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## JUNCTION AND SEGMENTATION IN FRENCH CHILDREN'S NARRATIVES

The paper focuses on development of connectivity in French narratives and is based on a study of connectors by children and adults. One hundred and twenty French monolingual children aged 3 to 11 years and 20 adults participated in the study. The narratives were elicited from the picture book "Frog, where are you?" (Mayer, 1969). The author analyzed the linguistic tools used by narrators to establish links between referential events and to segment these events. The results show a complexification of connectors and segmentation markers with age.

One of the main characteristics of spoken language is linearity. Encoded events are reported one after the other. This poses a double problem for speakers. On the one hand, there is no hierarchy established between the different events while on the other, the events can be temporally distant from each other even in cases where they maintain a close semantic relationship. Each language overcomes these constraints of spoken language production by providing their speakers with:

- junction markers (JM) which indicate links or junctions between events;
- segmentation markers (SM) which signal splits or segmentations between events.

These markers have been called connectives or "textual organizers" by Schneuwly, Rosat & Dolz (1989). "Textual organizers are considered as the main trace of some linguistic operations which depend on textual planification; there are not only connection operations, that is to say strings of propositions as the term connectives could suggest, but also segmentation operations at different text levels" (Schneuwly, Rosat, & Dolz, 1987, p. 40). Halliday and Hasan (1976), Roulet (1981), Zenone (1981a, 1981b, and 1983) insist on the double functions of connectives: semantic and pragmatic. On the one hand, connectives encode explicitly the logical link between two events which can be causal, temporal,

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adversative, etc. On the other hand, they serve an important function at the textual level, so far as they organize discourse in order to make a coherent whole.

Studies on acquisition of connectives have multiplied since 1980 (Berman, 1988, 1994; Berman & Slobin, 1994; Jisa, 1984; 1985; 1987; Peterson & McCabe, 1983; Ragnasdottir, 1991). Three main conclusions can be drawn from these studies.

The first conclusion insists on the plurifunctional use of connectives by children. The type of use decreases with the acquisition of new linguistic means. This recalls the well-known principle according to which old forms are used to encode new functions, which will afterwards be expressed by new forms (Werner & Kaplan, 1983). The use of *and* by children is a good example to illustrate this double movement. There have been many studies (Clancy et al., 1976; Jisa, 1984; 1985; 1987; Eisenberg, 1980) which have shown that *and* is able to fulfill many different semantic functions. *And* has been used, for example, by young children to encode sequentiality, causality or adversitivity between two events. Then, when children acquire more specific means to express these functions, like *because*, *so*, or *then*, they restrict their use of *and* to more specific situations in order to encode sequentiality or addition.

The second conclusion in some of the studies previously mentioned (Berman & Slobin, 1994; Ragnasdottir, 1991; Sebastian & Slobin, 1994) concerns the diversification of connectives with age that goes hand in hand with a complexification of linguistic means. With development comes a larger range of connectives. This range is larger not only in terms of different types of semantic relations but also of types of connectives. As far as temporal relations are concerned, in narrative discourse for example, current research shows that until five years of age children tend to encode mainly simultaneity and sequentiality. It is only later on that children are able to establish anteriority or posteriority relations. Also worth noting is the complexification of linguistic means with age: less coordination and more subordination.

Finally, these studies also show how progressively children learn to use connectives in order to construct a coherent discourse. Connectives are not only used to link two events but also play a role at a higher level, the discourse level. In fact, until adulthood, the system of connectives goes through several stages. Berman & Slobin (1994) depict these stages in detail from narratives produced by children aged from 3 to 9 in five different languages. Three-year-olds use few connectives, since 43% of their clauses are "free clauses" (Dromi & Berman, 1986), in which there is neither a lexical nor a syntactic link between them. These subjects list the events one after the other with no link between them. They only describe pictures and focus more on the spatial localization of the referents they mention than on the general temporal organization. From 5 years on, children use more connectives. These connectives, *after* or *then*, encode sequentiality between two events. We can even talk about an overmarking of sequentiality insofar as most of the clauses are introduced by such connectives. It is also from 5 years that we find some subordinating conjunctions in narratives (*when*, *while*) as well as some temporal adverbials to serve as anchor points to the events (*one day*, *in the morning*). These forms show how children begin to organize their production at a discourse level. But it is only around 9 years that the subject's linguistic profile clearly changes. New linguistic means are used to encode explicitly new semantic relations such as causality. There are also many adverbials and in-

In this paper, we study the quantity, type and function of junction markers (JM) and segmentation markers (SM) used by French monolingual children aged from 3 to 11 years and adults in their narrative texts based on pictures without text. We restrict our analysis to the linguistic tools used to establish reference to events. The goal of this study is to ascertain what kind of tools are used and how they are used: either to establish links between events or to segment the events.

Two main hypotheses motivate this work. One is decontextualization and diversification of connectives with age.

We expect that our youngest subjects will be dependant on the pictures to construct their discourse. This procedure should be revealed in a large number of deictic terms as well as an important number of connectives expressing sequentiality in the narratives of the youngest subjects, unlike those of the older ones which should contain more varied semantic relations (temporal and logical) encoded by use of more varied forms.

The other hypothesis is more hierarchy between events with age.

The narratives from the older subjects should also differ from those of the younger ones in the way a certain hierarchy between events is realized. To verify this hypothesis, we will observe what kind of junctions are used (juxtaposition versus coordination versus subordination); we expect to find more juxtaposition and coordination used by younger subjects and more subordination by older ones. Moreover, for older subjects we should observe the use of more than one subordinate clause for one main clause as well as an increase in non-finite subordination, two ways of encoding information units at the discourse level.

## Method

### Subjects

French monolingual children and adults produced 140 narratives. Subjects (number, mean age, age range) are presented in Table 1.

Table 1: Subjects (number, mean age<sup>1</sup> and age range)

Age	3/4yrs	5yrs	6yrs	7yrs	8yrs	10/11yrs	Adults
Number	20	20	20	20	20	20	20
Mean age	04;01	05;05	06;06	07;05	08;04	11;00	20;06
Range	03;03-04;08	05;00-05;11	06;02-06;11	07;00-07;10	08;00-08;09	10;02-11;08	20;00-21;00

### Stimulus material

Narratives were elicited from a picture-book "Frog, where are you?" (Mayer, 1969). This booklet is composed of 15 black-and-white pictures and depicts the adventures of a boy, a dog and their missing frog. Each narrative is recorded and transcribed according to Berman & Slobin's (1986) instructions. Narratives are separated into clauses. Generally, a clause is considered to contain one finite verb with its arguments as in example (1).

- (1) 07;04d 3b 011 après le chien il a toujours le bocal<sup>2</sup>  
 then the dog has got always the vase  
 However, there are some exceptions to this general principle. One clause can ex-  
 without any verb as in labeling (2) or verb ellipsis (3).
- (2) 07;04d 1- 001 euh euh le chien et le petit garçon et une grenouille  
 euh euh, the dog and the little boy and a frog
- (3) 07;07k 10b 030 après la chèvre elle court  
 031 le chien aussi  
 then the goat is running  
 the dog also

Table 2 gives the mean number of clauses and standard deviations according to age.

Table 2. Mean number of clauses and standard deviations according to age

Age	3/4yrs	5yrs	6yrs	7yrs	8yrs	10/11yrs	Adults
Mean number of clauses	45,5	51	53	48,5	51	54,5	80
SD	15,5	10,5	14,5	10	13,5	13,5	35,5

Anova analysis on these results confirms an important increase of number of clauses with age. But this analysis and particularly Fisher's PLSD shows us that the value is on significant between adults and children but not between children. Table 2 shows also the largest variation observed in the adult texts (SD of 35,5), contrary to the 7-year-olds that present the smallest deviation (SD of 10).

### Procedure

For children, the procedure follows three phases:

Phase 1: Researcher informs subject that she/he has to tell a story from a picture book to a "naive listener". The instructions are the following: "This is the story of a little boy, dog and a frog. You're going to look at all the pictures until the end and afterwards you have to tell the story to someone who does not know the story";

Phase 2: Researcher and subject look at the book together, the researcher can answer, necessary, questions about vocabulary during this phase;

Phase 3: Subject tells the story to a naive listener.

As for the adults, procedure differs insofar as subjects tell the story to the same person who gave her/him the instructions.

### Coding

#### *Forms of junction*

For junction, we will take Koch's (1995, p. 15) definition and categorization into consideration: "When we speak we are always obliged to join, to combine with syntactic procedures the linguistic representations of at least two or more extralinguistic event

These procedures are situated on a continuum defined by two important principles: juxtaposition of two clauses and integration of a sequence in another one".

Koch (1995) distinguishes 3 types of parataxis and 4 types of hypotaxis.

Parataxis

- Type I: Asyndetical parataxis [A] [B]

In this type, there is no explicit syntactic link between clause A and clause B

- Type II: Parataxis with anaphoric link [A] [ $\Delta$ B]

In type II, clause B contains an anaphoric element which refers to entire clause A. There is an indirect syntactic link between A and B.

- Type III: Syndetical parataxis [[A]  $\diamond$  [B]]

In type III, there is an explicit syntactic link between A and B.

Our data required some modifications in Koch's categorization of parataxis. We combined type I and type II under the term type I or juxtaposition, insofar as type II appears only 3 times by adults and never by children.

Hypotaxis

- Type IV: Subordination with finite verb [A[(U)B]]

B is a constituent of A and both contain a finite verb.

- Type IV\*: Subordination with nonfinite verb (infinitives) [A[(U)B]]

B is incorporated in A. Moreover, B has an infinitive form which depends on the finite verb of A.

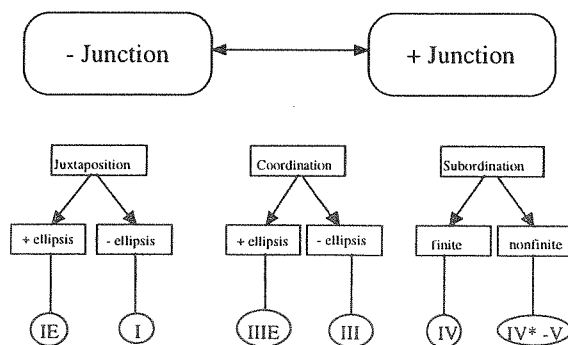
- Type V: Subordination with nonfinite verb (participles, gerunds) [A[(U)B]]

B is incorporated in A. What differs between Type IV\* and V concerns the verb of B, which is a participle or a gerund in type V.

We use this categorization in our analysis: Type IV will be called finite subordination and type IV\* and V nonfinite subordination.

Koch creates a further distinction in terms of degree of subordination. He distinguishes the subordination with one-degree, two-degree, three-degree, n-degrees according to the

Junction continuum



number of subordinate clauses linked to the same main clause. Finally, it is possible represent the junction continuum (from the less junctive to the more junctive) as follow

Examples

IE	20;00h	9b	035 il grimpe sur un caillou /- [A] 036 s'accroche à des bois,-[B] he climbs on a stone clings on the woods
I	20;00d	3a	016 alors i cherche dans les bottes [A] 017 <b>i</b> : i cherche un peu partout,- [B] then he searches in the boots <b>he</b> searches everywhere
IIIE	20;00d	2b	079 va voir trouve un tronc d'arbre [A] 080 <b>et</b> va regarder à l'intérieur [B] he finds a treetrunk <b>and</b> looks inside
III	10;03a	4b	024 le garçon était mécontent [A] 025 <b>mais</b> le chien le léchait [B] the boy was angry <b>but</b> the dog licked him
IV	20;00u	12b	140 petit Pierre rend= se rend compte [A] 141 <b>que</b> au milieu de la mare ya comme qui dirait 020 un coac familier [B] little Peter realizes <b>that</b> in the middle of the pond there is like a familiar coac
IV*	21;00c	9b	028 il monte sur l'rocher [A] 029 <b>pour voir</b> par dessus un bosquet,- [B] he climbs on the rock <b>in order to see</b> above the grove
V	21;00c	10a	030 <b>en montant sur c'rocher</b> [B] 031 il est il se: - is i's coince dans les dans les: i s'coince dans les bois d'un cerf.- [A] <b>by climbing</b> on this rock he gets stuck in the stag antlers
degree1	21;00e	1-	003 il est entrain de l'observer avec son son chien 004 <b>parce qu'</b> il l'a mis dans un bocal. 020 he's observing it with his dog <b>because</b> he put it in a jar
degree2	21;00e	5-	026 j'pense 027 <b>que</b> c'est là 028 <b>où</b> il l'a trouvée. 010 I think <b>that</b> it is the place

*Functions of junction*

So far we have given syntactic definitions of junction. Now, we turn to detailing the different semantic relations that exist between clauses. We will only take into account the relations that are explicitly syntactically encoded, that is to say, through syntactic means like coordination or subordination conjunctions. It is very difficult to establish the nature of a link between two events if this link is not verbally expressed. Therefore we will exclude asyndetical parataxis despite the fact that it is not the ideal solution.

As concerns syndetical parataxis, let us specify what will count as a coordinating conjunction. Our definition is based on Creissels' (1995) definition which stipulates that, in the case of two coordinate propositions, there is no hierarchy between them. He adds that coordinative conjunctions are subject to several syntactic blocks, such as focalization that should be impossible. In this work, we will adopt this principle of focalization in order to distinguish a coordinating from a non-coordinating conjunction. However, there are still unresolved problems which need to be treated individually. According to context, some forms play the role of a junction marker or that of a segmentation marker. This is the case with the following forms: *alors* (then), *enfin* (finally), *en fait* (in fact), *mais* (but), *et puis* (and then), and *donc* (so).

\* *Alors*

Adam (1984, p. 109) underlines the fact that this connective can potentially contain two values, one which makes it rather a causal relator, the other which leads *alors* to be compared to *soudain* (suddenly), *tout à coup* (all of a sudden). In this value, it introduces a break in the continuum of events. Unfortunately, as we have noticed many times after Gerech (1987, p. 73), "it is difficult to separate the temporal value from the resultative one". However, we allocate two types as well as two different functions to *alors*.

- *Alors* 1 = junction marker with consequence value
- *Alors* 2 = segmentation marker with sequentiality value. In this second case, *alors* allows switching to a new theme and therefore cannot be "considered anymore as anaphoric" (Hansen, 1996, p. 139).
- *Alors* 3 = segmentation marker, trace of discourse regulation. In this case, we find *alors* with hesitations and/or filled pauses or not.

\* *Enfin*

*Enfin* is also a plurifunctional form. Three possibilities emerge from our data:

- *Enfin* 1 = junction marker with a temporal value of finality
- *Enfin* 2 = junction marker with reformulative value. The defining criterion borrowed from Fernandez (1994, p. 175/176) is "the existence of a paraphrastic relation between two propositions that are linked through a certain semantic extradiscursive equivalence".
- *Enfin* 3 = segmentation marker, trace of discourse regulation. In this case, we find *enfin* with hesitations and/or filled pauses or not.

\* *En fait*

With *en fait*, two possibilities emerge:

- *En fait* 1 = junction marker with reformulative value
- *En fait* 2 = segmentation marker, trace of discourse regulation

These two types can be compared respectively to *enfin* 2 and *enfin* 3.

\* *Mais*

- *Mais* 1 = junction marker with adversative value
- *Mais* 2 = junction marker with substitutive value
- *Mais* 3 = junction marker with reformulative value (cf. *en fait* 1 and *enfin* 2)
- *Mais* 4 = segmentation marker with sequentiality value of theme switching

\* *Donc*

*Donc* is as difficult as *mais*

• *Donc* 1 = junction marker, with consecutive value. This form is very close to *alors*. This consecutive value will be attributed to *donc* only in cases where proposition B is direct consequence of proposition A, in order to distinguish between the consecutive value of *donc* and its sequential value (cf. *donc* 4).

- *Donc* 2 = junction marker with repetition value (Hansen, 1996, p. 134)
- *Donc* 3 = segmentation marker, trace of discourse regulation
- *Donc* 4 = segmentation marker with sequentiality value

\* (*Et*) *puis* / *pis*

Two functions emerge from our data for this form:

- (*Et*) *puis* / *pis* 1 = junction marker with additive value
- (*Et*) *puis* / *pis* 2 = segmentation marker with sequentiality value

From these case-by-case analyses, 15 coordinate means were retained which fulfil nine different semantic functions.

Table 3: Functions and forms of coordinate means

Functions	Forms
Consequence	<i>donc1, alors1</i> (so, then)
Adversativity	<i>mais1, seulement, par contre</i> (but, also, on the contrary)
Causality	<i>car</i> (because)
Addition	<i>(et) puis/pis</i> ((and) then)
Conclusion	<i>enfin1</i> (finally)
Reformulation	<i>mais3, enfin2, en fait, pardon</i> (but, well, in fact, sorry)
Repetition	<i>donc2</i> (so)
Alternative	<i>mais2</i> (but)
Substitution	<i>ou</i> (or)

Now we turn to hypotaxis. In this category, we separate subordination with adverbial value from the other types of subordination: Complements introduced by *que* (that), indirect interrogatives, clefts, infinitives and relatives without adverbial values.

Table 4 gives the forms and functions of the different subordination types with adverbial value and maintains the distinction between finite and nonfinite subordination.

Table 4 shows that 12 semantic functions are used (10 for finite adverbials and 9 for nonfinite ones). What is also worth noting is twice as many forms are used for the finite adverbials as compared to nonfinites.

### *Segmentation*



Table 4: Functions and forms of subordinate means with adverbial value

Adverbials			
Finite		Nonfinite	
Function	Form	Function	Form
Simultaneity	<i>pendant que</i> (while) <i>alors que</i> (while) <i>tandis que</i> (whereas) <i>lorsque</i> (when) <i>quand</i> (when) <i>maintenant que</i> (now that) relative	Simultaneity	gerunds participles (present)
Anteriority	<i>jusqu'à ce que</i> (until) <i>en attendant que</i> (in the meantime)	Anteriority	<i>avant de</i> + inf (before) participles (past)
Posteriority		Posteriority	<i>après</i> + inf (after) participles (past)
Cause	<i>dès que</i> (as soon as) <i>comme</i> (since) <i>parce que</i> (because) <i>puisque</i> (because) <i>tellement que</i> (so much that) relative	Cause	<i>à force de</i> + inf participles (present) gerunds
Concession	<i>même si</i> (even if) <i>bien que</i> (although)	Concession	participles (present)
Condition	<i>des fois que</i> (in case)	Condition	
Substitution		Substitution	<i>au lieu de</i> +inf (instead of)
Goal	<i>pour que</i> (in order to)	Goal	<i>pour</i> +inf (to)
Comparison	<i>ainsi que</i> (as well as)	Comparison	
Manner	<i>sans que</i> (without)	Manner	<i>sans</i> + inf (without) participles (present) participles (past) gerunds
Supposition	<i>à croire que</i> (to think that)	Supposition	
Consequence	relative	Consequence	participles (present) participles (past)
10	20	9	10

Table 5 presents these linguistic means in formal and in functional terms.

Several remarks are in order. First, we notice 9 different semantic functions for the total of 45 forms. Second, we observe that temporal relations dominate in terms of number of categories (3/9: sequentiality, punctuality, simultaneity) as well as in terms of different forms used to encode them (25/45). This is not surprising insofar as we are conducting our analysis on a particular type of text, i.e. narrative. Finally, we would like to point out, and this is directly correlated to the prior point, that subjects are using conventional

Table 5: Functions and forms of segmentation markers

Functions	Forms
Introduction	<i>c'est l'histoire</i> (it is the story), <i>il était une fois</i> (once upon a time), <i>au début</i> (at the beginning)
Conclusion	<i>voilà</i> (that's it), <i>l'histoire est finie</i> (that's the end of the story), <i>c'est tout</i> (that's all)
Deixis	<i>(et) là</i> ((and) there), <i>maintenant</i> (now), <i>l'image d'après</i> (on the next picture)
Simultaneity	<i>pendant ce temps</i> (during this time), <i>pendant la nuit</i> (during the night), <i>en attendant</i> (while waiting)
Sequentiality	<i>alors</i> <sup>2</sup> (then), <i>ensuite</i> (then), <i>(et) après</i> ((and) after), <i>puis après</i> (then after), <i>puis ensuite</i> (then after), <i>pis/puis alors</i> (then then), <i>alors ensuite</i> (then after), <i>alors après</i> (then after), <i>(et) puis/pis</i> <sup>2</sup> ((and) then) <i>quelques instants après</i> (just after), <i>le lendemain</i> (the following day), <i>donc</i> <sup>4</sup> (so), <i>mais</i> <sup>4</sup> (but)
Punctuality	<i>le matin</i> (in the morning), <i>à son réveil</i> (when he wakes up), <i>à la fin de la journée</i> (at the end of the day), <i>l'après-midi</i> (in the afternoon), <i>une fois</i> (once), <i>un jour</i> (one day), <i>à un moment donné</i> (one day), <i>à ce moment là</i> (at that time), <i>le soir</i> (at night)
Aspect	<i>tout à coup</i> (all of sudden), <i>soudain</i> (suddenly), <i>aussitôt</i> (as soon as), <i>à nouveau</i> (again)
Regulation	<i>bon</i> (so), <i>donc</i> <sup>3</sup> (so), <i>alors</i> <sup>3</sup> (so), <i>en fait</i> <sup>2</sup> (in fact), <i>eh ben</i> (well), <i>enfin</i> <sup>3</sup> (in fact)
Opposition	<i>quant à</i> (as to)
9	45

Before turning to the results, a final remark concerning the coding of multiple forms is needed. In the case of multiple forms, the following decisions were taken:

- If two connectives are of the same type (segmentation markers or junction markers and fulfill the same function, we consider the connectives as only one form composed of two connectives. For example, we consider *mais en fait* (but in fact) as one junction marker with adversative value.
- If two connectives are of the same type but fulfill different semantic functions, each connective is considered individually. In the case of *alors euh après* (so uh then), *alors* has been considered as a segmentation marker with regulative value and *après* as a segmentation marker with sequentiality value.
- If two connectives are of the same type and fulfill different functions, the connective has been considered individually, such as *mais ensuite* (but afterwards).

## Results

### Forms of junction

Figure 1 presents the distribution of different forms of junction according to age.

This figure reveals some important facts. First, if we consider the data from a longitudinal perspective, it is worth noting that the different junction procedures do not evolve in

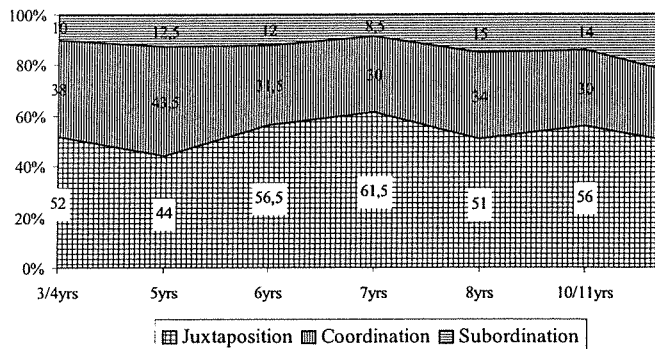


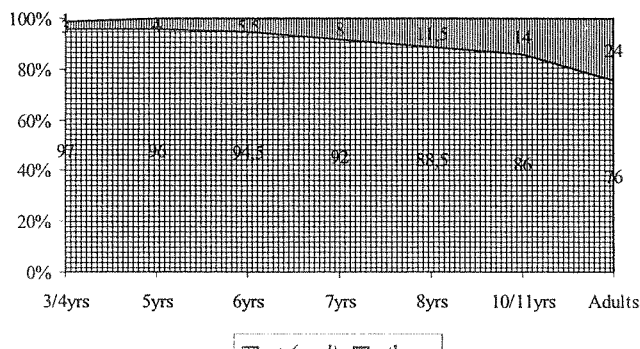
Figure 1. Juxtaposition, coordination and subordination with age

crease with 5-year-olds (44%) and a peak with 7-year-olds (61,5%). As for coordination, the percentage decreases significantly with age ( $p=0.0077$ ). Finally, subordination increases: 10% for the 3/4-year-olds against 25% for the adults ( $p<0.0001$ ).

These results verify only partially the hypothesis according to which junction means complexify with age, that is to say, there is an increase of coordination and subordination and a decrease of juxtaposition. However, this observation has to be modified. If we exclude coordination introduced by the pluri-functional *et* (and), the following profile emerges:

As we see in Figure 2, coordination introduced by *et* (and) decreases in favor of other types of coordination. This double movement is significant ( $p<0.0001$ ). These results show that children learn progressively to use more types of coordination, confirming the expected tendency.

We now go back to Figure 1 and observe the distribution of the different means within the age ranges. For all ages, juxtaposition represents a higher percentage than coordination which represents a higher percentage than subordination. However, according to age, the distribution between coordination and subordination is different but the percentage of juxtaposition remains stable. First, it is possible to combine the youngest subjects (from 3/4 years to 7 years), since for all these subjects there are three times as many coordinations than subordinations. For 8-year-olds and 10/11-year-olds, there are only twice as many



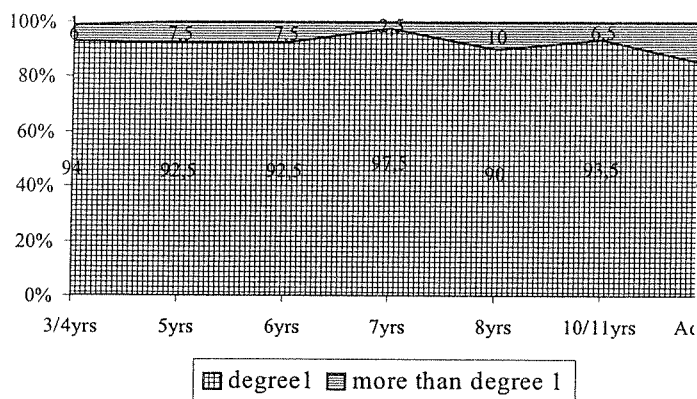


Figure 3. Subordinations of 1 degree vs. more than one degree with age

coordinations as subordinations. Finally, for the adults, the proportions are approximately the same: 27% coordination versus 25% subordination.

These results show a complexification of the means used to establish junction with age. Other results confirm this tendency. First, we observe an increase in the number of subordinations with a higher degree than 1, as it can be seen in Figure 3 which shows an increase in subordination of more than 1 degree with age ( $p=0.0207$ ).

Finally, we anticipated with age a more important use of finite subordination as opposed to nonfinite, which is one more sign of more cohesive narratives. This hypothesis is also confirmed (see Figure 4).

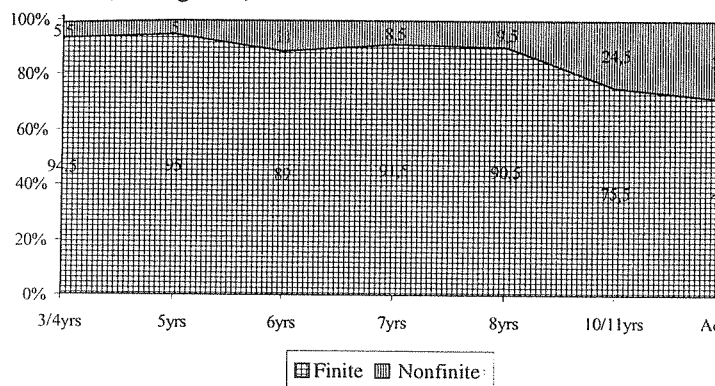


Figure 4. Finite and nonfinite subordinations with age

Until the age of 8, children use 90% finite subordination vs 10% non-finite against respectively 75% and 25% by adult subjects.

#### Functions of junctions

In view of the above remarks, what emerges is a complexification of the means. But the data show also that these means not only become more complex, but that they encode

Table 6. Distribution of semantic relations encoded by coordination according to age

	3/4yrs	5yrs	6yrs	7yrs	8yrs	10/11yrs	Adults
Consequence	1	1,5	3	3,5	7,5	4,5	5,5
Adversativity	0,5	1,5	0,5	4,5	4,5	5	7,5
Causality	-	-	-	-	-	1,5	1,5
Addition	2	2,5	1	-	-	-	0,5
Conclusion	-	-	-	-	-	-	0,161
Reformulation	0,5	0,5	-	-	0,5	0,5	4
Repetition	-	-	-	-	-	0,5	2
Alternative	-	-	-	0,5	-	-	-
Substitution	1,5	0,5	0,5	0,5	-	2	1,5
„et”	94,5	97,5	95	91	87,5	86	77,5

The first remark concerns the number of functions encoded according to age. The older the subjects, the higher the number of encoded semantic relations. Functions of causality, conclusion and repetition appear in the 10/11-year-old and adult texts, but only repetition increases significantly ( $p=0.0125$ ). Moreover, among the functions expressed by the markers, only one diminishes clearly, the addition function ( $p=0.0468$ ), unlike the reformulative function which increases ( $p<0.0001$ ).

We observe the same diversification in the functions expressed by subordination with adverbial value. This is shown in Table 7.

Table 7. Distribution of semantic relations encoded by subordinations with adverbial value according to age

	3/4yrs	5yrs	6yrs	7yrs	8yrs	10/11yrs	Adults
Simultaneity	33,5	38	23	36	42	49,5	14,5
Anteriority	-	1,5	-	-	1	1	3,5
Posteriority	-	1,5	-	-	6	6	1,5
Cause	40	31	52	41	20,5	13	39,5
Concession	-	-	-	-	-	-	1,5
Condition	-	-	-	-	-	-	0,5
Substitution	-	-	-	-	-	1	-
Goal	13	25,5	22,5	22	29,5	18	24
Comparison	-	-	-	-	-	1,5	1,5
Manner	13,5	3	2,5	1	1	9,5	12
Consequence	-	-	-	-	-	1	-
Supposition	-	-	-	-	-	-	1,5

We notice that a certain number of functions appear late. This is the case for the following functions: anteriority and posteriority but particularly concession, condition, substitution, comparison, supposition and consequence. On the other hand, the functions of simultaneity, cause, goal and manner are expressed from 3/4-year-olds on.

#### Forms of segmentation

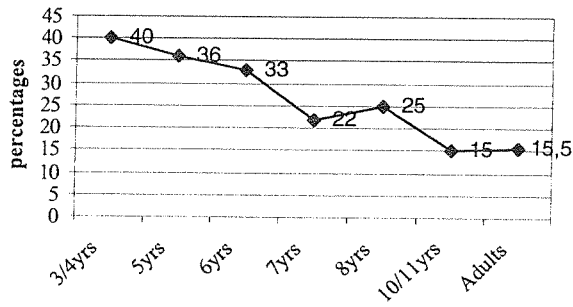


Figure 5. Segmentation markers with age

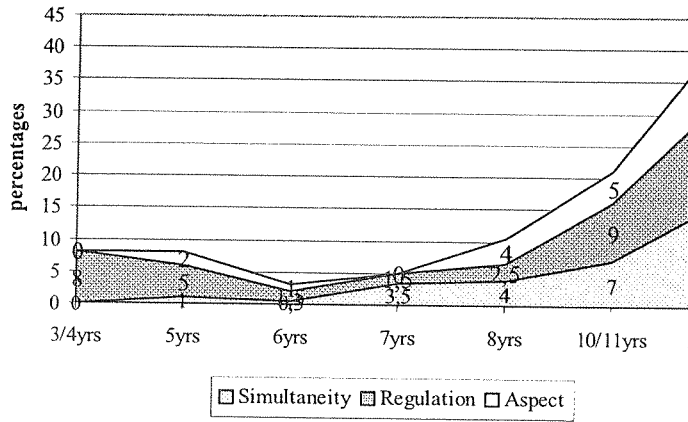


Figure 6. SM functions which increase significantly with age

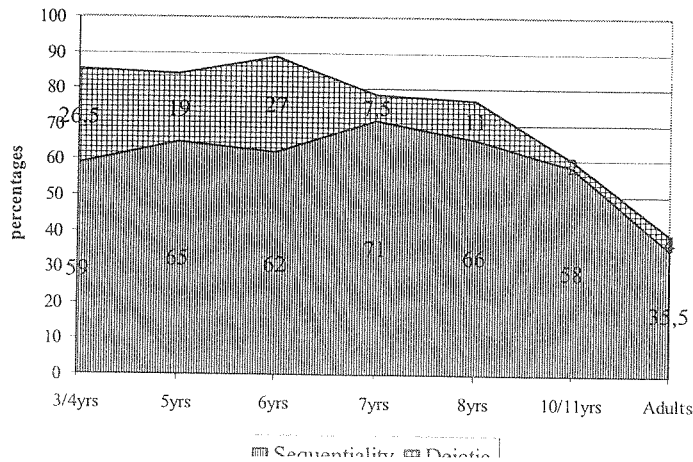


Figure 5 shows a decrease of segmentation markers with age ( $p < 0.0001$ ). By 5- and 6-year-olds, we notice one segmentation marker for three clauses, and four clauses by 3/4-year-olds. In the narratives of the 7- and 8-year-olds they represent only 22 and 25% and of the older subjects around 15%.

**Functions of segmentation markers**

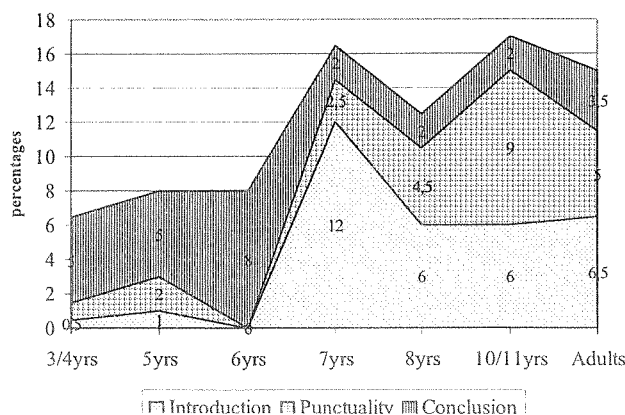
If we consider the results presented in Table 8 from a developmental perspective, we notice that the different functions fulfilled by segmentation markers behave differently according to age. It is possible to distinguish four cases: functions whose percentage increases (Figure 6) or diminishes (Figure 7) significantly and functions whose percentage have a tendency to increase or to diminish (Figure 8).

Segmentation markers that have a simultaneity value increase clearly with age ( $p < 0.0001$ ). Not only does this function increase, but different forms according to age also encode it. Until the age of 7, we found a lot of adverbials introduced by *pendant que* (while) or *quand* (when). At age 8, other conjunctions of subordination emerge: *alors que* (whereas), *lorsque* (when), *tandis que* (whereas) but also nonfinite forms like gerunds and participials.

The segmentation markers with a regulative value decrease between ages 6 and 8 but, globally, they increase. Once more, it is interesting to look at the range of forms used to express this function. Until the age of 8, subjects use one or two different forms (*eh ben* and *alors*), then they can use up to 6 forms: *bon*, *donc*, *en fait*, *eh ben*, *alors*, *enfin*.

Finally, the third function that increases is the aspectual one. This function is nearly absent until the age of 7, then it represents 4% by 8-year-olds, 5% by 10/11 and 9% by adults. *Tout à coup* and *soudain* are the more used forms with respectively 30 and 6 uses out of 42.

Figure 7 above indicates that segmentation markers with sequentiality or deictic value decrease significantly with age ( $p = 0.0087$  and  $p = 0.0019$ ). For the SM with sequentiality value, there are the forms (*et*) *après* and (*et*) *puis*, which have the highest representation with the exception of the adults who use *alors* 2 and *ensuite*. As far as the deictic terms are concerned, the most frequently observed is the spatial deictic term *là*, and this counts for all age groups



Segmentation markers with introduction value (see Figure 8) appear clearly in the narratives of the 7-year-olds. They represent 12%. After 7 years of age, they decrease and represent only 6%. As far as punctuality is concerned, only the 5-year-olds use it for more than 5%. Finally, the conclusion value is unevenly distributed in all age groups.

## Conclusion

The data show an increase in the ability to establish syntactic links between events or segment different information with age.

As far as junction is concerned, we observe an increase of subordination and decrease of other forms of junction such as coordination. The events are presented in a more hierarchical way through the use of nonfinite subordination, and subordination with a degree higher than 1. As for the semantic relations, these are also diversified with age whatever the syntactic nature of the link.

Clearly, the ability to segment text evolves with age. On the whole, we observe a decrease of segmentation markers correlated with a decontextualization phenomenon that has as consequence a decrease of segmentation markers with deictic and sequential value. More-over, segmentation markers always fulfill more varied and more specific functions.

According to our results, children become sensitive to the communicative situation with age, e.g. they obey the Gricean maxims of quantity and quality (say enough but not too much in an appropriate manner for a naive listener). This can be seen through the following results:

- with age subjects use fewer SMs with deictic function as well as fewer SMs with sequentiality function;

- decrease of plurifunctionality of *et* (and) and overall decrease in its use.

Children also become sensitive to discourse genre (narrative) with age:

- progressively they present the events in a hierarchical way by using more junctive forms that encode more specific functions;

- a wider variety of SMs takes on more specific functions.

As shown in this paper, segmentation markers and junction markers differ according to 2 aspects:

- communicative situation
- discourse genre

One more aspect has to be mentioned: language specificity. Berman and Slobin (1994) underline the fact that each language provides speakers with specific linguistic options. Some linguistic means are more or less used or fulfill different functions according to language. To what extent are children sensitive to these language specificities? That will be the object of future study.

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