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# TIME REFERENCE IN WEATHER REPORTS THE CONTRIBUTION OF GESTURE IN FRENCH AND ENGLISH

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## Introduction

We are all familiar with weather reports which are considered as landmarks in our everyday lives – many human activities being based on their output, ranging from social bonding to more weather-dependent activities like sailing or mountaineering. Although they are extremely short and monologic by nature, weather reports are in fact highly complex descriptions that involve constant switches from one spatial viewpoint to another (Fricke, 2002), as well as frequent shifts in deictic center (Bühler, 1982 ; Ferré and Brisson, 2015). Yet, if space is a most central element in weather reports, time is also an essential component in these narratives as they involve some prediction of a future situation based on the present state of the weather. Time and space are therefore closely intertwined in weather forecasts.

In terms of form, weather reports can be described as extremely condensed short communications based on scripts but that present many features of the spoken language. One of these features is the use of ellipsis in what can be described as rather a telegraphic speech style and another feature that follows from elliptical speech is the recurrent absence of tense marking on verbs: either the descriptions are made with nominal or small clauses that do not contain a finite verb, or the verb is mostly in the present tense whatever the time evoked. The present can then be seen as some default tense that reveals the shift in viewpoint by forecasters who predict a future situation basing their description on material physically present in their narrative space. Example (1) below illustrates this mismatch in between tense and time. The forecaster here describes the coming weather condition across most of the UK in what is quite a fully informative paragraph that contains only two finite verbs in the present tense in the first and last sentences of the paragraph. This absence of time marking on verbs in the example is only compensated by the addition of the lexical item “Thursday” at the end of the first sentence and an anaphoric phrase “at this stage” towards the end of the paragraph.

- (1) So **let's** head into our **Thursday**. A bit of a uh damp or dismal sort of start, really, across the bulk of England and Wales. Some patchy rain and drizzle certainly here across the uh Midlands and some of that spinning its way into northern England as well, actually not far away from Scotland **at this stage**. Most of Scotland **is** uh in the brighter weather.

Televised weather reports are highly multimodal constructions (Steen and Turner, 2013) that do not rely on speech and bodily behavior alone but also on the presence of background screens that convey some information although in a different form. Lexical compensation of the type presented in example (1) is therefore not the only means available to forecasters to make up for some absent or default tense marking in speech. The aim of this paper is to show how semiotic modes (Kress and van Leeuwen, 1990) combine to compensate or reinforce reference to time as opposed to other information content like weather condition or spatial information.

## 1. Some theoretical background on semiotic modes

Weather reports are essentially composed of descriptive discourse moves about the weather and contain few non-descriptive moves (e.g. *greetings*). What is presented in each descriptive move is the weather condition in a specific place at a particular time. We can therefore say that the three essential components of each descriptive move are SPACE, TIME and WEATHER CONDITION / TEMPERATURE. However, these three semantic fields need not

be explicitly mentioned in speech but may be present in another semiotic mode (Kress and van Leeuwen, 1990). For instance, images presented in the background screen may very well contain information available to the viewer which is not necessarily mentioned in speech but still participates in the global information content of the description. In televised weather reports we may distinguish four semiotic modes or four channels used for meaning making. Two of these channels may be considered as primary modes of communication, speech (in terms of verbal description) and background screens, since they convey the major part of the information content. In this communication situation, we may consider that gesture and prosody are secondary semiotic modes used especially to open up focus spaces (Grosz and Sidner, 1986) or to be used as contextualization cues (Gumperz, 1992). This means that the role played by gesture and focal accents in prosody (Katz and Selkirk, 2011) here is to either emphasize a lexical item or to establish a link between speech and the background screen. In weather reports, the three semantic fields (e.g. SPACE, TIME, WEATHER CONDITION / TEMPERATURE) mentioned earlier must be present in one or two of the primary semiotic modes (speech and background screen) and may be reinforced by prosody and/or gesture in a secondary semiotic mode. The resulting multimodal construction will give more or less weight to each semantic field.

### 1.1. Primary semiotic modes

Examples (2-3) below illustrate what semantic field(s) may be present or absent in **speech** first. You notice that none of these descriptive moves contains any finite verb which means that if time is mentioned, other means are going to be used.

- (2) But for the bulk of England and Wales, clear skies.
- (3) Temperatures overnight, eight to twelve degrees Celsius.

In example (2), SPACE is explicitly mentioned with “the bulk of England and Wales” as well as WEATHER CONDITION with “clear skies”. There is no mention of time in this descriptive move. This means that the TIME domain has to be present in another semiotic mode for the descriptive move to be complete. Example (3) explicitly mentions information related to TEMPERATURE as well as the word itself, and the TIME domain is present with “overnight” but SPACE is left out.

**Background screens** may also be more or less informative considering the three semantic fields. Figure 1(a) shows WEATHER CONDITION (satellite picture of weather front) but does not give any relevant spatial information or any indication of TIME. Figure 1(b) is slightly more informative as TEMPERATURES are mentioned as well as SPACE with the names of some French cities, but the TIME dimension is left out. Finally, Figure 1(c) is fully informative as SPACE is easily identified, TIME and TEMPERATURES are mentioned in script on the right of the screen and WEATHER CONDITION is represented by the weather icons.



Figure 1 Semantic fields present in or absent from background screens used in weather reports

### 1.2. Secondary semiotic modes

Secondary semiotic modes in this type of communication situation may highlight some information content present in speech, in the background screen or in both. That is the role of focal accents in **prosody** which reinforce some lexical item. The most common intonation contour to mark a focal accent in English is the rise-

fall which marks a strong emphasis (Wells, 2006) on the syllable that carries this tone. This is visible in Figure 2 which shows the intonation contour in Praat (Boersma and Weenink, 2009) of the utterance “this COLD front trying to swing in from the west” with a focal accent on “cold” produced with a large rising-falling tone that stands out from the rest of the utterance. Figure 3 presents the intonation contour in Praat of the French utterance “atmosphère qui va se rafraîchir sur les RÉGIONS de l’OUEST” (*atmosphere that is going to be cooler in the Western regions*). The figure shows the same large rise-fall contour on “ouest” but also a high rise contour on the second syllable of “régions”, the high rise being quite frequently used besides the rise-fall in French to mark a focal accent.

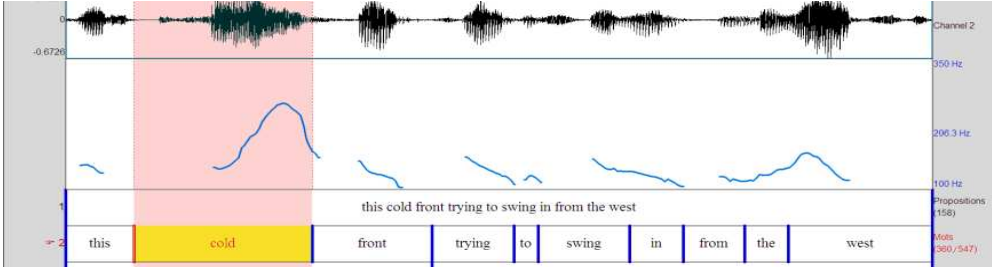


Figure 2 Intonation contour in Praat of “this COLD front trying to swing in from the west”

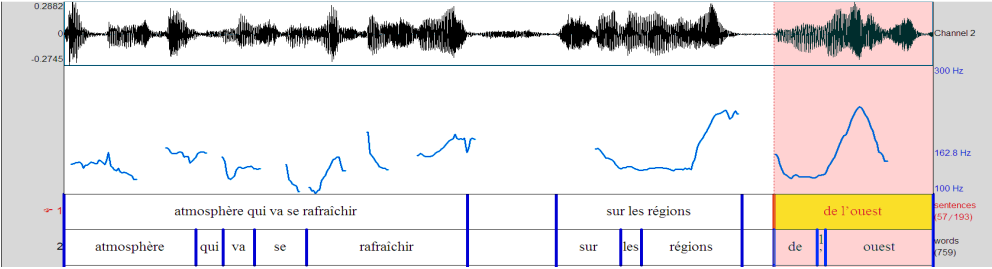


Figure 3 Intonation contour in Praat of “atmosphère qui va se rafraîchir sur les régions de l’OUEST”

Another way to mark emphasis in prosody is by lengthening a segment. Figure 4 Spectrogram of the utterance “but already today we’ve seen THIRTY FOUR degrees” in Praat. The two focal accents on the first syllable of “thirty” and on “four” are produced as strong syllable onsets, e.g. the two fricatives are lengthened compared with other sound segments in the sequence.

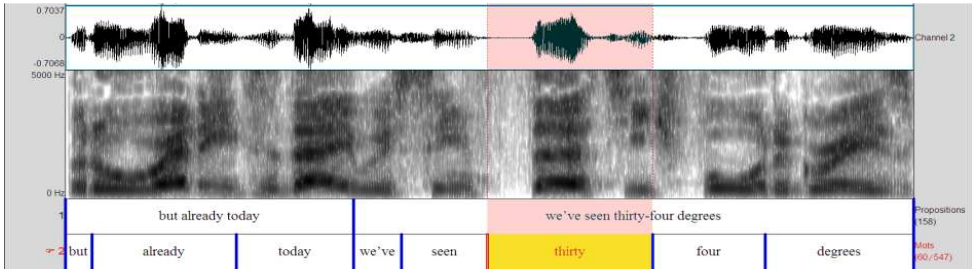


Figure 4 Spectrogram of the utterance “but already today we’ve seen THIRTY FOUR degrees” in Praat

**Gesture** may also be used as a secondary semiotic mode to emphasize one or several semantic fields. For instance, the forecaster in Figure 5 produces two gestures while he utters “so we’re not done until you officially get to say late TONIGHT and TOMORROW”. In (a), the speaker places his two open hands in front of him at the level of his head, the stroke corresponding to the word “tonight”. He then changes his hand shape into two pointing index fingers and moves his hands down to the level of his chest as seen in (b) as he utters the word

“tomorrow”. The two gestures can be seen as metaphoric gestures (McNeill, 1992, 2005) highlighting the TIME domain with which the speaker places two events in time on a metaphoric vertical timeline.

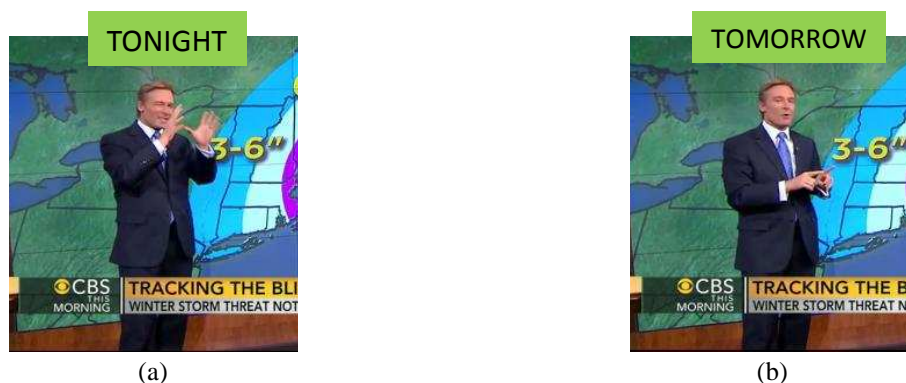


Figure 5 Two metaphoric gestures highlighting TIME in the utterance “so we’re not done until you officially get to say late TONIGHT and TOMORROW”

## 2. Working hypotheses

The research question addressed in this paper is how gesture, prosody and context participate in building time and space landmarks. The prediction is that SPACE and WEATHER CONDITION should be preferentially represented visually (on a background screen and/or in gesture) due to their greater iconic potential, whereas TIME should rather be represented orally (in speech, potentially reinforced by a focal accent).

A second prediction is that the frequent loss of verbs in this genre as mentioned in the introduction could have a stronger impact in French than in English, since the former language has a richer conjugation paradigm than English and the loss is therefore more important in terms of the expression of TIME. This greater loss should be compensated in some respect.

## 3. Data

These two predictions were tested on a preliminary corpus of 5 French and 5 English (GB & US) weather forecasts downloaded from the internet. The corpus was first transcribed verbatim using Praat (Boersma and Weenink, 2009). The units for the alignment with sound of this transcription were words and Intonation Phrases following the British School of intonation analysis (Crystal, 1969; Wells, 2006). Focal accents were then noted based on perception in a separate track.

The Praat annotations were then imported into Elan (Sloetjes and Wittenburg, 2008) where Intonation Phrases were grouped into discourse moves and subsequently tagged as descriptive and non descriptive moves, since only descriptive moves were considered here. representational gestures were then coded following McNeill’s typology (McNeill, 2005), namely metaphoric and iconic gestures as well as pointings. Finally, separate tracks served to note the three semantic fields (SPACE, TIME, WEATER CONDITION / TEMPERATURE) when present in each Intonation Phrase in the four semiotic modes (SPEECH, BACKGROUND SCREEN, PROSODY, GESTURE). It was possible to note several semantic fields in a single tag (for instance when the background screen presented several types of information either simultaneously or one after the other during the utterance of an Intonation Phrase). Table 1 below presents the number of units as well as relevant ratios between units in the two languages.

	GB	FR
Discourse moves	182	215
Intonation phrases	482	628
Word nb	2093	2669
Focal accents/Discourse moves	124	130

Focal Accents/IP	138	148
Gestures/Discourse moves	161	176
Gestures/IP	195	185
Total nb of gestures	314	311

*Table 1 Number of lexical, prosodic and gestural units in the corpus of 5 French and 5 English weather reports used in the study*

What Table 1 shows is that French weather reports are slightly longer than the forecasts in English: they have slightly more descriptive discourse moves, more Intonation Phrases and more words as well. The ratios of focal accents in discourse moves and in Intonation Phrases are also in the same proportion in the two languages with slightly more focal accents in French than in English. The total number of gestures is slightly lower in French with fewer gestures per Intonation Phrases but slightly more gestures per descriptive discourse moves.

#### 4. Preliminary results

Our first prediction is only partially confirmed: oral features are used in a proportion of 45 % for each of the semantic fields and visual cues represent a proportion of 55 %. This means that the information on SPACE, TIME and WEATHER CONDITION is slightly more often conveyed visually than verbally in this type of communication situation but the difference (only 10 %) is not large, so that speech, although often elliptical, does not cut out the essential information. Yet, if we consider secondary semiotic modes, we note that whereas SPACE and WEATHER CONDITION are more often reinforced by gesture (a visual cue), TIME and TEMPERATURE are more often reinforced by a focal accent (an oral cue). So this confirms the prediction that representational gestures (including pointing) will be used more to highlight semantic fields with a higher iconic potential than more abstract fields like TIME and TEMPERATURE.

The second prediction is fully confirmed: gestures are used to express or reinforce TIME expressions twice as much in French as in English and less gestures highlight spatial information. No other semiotic mode shows any difference for the expression of TIME in the two languages in proportion to the number of Intonation Phrases and discourse moves. This means that in French TIME is not represented more in script or with the use of other lexical items than in English which could have been other choices made by forecasters. What we find instead is that weather reports show many similarities in form in the two cultures. Since French forecasters tend to gesture less than the English and do not compensate in any other semiotic mode, this higher reinforcement of TIME expressions by gestures could well be interpreted as a compensatory device for the loss of tense marking in weather reports which is not made up for in the use of background screens. Table 2 below presents the number of occurrences of references to SPACE, TIME and WEATHER CONDITION / TEMPERATURE and their distribution across the four semiotic modes (speech, background screen, prosody and gestures) in the corpus.

	SPACE		TIME		WEATHER		TEMPERATURE	
	GB	FR	GB	FR	GB	FR	GB	FR
<i>Speech</i>	194	255	166	255	128	176	67	90
<i>Screen</i>	419	551	432	556	392	516	224	432
<i>Prosody</i>	42	54	34	43	34	30	28	25
<i>Gestures</i>	138	134	17	36	32	47	17	15
<b>Total</b>	793	994	649	890	586	769	336	562

*Table 2 Number of occurrences of references to SPACE, TIME and WEATHER / TEMPERATURE and their distribution across the four semiotic modes (speech, background screen, prosody and gestures) in English and French*

#### Conclusion

This paper has shown that weather reports are specific communication situations under large time constraints that involve a rather telegraphic speech style and few finite verbs. This has an influence on the expression of

temporal references, time being an essential semantic domain in weather reports. In French, the loss is compensated by a greater production of referential gestures linked to the expression of time.

Although the three semantic domains may be present or highlighted in all of the four semiotic modes, SPACE and WEATHER CONDITION are preferentially highlighted by gestures, whereas TIME and TEMPERATURE are more often highlighted by focal accents.

Of course, the corpus used in this study is rather limited and we should refrain from making hasty generalisations from results that do not yet permit statistical treatment, but this line of research on information structure in different languages remains promising should results be confirmed in larger corpora.

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