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# Modelling the interpretative impact of subordinate constructions in spontaneous conversation

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## 1. Introduction

- <sup>1</sup> In face-to-face interactions, participants use different channels (verbal, vocal, visual) when they speak. One of the aims of Multimodal Discourse Analysis<sup>1</sup> is to study the contribution of each channel to the content of messages. In line with this, the present article discusses subordination in discourse, more specifically how different types of subordination can be identified in spontaneous conversation. It focuses on the sequences containing subordinate constructions operating at the syntactic level of modification (see for instance Huddleston & Pullum, 2002).
- <sup>2</sup> In syntactic studies, "modifiers" refer to elements specifying or elaborating upon some primary features (Halliday, 1985), often described as additions to propositional contents in the host or embedding structure (Quirk *et al.*, 1985: 1058; Huddleston & Pullum, 2002: 1048). Two semantic types are distinguished when describing dependency relations (van Rijn, 2017). While some heads inherently require reference to a dependent, which may therefore be considered the head's argument, other dependents are not inherently presupposed by their head and are considered modifiers. They provide a further semantic characterisation of the referent (or state of affairs) expressed by the head, or they supplement the head with additional information. Well-known examples of modifiers are relative clauses (van Rijn, 2017: 10).
- <sup>3</sup> Instead of comparing subordinate clauses to non-subordinate clauses in discourse, the study aims at identifying differences between three syntactic types of subordinate constructions in terms of interpretative frames, through their multimodal expression. I propose that subordinate constructions are practices in interaction that offer an interpretative reconstruction of discourse. In the research presented here, the

subordinate constructions (SC) under study encompass the three most widespread types of finite clauses functioning as modifiers in our oral corpus of spontaneous interaction (which is described in the "Corpus and methodology section" of the paper): restrictive relative clauses, adverbial clauses, and appositive relative clauses, as illustrated in Excerpts (1-4).

- 4 Adverbial clauses qualify the main-clause process with respect to agencies such as time, means, cause, or purpose, often with an element specifying the nature of their relationship (Langacker, 2008: 419-420). This paper focuses on adverbial clauses introduced by "when". The results and conclusions given in this study for adverbial clauses only concern such temporal clauses. In (1) below, the adverbial clause specifies the circumstances in which the predicative relation in < my dad / teach in Hebburn > is realised, locating in time the situation expressed by the verb and its complements. Its referential elements are stabilised in that their scope is defined.

(1)	Adverbial clause (Transcription conventions are provided in the Appendix at the end of the paper)		
	Zoe	L	my dad used to teach in Hebburn
		SC	<b>when he was first starting teaching</b>
		R	and he was getting harassed by all the pupils (laughs)

- 5 Adverbial clauses are seen as exterior to the frame built by "main" clauses, and are related to the clause they modify through a connector indicating their adverbial status (Gosselin, 1990)<sup>2</sup>. The semantic nature of their connector determines several types of adverbial clauses, expressing for instance temporal relations with "when" in example (1). The semantic relation between adverbial clauses and the predication they modify is subject to debate (Muller, 2008). According to Blühdorn (2008: 11), adverbial connectives link portions of speech neither by government and embedding nor by linear sequence. Instead, they connect them by reference. Depending on where the required information is placed, anaphoric (backward oriented) and cataphoric (forward oriented) adverbial connections can be distinguished. In conversational English, adverbial clauses tend to follow the clause they modify (Miller *et al.*, 1998) as seen in example (1) featuring an anaphoric adverbial connection. The function of adverbial clauses is to "signal that several clauses appearing in the thread of a text have the same relation with a certain criterion, and can thus be grouped inside units" called frames (Péry-Woodley, 2000: 63). They have an effect on the cognitive process of the co-speaker. According to Dancygier and Sweetser (2000), "when" clauses engage the speaker to the reality of the mental space built in the "main" clause, even when this reality has already occurred or has not occurred yet. In example (2) below, the adverbial clause is in initial position. "I passed" as an event works as a cognitive landmark, framing the temporary cognitive state expressed in "I didn't think I was a very good driver".

(2)	Adverbial clause
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	Tim	L	although
		SC	<b>when i passed</b>
		R	i didn't think i was a very good driver

- 6 Whether initial or final, localising frames raise the question of their more or less rigid relation to the verb of the clause they are grouped with<sup>3</sup>. Initial adverbial clauses are used by speakers to avoid asserting some information considered as already known (*i.e.* as part of the common ground; Muller, 2008). In example (2), Tim does not directly state that he has passed his driving license, but uses it as part of the common ground between speakers to establish a contrast with the following utterance. On the contrary, final adverbial clauses suggest exhaustiveness before a potential question from the co-speaker about the preceding utterance (Muller, 2008). In example (1) further above, the adverbial clause answers a potential question from the co-speaker about the details in which "my dad used to teach in Hebburn" occurred.
- 7 While an adverbial clause modifies another clause, a restrictive relative clause modifies a nominal expression. A relation of co-referentiality holds between the nominal referent and some participant in the process designated by the relative clause. This participant has a semantic role in both the relative clause and the matrix clause containing the modified nominal (Langacker, 2008: 424). According to Langacker (1991: 302), the meaning of a common noun is a mere type of entity. The designation of instances requires a full NP, in which the "type specifications" conveyed by the common noun are tied to the speech exchange by determiners. A restrictive relative clause "restricts the head noun's type specification" (Langacker, 1991: 302), *i.e.* it delineates a subtype of the general type of entity designated by the head noun. In (3), the restrictive relative clause increases the relevance of "the street", creating a subcategory for this referent.

(3)	<b>Restrictive relative clause</b>		
	Tom		so burglary was quite common in #
		L	the street
		SC	<b>i lived in</b>
		R	and well they've #

- 8 This paper focuses on restrictive relative clauses introduced by "Ø" and "that" as relative pronouns. They have been analysed as mainly working at defining the antecedent (Cotte, 2008). This construction allows speakers to provide the co-speaker with more complex information about the antecedent than in non-relative structures, without the co-speaker having trouble processing it. The antecedent opens an informational frame about the referent it describes, while the relative pronoun indicates that the informational frame about this referent is about to be completed (Muller, 2006).

- 9 Although also introduced with a relative pronoun, appositive relative clauses are not invoked to single out a nominal referent, but to make an additional comment about it (Langacker, 2008: 429). Their modifying scope varies from a single nominal referent to a verb phrase or a whole clause (Longacre, 1985). In (4), the appositive relative clause qualitatively evaluates the direct object of DID (*i.e.* "the second year of # hem # like English"), which can however be identified independently.

(4)	<b>Appositive relative clause</b>		
	Alex	L	so i did the second year of # hem # like English # here (h) (laughs)
		SC	<b>which was interesting #</b>
		R	(h) hem yeah and then i just graduated now

- 10 This study focuses on appositive relative clauses introduced by "which" as a sentential pronoun. Unlike "that", "which" is said to introduce a subjective comment bearing on the relationship between two propositions, as well as a new relation between the pronoun and its antecedent. In (4), Alex links "the second year of English" with the non-neutral adjective "interesting". Setting up a functional distinction between several types of appositive relative clauses, Melis (2008) contrasts comment appositive clauses (as in Excerpt (2) above) with continuation appositive clauses. In the latter type, the relative pronoun only intervenes as an inter-propositional relator. The literature generally agrees on the fact that appositive relative clauses show several characteristics that are typically associated with non-subordinate clauses (Krifka, 2007)<sup>4</sup>. Their capacity to form distinct illocutionary acts (*e.g.* Holler, 2005; Peterson, 1999) is one of such properties.
- 11 Subordinate constructions are generally defined as dependent on another predication from a micro- or macro-syntactic point of view (Lehmann, 1988; Tomlin, 1985 among others) and as conveying background information (Fleischman, 1985; Tomlin, 1985; Lambrecht, 1996), but the literature shows little consensus in defining clear scopes and boundaries for these structures, in syntax as in prosody. While they are seen as embedded elements (Jackendoff, 1977), Jespersen (1927), Fabb (1990), and Peterson (1999) consider some relative constructions as exterior to the syntactic structure of the main clause. More specifically, the differentiation between restrictive relative clauses and appositive relatives on syntactic grounds is problematic (Borsley, 1992; Arnold & Borsley, 2008). While appositive relatives are derived from coordination for Burton-Roberts (1999) and De Vries (2006), Quirk *et al.* (1985: 1257) and Biber *et al.* (1999: 135) call for special levels of representation in subordination, with "telescoped relatives" and "peripheral elements" respectively. Appositive relatives are also classified as adverbials (Biber *et al.*, 1999: 853). Finally, in the rich framework of syntactical relations proposed by Matthiessen & Thompson (1988: 238), adverbials and non-restrictive relatives are "less subordinate" than other structures, belonging to relations of hypotactic combination instantiating hypotaxis, where dominant and dependent clause are syntactic sisters, rather than embedded, where the subordinate clause is a constituent of the dominant clause.

- 12 Cognitive Grammar has challenged the notion of subordinate constructions as dependent elements in showing that syntactic embedding often only reflects the starting point speakers choose to convey their message (Langacker, 2008), and represents only one parameter in a composite message, in which information is not presented in isolation but in a contiguity relationship (Ruth-Hirrel & Wilcox, 2018). Likewise, Cristofaro (2003, 2014) and Langacker (2008) make it clear that the notion of subordination is best understood in terms of dynamic conceptualisation. It has also been proposed that there may be a continuum of subordination even within one clause type (Tao & McCarthy, 2001), and that certain subordinate clause types may not actually be best described as such, especially adverbials and appositive relative clauses (Depraetere, 1996; Thompson, 2002).
- 13 Likewise, subordination is relevant to examine online language production and comprehension, and presents implications for discourse modelling. Yet compared to the vast amount of research on subordination either from the point of view of syntax alone or from that of pragmatics, the vocal and gestural contributions to subordination are often left out, just as data coming from spontaneous conversation.
- 14 In face-to-face conversation, participants negotiate meaning through multimodal contributions, in which the linguistic resources of speech interface with gesture. These modes do not work independently, although a particular mode may weigh more than the others at some point. Since the development of analytical tools and schemes (*e.g.* Sloetjes & Wittenburg, 2008; Benzitoun *et al.*, 2009; Schmidt *et al.*, 2009; Bigi, 2012; Boersma & Weenink, 2013) now facilitates an account of subordination as a multimodal phenomenon, we questioned in a variety of studies (Lelandais & Ferré, 2016, 2017, 2019) whether these constructions all expressed the same degree of dependence upon their co-text (dependence understood as integration, *i.e.* lack of boundary marks). Our hypothesis was based on the capacity of these constructions to show distinct forms of autonomy in function of their syntactic type.
- 15 The results of these studies show that subordinate constructions indeed express different types of independence, depending on the number of boundary cues they feature (Lelandais & Ferré, 2016, 2017, 2019). This article takes a different, qualitative angle, and looks at subordinate constructions in terms of what they do in interaction and in terms of interpretative frames. I show that subordinate constructions are practices in interaction that offer an interpretative reconstruction of discourse, and that all three types of subordinate constructions do not trigger the same reconstruction. The first part of this paper presents a review of the literature concerned with the notion of subordination, focusing on its syntactic, prosodic, and gestural acceptations. A detailed description of our corpus and methodology ensues, to be immediately followed by the analysis of several examples and a discussion of the data.

## 2. Theoretical background

### 2.1 Syntactic subordination

- 16 In the categorial division of clause complexes into a classification that comprises two uneven and complementary subgroups, *i.e.* a main clause and a subordinate, modifiers are viewed as optional constituents functioning at a phrasal or clausal level. This

classification arises from the concept of minimal utterances: some elements of the message are deemed semantically necessary without standing as constitutive elements (Gross, 2005). However, this semantic necessity has been questioned by a number of linguists (e.g. Chafe, 1988; Haiman & Thompson, 1984; Smessaert *et al.*, 2005), described as imprecise for analysing spontaneous speech, especially regarding the nature of introductory elements.

- 17 Because semantic necessity is felt to be imprecise, other criteria are suggested to evaluate clausal combination, in a hierarchy of syntactic and semantic relations: a close semantic relation between two clauses correlates to a tight syntactic linkage (Van Valin, 1984). Clauses are units comprising an essential nucleus (containing the predicate that corresponds to an event, process or state, and its core complements), and an optional periphery (corresponding to the spatiotemporal frame such as localisation or environment; Van Valin, 1984; Halliday, 1985). A clause attached to the nuclear components of another demonstrates a stronger bond than a clause linked to the peripheral elements of another.
- 18 These criteria all encourage to investigate clause linkage relying on a wider, more detailed set of syntactic and semantic parameters (Van Valin, 1984), or to go beyond the micro-syntactic frame in observing not only governing relations, but also modal and illocutionary relations (Ford, 1997; Thompson, 2002; Heringa, 2007). Cognitive Grammar has also shown that syntactic, semantic, and pragmatic subordination need not align for a same construction (Langacker, 2008; Cristofaro, 2014; Ehmer, 2016). A clause with an embedded participant can for instance be pragmatically autonomous and bring foreground information in discourse. Ford (1997) and Ehmer (2016) among others have highlighted the variety of independent pragmatic actions that subordinate constructions can accomplish.
- 19 Subordination has also been shown to be a matter of structural centres and referential domains priming on one another, which are chosen according to the participants' representations (Langacker, 2008). Moreover, subordination is a preferred format for speakers to act on their co-speaker's information treatment and on interpretation constraints, triggering operations of the inferential system (Chafe, 1984; Thompson, 2002; Clark & Krych, 2004). Subordinate constructions such as modifiers are especially useful to organise mental spaces with cognitive landmarks (Dancygier & Sweetser, 2000). They are useful to create or to modify interpretative frames in discourse, *i.e.* structures of expectations on a variety of levels (Tannen, 1993; Dancygier & Sweetser, 2000; Wylid, 2003).
- 20 Very little work analysed subordination from a multimodal point of view. Some gestural (Enfield, 2009; Streeck, 2009; Calbris, 2011) and vocal features (Bolinger, 1984; Local, 2007; Wells, 2006 among others) have nonetheless been shown to participate in the creation of subordination, as they are associated with integration or cohesion (Halliday & Hasan, 1976). These features are not necessarily correlated with verbal subordination.

## 2.2 Prosodic subordination

- 21 As far as prosody is concerned, subordination is essentially achieved through intonation (Bolinger, 1984), which can convey subordinating information that is not marked with verbal means. Throughout a vocal paragraph, pitch height naturally



declines in a progressive manner (Wichmann, 2000). A subordinate unit is signalled by downward changes in key (*i.e.* major levels in a speaker's pitch range) or in pitch height (Lelandais & Ferré, 2016). To integrate a prosodic unit to an adjacent segment, pitch generally rises on the final syllable of this adjacent segment, indexing this segment as prefacing further speech, continuing the paragraph and the point being treated (Wells, 2006). A downstepped tone compared to a preceding high tone corresponds to the general neutral relationship between two prosodic groups, often used to express seamless continuity (Wennerstrom, 2001).

- 22 On the contrary, a variation on the initial syllable signals a boundary. Likewise, a discourse segment featuring a low final syllable with a termination contour does not embed the following segment, and is autonomous regarding what follows. Speech segmentation can be achieved with silent pauses (Yoon, *et al.*, 2007), a variation of tempo (Priva, 2017), and final syllabic lengthening (Wightman *et al.*, 1992; Cho, 2006; Mo, 2008). Likewise, a variation on the initial syllable of a tone-unit signals a boundary (Wagner & Watson, 2010).

### 2.3 Gestural subordination

- 23 The important role of co-speech gestures in linguistic production has been shown in pragmatics (Lascarides & Stone, 2009), cognitive linguistics (Sweetser, 2006), and psycholinguistics (Kita & Özyürek, 2003; McNeill, 2005).
- 24 Representing referents through hand gestures is a cumulative process, often achieved through a series of several gesture units (Cassell & McNeill, 1990; Gullberg, 2006; Eisenstein *et al.*, 2008; Hoetjes *et al.*, 2015; Perniss & Özyürek, 2015; Azar *et al.*, 2016; Sekine & Kita, 2017). Reference is maintained through cohesiveness of space, handedness, and/or form, including style of movement (McNeill & Levy, 1993; Streeck, 2009). Two speech segments can be related through their production in a single gesture unit (Enfield, 2009). By formally linking a new speech segment with a preceding one, a gesture hold also affords a cohesive way to explicitly represent two related ideas at the same time (Laursen, 2005; Park-Doob, 2010; Frederiksen, 2016). On the contrary, a rest position for both hands contrasting with a preceding gesture sequence can signal a boundary in discourse (Calbris, 2011), just like isolated hand or head beats (Heylen, 2006; Holle *et al.*, 2012; Biau & Soto-Faraco, 2013; Biau *et al.*, 2016; Dimitrova *et al.*, 2016). Discontinuity can also be established in movements with opposite directions, *i.e.* to the right and then to the left (Calbris, 2011).
- 25 As far as other articulators are concerned, gaze often moves away from the co-speaker for discourse elaboration as soon as the speaking turn is taken and secured (Kendon, 1967; Beattie, 1978; De Kok & Heylen, 2009). A change in gaze direction towards the co-speaker announces a discourse boundary or an appeal to the co-speaker (De Kok & Heylen, 2009; Nakano *et al.*, 2003). Eyebrow rises can emphasise particular entities and provide segmental information (Granström *et al.*, 1999; Barkhuysen *et al.*, 2008). They are linked to prosody, particularly to focalisation and emphasis.

## 3. Corpus and methodology

### 3.1 Corpus recording

- 26 The corpus used for this study, ENVID, is a collection of dialogues in British English. This collaborative corpus gathers videos recorded between 2000 and 2012. The videos represent five dialogues, making up a total of 2 hours and 10 minutes of interaction. Each interaction was recorded in a soundproof studio, guaranteeing its prosodic treatment. The participants are British people aged 20 to 23. Each participant had a lavalier microphone, which provided two separate audio tracks. Two audio files corresponding to each microphone were created in a WAV format, so as to facilitate the analysis of overlapping speech. The native video recordings were transformed into MPEG-4 stereo files, with a rate of 25 frames per second. Each dialogue had a single MPEG-4 file, juxtaposing the images of both cameras for the interactions filmed with a camera facing each participant.
- 27 Each participant is filmed in a static, wide-angled shot, facing or three-quarters turned towards their interlocutor. They are visible at least from head to chest, the cameras capturing subtle face movements but also rendering an overview of their upper body parts. In two of the dialogues, a single fixed camera faces the two participants. In the other three interactions, a fixed camera faces each participant.

### 3.2. Corpus transcription

- 28 The corpus was first transcribed in Praat (Boersma & Weenink, 2013) by the author and another expert transcriber adopting a standard orthographic spelling. It was segmented into tone-units, according to the British school of intonation (Crystal, 1969; Wells, 2006), based on dynamic pitch contours. Subordinate constructions were then localised and coded on a separate track as SC. All the annotations made in Praat were afterwards exported into Elan (Sloetjes & Wittenburg, 2008), a video annotation tool, to relate information in the different domains.

#### 3.2.1. Syntactic annotation

- 29 A total of 303 syntactic constructions were annotated in the corpus by the author, representing 10.09% of the total speaking time (*i.e.* 2.68 form/min). Among these subordinate constructions were 83 restrictive relative clauses (1.88% of speaking time), 161 adverbial clauses (3.46% of speaking time), and 59 appositive relative clauses (1.23% of speaking time).
- 30 55 occurrences of each syntactic type (appositive relative clauses and restrictive relative clauses) were selected for a balanced comparison, making up a total of 165 forms. The selection targeted occurrences without an interruption, surrounded with immediate left and right co-texts other than a single silent pause yielding the speaking turn. We also made sure that our selection of syntactic constructions was balanced across speakers. This was significantly important for the analysis of gestures, so as to avoid any bias due to inter-speaker gestural variability.
- 31 The selected occurrences were classified according to their syntactic type in Praat (restrictive relative clause, appositive relative clause). A second track delimitates the

environment of these clauses: the preceding tone-unit or part of tone-unit was labelled L (left co-text), the subsequent one labelled R (right co-text).

- 32 In order to establish reliability of the clause type classification (restrictive relative clause, adverbial clause, appositive relative clause), a second expert coder judged 20% of the data that had been classified by the original coder. The agreement between coders was 100%.

### 3.2.2 Prosodic annotation

- 33 The corpus was segmented into tone-units, according to the British school of intonation (Crystal, 1969; Wells, 2006), based on dynamic pitch contours. Tone-units correspond to Intermediate Phrases in the ToBI system (Beckman *et al.*, 2005).
- 34 Although our annotation relies on a different theoretical framework from that of the ToBI system, our interest in boundaries can be drawn close to the systematic annotation of break indices in the ToBI line of work (*e.g.* Beckman *et al.*, 2005).
- 35 The Momel-Intsint algorithm (Bigi, 2012; Hirst, 2007) was used for the automatic annotation of the F0 target points in the signal. Annotations are made in two respects: the algorithm notes pitch height (in Hz) on target syllables, which allows us to calculate mean F0 values for specific segments. The algorithm also codes symbolic (relative) values of intonation, in which each measured F0 value is compared to preceding ones, *i.e.* significant changes in the F0 curve either regarding the speaker's pitch range (Top, Bottom) or regarding the neighbouring tones or sequences of tones (Upstep, Downstep, Same, Low, High). We are here particularly interested in values which indicate a significant pitch reset (Top, Bottom), or a significant change in pitch key (Upstep – change towards higher pitch range, Downstep – towards lower pitch range). We are also interested in the value "Same" which, if found in greater number in our sequences, would indicate that there is no break in between the different elements of the sequence.
- 36 Within each segment of the sequences under study, the nature of each nuclear contour (fall; fall-rise; rise; rise-fall; flat) was also coded manually by the author. Pitch key was then annotated in regards to each speaker's specific range (high; mid; low) on both the whole segments (L, SC, R) and the boundary (initial and final) syllables in these segments.
- 37 In order to establish reliability of the nuclear contour classification, a second expert coder judged 20% of the data that had been classified by the original coder. The agreement between coders was 81.9%.

### 3.2.3 Gesture annotation

- 38 Communicative gestures were coded in Elan (Sloetjes & Wittenburg, 2008), in which hand gestures, head and eyebrow movement as well as gaze direction were manually coded by the same two expert coders, following the parameters proposed by Bressemer & Ladewig (2011).
- 39 Gesture annotation was based on gesture phrases (Kendon, 2004). Each gesture phrase was considered to start at the onset of the gesture and to end at the return to rest position if there was one. In the case of two consecutive gestures, the first gesture phrase ends at a significant change in shape and/or trajectory.

- 40 Head movements were labelled into nods, shakes, tilts, beats, or jerks. In separate tracks, gaze direction was annotated as either towards the co-participant or away, eyebrow movement distinguished between rise and frown, and hand gestures were categorised into iconics, metaphoric, pointings, beats, emblems, butterworths, and adaptators, drawing mainly from McNeill's typology (2005). As hand gestures may have several dimensions, two values could be noted and counted if need be.
- 41 Hand gestures were coded considering their link with co-occurring speech and their relationship to lexical affiliates (Kipp *et al.*, 2007). Ambiguous types were resolved with discussion between the two coders and agreement was reached on the main dimension of gesture types. Iconics are "images of concrete entities and/or action", whereas metaphoric are "images of the abstract" involving a metaphoric use of form and/or space (McNeill, 2005: 39). Pointing gestures are deictics whereas beats are linked with speech rhythm (McNeill, 1992: 80), emblems are conventionalised signs and butterworths are disorganised gestures made in lexical retrieval. Adaptators, *i.e.* self-contact gestures used for comfort like scratching one's head, were included given their high number and the fact that they give the experimenters information on the organisation of turns, being more frequent when the participant is listening.
- 42 In order to establish reliability of the gesture type classification, a second expert coder judged 20% of the data that had been classified by the original coder. The agreement between coders was 100% for gaze direction, 96.4% for eyebrow movement, 81.3% for head movement, and 72.1% for hand gestures.

### 3.3 Working hypotheses

- 43 Based on the theoretical background defined by the literature, a specific list of syntactic, rhythmical, intonational, and visual cues is taken into account to survey different types of boundaries.
- 44 If the constructions are not autonomous, they should be syntactically governed (*i.e.* they should fall under the scope of the main predicate, which determines their syntactic position in the segment) and/or show restricted modal and semantic autonomies, as these features are associated with subordinate segments (Van Valin, 1984).
- 45 At a prosodic level, embedded constructions are expected to be integrated in the same tone-unit as the main structure (Bolinger, 1984), or to show continuation contours (final rise conveying that speaker will hold the floor; Hirschberg & Grosz, 1992). Subordinate constructions should be uttered in a low or mid-key, the usual declination line of the paragraph being followed without any break (Wennerstrom, 2001). Subordinate constructions should not cause any important change in rhythm, featuring few pauses (Local, 2007) with no final syllabic lengthening (Katsika *et al.*, 2014).
- 46 As far as the co-verbal gestures are concerned, non-autonomous constructions are expected to be produced with gestural cohesive linkages such as the use of the same gesture unit as their sequential environment (Enfield, 2009). No hand beat is expected around subordinate structures. If subordinate constructions are integrated in their context, they should be realised without any change in gaze direction towards the co-speaker (Beattie, 1979; De Kok & Heylen, 2009), and without any eyebrow rise (Cavé *et al.*, 1996).

## 4. Results

- 47 The analysis evaluates the autonomy of subordinate constructions on a linear organisational mode (integration vs. demarcation). We test whether these constructions mainly create a break or whether they are preferentially integrated in their left and/or right co-text. After identifying and measuring the most relevant cues expressing boundaries in the different modalities drawing on our assumptions, the three syntactic types can be differentiated in terms of autonomy. Restrictive relative clauses are more integrated than adverbial clauses, which show themselves less boundary cues than appositive relative clauses. This section presents raw results. Examples will be provided in relation with these results in the Qualitative Analysis section that follows, in which the particularities are detailed for the three syntactic types. The subsequent series of tables (Table 1, Table 2, Table 3) present the cues taken into account, along with their distribution in the three syntactic types of subordinate constructions. Our analysis is selective in choosing which elements to comment upon for reasons of space, and highlights different cues for each clause type. However, each table gives the number of occurrences (out of 55) featuring the cue taken into account, and the percentage this number represents. Statistical F-tests were run instead of ANOVAs, as the sets of data do not follow a normal distribution and are relatively small. These tests aim at detecting a significant difference between the three different types of subordinate constructions (appositive relative clauses, *i.e.* ARCs in the tables, adverbial clauses, *i.e.* ACs in the tables restrictive relative clauses, *i.e.* RRCs in the tables). An asterisk (\*) signals a statistically significant result ( $p < .05$ )<sup>5</sup>.
- 48 Table 1 describes the macro-syntactic boundary features that are considered in our analysis. For reasons of space and clarity, this paper focuses on the verbal boundary cues at a macro-syntactic level only: boundaries at the level of discourse are not included.

Macro-syntax	ARCs		ACs		RRCs	
	nb occurrences	of %	nb occurrences	of %	nb occurrences	of %
total government	12	22	13	24	33	60*
syntactic government; illocutionary autonomy	12	22	13	24	13	24
syntactic autonomy; illocutionary government	4	7	18	31*	2	4
total autonomy	27	49*	11	20	7	13

Table 1. Macro-syntactic features taken into account to determine the dependency or autonomy (grey zones) of each syntactic type (each column gives the number of constructions out of 55 that shows each feature and the percentage that it represents).

- 49 In the macro-syntactic part, we focus on the relation between the subordinate construction and other verb phrases in the sequence (located in L, *i.e.* the preceding tone-unit, or in R, *i.e.* the following tone-unit). Following Van Valin (1984), Thompson (2002), and Heringa (2007), we identify degrees of integration, in which modal and pragmatic parameters intervene. Total government describes integration, in which another verb phrase in the sequence determines the syntactic position of the subordinate clause and imposes functional restrictions, such as tense, mood, negation, agreement, and/or position in the syntactic unit. Total government also means that the subordinate construction is not pragmatically free (*i.e.* its truth value as a speech act cannot be separated from that of L or R). We distinguish two intermediate configurations, in which the subordinate construction is either syntactically or pragmatically autonomous. Total autonomy represents the cases in which the subordinate construction is not determined by another verb phrase in any syntactic means, and forms a distinct illocutionary unit (*i.e.* a speech act).
- 50 Table 1 shows that restrictive relative clauses are more characterised with total government, with 60% of governed occurrences. This is significantly different from appositive relative clauses ( $F(54, 54) = 2,3 p < .001$ ; independent variable: syntactic type, dependent variable: total macro-syntactic government), but not from adverbial clauses ( $p > .05$ ). Likewise, appositive relative clauses feature 49% of occurrences showing total macro-syntactic autonomy. Again, this result is significantly different from restrictive relative clauses ( $F(54, 54) = 2,3 p < .002$ ; independent variable: syntactic type, dependent variable: total macro-syntactic autonomy), but not from adverbial clauses ( $p > .05$ ). It appears from Table 1 that while appositive relative clauses and restrictive relative clauses are respectively on opposite ends of the integration continuum, adverbial clauses show a partial macro-syntactic autonomy.
- 51 Table 2 features the prosodic boundary cues we have included in the analysis.

Prosody	ARCs		ACs		RRCs	
	nb occurrences	of %	nb occurrences	of %	nb occurrences	of %
longer duration	4	7.2	6	11	24	43.6*
extra-constituent silent pauses in seconds (% pausing time)	64	58.2*	19	17.3	27	24.5
intra-constituent silent pauses in seconds (% pausing time)	11.7	37.1	5.7	12.8	12.7	50
INTSINT pitch variation values	107		116		99	
SC features a distinct tone-unit from that of L and from that of R	54	98.1*	38	69	30	54

no continuation contour on L or SC	45	82*	27	49	9	16
significant pitch gap (>20Hz) in SC	60% of speakers		10% of speakers		10% of speakers	
final syllabic lengthening on L	29	52.7*	3	5	2	4

Table 2. Prosodic features taken into account to determine the dependency or autonomy (grey zones) of each syntactic type (each column gives the number of constructions out of 55 that shows each feature and the percentage that it represents).

- 52 As far as rhythm is concerned, changes in duration, as part of tempo, are strong indicators of a boundary in speech (Crystal, 1969). Pauses segment the flow of speech (Local, 1992); we have considered both extra-constituent pauses (*i.e.* pauses separating two different tone-units) and intra-constituent pauses (*i.e.* pauses inside tone-units). Filled pauses are not included in this analysis, as disfluencies would have been treated as verbal phenomena at the level of discourse, and as audible inbreath is a source of important variation among the speakers of our corpus. We also take final syllabic lengthening into account, as it is considered a strong boundary cue (Katsika et al., 2014). As far as intonation is concerned, we focus on INTSINT's automatic demarcative pitch values, as well as on significant gaps in pitch height between the subordinate clause and the preceding segment (Wennerstrom, 2001). The occurrences in which the subordinate construction features its own tone-unit (*i.e.* is realized in a distinct tone-unit from that of L and from that of R) are taken into account. We also measure the number of continuation contours (both on the subordinate clause and the preceding segment), which indicate a strong link with the following tone-unit (Hirschberg & Grosz, 1992).
- 53 Table 2 shows that appositive relative clauses feature significantly more extra-constituent silent pauses (58.2% of pausing time) than adverbial clauses ( $F(63, 18) = 2.70, p < .002$ ; independent variable: syntactic type, dependent variable: duration of extra-constituent silent pauses in seconds) and restrictive relative clauses ( $F(63, 26) = 3.22, p < .001$ ; independent variable: syntactic type, dependent variable: duration of extra-constituent silent pauses in seconds). Appositive relative clauses are not only significantly realised more often with distinct tone-units than restrictive relative clauses (with 98.1% of occurrences featuring their own tone-unit;  $F(54, 54) = 13.89, p < .0001$ ; independent variable: syntactic type, dependent variable: distinct tone-unit on SC) and adverbial clauses ( $F(54, 54) = 12.34, p < .0001$ ; independent variable: syntactic type, dependent variable: distinct tone-unit on SC), but also show significantly less continuation contours than adverbial clauses ( $F(54, 54) = 1.68, p < .05$ ; independent variable: syntactic type, dependent variable: number of intonational continuation contours) and restrictive relative clauses ( $p > .05$ ), in that 82% of the sequences containing them do not feature any. Appositive clauses also feature significant syllabic lengthening both on L's final syllables and on SC's final syllables. Phonemic duration is greater than that on the left co-text of restrictive relative clauses ( $F(69, 55) = 3.92, p < .0001$ ; independent variable: syntactic type, dependent variable: phonemic duration on L's final syllables), with a mean phonemic duration of 0.095 seconds on the left co-text of appositive relative clauses and 0.069 seconds for that of restrictive relative clauses. Phonemic duration is also greater than that on the left co-text of



adverbial clauses ( $F(69, 58) = 3.9, p < .05$ ; independent variable: syntactic type, dependent variable: phonemic duration on L's final syllables), with a mean phonemic duration of 0.095 seconds on the left co-text of appositive relative clauses and 0.077 seconds for that of adverbial clauses.

- 54 Restrictive relative clauses feature only one disruptive prosodic cue. They show a distinct duration pattern, in that SC is the longest segment of the sequence in which it is inscribed (L:  $F(54, 54) = 3.01, p < .0001$ ; R:  $F(54, 54) = 4.48, p < .0001$ ; independent variable: sequence segment (L, SC, R), dependent variable: speech segment production duration in seconds). However, the difference with appositive relative clauses is not significant.
- 55 Likewise, adverbial clauses also feature one prosodic boundary cue, in that they feature more Intsint symbolic boundary values than appositive clauses and restrictive relative clauses. Adverbial clauses feature more changes in their pitch curve regarding the neighbouring tones and each speaker's pitch range, meaning that adverbial clauses are more modulated than the two other syntactic types.
- 56 Table 3 shows the gestural parameters we have considered as boundary markers.

Prosody	ARCs		ACs		RRCs	
	nb occurrences	of %	nb occurrences	of %	nb occurrences	of %
overlapping hand gestures	8	14.5*	22	40	22	40
(L-SC	7	13	10	18	11	20
SC-R	0	0	10	18	4	7
L-R)	1	2	2	4	7	13
hand beats (% total hand beats)	7	22	3	10	21	68*
head beats (% total head beats)	25	34	34	47	14	19
no change in gaze direction through L-SC-R	4	7.3*	14	26	15	27
eyebrow rises (% total rises)	21	51.2*	10	24.4	10	24.4

Table 3. Gesture features taken into account to determine the dependency or autonomy (grey zones) of each syntactic type (each column gives the number of constructions out of 55 that shows each feature and the percentage that it represents).

- 57 We measure the number of gestures that are produced in overlap with two or three different tone-units during the sequences under study, specifying the tone-units in question (overlap from L to SC, from SC to R, or from L to R). The overlaps in question include the subordinate construction in the same gesture unit as the co-text (Enfield, 2009; Streeck, 2009), showing no boundary. The subordinate type produced with the



smallest proportion of gestural overlap is thus taken into account. Beat gestures (hand and head gestures alike) occurring in isolation (*i.e.* the beats that are not included in a catchment – a recurrent pattern of beats providing cohesion in a specific discourse sequence) are also included for their segmental properties (Kendon, 1972; Cavé *et al.*, 1996). Changes in gaze direction patterns (De Kok & Heylen, 2009) are enquired into, as well as the number of eyebrow rises (Granström & House, 2005).

- 58 Table 3 shows that appositive relative clauses are uttered together with distinct gesture units: the distribution of overlapping hand gestures between L, SC, and R is significantly lower than for restrictive relatives (14.5% of occurrences, in which only 2% feature gestures overlapping from L to R;  $F(54, 54) = 1.93, p < .01$ ; independent variable: syntactic type, dependent variable: number of overlapping hand gestures). In addition, the sequences containing appositive clauses feature important changes in gaze direction, as only 7.3% of occurrences do not feature any change through L, SC, and R. This is significantly different from what happens in sequences containing adverbial clauses ( $F(54, 54) = 2.81, p < .001$ ) and restrictive relative clauses ( $F(54, 54) = 2.94, p < .0001$ ). Eyebrow rises also characteristically feature in appositive relative clauses, as they not only occur significantly more in SC than in the preceding segment (L:  $p > .05$ ; R:  $F(54, 54) = 2.13, p < .005$ ; independent variable: sequence segment (L, SC, R), dependent variable: number of eyebrow rises), but also occur significantly more with this syntactic type than in the others (adverbial clauses and restrictive relative clauses:  $F(54, 54) = 1.59, p < .05$ ; independent variable: syntactic type, dependent variable: number of eyebrow rises).
- 59 Restrictive relative clauses are only marked with a single gestural boundary cue, in that they feature the highest number of hand beats (68% of these gestures are produced with this syntactic type), compared with their embedding sequence (L:  $F(89, 69) = 1.74, p < .005$ ; R:  $p > .05$ ; independent variable: sequence segment (L, SC, R), dependent variable: number of hand beats) and with appositive relatives ( $F(89, 75) = 2.33, p < .0002$ ; independent variable: syntactic type, dependent variable: number of hand beats) and adverbial clauses ( $F(89, 96) = 2.15, p < .0002$ ; independent variable: syntactic type, dependent variable: number of hand beats).
- 60 Likewise, adverbial clauses show only one boundary tendency, which does not reach statistical significance. Adverbial clauses tend to be produced with more head beats than the other syntactic types, and their co-text. These head beats represent 47% of the total head beats produced in co-occurrence with subordinate clauses.

#### 4.1 Hypotheses for the qualitative analysis

- 61 In the next section, examples will be provided in relation with the raw results described in Section 4. Bearing in mind that subordinate constructions in spontaneous speech are different in their number of boundary cues and that subordinate constructions are a preferred format to act on interpretative frames (Thompson, 2002; Clark & Krych, 2004), I discuss whether 1) boundary cues in subordinate clauses impact interpretative frames in different ways depending on the syntactic type of subordination; 2) both prosodic and gestural boundary cues are used in a same discourse sequence to act on interpretative frames.

## 5. Qualitative analysis and discussion

- 62 We focus on three occurrences of subordinate clauses in context, positioned in different discourse sequences.

### 5.1 Restrictive relative clause

(5)	Michelle		who is she again #
	Zoe		Felicity's that woman that #
	Michelle	L	oh [(a) POINTING she's that # woman
		SC	<b>that # (b) BEAT looks after] [ (c) HEAD NOD the Nottingham crowd] (laughs)</b>
	Zoe		looks after us
	Michelle	R	[(d) HEAD TILT that woman #]

- 63 Extract (5) is from a narrative. Zoe has just mentioned a referent (Felicity) assuming that this referent is known from the co-speaker, Michelle, and that it can be easily activated in Michelle's memory. Michelle makes it clear that on the contrary, she needs more information on the identity of this referent. Michelle selects the referent in a more precise way with the subordinate construction. Both the clauses in L and in SC presuppose the existence of other women that are known from the participants. Michelle repeats the lexical items "that woman" in R after the completion of the restrictive relative clause, showing that the reanalysis of L triggered by SC has given her access to another meaning. The information carried in SC is different from that of L, but they both belong to the same interpretative frame. As far as gestures are concerned, some devices are used to integrate the beginning of the subordinate construction to L's gesture unit. Extract (5) is associated with Figure 1, where (a), (b), (c), and (d) correspond to different moments in its production.

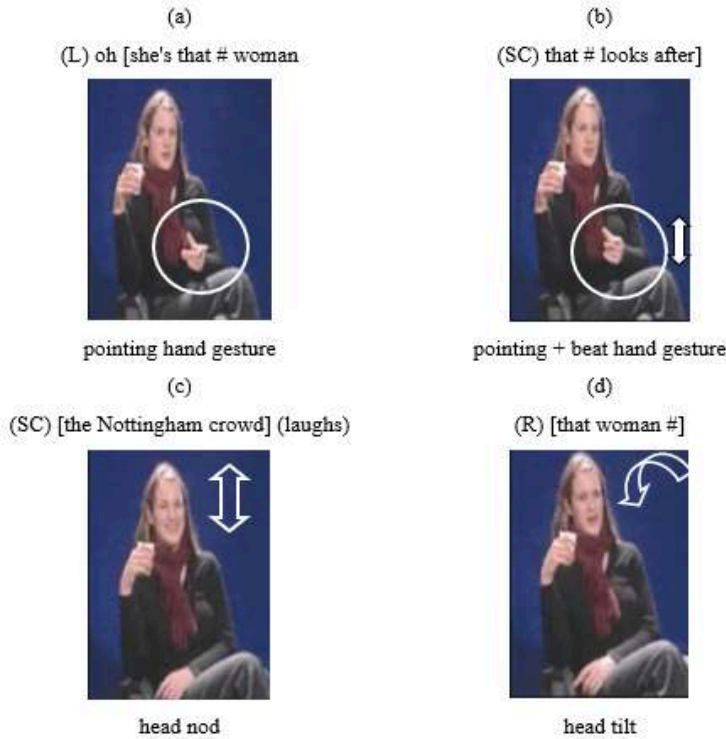


Figure 1. Superimposed hand beat on a pointing gesture, integrating the beginning of SC to L's gesture unit, and head nod realised in co-occurrence with the production of a restrictive relative clause, followed by a head tilt in example (5).

64 Michelle (on the left in the video) produces a pointing gesture during L, and holds it. While producing the beginning of SC, she adds a hand beat to the held configuration. Through one single gesture unit for two segments, Michelle marks the two segments as belonging to same cognitive unit. Figure 2 shows the vocal realisation of example (5).

(5)	Michelle	L	oh she's that # woman	1.3 s
		sc	<b>that # looks after the Nottingham crowd (laughs)</b>	3 s
	Zoe		looks after us	
	Michelle	R	that woman #	0.5 s

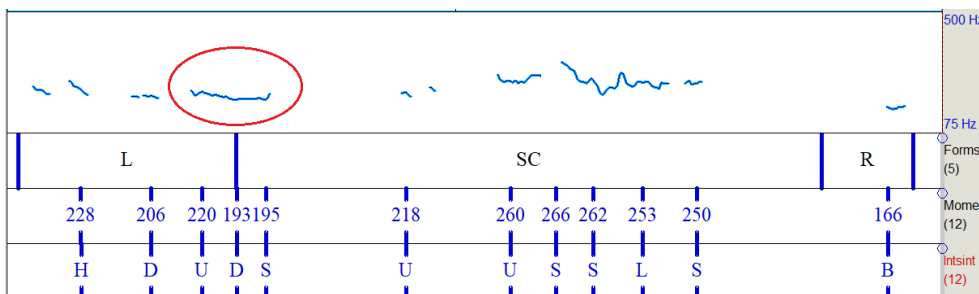


Figure . Intonation curve of example (5) in Praat, showing the integration of sc's initial items into L's tone-unit (the first transcription track shows segments -L, sc, R- in the sequence, the second transcription track gives Momet's corrected F0 values in Hz, and the third transcription track shows Intsint's coded values).

- 65 SC is a bit longer in duration than the co-text (3 seconds compared to 1.3 seconds for L and to 0.5 seconds for R). Michelle also uses two intra-constituent silent pauses to keep her turn. The first silent pause is produced between in the subject complement, between the demonstrative determiner "that" and the noun "woman", and the second silent pause is between SC's relative pronoun and the clause it introduces. They are not aligned with syntactic boundaries and they are not paired with a significant change in speech rate: they are displaced demarcation pauses, allowing the speaker to keep her speech turn while going through a lexical search or unit processing. With these pauses, Michelle makes sure that the beginning of SC is integrated to L's final items and that the boundary between L and SC is not going to be interpreted as a Transition Relevance Place. Apart from the silent pauses produced by Michelle to secure her turn, no prosodic boundary cue is to be found before the completion of the restrictive relative clause. The beginning of SC is integrated to L's tone unit. However, we see a clear break after the completion of the subordinate clause with an important gap in pitch height (Intsint symbolic value "B" for bottom of speaker's range).
- 66 To sum up, in this extract, both gesture and prosody work at the integration of the subordinate construction as part of the left co-text. This extract features an embedding of tone-units and one single gesture unit indicating that L and SC are part of a same group. Another way to represent restrictive relative clauses in their discourse sequence would be to state that in our corpus, restrictive relative clauses prototypically mark an identity of interpretative frames between the main and subordinate clauses with no break in prosody and gesture between the main clause and the subordinate construction. The sequences containing a restrictive relative clause feature an important break between SC and R, as seen in example (5) with the pitch reset and the change in Michelle's use of articulators. The action of restrictive relative clauses on interpretative frames is modelled in Figure 3 below.

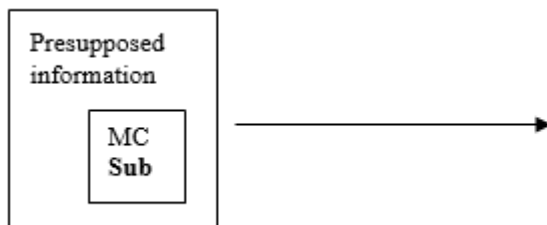


Figure 3. Restrictive relative clauses: identity of interpretative frames for the main clause (MC) and the subordinate clause (Sub), with a single possible continuation after the production of the subordinate clause (represented with the arrow)

## 5.2. Adverbial clause

- 67 Our second extract, sequence (6), features an adverbial clause in a narrative.

(6)	Rhianna	L	i tried [(a) METAPHORIC driving once] in her car
		SC	<b>when we were on a # [ICONIC little road</b>
			<b>in the countryside] #</b>

		R	and hem (swallows) she said well turn left #
--	--	---	--

68 Rhianna explains why driving is not for her. The subordinate clause adds contextual elements to the action described in L. L's referential elements are stabilised in that SC delimitates their scope. Extract (6) is associated with Figure 4, where (a), (b), and (c) correspond to different moments in its production.

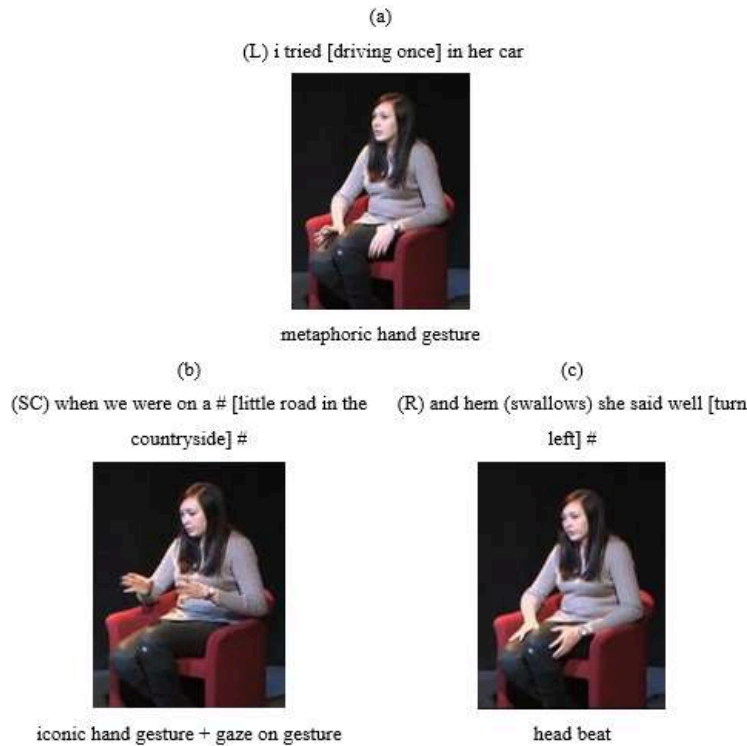


Figure 4. Metaphoric and iconic hand gestures produced in co-occurrence with sequence (6), followed by a head beat.

69 Rhianna produces a metaphoric gesture in the low periphery in L, insisting on the exceptional character of the situation. She also marks the verbal item "once" with a head beat. She then produces a large iconic gesture in SC, her two hands symmetrically drawing parallel lines in front of her, in a representation of the "little road". Her gaze on this gesture has a deictic value. She positions herself as a participant in her narrative, contrary to L in which she does not describe any event but gives information about them as a speaker-utterer. R is not accompanied with any hand gesture, although this segment describes the first event triggering the complication. The gestural frame that was defined with SC is not maintained, although it is still valid for the interpretation of the segments that follow. Apart from the fact that Rhianna produces a large gesture and then stops gesturing, this extract features no other cue either for demarcation or for integration. Figure 5 shows the vocal realisation of example (6).

(6)	Rhianna	L	i tried driving once in her car
		SC	<b>when we were on a # little road</b>

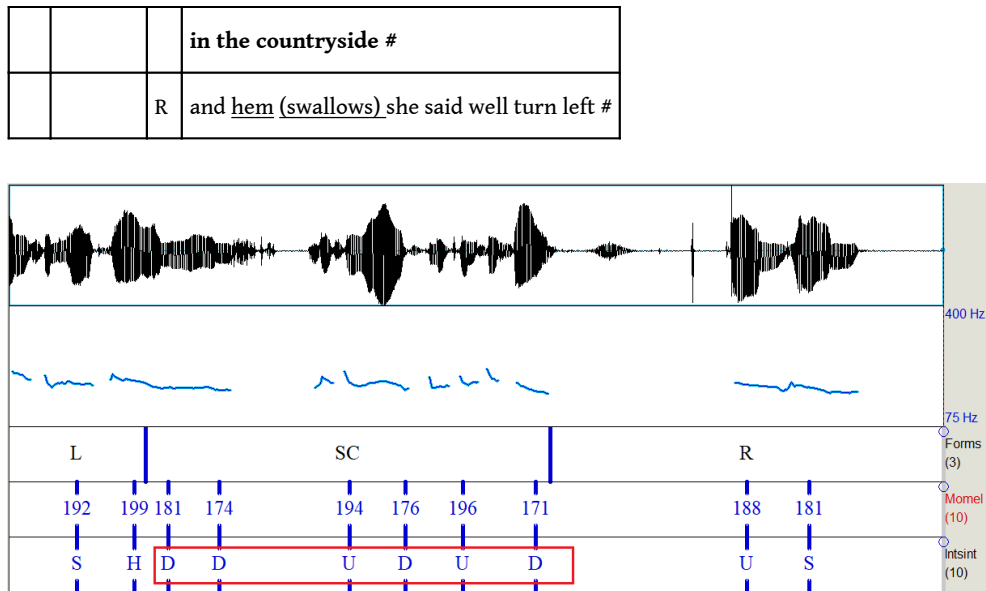


Figure 5. Intonation curve of example (6) in Praat, showing more pitch height variation in SC (Intsint symbolic values "D" for downstep, and "U" for upstep) than in the co-text (the first transcription track shows segments –L, SC, R– in the sequence, the second transcription track gives Momel's corrected F0 values in Hz, and the third transcription track shows Intsint's coded values).

- 70 At the prosodic level, SC shows more pitch modulation than its co-text: the subordinate construction shows more movement with downsteps and upsteps in pitch, as shown with the Intsint "D" and "U" values. The beginning of R shows the combination of the resumption discourse marker "and" with a filled pause, "hem". This suggests that the projection of R as a segment and of further speech has a higher cognitive cost for Rhianna than the rest.
- 71 To sum up, Rhianna produces a large gesture in SC, while looking at her hands in this extract. We have more pitch modulation in SC and more filled pauses afterwards. A way to represent the role of adverbial clauses in their discourse sequence would be to say that adverbial clauses enlarge the interpretative frame of the main clause, with a higher break index in prosody than for relative clauses. There are no cues for either break or integration in gestures. The action of adverbial clauses on interpretative frames is modelled in Figure 6 below.

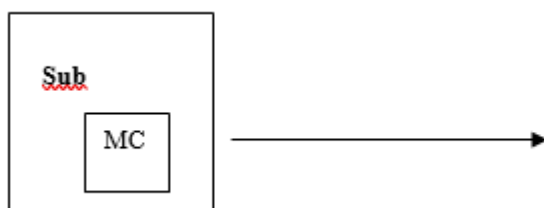


Figure 6. Adverbial clauses: the subordinate clause (Sub) enlarges the interpretative frame regarding that of the main clause (MC), with a single possible continuation after the production of the subordinate clause (represented with the arrow).

### 5.3 Appositive clause

72 Extract (7) features an appositive clause and is part of an argumentation. Rhianna is still laying out the reasons why driving is not for her. In this extract, underlined items represent overlapping speech.

(7)	Rhianna	L	i mean [ICONIC my mum's pushing me] to get my license
		SC	(h) uh which [METAPHORIC i guess i should] #
	Alex		it's a good thing to <u>have</u>
	Rhianna	R	(h) <u>but</u> # well <u>first of all</u>
	Alex		<u>if you ever need it i mean</u>

73 Rhianna begins with mentioning her mother's opinion, and concedes that it has a certain value in SC. Figure 7 is associated with extract (7), where (a), (b), (c), (d), and (e) are associated with different moments in its production.

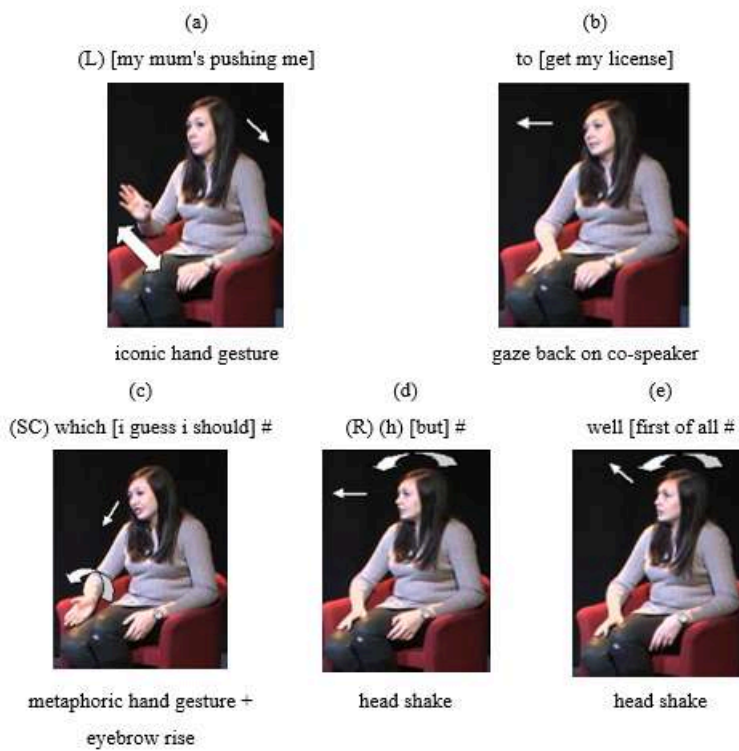


Figure 7. Metaphoric hand gesture contrasting with a previous iconic gesture and eyebrow rise, produced in co-occurrence with the production of an appositive clause, followed by a head shake in example (7).

74 Extract (7) shows two very different hand gestures between L and SC, and a head shake in R. Rhianna produces an iconic gesture with her right hand in L, connected to the verbal item "pushing". This gesture gives a hyperbolic dimension to the segment as her mother's advice is materialised as strong pressure. Rhianna looks at the co-speaker at the end of the tone-unit. As she makes a concessive comment in SC, Rhianna realises a

small palm-presentation gesture, which is much lower than her previous hand gesture. Gesture allows Rhianna to act both as a character of the situation she has built in L (she assents to her mother's advice), and as a speaker-utterer (she concedes that her mother's advice has some value with the hand flip). Rhianna also raises her eyebrows as she takes a modal stance. This eyebrow rise marks SC as a contrastive discourse move in the argumentation. Her gaze has left the co-speaker in SC, suggesting that Rhianna is centred upon her own discourse. On R, Rhianna is back on her main argumentation line, and takes a more categorical stance. The segment is marked with a continuous head shake starting on "but" and Rhianna's gaze is back on Alex, who inserts a substantial backchannel. This sequence is then characterised with two successive modal positions, one in SC and one in R. From an assertive point of view, the stance taken in R is stronger than that in SC. This mirrors the discourse structure, as R continues the sequential agenda while SC does not. The interpretative frame opened in SC, presenting Rhianna as a speaker-utterer taking a modal stance on her mother's arguments, is not continued. Figure 8 shows the vocal realisation of example (7).

(7)	Rhianna	L	i mean my mum's pushing me to get my license	2.4 s
		SC	<b>(h) uh which i guess i should #</b>	<u>2.1 s</u>
	Rhianna	R	(h) but # well first of all	2.6 s

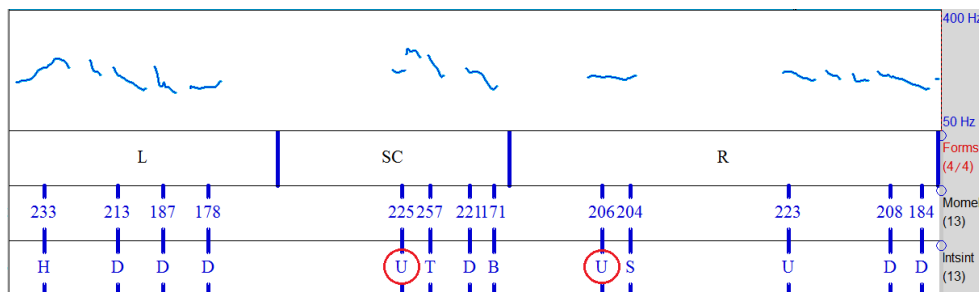


Figure 8. Intonation curve of example (7) in Praat, showing SC as clearly set off from L and from R, and pitch upsteps (Intsint symbolic value "U" for upstep) between each tone-unit (the first transcription track shows segments -L, SC, R- in the sequence, the second transcription track gives Momet's corrected F0 values in Hz, and the third transcription track shows Intsint's coded values).

- 75 As far as prosody is concerned, SC is clearly set off from L and from R through a specific duration, silent pauses, audible inbreath, and non-neutral intervals, in that there are pitch upsteps between tone-units. The end of SC is also clearly perceived as a boundary by the co-speaker, who inserts a substantial comment. Rhianna does not want to yield the speech turn and uses a flat continuation contour on "but", which is also lengthened.
- 76 To sum up, gesture shows a wide array of demarcative features such as eyebrow rises, changes in gaze direction and clear-cut hand gesture units. Prosody is also very demarcative through both rhythm and intonation. Appositive clauses can be described as opening a new interpretative frame compared to that of the main clause, which is marked by a higher prosodic and gestural break index than for the other two subordinate constructions. Two continuations are possible after the production of the appositive clause: either the interpretative frame of the main clause is resumed as in



the example (7), or the interpretative frame of the subordinate clause is continued. The action of appositive clauses on interpretative frames is modelled in Figure 9 below.

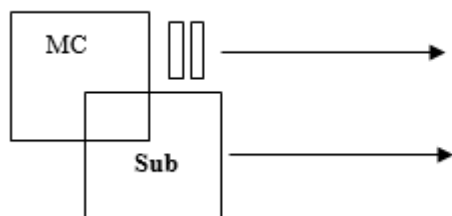


Figure 9. Appositive relative clauses: the subordinate clause (Sub) opens a new interpretative frame compared to that of the main clause (MC). Two continuations are possible after the production of the appositive clause: either the interpretative frame of the main clause is resumed, or the interpretative frame of the subordinate clause is continued.

## 6. Discussion and conclusion

- 77 Through the qualitative analysis of three occurrences, I have shown that subordinate constructions do not offer the same interpretative reconstruction of discourse. We have seen that both prosody and gesture in restrictive relative clauses mark an identity of interpretative frames regarding that of the main clause. Speakers only produce a boundary after their production. The absence of boundaries before the completion of the restrictive relative clause can be partly explained by the complexity constraint added by the insertion of a restrictive clause in a discourse sequence. Prosody and gesture help at disambiguating the discourse sequence, since restrictive clauses lengthen tone-units and add syntactic complexity to the sequence. The hand beat we have seen in example (5) for instance helps at selecting the most relevant informational items to facilitate the co-speaker's treatment.
- 78 The prosodic and gestural cues in adverbial clauses enlarge the interpretative frame regarding that of the main clause. The speaker uses pitch modulation and large gestures to focus the co-speaker's attention on this specific segment in the sequence.
- 79 Finally, appositive clauses show a variety of prosodic and gestural boundary cues in appositive clauses, that open a new interpretative frame. Boundaries are to be found both before the production of the subordinate clause and afterwards. These cues signal a discrepancy regarding the host sequence. This discrepancy is often the speaker taking a different stance compared to that taken before.
- 80 Through a multimodal analysis of several syntactic types of subordinate constructions, this paper proposes a multiparameter approach for modelling subordinate constructions in spontaneous speech. When analysing how semiotic units form larger sequences of action in discourse and conversation, spontaneous speech presents both complex chains of structures embedded in one another, and disruptions in which the discourse parts no longer follow one another. Subordinate constructions introduce a break when they open a different interpretative frame from that in the preceding utterance. While this break can directly be expressed with syntactic or discursive means, prosody creates a break during the production of the subordinate construction through rhythmic features or pitch upsteps, signalling that the previous elements have to be recontextualised. To avoid a gap between the co-speaker's representations and the speaker's input, gestures give pragmatic instructions on the informational value of

the propositional content (*e.g.* hand beats, eyebrow rises), showing a different relation to the linearity of discourse through the use of physical space.

- 81 Going beyond the verbal, vocal, and gestural characteristics of a message, we have seen that gesture can take prosodic, semantic, pragmatic and modal dimensions. In this sense, I have tried to show how gesture and speech are exploiting common dimensions in various ways and temporalities in subordinate structures.
- 82 These three examples also show that the interactions and overlaps between units of a discourse sequence are not the same depending on the syntactic type of subordinate construction. If the interactions and overlaps between units are different, the interactions and overlaps between symbolic assemblies<sup>6</sup> (*i.e.* multimodal expressions incorporating several meaningful components to form meaningful wholes; Hirrel, 2018) are also different. Symbolic assemblies can be found on very different scales, and those created by prosody and by gesture are complex. As Hirrel (2018) points out, very few studies examine the relationship between the meaning of symbolically complex gestural expressions (*i.e.*, gestures that incorporate more than one meaningful component) and the meanings of the individual component gestures that comprise them. The complexity of these symbolic assemblies and the symbolic integration of gesture and speech need to be better accounted for. The current work is part of a larger project aiming at a formal account of symbolic assemblies with data from spontaneous conversation, and at representing speech and gesture units with their interactions and overlaps.
- 83 Another development lies in a comparative study, in which the proposed multiparameter framework for subordinate constructions is confronted with a multiparameter framework for coordinate constructions in similar discourse conditions, exploring whether and how the interpretational frames are modified in different ways.

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## BIBLIOGRAPHY

- Arnold, D., & Borsley, R. D. (2008). Non-restrictive Relative Clauses, Ellipsis and Anaphora. *Proceedings of the HPSG08 Conference*, 5–25. Stanford, CA, USA: CSLI Publications.
- Auer, P. (2005). Projection in interaction and projection in grammar. *Text*, 25(1), 7–36.
- Azar, Z., Backus, A., & Ozyurek, A. (2016). Multimodal reference tracking in Dutch and Turkish discourse: Role of culture and typological differences. *Proceedings of ISGS7*, 1–5. Paris, France.
- Barkhuysen, P., Krahmer, E., & Swerts, M. (2008). The interplay between the auditory and visual modality for end-of-utterance detection. *The Journal of the Acoustical Society of America*, 123(1), 354–365.
- Beattie, G. (1978). Sequential Temporal Patterns of Speech and Gaze in Dialogue. *Semiotica*, 23(1–2), 29–52.

- Beckman, M. E., Hirschberg, J., & Shattuck-Hufnagel, S. (2005). The original ToBI system and the evolution of the ToBI framework. In S.-A. Jun (Ed.), *Prosodic Typology. The Phonology of Intonation and Phrasing* (pp. 9–54). New York: Oxford University Press.
- Benzitoun, C., Dister, A., Gerdes, K., Kahane, S., & Marlet, R. (2009). Annoter du des textes tu te demandes si c'est syntaxique tu vois. *Proceedings of the 28th International Conference on Lexis and Grammar (LGC 2009)*, 4, 16–27. Bergen, Norway: Bergen University Press.
- Bestgen, Y. (2009). The discourse functions of sentence-initial adverbials: Studies in comprehension. *Proceedings of Linguistic & Psycholinguistic Approaches to Text Structuring*, 7–13. Paris: Ecole Normale Supérieure.
- Biau, E., Fernandez, L. M., Holle, H., Avila, C., & Soto-Faraco, S. (2016). Hand gestures as visual prosody: BOLD responses to audio-visual alignment are modulated by the communicative nature of the stimuli. *NeuroImage*, 132, 129–137.
- Biau, E., & Soto-Faraco, S. (2013). Beat gestures modulate auditory integration in speech perception. *Brain and Language*, 124(2), 143–152.
- Biber, D., Johansson, S., Leech, G., Conrad, S., Finegan, E., & Quirk, R. (1999). *Longman Grammar of Spoken and Written English*. London: Pearson Education.
- Bigi, B. (2012). SPPAS: a tool for the phonetic segmentation of Speech. *Proceedings of the International Conference on Language Resources and Evaluation (LREC 2012)*, 1748–1755. Istanbul, Turkey.
- Blanche-Benveniste, C. (1990). Un modèle d'analyse syntaxique "en grilles" pour les productions orales. *Anuario de Psicología*, 47, 11–28.
- Blühndorn, H. (2008). Subordination and coordination in syntax, semantics and discourse. In C. Fabricius-Hansen & W. Ramm (Eds.), "Subordination" versus "Coordination" in *Sentence and Text. A Cross-Linguistic Perspective* (pp. 59–85). Amsterdam: John Benjamins.
- Boersma, P., & Weenink, D. (n.d.). Praat: Doing Phonetics by Computer. Retrieved 30 January 2013, from <http://www.fon.hum.uva.nl/praat/>
- Bolinger, D. (1984). Intonational signals of subordination. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society*, 401–413. Berkeley, CA, USA: eLanguage.
- Borsley, R. D. (1992). More on the Difference between English Restrictive and Non-Restrictive Relative Clauses. *Journal of Linguistics*, 28(1), 139–148.
- Bressemer, J., & Ladewig, S. (2011). Rethinking gesture phases: Articulatory features of gestural movement? *Semiotica*, 184, 53–91.
- Burton-Roberts, N. (1999). Language, linear precedence and parentheticals. In P. Collins & D. Lee (Eds.), *The Clause in English: In honour of Rodney Huddleston* (pp. 33–51). Amsterdam: John Benjamins.
- Calbris, G. (2011). *Elements of meaning in gesture*. Amsterdam: John Benjamins.
- Cassell, J., & McNeill, D. (1990). Gesture and ground. *Proceedings of the Sixteenth Annual Meeting of the Berkeley Linguistics Society*, 16, 57–68. Berkeley, CA, USA.
- Cavé, C., Guaitella, I., Bertrand, R., Santi, S., Harlay, F., & Espesser, R. (1996). About the Relationship between Eyebrow Movements and F0 Variations. *Proceedings from the Fourth International Conference on Spoken Language*, 2175–78. Philadelphia, USA: IEEE.

- Chafe, W. (1976). Givenness, Contrastiveness, Definiteness, Subjects, Topics, and Point of View. In C. N. Li (Ed.), *Subject and Topic* (pp. 25–55). New York: Academic Press.
- Chafe, W. (1984). How People Use Adverbial Clauses. *Proceedings of the Tenth Annual Meeting of the Berkeley Linguistics Society*, 437–449. Berkeley, CA, USA: Linguistic Society of America.
- Chafe, W. (1988). Linking intonation units in spoken English. In J. Haiman & S. A. Thompson (Eds.), *Clause Combining in Grammar and Discourse* (pp. 1–27). Amsterdam: John Benjamins.
- Cho, T. (2006). Manifestation of prosodic structure in articulation: Evidence from lip kinematics in English. In L. Goldstein (Ed.), *Laboratory Phonology 8: Varieties of phonological competence* (pp. 519–548). New York: Walter de Gruyter.
- Clark, H. H., & Krych, M. A. (2004). Speaking while monitoring addressees for understanding. *Journal of Memory and Language*, 50(1), 62–81.
- Cotte, P. (2008). Subordination and the English infinitive. *Etudes Anglaises*, 61(4), 455–468.
- Cristofaro, S. (2003). *Subordination*. Oxford: Oxford University Press.
- Cristofaro, S. (2014). Is there really a syntactic category of subordination? In L. Visapää, J. Kalliokoski, & H. Sorva (Eds.), *Contexts of Subordination* (pp. 73–92). Amsterdam: John Benjamins.
- Crystal, D. (1969). *Prosodic Systems and Intonation in English*. Cambridge: Cambridge University Press.
- Dancygier, B., & Sweetser, E. (2000). Constructions with if, since, and because: Causality, epistemic stance, and clause order. In E. Couper-Kuhlen & B. Kortmann (Eds.), *Cause, Condition, Concession, Contrast* (pp. 111–142). Berlin: Mouton de Gruyter.
- De Kok, I., & Heylen, D. (2009). Multimodal end-of-turn prediction in multi-party meetings. *Proceedings of the 2009 International Conference on Multimodal Interfaces*, 91–98. New York, USA: ACM.
- De Vries, M. (2006). The syntax of appositive relativization: On specifying coordination, false free relatives, and promotion. *Linguistic Inquiry*, 37(2), 229–270.
- Depraetere, I. (1996). Foregrounding in English relative clauses. *Linguistics*, 34(4), 699–732.
- Dik, S. C. (1989). *The Theory of Functional Grammar*. Dordrecht: Foris.
- Dimitrova, D., Chu, M., Wang, L., Özyürek, A., & Hagoort, P. (2016). Beat that Word: How Listeners Integrate Beat Gesture and Focus in Multimodal Speech Discourse. *Journal of Cognitive Neuroscience*, 28(9), 1255–1269.
- Dohen, M., & Loevenbruck, H. (2009). Interaction of audition and vision for the perception of prosodic contrastive focus. *Language and Speech*, 52(2–3), 177–206.
- Ehmer, O. (2016). Adverbial patterns in interaction. *Language Sciences*, 58, 1–7. <http://dx.doi.org/10.1016/j.langsci.2016.05.001>
- Eisenstein, J., Barzilay, R., & Davis, R. (2008). Gestural Cohesion for Topic Segmentation. *Proceedings of ACL*, 852–860. Columbus, USA: Association for Computational Linguistics.
- Enfield, N. J. (2009). *The Anatomy of Meaning: Speech, Gesture and Composite Utterances*. Cambridge: Cambridge University Press.
- Fabb, N. (1990). The difference between English restrictive and nonrestrictive relative clauses. *Journal of Linguistics*, 26(1), 57–77.
- Ferré, G. (2014). A Multimodal Approach to Markedness in Spoken French. *Speech Communication: Special Issue on Gesture and Speech in Interaction*, 57, 268–282.

- Fleischman, S. (1985). Discourse functions of tense-aspect oppositions in narrative: Toward a theory of grounding. *Linguistics*, 23, 851–882.
- Ford, C. E. (1997). Speaking conditionally. In A. Athanasiadou & R. Dirven (Eds.), *On Conditionals Again* (pp. 387–414). Amsterdam: John Benjamins.
- Frederiksen, A. T. (2016). Hold + Stroke Gesture Sequences as Cohesion Devices: Examples from Danish Narratives. *San Diego Linguistics Papers*, 6, 2–13.
- Gosselin, L. (1990). Les circonstanciels: De la phrase au texte. *Langue Française*, (86), 37–45.
- Granström, B., House, D., & Lundeborg, M. (1999). Prosodic cues in multimodal speech perception. *Proceedings of the International Congress of Phonetic Sciences (ICPhS99)*, 655–658. San Francisco, USA.
- Gross, G. (2005). Les circonstanciels sont des complétives. In F. Lambert & H. Nolke (Eds.), *La Syntaxe au coeur de la Grammaire. Recueil offert en hommage pour le 60e anniversaire de Claude Muller* (pp. 121–126). Rennes, France: Presses Universitaires de Rennes.
- Gullberg, M. (2006). Handling discourse: Gestures, reference tracking, and communication strategies in early L2. *Language Learning*, 56(1), 155–196.
- Haiman, J., & Thompson, S. A. (1984). "Subordination" in Universal Grammar. *Proceedings of the Tenth Annual Meeting of the Berkeley Linguistics Society*, 510–523. Berkeley, CA, USA: eLanguage.
- Halliday, M. A. K. (1985). *An Introduction to Functional Grammar*. London: Edward Arnold.
- Halliday, M. A. K., & Hasan, R. (1976). *Cohesion in English*. London: Longman.
- Harris, Z. (1982). *A Grammar of English on Mathematical Principles*. New York: John Wiley.
- Heringa, H. (2007). Appositional constructions: Coordination and predication. *Proceedings of the Fifth Semantics in the Netherlands Day*, 67–82. Retrieved from <http://www.let.rug.nl/heringa/apcopred.pdf>
- Heylen, D. (2006). Head gestures, gaze, and the principles of conversational structure. *International Journal of Humanoid Robotics*, 3(3), 241–267.
- Hirrel, L. (2018). *Cyclic gestures and multimodal symbolic assemblies: An argument for symbolic complexity in gesture* (PhD Thesis). University of New Mexico, Albuquerque, NM, USA.
- Hirschberg, J., & Grosz, B. (1992). Intonational features of local and global discourse structure. *Proceedings of the Workshop on Speech and Natural Language*, 441–446. Morristown, USA: Association for Computational Linguistics.
- Hirst, D. J. (2007). A Praat plugin for Momel and INTSINT with improved algorithms for modelling and coding intonation. *Proceedings of the XVth International Conference of Phonetic Sciences*, 1233–1236. Retrieved from [http://fedora.tge-adonis.fr:8090/fedora/get/CRDO-Aix:234079/DEPOT\\_DESC\\_2068.pdf](http://fedora.tge-adonis.fr:8090/fedora/get/CRDO-Aix:234079/DEPOT_DESC_2068.pdf)
- Hoetjes, M., Koolen, R., Goudbeek, M., Krahmer, E., & Swerts, M. (2015). Reduction in gesture during the production of repeated references. *Journal of Memory and Language*, 79, 1–17.
- Holle, H., Obermeier, C., Schmidt-Kassow, M., Friederici, A. D., Ward, J., & Gunter, T. C. (2012). Gesture facilitates the syntactic analysis of speech. *Frontiers in Psychology*, 3(74), 1–12.
- Holler, A. (2005). Expressing communicative-weight assignment discourse structurally. *Proceedings of the Workshop on Constraints in Discourse*, 6, 88–94. Dortmund, Germany: Universität Dortmund.

- Huddleston, R., & Pullum, G. K. (2002). *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.
- Jackendoff, R. (1977). *X-bar Syntax: A Study of Phrase Structure*. Cambridge, MA: The MIT Press.
- Jespersen, O. (1927). *A Modern English Grammar on Historical Principles* (Vol. 3). London: George Allen & Unwin.
- Katsika, A., Krivokapic, J., Mooshammer, C., Tiede, M., & Goldstein, L. (2014). The coordination of boundary tones and its interaction with prominence. *Journal of Phonetics*, 44, 62–82.
- Kendon, A. (1967). Some functions of gaze-direction in social interaction. *Acta Psychologica*, 26, 22–63.
- Kendon, A. (2004). *Gesture: Visible action as utterance*. Cambridge: Cambridge University Press.
- Kipp, M., Neff, M., & Albrecht, I. (2007). An annotation scheme for conversational gestures: How to economically capture timing and form. *Language Resources & Evaluation*, 41, 325–339.
- Kita, S., & Özyürek, A. (2003). What does cross-linguistic variation in semantic coordination of speech and gesture reveal?: Evidence for an interface representation of spatial thinking and speaking. *Journal of Memory and Language*, 48(1), 16–32.
- Krifka, M. (2007). Basic Notions of Information Structure. *Interdisciplinary Studies on Information Structure*, 6, 13–55.
- Lambrecht, K. (1996). *Information structure and sentence form: Topic, focus, and the mental representations of discourse referents*. New York: Cambridge University Press.
- Lambrecht, K. (1998). There was a farmer had a dog: Syntactic amalgams revisited. *Proceedings of the 14th Annual Meeting of the Berkeley Linguistic Society*, 319–339. Berkeley, CA: eLanguage.
- Langacker, R. W. (1991). Cognitive grammar. In F. G. Droste & J. E. Joseph (Eds.), *Linguistic Theory and Grammatical Description: Nine Current Approaches* (pp. 275–306). Amsterdam: John Benjamins.
- Langacker, R. W. (2008). *Cognitive Grammar. A Basic Introduction*. Oxford: Oxford University Press.
- Lascardes, A., & Stone, M. (2009). Discourse coherence and gesture interpretation. *Gesture*, 9(2), 147–180.
- Laurson, L. (2005). Towards an embodied Grammar: Gesture in tying practices Constructing obvious cohesion. *Proceedings of ISGS2*. Lyon, France. Retrieved from [http://gesture-lyon2005.ens-lyon.fr/article.php?id\\_article=238](http://gesture-lyon2005.ens-lyon.fr/article.php?id_article=238)
- Lazard, G. (1994). *L'Actance*. Paris, France: PUF.
- Lehmann, C. (1988). Towards a typology of clause linkage. In J. Haiman & S. A. Thompson (Eds.), *Clause Combining in Grammar and Discourse* (pp. 181–225). Amsterdam: Academic Press.
- Lelandais, M., & Ferré, G. (2019). The verbal, vocal, and gestural expression of (in)dependency in two types of subordinate constructions. *Journal of Corpora and Discourse Studies*, 2, 117–143.
- Lelandais, M., & Ferré, G. (2017). What do gestures in subordination tell us about (in)dependence? *Journal of Communication Studies*, 4(1–2), 43–49.
- Lelandais, M., & Ferré, G. (2016). Prosodic boundaries in subordinate syntactic constructions. *Proceedings of Speech Prosody 2016*, 183–187. Boston, USA: ISCA.
- Local, J. (2007). Phonetic detail and the organisation of talk-in-interaction. *Proceedings of the 16th ICPhS*. Saarbrücken, Germany. Retrieved from [http://icar.univ-lyon2.fr/ecole\\_thematique/tranal\\_i/documents/Local\\_Phoneticdetails.pdf](http://icar.univ-lyon2.fr/ecole_thematique/tranal_i/documents/Local_Phoneticdetails.pdf)

- Loehr, D. P. (2004). *Gesture and intonation* (PhD Thesis). Georgetown University, District of Columbia, USA. Retrieved from [http://www9.georgetown.edu/faculty/loehrd/pubs\\_files/loehr04.pdf](http://www9.georgetown.edu/faculty/loehrd/pubs_files/loehr04.pdf)
- Longacre, R. E. (1985). Sentences as combination of clauses. In T. Shopen (Ed.), *Language Typology and Syntactic Description: Complex Constructions* (pp. 372–420). Cambridge, UK: Cambridge University Press.
- Loock, R. (2007). Appositive relative clauses and their functions in discourse. *Journal of Pragmatics*, 39(2), 336–362.
- Lytvynova, M., & Dao, H. L. (2014). Les relatives appositives entre intégration syntaxique et intégration discursive. *Actes Du Congrès Mondial de Linguistique Française – CMLF 2014*. Berlin, Germany.
- Matthiessen, C., & Thompson, S. A. (1988). The structure of discourse and “subordination”. In J. Haiman & S. A. Thompson (Eds.), *Clause Combining in Grammar and Discourse* (pp. 275–329). Amsterdam: John Benjamins.
- McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago: University of Chicago Press.
- McNeill, D. (2005). *Gesture and thought*. Chicago: University of Chicago Press.
- McNeill, D., & Levy, E. T. (1993). Cohesion and gesture. *Discourse Processes*, 16(4), 363–386.
- Melis, G. (2008). Relatives et types de qualification. *Cycnos [En Ligne]*, 17.
- Miller, J. E., Weinert, R., & Miller, J. (1998). *Spontaneous Spoken Language: Syntax and Discourse*. Oxford: Clarendon Press.
- Mo, Y. (2008). Duration and intensity as perceptual cues for naïve listeners’ prominence and boundary perception. *Proceedings of Speech Prosody 2008*, 739–742. Campinas, Brazil: ISCA.
- Muller, C. (2006). Sur les propriétés des relatives. *Cahiers de Grammaire*, 30, 319–337.
- Muller, C. (2008). La relation au verbe principal dans les relatives prédicatives en français. *Faits de Langues*, 31(32), 337–346.
- Nakano, Y. I., Reinstein, G., Stocky, T., & Cassell, J. (2003). Towards a model of face-to-face grounding. *Proceedings of the 41st Annual Meeting on Association for Computational Linguistics-Volume 1*, 553–561. Sapporo, Japan: Association for Computational Linguistics.
- Park-Doob, M. A. (2010). *Gesturing through time: Holds and intermodal timing in the stream of speech* (PhD Thesis). University of Chicago, Chicago, USA.
- Perniss, P., & Özyürek, A. (2015). Visible Cohesion: A Comparison of Reference Tracking in Sign, Speech, and Co-Speech Gesture. *Topics in Cognitive Science*, 7(1), 36–60.
- Péry-Woodley, M.-P. (2000). Cadrer ou centrer son discours? Introduteurs de cadres et centrage. *Verbum*, 22(1), 59–78.
- Peterson, P. (1999). On the boundaries of syntax: Non-syntagmatic relations. In P. Collins & D. Lee (Eds.), *The Clause in English: In honour of Rodney Huddleston* (pp. 229–250). Amsterdam: John Benjamins.
- Potts, C. (2005). *The Logic of conventional implicatures*. New York: Oxford University Press.
- Priva, U. C. (2017). Not so fast: Fast speech correlates with lower lexical and structural information. *Cognition*, 160, 27–34.

- Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). *A Comprehensive Grammar of the English Language*. London: Longman.
- Ruth-Hirrel, L., & Wilcox, S. (2018). Speech-gesture constructions in cognitive grammar: The case of beats and points. *Cognitive Linguistics*, 29(3), [online]. <https://doi.org/10.1515/cog-2017-0116>
- Schmidt, T., Duncan, S., Ehmer, O., Hoyt, J., Kipp, M., Loehr, D., ... Sloetjes, H. (2009). An exchange format for multimodal annotations. In *Multimodal Corpora* (pp. 207–221). Berlin: Springer.
- Sekine, K., & Kita, S. (2017). The listener automatically uses spatial story representations from the speaker's cohesive gestures when processing subsequent sentences without gestures. *Acta Psychologica*, 179, 89–95.
- Sloetjes, H., & Wittenburg, P. (2008). Annotation by Category: ELAN and ISO DCR. *Proceedings of the 6th International Conference on Language Resources and Evaluation*. Presented at the LREC 2008, Marrakech, Morocco. Retrieved from <http://www.lat-mpi.eu/tools/elan/>
- Smessaert, H., Cornillie, B., Divjak, D., & Eynde, K. (2005). Degrees of clause integration: From endotactic to exotactic subordination in Dutch. *Linguistics*, 43(3), 471–529.
- Streeck, J. (2009). *Gesturecraft. The manu-facture of meaning*. Amsterdam: John Benjamins.
- Sweetser, E. (2006). Looking at space to study mental spaces: Co-speech gesture as a crucial data source in cognitive linguistics. In M. Gonzalez-Marquez, I. Mittleberg, S. Coulson, & M. Spivey (Eds.), *Methods in Cognitive Linguistics* (pp. 203–226). Amsterdam: John Benjamins.
- Swerts, M., & Kraemer, E. (2005). Audiovisual prosody and feeling of knowing. *Journal of Memory and Language*, 53, 81–94.
- Swerts, M., & Kraemer, E. (2008). Facial expression and prosodic prominence: Effects of modality and facial area. *Journal of Phonetics*, 36(2), 219–238.
- Tannen, D. (1993). *Framing in Discourse*. Oxford: Oxford University Press.
- Tao, H., & McCarthy, M. (2001). Understanding non-restrictive which-clauses in spoken English, which is not an easy thing. *Language Sciences*, 23, 651–677.
- Thompson, S. A. (1985). Grammar and written discourse: Initial vs. Final purpose clause in English. *Text*, 5(1–2), 55–84.
- Thompson, S. A. (2002). "Object complements" and conversation: Towards a realistic account. *Studies in Language*, 26(1), 125–163.
- Thompson, S. A., & Longacre, R. E. (1985). Adverbial clauses. In T. Shopen (Ed.), *Language Typology and Syntactic Description: Complex Constructions* (pp. 237–268). Cambridge, UK: Cambridge University Press.
- Tomlin, R. S. (1985). Foreground-background information and the syntax of subordination. *Text*, 5(1–2), 85–122.
- van Rijn, M. A. (2017). *The expression of modifiers and arguments in the noun phrase and beyond* (PhD Thesis). University of Amsterdam, Amsterdam, Netherlands.
- Van Valin, R. D. (1984). A Typology of Syntactic Relations in Clause Linkage. *Proceedings of the Tenth Annual Meeting of the Berkeley Linguistics Society*, 542–558. Berkeley, CA, USA: eLanguage.
- Wagner, M., & Watson, D. G. (2010). Experimental and theoretical advances in prosody: A review. *Language and Cognitive Processes*, 25(7–9), 905–945.
- Wells, J. C. (2006). *English Intonation: An Introduction*. Cambridge, UK: Cambridge University Press.



Wennerstrom, A. (2001). *The Music of Everyday Speech. Prosody and Discourse Analysis*. Oxford: Oxford University Press.

Wichmann, A. (2000). *Intonation in Text and Discourse*. London: Longman.

Wightman, C., Shattuck-Hufnagel, S., Otsendorf, M., & Price, P. J. (1992). Segmental durations in the vicinity of prosodic phrase boundaries. *Journal of Acoustical Society of America*, 91, 1707–1717.

Wyld, H. (2003). Adverbial clauses: An enunciative approach. In A. Celle & S. Gresset (Eds.), *La Subordination en Anglais: Une approche énonciative* (pp. 15–38). Toulouse, France: Presses Universitaires du Mirail.

Yoon, T.-J., Cole, J., & Hasegawa-Johnson, M. (2007). On the edge: Acoustic cues to layered prosodic domains. *Proceedings of ICPhS XVI*, 1264–1267. Saarbrücken, Germany.

## APPENDIXES

### Appendix. Transcription conventions

one line of transcription corresponds to one tone-unit

(h) audible inbreath

# pause

[...] illustrated gestural activity

- interrupted construction

L left co-text

SC subordinate construction

R right co-text

## NOTES

1. Multimodal Discourse Analysis (MDA) is a growing field of research that includes works in a wide array of disciplines such as communication studies, social semiotics or (psycho or socio-) linguistics. In linguistics, most "multimodal" studies are in fact bimodal, since they are mainly concerned with the relation of verbal phenomena to gesture. In this discipline, very few studies adopt a truly multimodal perspective: Loehr's work (2004) can be mentioned, since it focuses on timing relationships between gestures and intonation units in discourse. Swerts and Kraemer's studies (2005, 2008) are also multimodal, investigating audiovisual prosody. Dohen and Løevenbruck (2009) analyse audiovisual cues in perception studies about discourse phenomena. Finally, Ferré (2014) proposes a multimodal approach to markedness in discourse. However, we are not aware of any work on subordination in MDA other than the study described in the present paper.

2. Traditional grammar does not detail in great length the syntactic link between adverbial clauses and the clause they modify (Gosselin, 1990; Auer, 2005). Adverbial clauses are given a different status from that of completive clauses, functioning either as subject or complement of a verb, *i.e.* an argument. They are "satellites", as dependencies that are more external to predicates and their arguments (Dik, 1989), or only "associated" with the verbal construction, even though they can be inserted around the verbal nucleus of a clause (Blanche-Benveniste, 1990). Harris

(1982) considers adverbial clauses as predicates in which one of the agents is the verbal action in itself. Just as other predicates, they are not included in choices occurring at a lower level, such as the choice of their arguments. Adverbial clauses are also described as "required as part of the communicative target", but not from the point of view of grammatical agency (Lazard, 1994: 81). While it is often difficult to distinguish the range of adverbial clauses between the narrow target of the verbal phrase and the larger target of the whole clause, they are detached constructions that create an external entity to the predication by their syntactic position, but internal to the utterance. They connect portions of speech without necessarily involving their predicate in a syntactic relation of subordination (Muller, 2006). Adverbial clauses belong to the discourse background, related to the predictions of the clause they modify (Dancygier & Sweetser, 2000).

3. The interpretational range of initial and final adverbial clauses has been investigated by numerous studies in the discourse literature. Chafe (1976) first describes adverbial clauses as establishing "a spatial, temporal, or individual framework within which the main predication holds". Thompson and Longacre (1985) argue in favour of their relevant contribution to the structuring of discourse paragraphs. Initial temporal relative clauses are "grammatical signals" indicating the opening of a new discourse unit, which they frame (Bestgen, 2009). Thompson (1985) adds that an initial adverbial clause raises a "problem" regarding the expectancies fulfilled by previous discourse segments, and that the following utterances bring solutions. Final adverbial clauses play a more restricted, local role, explicitly unfolding the spatio-temporal scene in which the action described in the previous clause is achieved (Muller, 2006).

4. While the functional distinction between continuation appositive relative clauses (moving the discourse forward and contributing to the foreground) and comment appositive relative clauses (bringing background information in discourse) is widely accepted (Holler, 2005; Lambrecht, 1998; Loock, 2007), a recent study ((Lytvynova & Dao, 2014) calls it into question, asserting that none of these two categories can be likened to autonomous discourse units, from both grammatical and pragmatic points of view. Potts (2005) also describes the content of appositive relative clauses as non-asserted, as it cannot be directly questioned.

5. In this paper, the *p*-value corresponds to the probability that the sample difference between two compared groups is due to chance factors. The null hypothesis is rejected if any of these probabilities is less than or equal to the significance level of 5%.

6. According to Langacker (2008: 61), "most of the expressions we employ are symbolically complex, being assembled out of smaller symbolic elements." Complex expressions in language are called symbolic assemblies in Cognitive Grammar. Symbolic assemblies are combinations of symbolic structures. The semantic and phonological structures that comprise a symbolic structure are integrated with the phonological and semantic structures of at least one other symbolic structure to form a composite symbolic structure or a symbolic assembly (Hirrel, 2018).

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## ABSTRACTS

This qualitative study proposes a multimodal framework for modelling subordinate constructions in spontaneous conversation, based on their action on interpretative frames. Subordinate constructions have long been described in linguistics as dependent elements elaborating upon some primary features. However, Cognitive Grammar has challenged this view in showing that syntactic embedding often only reflects the starting point speakers choose to convey their message. Subordinate constructions are practices in interaction that offer an

interpretative reconstruction of discourse. The different syntactic types of subordinate constructions refer to different interpretative frames in the speaker's experience. The selection of these interpretative frames is expressed by the different amount of prosodic and gestural boundary cues produced in co-occurrence with each syntactic type of subordinate construction.

Cette étude qualitative propose une modélisation multimodale des constructions subordonnées en conversation spontanée, à partir de leur action sur les cadres interprétatifs. Les subordonnées ont longtemps été décrites en linguistique comme des éléments dépendants qui complètent des éléments primaires. Cependant, la Grammaire Cognitive a remis en question ce point de vue en montrant que l'emboîtement syntaxique ne reflète souvent que le point de départ choisi par les locuteurs pour véhiculer leur message. Les subordonnées sont des pratiques interactionnelles qui offrent une reconstruction interprétative du discours. Les différents types syntaxiques de subordonnées font référence à différents cadres interprétatifs dans l'expérience du locuteur. La sélection de ces différents cadres est exprimée par le nombre différent d'indices de frontière prosodiques et gestuels produits en co-occurrence avec chaque type syntaxique de subordonnée.

## INDEX

**Mots-clés:** subordination; syntaxe; prosodie; gestualité; conversation spontanée; multimodalité

**Keywords:** subordination; syntax; prosody; gesture; spontaneous speech; multimodality

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