NOTE

On the use of the connective 'and' in oral narration: a study of French-speaking elementary school children*

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ABSTRACT

The study deals with children's use of the connective *and* to end a story. One hundred and ninety-one children (aged 7;0 to 11;0) who were native speakers of French told two-character comic strip stories with no text to a same-age peer. In the consecutive-display condition, the comic strip was in booklet format with one frame per page, whereas in the simultaneous-display condition, all frames were on the same page. In the arbitrary-sequence condition, the events in each comic strip, although presented as a sequence, could have occurred in any order, whereas in the ordered-sequence condition, the order of the events could not be changed. In the maintained-topic condition, the materials were designed to induce a thematic subject right after the first frame (by the repeated presence of the same character in every picture, up to and including the last one), whereas in the changed-topic condition, the other character appeared alone in the last frame.

The analysis focused on cases where the children began the narration of the last frame using *and* to change the text pattern established so far. The results showed that *and* was often used in this way (35·2% of the productions), especially in the experimental conditions that facilitated event interconnection (simultaneous display, ordered sequence, maintained topic). The ordered-sequence condition showed that the nine-year-olds in simultaneous display employed *and* in co-occurrence with

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another connective, whereas the eleven-year-olds mainly used *and* more specifically: when the topic changed. The discussion deals with the specialization during development of the use of *and* within a speaker's discourse.

INTRODUCTION

During language acquisition, children learn to build relevant and coherent messages to communicate effectively with individuals in their surroundings. To do so, they learn to take their audience's perspective and to adjust their messages accordingly. They also learn how to interconnect different kinds of propositions in accordance with culturally predefined discourse categories (dialogue, narration, description, argumentation, explanation), and to master the marking devices offered by their language to express conceptual relationships within a discourse (anaphora, connectives, etc.).

The study presented here concerns narrative discourse and the use of the connective *and* in French (*et*). *And* has been recognized as the first attested connective in children's speech and writing (approximately age 2;0 or 3;0 in spontaneous oral narration; Brown, 1973; Peterson & McCabe, 1983; Scott, 1984) and as the most frequently used connective at all ages (McCutchen & Perfetti, 1982; Bennett-Kastor, 1986; Jisa, 1987; Peterson & McCabe, 1987*a*; De Weck, 1991; McCabe & Peterson, 1991; Berman & Slobin, 1994; on connective acquisition in writing and speech in various languages and type of texts, see also Favart, 1997, and Schneuwly, 1997). In fact, in addition to using *and* for coordination, young children appear to employ this connective to express various other meanings such as temporal, causal, or adversative relationships, even when more appropriate connectives exist. Consequently *and* is generally seen as having little if any semantic content. Very early in linguistic development, *and* starts playing a role in the emergence of discourse: it formally codes the existence of a minimal relationship between propositions, and it groups sequences of propositions into a whole, even if, from the observer's point of view, the links between the content of the different propositions in this 'whole' are not always clear (Jisa, 1984/85; Peterson & McCabe, 1987*b*, 1988). At a later age, it has generally been shown in empirical studies of personal or picture-based narrations that *and* is very frequent in narrative discourse. It occurs between clauses referring to events that follow each other in time. In marking inter-propositional chaining *and* (employed alone or with another connective such as *then* or *after*) organizes a passage of text at the local level by the simple concatenation of events, each one being linked to the preceding one in the same way. A number of authors have noted another specific use of *and* (Fayol, 1986; Mouchon, Fayol & Gombert, 1991; Bestgen, 1992): French elementary school children asked to

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write about something that happened to them or to tell pictorial narratives were found to nearly always start the last sentence or utterance of their account with the word *and*. According to the authors, the tendency for *and* to appear much more often near the end of a text (oral or written) is very strong in seven- and eight-year-olds. These studies suggest that children use *and* at both the local and the global level of a text.

Although they are neither necessary nor sufficient for achieving discursive coherence, it is generally acknowledged that connectives occur at strategic positions in a discourse. As textual organizers, these linguistic units serve locally to link propositions that have a similar function in a linear sequence, and at the global level, to mark the structure of textual sequences. In their study of elicited personal narratives by English-speaking children aged 3;6 to 9;6, McCabe & Peterson (1991) showed that use or non-use of a connective to link two clauses was to some degree determined by whether the narrated events were on or off the time line of the narrative (children were more likely to use *and* in their discourse when they returned to the time line). A detailed study of how *and* functions at the text level in English-speaking adult conversations has shown that it can serve to mark different types of units, at various levels in the discourse structure (Schiffrin, 1986, 1987). In conjunction with *zero*, *and* can be used in patterns that create a contrast along the syntagmatic axis. In cases where one of these two forms (irrespectively *and* or *zero*) is employed to establish a text pattern by grouping a series of propositions into a conceptual whole, the other, by virtue of the fact that it deviates from that pattern, marks a change in the organization of ideas. Examples of this are the transition between the elements of a description and its summary, or between a list of arguments and the conclusion. A sequential pattern containing a change in connection mode (e.g. *zero-zero-zero-zero-and* or *and-and-and-and-zero*) introduces a new conceptual unit. In this way, *and* can play a role both at the local level (by linking propositions with a similar function within a discourse topic), and at the global level (by introducing a new text pattern to differentiate discourse topics). Schiffrin (1987) argued that when used at the text level, *and* does not convey more referential information than *zero*. When listeners come across an *and*, they know only that it connects a current unit to a structurally equivalent unit located further along in the discourse.

It was hypothesized in the present study (1) that elementary school children will employ *and* in their narrations to formally indicate conceptual transitions, and (2) that this strategic use depends upon the age-related improvement of children's ability to understand relationships between a series of events.

The experiment was conducted as part of a larger research project designed to study the possible influence of the pictorial medium on the linguistic tools used by narrators (Vion & Colas, 1999*a*, *b*). The general hypothesis was that

the linguistic expressions that structure discourse are manifestations of the conceptual constraints involved in handling referential links (Bronckart, 1985; Chafe, 1986). Picture-based tasks are an important means of observation in research on narrative development (Fine, 1985; Bamberg, 1987; Norris & Bruning, 1988; Roth & Spekman, 1989; De Weck, 1991; Berman & Slobin, 1994; Bamberg, 1997; Berman & Katzenberg, 1998; Jisa & Kern, 1998; Kern, 1998; Jisa, 2000). They are known to be more demanding for the speaker than spontaneous or simply-elicited narrations (Peterson, 1993; Roth, Spekman & Fye, 1995). They require the speaker to deliberately mobilize his/her skills upon request. The speaker must first understand the events represented in each picture and how they are connected to each other (which involves inferring the depicted meanings and building an overall representation of the story) and then encode the interpreted meaning in narrative format (Stein & Albro, 1997; Trabasso & Stein, 1997). Establishing relations between pictured events and determining how they are connected to each other, whether locally (between two consecutive pictures) or globally (between all pictures), can be facilitated to different extents by what information is given in each frame. Similarly, a 'storyteller's' understanding of the relationships between events in the story can be promoted to varying degrees by how that information is displayed. For example, the pictures in a comic strip could be presented in ordinary format with all frames on the same page, or they could be displayed in a booklet with one picture per page. In the former case, the overall content of the story can be inferred before encoding, whereas in the latter, the content can only be inferred and encoded step by step: the speaker sees only one event at a time and therefore must 'tell' the event at the same time as he/she connects it to the story content elaborated so far.

The experiment was run on seven- to eleven-year-old native-French-speaking children in different conditions of information availability (simultaneous vs. gradual), inference making (ordered vs. arbitrary nature of the event sequences), and thematic continuity (continuous vs. discontinuous). Each speaker was asked to tell the story depicted in the comic strips to a same-age peer who was unfamiliar with the story. There were no captions or balloons. The speaker's task was to tell the story as accurately as possible by taking each picture into account, but avoiding too many details. The pictorial-narrative verbalization task devised for this research offered the possibility of systematically examining the cognitive conditions that allow children to express the links between depicted events using connectives.

An earlier study on how children explicitly mark inter-propositional links was carried out on the part of the children's narrations where the same character was carrying out a sequence of actions (Vion & Colas, 2003). One of the main results of that study was that more connectives were used when the speaker could see all of the pictures at once.

The present study focuses on the occurrences of *and* within children's discourse as they begin to describe the last event in the comic strip. More precisely, the study examines the use of *and* at this point in the story to formally indicate a new idea. This occurs when a textual regularity has been established to talk about the previous frames, and then *and* is used to mark a change. The joint manipulation of the span of available information, the type of event sequence and thematic continuity offers the oportunity to gain insight into the conditions under which the strategic use of *and* to introduce conceptual transitions emerges (at the end of an account, or when a new topic begins).

METHOD

Participants

One hundred and ninety-one native French-speaking boys and girls aged 7;0 to 11;0 participated in the study. There were 63 seven-year-olds (median age: 6;6), 64 nine-year-olds (median age: 8;8), and 64 eleven-year-olds (median age: 10;6).

Materials

Each comic strip contained eight frames (8×8 cm). The first frame showed two characters. All subsequent frames showed only one of the two characters carrying out various activities. A minimal link between the frames was maintained by the continuous presence of one of the characters after the first frame.

Four comic strip structures or versions were generated with the two characters (X, Y) by taking all combinations of two variables, each with two categories. The first variable was the topic of the comic strip, which either changed or remained the same. In the MAINTAINED-TOPIC condition, the materials induced a thematic subject (Karmiloff-Smith, 1981) after the first frame via the repeated presence of the same character throughout the story (character X was in every frame up to and including the last one). In the CHANGED-TOPIC condition, the materials generated a thematic break by reintroducing the other character (Y) in the last picture (Frames 2 through 7 showed only X and Frame 8 showed only Y). The thematic break was deliberately introduced late so it would be possible to assess the potential impact of its anticipation on the expression of links between events. The next variable was a secondary variable used to control the arrangement of the characters in the frames. To make sure the characters' location in the pictures would not trigger a bias in referent marking due to the greater salience of one of the characters, their locations (*left*, *right*) in the first frame were counterbalanced.

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Fig. 1. Types of event sequences: (1a) arbitrary, (1b) ordered.

The third variable was the type of event sequence. The comic strips differed as to how obvious the links were between the consecutive frames (Figure 1). In the ARBITRARY condition, the events, although presented as a sequence, could have occurred in any order. For example, the activities depicted in Figure 1a are relatively independent of each other: the picture of the woman changing clothes could have been placed after the one where she is doing her makeup (or anywhere else in the sequence for that matter). It was the speaker's task to infer the links between the pictures in order to devise an overall representation of the story. In the ORDERED condition, the events could only occur in one order. For example, in Figure 1b, before potentially catching a fish, the man had to put on his fishing gear, go to the water's edge,

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and cast the line. Although the events were proposed in a chronological order that was more constrained than in the arbitrary condition, the ordered stories still did not have a script structure, because in every case, the ordinary sequence of events was modified by the occurrence of a surprise event or an event that interrupted the causal chain.

For each type of event sequences, there were 32 test comic strips (8 pairs of characters × 4 versions) and three filler comic strips containing only one character (see list of materials in Appendix).

The last variable manipulated was the frame display mode. In the SIMULTANEOUS mode, the speaker saw all frames at once (on one page), and he/she was asked to look at the entire comic strip and prepare to tell the story immediately afterwards. In the CONSECUTIVE mode, the comic strip was presented in booklet format, with one picture per page. The speaker was asked to turn the pages one by one, and to say what was happening as each new picture was discovered.

Data collection design

Each speaker was tested on one display mode, one type of event sequence, but both topic conditions. During testing, a given participant saw eight test comic strips in a random order (each proposed in one of the four versions) and three filler comic strips interspersed between two test comic strips. The fillers were designed to introduce variations in the structure of the material; they were not taken into account in the results.

Procedure

Testing was individual and lasted approximately 20 minutes. In the room where the experiment took place, there were three persons, the speaker, the experimenter, and a listener (who was a same-age, same-grade peer as the speaker and acted as a listener for only one speaker during the experiment). The two child participants were sitting facing each other at a table, so that the listener could not see the pictures and the speaker could not assume shared background knowledge of the narrated content.

In simultaneous display (one page), the speaker was given the following instructions: 'I'm going to show you some comic strip stories. You'll see that there are no words in them, just pictures. Your task will be to tell the stories to your partner, who can't see them. Be careful to talk about every picture, without forgetting any. Tell them in the following order (the experimenter pointed to the pictures in the normal reading order). You may study the pictures as long as you want before beginning.' The first practice comic strip was presented to the speaker, who studied it and kept it in sight until he/she had finished telling the story. Then it was taken away and the remaining comic strips were proposed one by one.

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In consecutive display (booklets), the above instructions were modified as follows: 'I'm going to present some stories in booklets (the experimenter showed a booklet). (…) You will be asked to say what's happening in each picture, without forgetting any. Be careful to talk about every picture, one after the other, but you can't look back.' Then the first practice booklet was presented to the speaker. Between each comic strip in this mode, the experimenter reminded the speaker to work picture by picture without backtracking.

The instructions given to the listeners were the same in the two conditions. Listeners were to be attentive and listen carefully to the stories in order to understand them, but they were not supposed to talk.

Transcription of recordings

The recorded narrations were fully transcribed in line with the conventions established by Hickmann, Hendriks, Roland & Liang (1994). Each text was divided into three parts (concerning Frame 1, Frames 2 to 7, and Frame 8).

Detection of occurrences

All connectives occurring at the beginning of the third part of each text (Frame 8), such as *and* (*et*), *then* (*puis*), *so* (*alors*), *after that* (*après*), *but* (*mais*), etc., were tallied. When a connective was combined with another connective, as in *and then* (*et puis*) or *and then after that* (*et puis après*), with a deictic, as in *and there* (*et là*) or *and here* (*et ici*), or with a temporal marker, as in *and all of the sudden* (*et tout d'un coup*) or *so when* (*puis quand*), the combination was taken as a unit, and its elements were connected with a plus sign in the transcribed text (e.g. *and + so + then*).

Coding

Each occurrence was assigned a two-part code. The first part was the form itself: *and* or *and + …*, *then* or *then + …*, etc. The second part indicated how the connective was used to connect the description of Frame 8 (F8) to the description of the preceding frames (F2–F7). This part was labelled 'no change' (nc) if all or nearly all of the preceding frames were connected in the same way (with the same form), as illustrated in Example 1 below.

(1)   *F2–F7 la grenouille qui voit passer une libellule elle veut l'attraper … alors elle saute, elle sort sa langue, pour pouvoir l'attraper … et elle a réussi à l'attraper, elle est tombée sur la plage et elle a pas l'air trop contente … et elle ressaute sur un gros bout de bois … et ce bout de bois coule avec la grenouille, mais c'était une chaussure … et la grenouille elle remonte à la surface de l'eau*

   (the frog who sees a dragonfly go by wants to catch it … so it jumps, it sticks out its tongue, to catch it … and it manages to catch it, it falls on

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the beach and it doesn't look too happy … and it jumps again on a big piece of wood … and the piece of wood sinks with the frog, but it was a shoe … and the frog comes back up to the surface of the water)

F8   et le poisson descend sous la mer.

(and the fish goes down under the sea.)

The connective was labelled 'change' (c) if the preceding frames contained no connectives (except perhaps a marker of the transition from F1 to the subsequent pictures) as in Example 2 (*and* after *zero*), or if they contained a variety of other connectives (one or more, but not *and*) as in Example 3 (*and* after other connectives).

(2)   *F2–F7 après il respire. il fait des petites bulles et une grosse. il rentre dans la grosse bulle. il sort de l'eau. recommence à aller dans l'air. la bulle elle éclate.*

(after that it breathes. it makes some little bubbles and a big one. it goes into the big bubble. it comes out of the water. starts again to go up in the air. the bubble bursts.)

F8   et lui retourne dans l'eau.

(and it goes back into the water.)

(3)   *F2–F7 la grenouille elle est sur son nénuphar, i passe une libellule … elle saute pour l'attraper … ensuite elle mange la libellule … elle va sur une chaussure … la chaussure elle s'enfonce dans l'eau … elle revient à la surface …*

(the frog is on its lily pad, a dragonfly goes by … it jumps to catch it … then it eats the dragonfly … it gets on a shoe … the shoe sinks into the water … it comes back up to the top …)

F8   et le poisson il la mange.

(and the fish eats it.)

The corpus was coded separately by each author. Any disagreements in the codes assigned were resolved by discussion. The occurrences were tallied and analysed using the Child Data Exchange System (CHILDES, MacWhinney, 1991). The data was entered in the format defined by the system (CHAT module), which made it possible to search in the transcriptions for text strings or codes (CLAN module).

Predictions

The predictions concerned the speaker's use of *and* to change the text pattern established so far, at the point when he/she started telling the last event in the comic strip. More precisely, this occurred in case 'c' above when the speaker used *and* following a series of other markers (*zero* or connectives other than *and*) in F2–F7 (codes: *andc* or *and+connc*).

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The production variables manipulated should identify the circumstances for the appearance of *and* employed in this way. It was predicted that this particular use of *and* to begin the narration of the last event would be more frequent in simultaneous display (which allowed the speaker to build an overall representation of the series of events to be related), in chronologically ordered event sequences (which facilitated the detection of a thematic subject), and in cases where there was a character change at the end of the comic strip (which initiated a new topic).

The ability to understand and mentally represent a series of events as an integrated whole is known to emerge and solidify gradually in the course of development (Bestgen, 1992; van den Broek, 1997). So, although expected for all speakers over the age range considered here, the use of *and* to indicate conceptual transitions should rise in frequency as the children's ability to understand relationships between events improves.

RESULTS

Overall results

Eight narrations per speaker were recorded, making a total of 1528 productions in which narrators had the opportunity to use a connective to begin describing the last picture. This in fact happened 74% of the time (1132 occurrences). The children started the narration of the last picture with *and* (*and* or *and* + ... i.e. co-occurring with another connective, a deictic, or a temporal marker) more than half of the time (58·8% of the productions, 899 occurrences). Note that among the other forms observed (*then*, *but*, *after that*, *so*), *après* (*after that*) was the most frequent (40·7% of the 233 other forms). It appears that when oral narration based on pictures is requested, the use of *and* to begin describing the last event of a story, although not always present, is a relatively frequent phenomenon.

At this point in the narration, for nearly a quarter of the productions (23·6%), *and* connected the rest of the production (description of F8) to the preceding part with no change in the connection mode (for F2–F7, the descriptions were themselves interconnected by *and*). The remaining occurrences of *and*, about a third of the productions (35·2%), were cases in which *and* created a syntagmatic contrast with the earlier connection mode (marking by *zero* or by various other connectives like *after that*, *then*, etc.). Note that *and* was not the only connective used to establish a syntagmatic contrast at this point in the narration. In the remaining 15·2% of the descriptions of F8 that began with a connective (those that did not have *and* at this location), the connective was sometimes used to create a syntagmatic contrast (like *puis* in Example 4 below). But such sequences were too scarce to be further analysed.
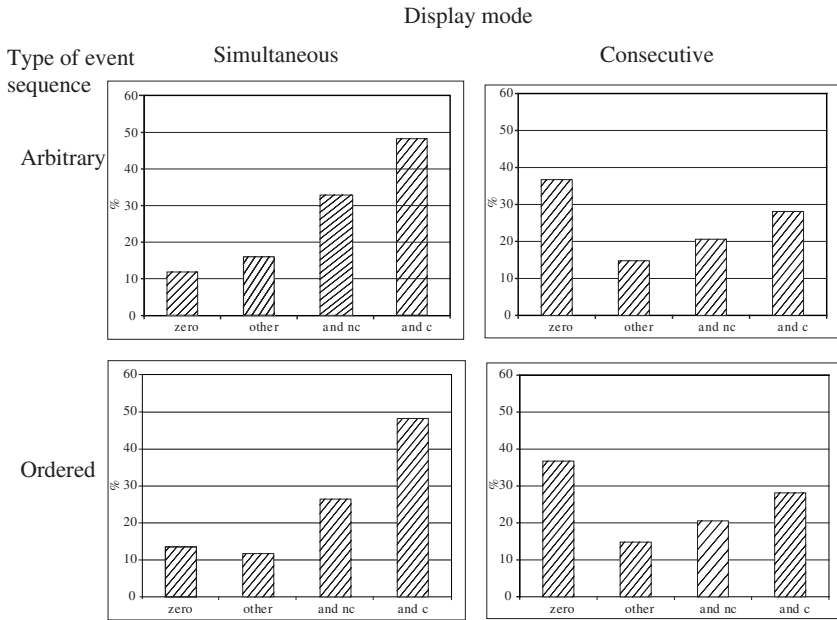
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Display mode

Type of event sequence	Simultaneous	Consecutive

Arbitrary

Ordered

Fig. 2. Distribution of occurrences, by type of event sequence and display mode (in percent).
Legend:
ANDnc = *and* at the beginning of F8 without a change in the text pattern established so far.
ANDc = *and* at the beginning of F8 following *zero* or other connectives in F2–F7.
Other = other connectives at the beginning of F8.
Zero = no connectives at the beginning of F8.

(4) *F2–F7 et après la femme, elle va nettoyer la chambre, avec son balai. elle*
range les affaires … elle se déshabille … elle se maquille … elle regarde le ski
à la télé … elle tape à la machine …
(and after that the lady goes to clean the room with her broom. she puts
things away … she gets undressed … she puts on makeup … she
watches skiing on TV … she types on a typewriter …)
F8 puis elle va faire les courses.
(then she goes shopping.)

Figure 2 presents the distribution of the different coded occurrences, for
each type of event sequence and frame display mode. The 'other' category
includes connectives other than *and*. It shows that the shape of the dis-
tributions varied with display mode and sequence type. From a descriptive
point of view the use of *and* to create a syntagmatic contrast with the earlier
connection mode was, as expected, more frequent (1) when the whole comic
strip was presented at once (44·3% vs. 25·1%) and (2) when the comic strip
offered an ordered sequence of events (39·5% vs. 30·7%).

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TABLE 1. *And-alone: results of analyses of variance*

Independant variable effect	All data pooled			Arbitrary sequences			Ordered sequences		
	df	F	p	df	F	p	df	F	p
D	1, 180	17·920	0·00001	1, 90	4·847	0·0303	1, 90	14·21	0·0003
L	1, 180	8·879	0·0033						
T	1, 180	11·757	0·0008				1, 90	9·70	0·0032
D × T							1, 90	4·075	0·0465
A	2, 180	4·399	0·0136	2, 90	3·36	0·0392			
A × D							2, 90	3·465	0·0355
A × T	2, 180	5·633	0·0042				2, 90	4·16	0·0187
A × D × L	2, 180	4·428	0·0133						

Legend: A, age; D, display mode; L, sequence type; T, topic.

Analyses

The statistical analyses focused on the use of *and* to create a syntagmatic contrast with the earlier connection mode (codes *andc*, the most numerous, and codes *and + connc*). Analyses of variance were carried out by taking two dependent variables: (1) the number of occurrences of *and* employed alone (code *andc*, hereafter denoted *and-alone*), and (2) the number of occurrences where *and* was followed by another connective, as in *and + then* (hereafter denoted *and + conn*). These co-occurrences, very often observed in research on narrative development, are seldom the focus of study. With these two dependent variables the analysis allows us to assess the functions of *and* when used alone and its functions when combined with other connectives. The value taken on by each dependent variable ranged between 0 and 4.

The results for all data pooled were examined first. The analysis design was: (3) age (7;0, 9;0, 11;0) × (2) display (*simultaneous, consecutive*) × (2) sequence type (*arbitrary, ordered*) × (2) topic (*maintained, changed*), with repeated measures on the topic factor. Then the data concerning the arbitrary sequences and the data concerning the ordered sequences were analyzed separately. The analysis design was: (3) age × (2) display × (2) topic, with repeated measures on the topic factor. The effects at a significant level less than or equal to 0·05 are reported here.

'And' employed alone

The results of the three analyses with the number of occurrences of *and-alone* as the dependent variable are presented in Table 1. The analysis for all data pooled yielded a significant main effect of each factor and two significant interactions.

Figure 3 presents the interaction between age, display, and sequence type. Pairwise comparisons using the Newman–Keuls test indicated (at 0·01) that

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Mean no. of
occurrences (0,4)

3a: Age 7;0

Mean no. of
occurrences (0,4)

3b: Age 9;0

Mean no. of
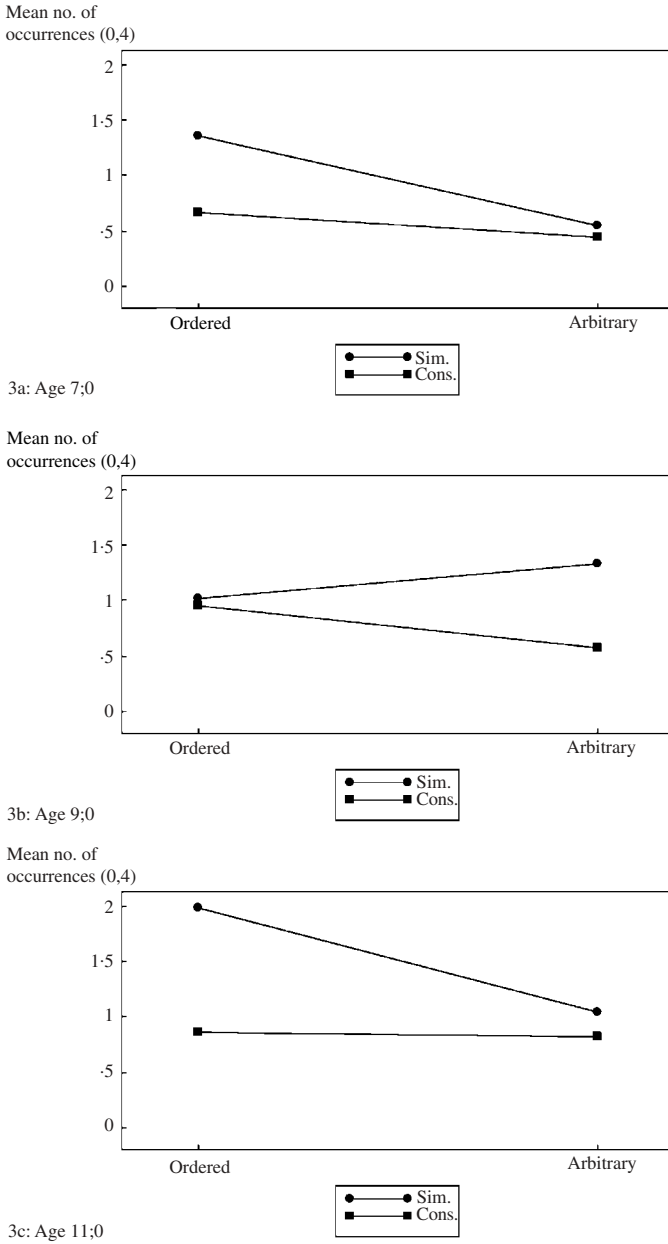occurrences (0,4)

3c: Age 11;0

Fig. 3. *And-alone* in all data pooled: age-by-display and sequence-type interaction.
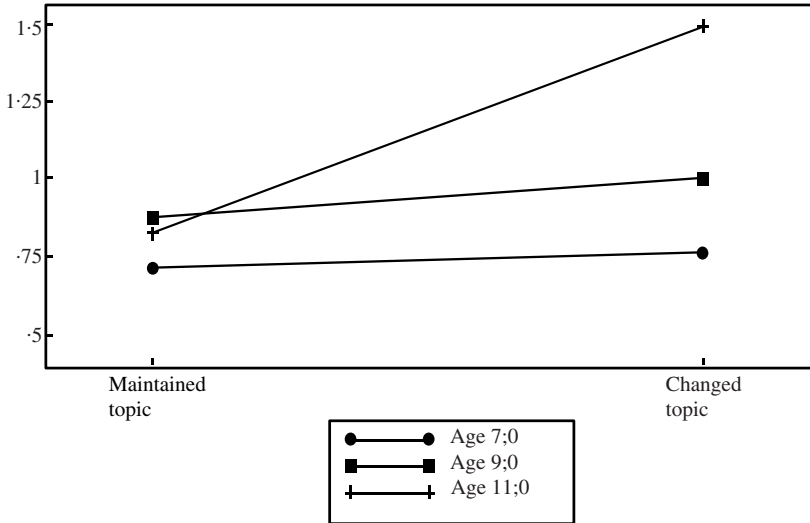
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Mean no. of
occurrences (0,4)

Fig. 4. *And-alone* in all data pooled: age-by-topic interaction.

the eleven-year-olds (Figure 3c) had a significantly greater tendency than the seven-year-olds (Figure 3a) to start narrating the last picture by using *and-alone* to change the previously established connection mode. As a whole also, *and-alone* was more frequent (1) when the whole comic strip was presented at once than when it was shown frame by frame (display effect) and (2), when the comic strips offered an ordered sequence of the events than when they offered an arbitrary sequence (sequence-type effect). But the magnitude of each of these effects changed with age: the pattern of the results for the nine-year-olds (Figure 3b) differed from those obtained for the seven-year-olds (Figure 3a) and the eleven-year-olds (Figure 3c).

Figure 4 presents the age-by-topic interaction. Children used *and-alone* to change the textual standard established so far more often when the character in the last picture was not the one in the preceding frames than when it was the same throughout the frames (topic effect). However only the eleven-year-olds were responsible for this increase. When the comic strip continued to show the same character until the end, the performance of the children in the three age groups was similar. It was also similar to that of the-seven-year-olds and nine-year-olds in the other condition. Thus, only the oldest children produced a syntagmatic contrast using *and-alone*, and they did so when the topic changed. The separate analysis of the data for the two sequence types makes it possible to further specify these results.
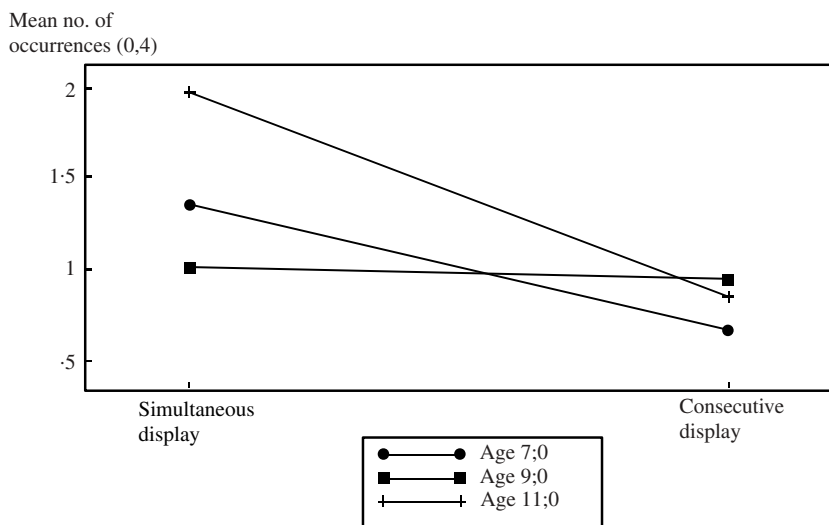
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Mean no. of
occurrences (0,4)

Fig. 5. *And-alone* in ordered sequences: age-by-display interaction.

The analysis of the data concerning the arbitrary sequences indicated significant effects of the age and display factors only. Each of these effects went in the direction described before. In arbitrary-sequence productions, a change in connection mode using *and-alone* at the beginning of the narration of the last picture was dependent on the age-related increase in the capacity to understand that a sequence of pictures constitutes a whole, and on being able to see all of the events to be reported in advance. In arbitrary-sequence narrations, *and-alone* acted for the eleven-year-olds as an indicator of the transition to the end of the account.

The analysis of the data concerning the ordered sequences yielded a significant effect of the display and topic factors, both in the direction described above. It also yielded a significant interaction between these two factors. *And-alone* occurrences in simultaneous display were more frequent when the topic changed. Thus, as expected, by allowing for the structuring of an overall story representation and the anticipation of a topic change, the simultaneous display of ordered sequences made it possible for the speaker to employ *and-alone* to indicate a topic change. Moreover, the analysis brought out an interaction between the age and display factors and between the age and topic factors.

Figure 5 presents the age-by-display interaction. It confirms the results observed for the arbitrary sequences: in simultaneous display where the occurrences of *and-alone* were more frequent, the eleven-year-old children employed this form the most.
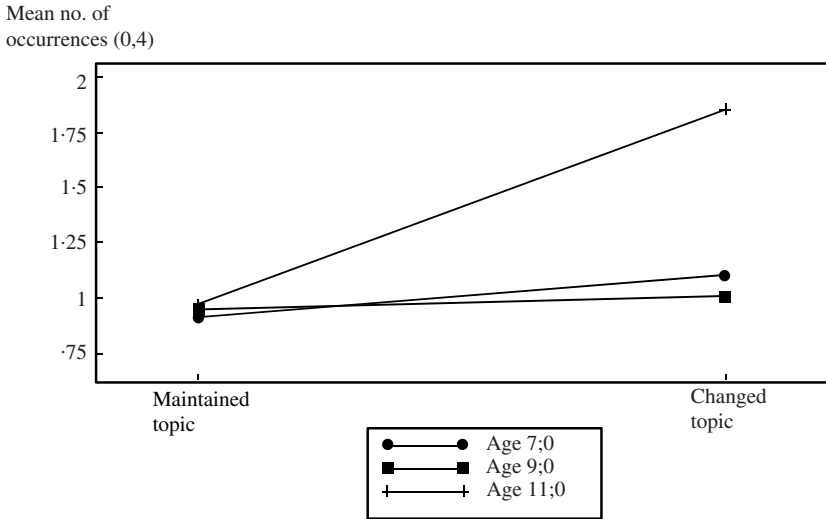
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Mean no. of
occurrences (0,4)

Fig. 6. *And-alone* in ordered sequences: age-by-topic interaction.

Figure 6 presents the age-by-topic interaction. It shows that the increase in the occurrences of *and-alone* when the topic changed was mainly due to the eleven-year-olds. The analysis of the productions obtained for the ordered sequences confirms the role of the children increasing ability to organize the event sequences in order to use *and-alone* to indicate conceptual transitions. It also confirms the impact of knowing the entire event sequence in advance on the use of *and-alone*. It was the eleven-year-olds who benefited the most from the simultaneous presentation of the pictures, and who employed *and-alone* the most often to indicate a topic change.

And in co-occurence with other connectives

The result of the three analyses with the number of occurrences of *and + conn* as dependent variable is presented in Table 2. The analysis of all data pooled yielded a significant main effect of the topic and display factors, as well as an interaction between age and display. The separate analysis of the data for each sequence type showed that these effects were significant for the ordered sequences only.

For ordered sequences, *and + conn* were more frequently used in simultaneous display than in consecutive display (display effect) and when the topic was maintained than when it changed (topic effect). It should be noted that the effect of the topic factor on the dependent variable *and + conn* went in the opposite direction to that observed for *and-alone*. This finding suggests

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TABLE 2. *And + conn: results of the analyses of variance*

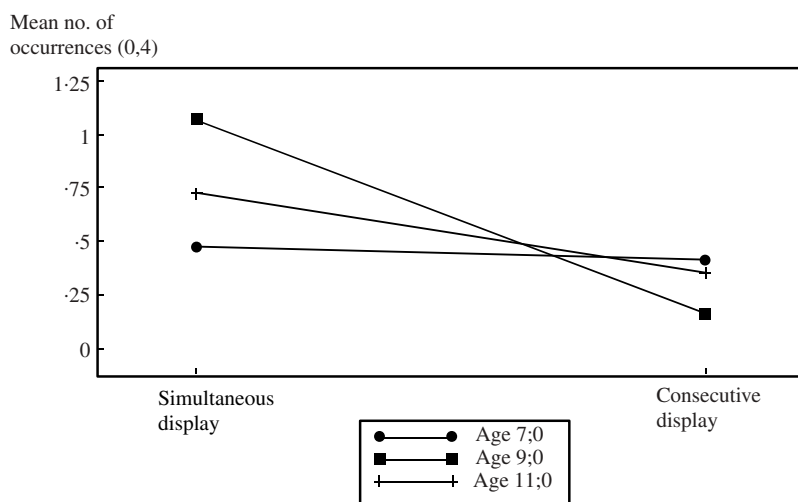| Independant variable effect	All data pooled			Arbitrary sequences			Ordered sequences		
	df	F	p	df	F	p	df	F	p
D	1, 180	9·046	0·003				1, 90	10·322	0·0018
T	1, 180	4·646	0·0325				1, 90	6·200	0·0146
A × D	2, 180	3·662	0·0276				2, 90	3·121	0·0489

Legend: A, age; D, display mode; T, topic.

Fig. 7. Co-occurrence of *and* with another connective in ordered sequences: age-by-display interaction.

that *and + conn* and *and-alone* fulfill complementary functions with regard to the marking of thematic continuity. Whereas *and-alone* seems to be dedicated both to the marking of topic change and the transition to the end of the story, *and + conn* appears to mark topic continuity while indicating the transition at the end of the story. This last result concerned not only the eleven-year-olds but especially the nine-year-olds here (Figure 7, age-by-display interaction). The nine-year-old children were the ones who employed *and + conn* the most in simultaneous display and the least in consecutive display.

This final result explains the difference between the pattern observed in Figure 3 for the nine-year-olds and those observed for the other children. In the simultaneous display of ordered sequences, nine-year-old children employed more *and + conn* than *and-alone* to create a syntagmatic contrast with the earlier connection mode.

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DISCUSSION

The present experiment was devised to study how elementary school children used connectives at the local and the global text levels in picture-elicited oral narratives. It focused on the creation of a syntagmatic contrast between *and* and other previous modes of connection when children start narrating the last picture of comic-strip stories. The overall results showed that more than half of the time, the children started the narration of the last event using *and*. The majority of these occurrences were ones that changed the previously established text pattern. So to tell the pictorial narratives proposed here, about a third of the time, the children created a sequential contrast between *and* and *zero* (or some other connective) that displayed the structure of the production. This result is in line with a text-level use of *and* for the purposes of marking transitions in an idea structure (Schiffrin, 1986, 1987).

The manipulation of the type of event sequence and the display mode allowed us to verify that cognitive constraints involved in handling referential links underlies the linguistic functions of *and*. Comparison of the productions in these two conditions showed that *and* used as a final transition marker (whether alone or in conjunction with another connective, as in *and then*) was more frequent in simultaneous display. Comparison of the productions collected for each type of event sequence showed that comic strips depicting a linear series of temporally independent actions gave rise to fewer connection-mode changes starting with *and* than those where the actions formed a chronologically ordered sequence. The display mode sometimes did and sometimes did not allow the speakers to verify their understanding of the temporal and causal structure of the events to be related. Compared to when the pictures were shown one by one the production situation where the whole comic strip was seen before the narration began made it easier to integrate and interconnect the events into an overall representation. These results confirm the idea that the connective *and* plays a role at the overall text level whenever it is possible to organize the to-be-related events into a whole.

Above all, the constraints imposed on planning and inference-making by the present experimental setup enabled us to determine the linguistic functions granted to *and* as children ability to understand relationships between events improves. The arbitrary-sequence condition, which is very demanding of the speakers' cognitive competencies showed that the eleven-year-olds had a greater tendency than the youngest children to switch to a new connection mode when beginning to tell the last picture, whatever the topic conditions. In doing so they announced the upcoming end of their account. The ordered-sequence condition showed that in simultaneous display, which was more conducive to the building of an overall representation of the event sequence, the nine-year-olds were also able to announce the upcoming end of their account. But to do this, they used *and* jointly with another connective. The ordered-sequence condition also showed that

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eleven-year-olds were able to use *and* not only to announce the end of their account, but also in case of a topic change.

Thus, in the present experiment, the manipulation of the narration conditions allowed us (1) to demonstrate a strategic use of *and* to formally indicate the approaching end of an account, particularly when all pictures were presented simultaneously and had a strict intrinsic order and (2) to show that this strategic use emerged at the age of nine and became most salient at the age of eleven.

Thus the functional value of the connective *and* seems to evolve during linguistic development from its very early function of forming a discourse by grouping a series of propositions into a linear sequence, to its function in creating a hierarchically organized structure. It seems that at the global text level, *and* acquires greater specialization with increasing age, evolving from a way of marking a change near the end of an account to a way of marking a change to a new conceptual unit. However this issue needs futher investigation (1) to clearly differentiate between the various ways in which *and* displays the structure of a text (to announce the upcoming end of an account, to return to the time line of a narration, to differentiate topics in the discourse), and (2) to specify when in the course of development and (3) in which production settings, children rely on *and* to indicate conceptual transitions.

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APPENDIX

EXPERIMENTAL MATERIALS

Arbitrary sequences

Test comic strips: content of first frame
1. A man and a woman sitting on a sofa
2. An adolescent and a little boy
3. A man and an adolescent at the beach
4. A woman and a little girl sitting at the table
5. A turtle and a crocodile at the water's edge
6. A monkey and a lion in the brush
7. A hen and chicks in the courtyard
8. A cat and a donkey in the fields

Topic of filler comic strips (one character only)
a. A cat is playing by the sea
b. A grandmother is shopping
c. A man is getting up in the morning

Ordered sequences

Test comic strips: content of first frame
1. A child and an old man in the living room
2. A man and a woman at home
3. A boy and a girl at the beach
4. A boy and a man fishing
5. A dog and a cat sleeping on a rug
6. An earthworm and a snail in a kitchen
7. A hedgehog and a rabbit at the roadside
8. A fish and a frog near a pond

Topic of filler comic strips (one character only)
a. A dog is playing in a yard
b. A boy is exploring a cave
c. A mouse is looking for food

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