Anvil. What was noted in Praat was the entire clause that carried the emphasis and in Anvil, multilinks were created between the notation of the emphasis and the word that carried it. Prosodic emphasis is understood as some unusually strong word onset (this is unusual since French normally carries primary stress on the last syllable of the word and nuclear stress falls on the last syllable of the intonation group) that may be accompanied by a step up in pitch. *Figure 1* below shows an example of two utterances which are almost identical semantically (*We didn't speak about it later*). They were produced by the same speaker and whereas the first utterance shows the unmarked prosodic contour for this type of statement, with a continuation rise of the curve on the last syllable of the intonation group, the second curve shows a strong emphatic stress on "pas" (*not*) characterized by a strong initial plosive and a step up in pitch that is then forming a plateau up to the end of the utterance.

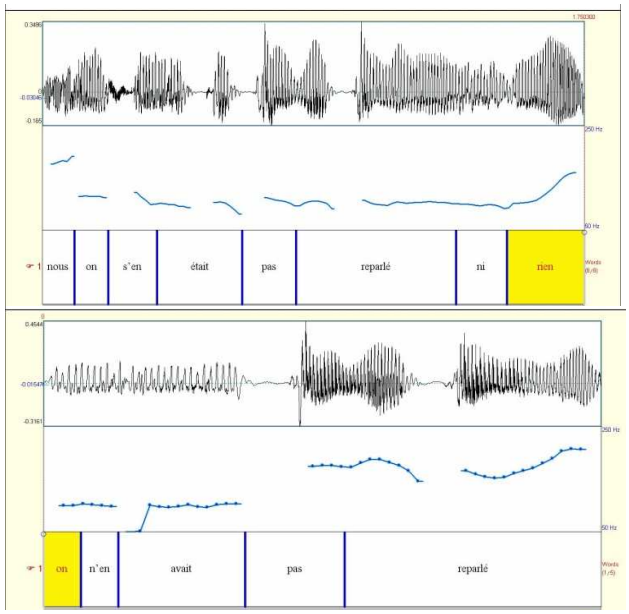

Figure 1: F0 Praat curves in Hz of the utterances "on s'en était pas reparlé" and "on en avait pas reparlé" produced by the same speaker.

We did not note normal nuclear stress as emphatic. However, prosodic emphasis may play different roles in discourse and these were noted as well, based on discourse context. It is true that the different types of prosodic emphases that we analyzed here may not be distinguished by any prosodic differences in the signal, but since they play different functions in discourse, they may well be accompanied by different types of gestures. We therefore thought it might be relevant to distinguish the following categories:

Lexical retrieval (LEX R) induces prosodic emphasis when the right word has been found after some hesitation on the part of the speaker. Sometimes, the question is not so much "how shall I put it?", but rather "what was it I wanted to say?". In this context, the emphasis type was tagged *Idea retrieval* (ID R).

When some contrast is explicitly marked in discourse (with phrases like *not... but…*), the emphasis was tagged *Discourse contrast* (DIS CONT).

When the speaker corrects a word he has uttered or partially uttered just before, the emphasis was tagged *Self-correction* (SC) and when he/she openly contradicts the other participant, the emphasis was tagged *Other contradiction* (OC).

All other cases of emphasis were tagged *Focalization* (FOC).

Table 2. Number of occurrences in each type of prosodic emphasis.

Prosodic emphasis	Nb
ID R	14
FOC	271
DIS CONT	49
LEX R	23
OC	23
SC	8
TOTAL	388

2.3. Gestures

The coding scheme and the annotations made for gestures have been fully described in [4] and [9]. It is quite complex as it includes quite a precise description of the gestures produced by speakers, most of which were not used here so we will rather concentrate in this section on the description of the annotations actually used for this particular study.

Gestures were annotated using Anvil in a series of different tracks, three of which were actually copied onto the file that included words, prosodic emphasis and syntactic constructions. The three tracks were:

- Eyebrow movements, which has only two values: *raising* and *frowning*.
- Head movements, with the following values: *beat, jerk, nod, shake, tilt, turn, pointing, other*. These values encode what is perceived as gesture, not change of posture or direction of the head.
- Hand gestures, with values inspired from [14] and [15]: *beat, deictic, emblem, iconic, metaphoric, butterworth*. The original annotation also included *adaptators* but these were not taken into account in this study.

Gestures were considered as co-occurring with syntactic constructions or prosodic emphasis when they were produced in overlap with either the detached NP in the case of thematisations or with the word that bore the focal accent in the case of prosodic emphasis. This was noted in the Anvil file with multilinks for easier retrieval of the information. Whenever two gestures co-occurred with syntactic constructions, both head movements were selected as co-occurring gestures, and only the hand gesture whose stroke coincided with the syntactic construction was selected. This distinction was made because of the fact that whereas head movements are generally quite short, hand gestures are much longer and produced in anticipation of the affiliate as shown in [8] and therefore the preparation of the second gesture in a sequence of two gestures may be produced in overlap with the first affiliate.

Table 3.Number of gestures annotated in the corpus.

Eyebrows	NB
Raising	495
Frowning	83
Head	**NB**
Beat	309
Jerk	293
Nod	587
Pointing	9
Shake	489
Tilt	259
Turn	309
Other	265
Hands	**NB**
Beat	180
Butterworth	36
Deictic	159
Emblem	174
Iconic	324
Metaphoric	416

3. Results

3.1. Syntactic vs. prosodic emphasis

Out of the 314 occurrences of thematic syntactic constructions, only 51 co-occur with prosodic emphasis and these are distributed evenly among the different types of prosodic emphasis so that no particular type of prosodic emphasis is preferred to accompany the syntactic constructions and vice versa. What should be noted is that among the 51 co-occurrences of syntactic and prosodic emphasis, the prosodic emphasis occurs on an element of the rheme of the syntactic construction in 36 cases and on an element of the theme in only 15 cases. Due to the small number of occurrences, no statistical treatment could be done[1], but the syntactic constructions with the highest percentage of prosodic emphasis on the theme are the PRES, PSEUDO-C and TOP, as illustrated in *Table 4*.

Table 4. Percentage of prosodic emphasis occurring on the theme of the different syntactic constructions.

Syntactic constructions	% of prosodic emphasis on the theme
FULL NP DS	2.46
PRO DS	2.58
CLEFT	2.77
PRES	10.34
PSEUDO-C	11.11
TOP	14.28

3.2. Gesture marking

Table 5. Number of occurrences and percentage of gesture combinations and gesture types alone in the syntactic and the prosodic contexts[2].

Gestures	Syntax	%	Prosody	%
head+eyebrows+hands	1	0.38	13	3.35
head + eyebrows	3	1.14	13	3.35
head+hands	3	1.14	25	6.44
eyebrows+hands	6	2.28	19	4.89
head alone	15	5.70	*53	13.65
eyebrows alone	18	6.84	19	4.89
hands alone	72	27.37	114	29.38
TOTAL	118		*256	

Syntactic constructions and prosodic emphasis may be accompanied with one or more gestures. Before going into the detail of which gestures are preferred in both cases, it is interesting to have a view of the load of gesture accompaniment. As we tested head and eyebrow movements

[1] No statistical treatment has been done under 10 occurrences.
[2] Figures preceded by * are statistically significant, but only the grey-highlighted part of the table was tested with the proportion test. Statistics were run with R (http://www.r-project.org/).

as well as hand gestures, we were interested in knowing if gestures would combine or be used alone when accompanying syntactic constructions or prosodic emphasis. *Table 5* above gives the number of occurrences and the percentage of gesture combinations and gesture types alone in the syntactic and the prosodic contexts respectively.

A proportion test revealed that there is higher proportion of total gesture marking with prosodic emphasis than with syntactic constructions (Prop.Test: X-squared = 27.72, df = 1, p-value = 1.39e-07) and that is probably due to the fact that there is a higher proportion of head movements alone than for syntactic constructions (Prop.Test: X-squared = 9.77, df = 1, p-value = 0.001). There was no significant difference in the proportion of eyebrow movements or hand gestures alone between both contexts.

3.3. Eyebrow movements

Table 6 and *Table 7* show the number of eyebrow movements that accompany prosodic emphasis and syntactic constructions (which are not themselves linked to emphasis). The proportion test shows that there are slightly more eyebrow movements in the case of prosodic emphasis than in that of syntactic constructions (Prop.Test: X-squared = 3.70, df = 1, p-value = 0.05). We thought that this might be due to a higher proportion of eyebrow movements in the case of prosodic focalisation (with 39 occurrences out of the 65 total number), but the test is not significant. The proportional distribution of frowns and raises co-occurring with prosodic emphasis and syntactic constructions is of the same order as there is no significant difference between the two contexts in this respect.

Table 6. Number of eyebrow movements accompanying each type of prosodic emphasis.

Prosody	frowning	raising	total
ID R	0	2	2
FOC	8	31	39
DIS CONT	1	7	8
LEX R	2	3	5
OC	3	5	8
SC	1	2	3
TOTAL	15	50	*65

Table 7. Number of eyebrow movements accompanying each type of syntactic construction.

Syntax	frowning	raising	total
PSEUDO-C	0	0	0
FULL NP DS	1	2	3
PRES	0	3	3
PRO DS	4	11	15
CLEFT	1	4	5
TOP	1	2	3
TOTAL	7	22	29

3.4. Head movements

Table 8 below gives the number of head movements (of which only the most frequent types – beats, nods and shakes –are detailed here) that accompany prosodic emphasis. Details are not given for the head movements that accompanied syntactic constructions as there were only 22 head movements in all for the 263 syntactic construction not linked to emphasis, evenly distributed among the different head movements and syntactic construction types, and yielding few occurrences each time.

Table 8. Number of head movements accompanying each type of prosodic emphasis.

Prosody	beats	nods	shakes	other	total
ID R	0	0	0	2	2
DIS CONT	3	4	2	3	12
SC	1	0	1	0	2
FOC	24	10	20	15	69
LEX R	2	0	4	1	7
OC	1	1	2	3	7
TOTAL	*31	15	*29	24	*99

The test first revealed that the proportion of total head movements that accompany prosodic emphasis is higher than the one for syntactic constructions (Prop.Test: X-squared = 29.34, df = 1, p-value = 6.05e-08). Among the head movements produced with prosodic emphasis, there is a higher proportion of beats (Prop.Test: X-squared = 28.94, df = 1, p-value = 7.45e-08) and of shakes (Prop.Test: X-squared = 5.26, df = 1, p-value = 0.02), than in the rest of the corpus. However, the proportion of head nods is not significantly different from the rest of the corpus.

We tested the hypothesis that head movements might be more frequent with DIS CON and FOC, but none of the two types of prosodic emphasis revealed significant proportions of head movements, which means that once again, head movements are distributed evenly among the different types of prosodic emphasis.

3.5. Hand gestures

Once again, only the most productive categories are detailed in *Table 9* and *Table 10* below for co-occurring hand gestures.

Table 9. Number of hand gestures accompanying each type of prosodic emphasis.

Prosody	DIS CONT	FOC	other	total
beats	3	*26	6	*35
deictic	4	17	1	22
emblems	3	25	3	31
iconics	0	25	3	*28
metaphorics	11	37	10	58
total	22	132	20	*174

Table 10. Number of hand gestures accompanying each type of syntactic construction.

Syntax	PRO DS	FULL NP DS	PRES	other	total
beats	1	1	0	1	3
deictic	5	1	1	2	9
emblems	0	4	1	2	7
iconics	2	9	5	2	18
metaphorics	13	11	13	8	*45
total	21	27	20	14	82

Exactly like with eyebrow and head movements, the statistical test showed that the total proportion of hand gestures produced together with prosodic emphasis is higher than the proportion of hand gestures produced with syntactic constructions (Prop.Test: X-squared = 12.33, df = 1, p-value = 0.0004). As far as gesture type is concerned, the proportion of hand beats is higher with prosodic emphasis than in the rest of the corpus (Prop.Test: X-squared = 3.74, df = 1, p-value = 0.05) and this is mainly due to the fact that the proportion of beats in contexts of focalisation is also much higher than in the rest of

the corpus (Prop.Test: X-squared = 89.83, df = 1, p-value = 2.2e-16), although we cannot say that the total proportion of hand gestures in this particular type of prosodic emphasis is higher than in other emphasis types. The test also revealed that the proportion of iconics is lower in contexts of prosodic emphasis than in the rest of the corpus (Prop.Test: X-squared = 6.90, df = 1, p-value = 0.008). The proportion of all other gesture types that accompany prosodic emphasis was not significantly different from their proportion in the rest of the corpus.

As far as syntactic constructions are concerned, the only significant result is that the proportion of metaphorics is higher than in the rest of the corpus (Prop.Test: X-squared = 15.86, df = 1, p-value = 6.81e-05). However, this significant increase of the number of metaphorics is evenly distributed among the different types of syntactic constructions so that none of them in particular can be linked to the increase.

4. Discussion

The results in the previous section show that gestural reinforcing is higher in the case of prosodic emphasis than in syntactic constructions of thematisation and this is mainly due to the fact that prosodic emphasis is reinforced by a higher proportion of head movements only than syntactic constructions. We have seen about gesture marking that two or three gestures may combine to reinforce emphasis in other speech modalities (verbal modality for syntactic constructions and vocal modality for prosodic emphasis), but the total number of combined gestural reinforcing (13 for syntax and 70 occurrences for prosody) is much lower than the total number of reinforcing made by a single gesture (105 for syntax and 186 occurrences for prosody). This means that speakers generally do not prefer to express emphasis in several modalities at the same time, but use emphatic cues in complementary distribution. This is what was also found in [1]. This explains as well why syntactic reinforcing is accompanied by prosodic emphasis in only 51 occurrences, among which the theme of the construction is highlighted both by a syntactic and a prosodic device in only 15 occurrences.

Whenever there is gestural reinforcing, results show that eyebrow and head movements, as well as hand gestures are produced in greater proportion to reinforce prosodic emphasis than syntactic constructions, which means that syntactic and prosodic highlighting do not play the same role in discourse, since they are not reinforced by gestures in the same way.

When considering gestures separately, results show that eyebrow raises, although in greater proportion with prosodic emphasis than with syntactic constructions, are not produced in greater proportion in the case of prosodic emphasis than in the rest of the corpus. Results also showed that among the different types of prosodic emphasis, eyebrow raising is distributed evenly. This doesn't mean however that eyebrow raising is not linked with emphasis in any way, but rather that it may be a strong enough marker of emphasis to be used on its own instead of being used in combination with other markers of emphasis.

As far as head movements are concerned, the results show that whereas head beats and shakes occur in greater proportion with prosodic emphasis than in the rest of the corpus, this is not the case of head nods. The absence of statistical significance for head nods can be explained in two ways: first, it means that the proportion of head nods is not higher in contexts of prosodic emphasis than in the rest of the corpus. That is probably due to the polysemy of the gesture which is used both as a means of reinforcing speech and as a backchannel, i.e. minimal responses made by the co-participant who is not presently holding the speech turn (head shakes used as backchannels are much less frequent than nods when the topic of conversation is not controversial). Second, it is quite relevant that the proportion of head nods in contexts of prosodic emphasis is not lower than the proportion of nods in the rest of the corpus considering the high frequency of nods used as backchannels. It is quite certain that if head nods were examined only when the participant is holding the speech turn (therefore excluding backchannels), then they would probably show a stronger link with prosodic emphasis.

The results for hand gestures show that the proportion of beats is higher in the presence of prosodic emphasis than in the rest of the corpus, which is in agreement with [14] who states (p. 41) that "a beat may highlight words whose occurrence is relevant for a larger narrative purpose", which is also in agreement with the aim of prosodic focalisation and this explains why beats are more frequently found with this type of prosodic emphasis. We also found that iconics are found in a lower proportion with prosodic emphasis than in the rest of the corpus. Iconics are described by [14] (p. 39) as gestures which "present images of concrete entities and/or actions". Since prosodic emphasis (and especially focalisation) is very frequently applied to degree adverbs, it is not surprising that iconics do not co-occur with prosodic emphasis. We expected iconics to rather co-occur with syntactic constructions which aim at highlighting an item of discourse (mostly NPs). However, we noticed that among the 18 iconics that reinforce syntactic constructions, 5 co-occur with animate agents or patients (when the gesture anticipates the predicate in the main clause, therefore co-occurring with the dislocated element), whereas 13 co-occur with inanimate agents or patients, with which they are in a relation of lexical affiliation. Since a large number of the NPs highlighted by the syntactic constructions are either proper nouns or pronouns, it is therefore not surprising that we didn't find a higher proportion of iconics with syntactic constructions than in the rest of the corpus. Instead, the proportion of metaphorics is higher. This is quite consistent with the role of the syntactic constructions: these constructions are mostly used to (re)introduce some item in the discourse of the speaker and metaphorics precisely demarcate the different units in discourse organization. What syntactic thematisation does in discourse is probably not so much linked with semantic presentation than with grammatical organisation.

5. Conclusion and further developments

This paper has shown the interaction between three possible ways of highlighting elements of discourse: this can be done syntactically with the use of thematic constructions such as dislocation, topicalisation, (pseudo-)cleft and presentative constructions in the verbal modality. It can also be achieved with prosodic emphasis in the vocal modality and gesture reinforcing in the visual modality. We have shown that on the whole, the three types of highlighting are complementary and are very rarely used in conjunction. When they are, then speakers mark a strong preference for the double marking of prosodic emphasis and gesture reinforcement, whereas syntactic highlighting is generally not associated with any other type of marking apart from metaphoric hand gestures. A bit disappointing was the fact that the different categories in the prosodic emphasis and syntactic constructions were not distinguished thanks to the proportion of accompanying gestures when they had some. This may be due to the fact that the subdivision into categories reduces the number of occurrences per category and many of them could not even be tested statistically. It is then an encouragement to increase the

amount of corpus treated, in the hope that a greater number of occurrences would enable us to find patterns which we could not possibly find in this study.

Interestingly, the study has drawn up a wells of questions, that could be answered in further research. For instance, as we were annotating, we noticed that the speaker's gaze tended to be oriented towards the co-participant while he was producing prosodic emphasis. We didn't have the time to check this systematically, but it would be interesting to know more of gaze direction during the production of syntactic or prosodic emphasis. It would also be quite interesting to enquire into some features of the hand gestures that reinforce the syntactic and prosodic emphasis: are the gestures produced with particular amplitude, velocity or hand shape for instance? The current corpus allows this type of analysis, but once again, more data may be needed in syntax and prosody for any pattern to emerge. Also to be enquired into is the fact that for instance, pronominal dislocation (of the type *me, I...*) – being extremely frequent in spoken French – does not emphasize the dislocated item to the same degree as other types of syntactic thematisations. We also noticed that for pronominal dislocation to acquire a real discourse contrast value in spoken French, it had to be accompanied with prosodic emphasis on the dislocated pronoun, which it does sometimes. With more occurrences, it would be possible to better understand the role of these syntactic constructions in the spoken language, which is necessarily different from what we find in written French. And indeed, few studies have been conducted on spoken French in this respect: [17] presented an analysis of thematic constructions in spoken dialogues, from a pragmatic viewpoint in a qualitative study, but to our knowledge, no such study has been carried out in a multimodal perspective on spoken French. Yet, the most important question to our eyes is to study the functioning and weight of reinforcing gestures which are not linked in any way to another emphatic construction.

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