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## Anaphoric Procedures in Four Text Types Written by Children

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Until now, there has been no study which has systematically compared anaphoric procedures used by children in different text types. Studies concentrated on sentence level or analyzed only stories. The present article describes the anaphoric procedures used in four text types (argumentation, explanation, account of a recent personal experience, and story) written by children 10, 12, and 14 years old. It shows that each text type is characterized by specific means to create anaphoric cohesion. From an ontogenetic point of view, one can observe important changes in the explanation. For the other text types, no important differences appear.

The present study deals with the use of anaphora in four text types written by 10-, 12-, and 14-year-olds. Its aim is to characterize the anaphoric procedures used and, in this way, to shed light on some of the aspects of textual cohesion in the language of older children. Textual cohesion is defined as a phenomenon occurring on the level of the linear progression of discourse and contributing to its unification. It is the result of an equilibration between continuity and progression of the elements of text. In the majority of cases, this process is accomplished by different anaphoric procedures. Our definition of cohesion is thus more limited than the one used by Halliday and Hasan (1976).

The body of developmental research focussing on the study of surface markers of anaphoric procedures has for the most part relied upon sentence comprehension tasks to bring out different strategies used by children and adults (see Kail, 1983; Noizet, 1983; or de Weck, 1991, for an overview of the main findings).

Studies of production are less frequent, although there has been an increasing interest in this topic in recent years. Similar to comprehension, the experimental studies were first conducted on the production (Amy & Vion, 1976; Deyts & Noizet, 1973; Ferreiro, Othenin-Girard, Chipman, & Sinclair, 1976) or reproduction (Kail, 1975a, 1975b) of decontextualized relative sentences. They attempted to evaluate how general the strategy of parallel functions is and to determine the factors influencing the correct use of relative sentences (type of

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embedding, type of pronouns, semantic factors of verbs, etc.). Personal pronouns have seldom been studied from the point of view of morpho-syntactic strategies. The studies of Chipman and de Dardel (1974) on accusative pronouns and of Deutsch and Pechmann (1978) on dative pronouns focused only on the deictic function. The anaphoric function of third-person pronouns has never been studied from the point of view of sentence, because the purpose of anaphora is to function *between* sentences. Another important study (Karmiloff-Smith, 1979) has shown how children acquire the different functions of the articles (anaphora, exophora, and cataphora) when they produce sentences about objects in their view.

All these experimental studies were conducted orally and focused on isolated sentences. Since a few years ago, under the influence of enunciative and textual linguistic theories (Benveniste, 1966; Halliday & Hasan, 1976), *extensive discourse* has become the main field for studies on anaphora, in oral as well as in written language.

From a developmental point of view, one of the main questions raised is to know when linguistic units like pronouns and articles can be used in their anaphoric function. Contrary to previous studies (Brown, 1973; Huxley, 1970; Tanz, 1974), which claimed that the anaphoric function already appears at 4 years, it now seems that this capacity is acquired quite late, namely at about 6 to 7 years (Hickmann, 1987). The main studies conducted on oral and written texts confirm this hypothesis.

Karmiloff-Smith (1980, 1981) studied 4- to 9-year-olds' recourse to personal pronouns in an oral description of a cartoon sequence. She described three stages in the use of personal pronoun anaphora. In Stage 1, children under 6 use pronouns mainly as deictics; in Stage 2, pronouns are reserved for the thematic subject, in the initial slot of utterances; and in Stage 3, children tend to signal to the addressee that pronouns can refer to other elements than the initial thematic subject in reduplicating a noun phrase in initial or last slot of utterances. This analysis goes beyond pronouns use and analyzes noun phrases as well. Bamberg (1986) confirmed these results for German children in a study also using an oral story production task prompted by a cartoon sequence. Bamberg reported that most 3- to 4-year-olds, but also some 5- to 6-year-olds, used a thematic subject strategy consisting mainly of third-person pronoun signaling. However, 9- and 10-year-olds and adults had recourse to anaphoric noun phrases to indicate switches in referents but used pronouns to indicate maintenance of referents.

In her study of stories prompted by a cartoon film, Hickmann (1980, 1987) investigated the introduction and maintenance of referents. She confirmed the hypotheses of a gradual development and a late mastery of intralinguistic referential units used for textual cohesion. At 7 years, these units "still depend directly on non-linguistic context and are not anchored in the discourse" (1987, p. 24); "the children presuppose either *too much* or *not enough* of the referents" (p. 25).

Cohesion markers, as defined by Halliday and Hasan (1976), have been

analyzed from a developmental point of view by Rutter and Raban (1982) and by Pellegrini, Galda, and Rubin (1984). These studies are particularly informative in that they dealt with a wider range of anaphoric devices: Aside from personal pronouns, they also included demonstrative pronouns and comparatives ("reference categories"); noun phrases ("lexical category") were analyzed in terms of lexical choice made by the speaker/writer (repetition of the nominal anaphora, use of synonyms, generics, etc.). Attention was also given to ellipsis (zero anaphora) and substitution.

Rutter and Raban (1982) analyzed 6- and 10-year-olds' narratives written in a free-situation. Their findings show that the youngest subjects tend to employ personal pronouns, whereas older children have a broader range of devices at their disposal (other pronouns from the "reference" category, different forms of nominal anaphora—the "lexical" category in particular). The intrinsic value of these findings is however limited by the fact that the analyses tended to collapse the data over text types: The variation generated by an absence of constraints in the situation of production may have produced a heterogeneity of text types which would have repercussions on the type of anaphoric devices present.

Pellegrini et al. (1984) included the "text type" variable in their study of narrative and persuasive texts produced both orally and in writing by 7-, 9-, and 11-year-olds. Their results indicated in particular that the narratives contained more items from the "lexical" category. From a developmental point of view, this study was able to confirm the fact that grammatical cohesion is acquired by the age of 9 to 10, whereas skill in the organization of causal text relations continues to improve throughout the elementary school years.

Contrary to studies which oppose oral and written language (for instance, Geva & Olson, 1983), the studies of anaphora in extensive discourse allows us to go beyond the differences between oral and written production. Different results show that using anaphoric procedures necessitates a basic capacity to create intralinguistic links independently of extralinguistic aspects, and that this capacity emerges gradually and quite late. In a previous study (de Weck, 1991) on different narrative types (oral and written fairy tales, personal experience), we showed that the basic capacity acquired in the oral mode can be used when the subjects write narrative texts. We also found that the differences in using anaphoric markers are much more important between different text types than between oral and written modes, in spite of displacements observed on the age variable. This can be explained by the type of relation the text maintains with the context of production and by the internal organization of referents. This effect of context and organization appears even more clearly when text organizers and anaphora are analyzed with regard to each other: In four text types, the higher the anaphoric density, the lower the number of text organizers, and vice-versa (Schneuwly & Bronckart, 1986).

In the experience reported here, we wanted to study more thoroughly the influence of text types on anaphoric procedures, by including more situations

than in the previous studies. We focused on subjects from 10 to 14 years old for two reasons: 10-year-old children write already quite fluently; intralinguistic use of anaphoric procedures emerges gradually and quite late. On the basis of the theoretical framework presented elsewhere (Bronckart, Bain, Schneuwly, Davaud, & Pasquier, 1985; Schneuwly, 1988), we assume that anaphoric procedures vary essentially as a function of two factors:

1. Text anchoring—that is, the relationship established between the physical discourse setting (locutors and interlocutors, moment and place of discourse production) on one hand and forms of social interaction and content on the other hand—influences anaphoric density and, to a lesser extent, the categories of anaphora used.
2. Text planning and organization as well as the manner, depending on planning, of treating the elements of content, affect the specific configuration of categories of anaphora.

From a developmental point of view, the configurations of anaphoric units may be expected to change across different age groups. This may be due, among other factors, to changes in text planning.

## METHOD

### Experimental Situations

Four conditions were set up to test our hypotheses:

1. Argument Condition—The subjects were given a letter arguing that children should no longer receive pocket money. The author of the letter requests comments from people: “It would be interesting if other people would express their opinion about this problem.”
2. Explanatory Condition—“I would like you to write a text explaining how to play hide-and-seek to people who are unfamiliar with the game so that, after having read the text, they can play it themselves. Imagine you are writing a rule book on games and write the explanation of the game of hide-and-seek for this book. To help you we will write the main phases of the game on the board.” During a discussion, the subjects reconstitute the main phases.
3. Personal Account Condition—“We are collecting texts written by children for a school library in Geneva. When we finish we will have a collection that children can borrow when they feel like reading. Today we would like you to write about what you did yesterday.”
4. Story Condition—“We would like to make a book of fairy tales for children told by children themselves. This is why we would like you to write a fairy tale about animals and their adventures.”

Concerning text anchoring, the stories, the explanations, and, to a lesser extent, the argumentative texts can be characterized as *autonomous* with respect to the situational features of the task. In contrast, the personal accounts are *implicated* vis-à-vis the situation. From the point of view of planning, the text structure of argumentative texts is entirely governed by the enunciator; the content elements, that is, the thesis and the arguments, do not depend on a pre-established form. In the stories, the texts exhibit the conventional narrative schema with a chain of actants. In the personal accounts, the texts present a sequential structure of the script type (comprising also chains of actants). In the explanations, one can find a more stereotyped explanatory model with definition of a problem, functioning of an object or a process, and generalization or concluding commentaries.

### Subjects

The subjects were 380 pupils attending public primary and secondary school in Geneva; they produced one text in French in their classroom in normal school conditions. The distribution of pupils is shown in Table 1.

The mean age of subjects was 10 years;1 month for 4th grade, 12;2 for 6th grade, and 13;11 for 8th grade.

A quantitative analysis was conducted to insure that the texts fit with the expected text types (analysis of verb tenses, deictic pronouns, auxiliaries, etc.). Second, a qualitative analysis was performed to check that each of the different instructions successfully generated clearly contrasted texts, in terms of anchoring, text organization and thematic elements. Nineteen aberrant texts were excluded (4 stories for each grade; 3 and 4 texts for personal accounts by 10- and 12-year-olds). Therefore, the analysis presented here included 361 texts.

### Measures

Anaphoric devices were investigated by noting each instance of the markers of text cohesion described above to characterize each text type in terms of a variety

TABLE 1  
Population: Distribution by Text Types and Grade Level

	Grade 4	Grade 6	Grade 8	Total
ARG	30	30	30	90
EXP	30	30	30	90
STO	40	39	37	116
PAC	23	24	37	84
Total	123	123	134	380

Note. ARG = Argument Condition; EXP = Explanatory Condition; STO = Story Condition; PAC = Personal Account Condition.

of anaphoric functioning. Each instance was assigned to 1 of the 12 categories of anaphora: 6 pronominal categories, 5 nominal categories, and 1 residual category.

**A. Pronominal Categories**

1. third person pronouns
2. demonstrative pronouns
3. third person possessive pronouns and adjectives
4. first and second person possessive pronouns and adjectives
5. relative pronouns
6. indefinite pronouns

**B. Nominal Categories**

7. repetitions (second mention of a lexeme without change of determiner; second mention of a proper noun)
8. definitivizations (second mention that defines, with a definite article, an indefinite lexeme used in the first mention)
9. intersentential deictic referentiations (second mention using a demonstrative determiner with the same lexeme as in the first mention)
10. lexical substitutions (second mention of an expression by another lexeme referring to the same entity)
11. nominalizations (second mention of a verb phrase, sentence, paragraph, part of text, by conversion into a noun phrase)

**C. Residual Category**

12. place adverbs essentially

The categorization of nominal anaphora draws extensively on Charolles (1978). Certain categories can be found under different labels in Halliday and Hasan (1976). The definition of the categories is sufficiently clear so that there are almost no differences in coding between coders.

## RESULTS

To compare the anaphoric density of the different text types, we used the number of total anaphora per 100 verbs (see Table 2).

A 3 (Age)  $\times$  4 (Text Type) analysis of variance was performed. Within each age group, text types differed significantly in anaphoric density,  $F(3, 349) = 103.40, p = .000$ . The rank order was identical for all grades: stories > explanations > argumentative texts > personal accounts. In the stories, one anaphoric device appeared every 5 to 6 words, whereas in the personal accounts, one appeared every 13 to 14 words.

Density varied also as a function of grade as shown in the comparison among age groups,  $F(2, 349) = 6.79, p = .001$ . The direction of this variation is not homogeneous, which results in an interaction effect,  $F(6, 349) = 3.30, p =$



TABLE 2  
Anaphoric Density by Four Text Types and Grade Level

	Grade 4		Grade 6		Grade 8	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Argumentative Texts	60.1	29.6	74.9	28.8	79.6	21.7
Explanations	71.9	22.2	85.9	17.6	92.8	33.6
Stories	117.6	17.9	114.1	21.5	106.9	23.5
Personal Accounts	41.4	27.0	58.3	27.0	51.3	29.1

.004. Whereas anaphoric density tended to drop in stories, it grew in explanations and particularly in argumentative texts. Note that there is a relationship between anaphoric density and text length for argumentative texts and personal accounts: The longer the text, the higher the density.

Table 3 gives a more detailed analysis: It illustrates the relationship between pronominal anaphora and nominal anaphora in the different texts.

As expected, both types of anaphora differed significantly as a function of text type,  $F(3, 349) = 42.30, p = .000$ , for pronominal anaphora, and  $F(3, 349) = 76.30, p = .000$ , for nominal anaphora. Between age groups, however, the situation is more complex: Only pronominal anaphora was significant,  $F(2, 349) = 3.60, p = .028$ , due to the increase of anaphora of this type in argumentative

TABLE 3  
Pronominal and Nominal Anaphora by Grade Level and Text Type; Scores per 100 Verbs

	Pronominal Anaphora		Nominal Anaphora	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Grade 4</b>				
Argumentative Texts	36.9	30.5	23.2	14.4
Explanations	63.9	20.9	7.5	9.3
Stories	64.9	19.9	51.7	25.7
Personal Accounts	28.6	21.6	12.8	10.6
<b>Grade 6</b>				
Argumentative Texts	44.9	19.8	29.8	16.3
Explanations	66.3	17.5	19.6	14.1
Stories	64.4	17.8	48.7	17.8
Personal Accounts	39.8	17.7	17.7	13.7
<b>Grade 8</b>				
Argumentative Texts	53.6	15.4	25.9	12.8
Explanations	63.9	14.9	28.7	15.9
Stories	65.2	19.3	40.5	16.7
Personal Accounts	39.1	24.3	11.3	11.8

texts and partly in personal accounts. One can however observe a significant effect of interaction between grade level and text type for nominal anaphora,  $F(6, 349) = 5.70$ ,  $p = .000$ , due to a decrease of nominal anaphora in stories and an increase in explanations.

A closer look at the 12 categories of anaphora leads to the following observations: Within age groups, the differences were significant for all anaphoric categories as a function of text type,  $F(3, 349)$  varies between 5.50 and 91.20,  $p = .000$ . Table 4 shows the distribution of anaphora, without taking into account the variable of grade level, and defines which devices best characterize each text type compared to the others.

The following profiles can be defined for each text type:

- Argumentative texts: repetitions = personal pronouns > relative pronouns
- Explanations: personal pronouns > relative pronouns > demonstrative = substitutions and nominalizations
- Personal Accounts: 1st and 2nd person possessive > personal pronouns > repetitions
- Stories: personal pronouns > definitivizations = repetitions > 3rd person possessive.

Concerning grade level, the following tendencies were notable: Among the pronominal anaphora categories, there was a significant increase in demonstrative (in personal accounts and argumentative texts), relative (in personal accounts), and indefinite (in argumentative texts and explanations) pronouns,  $F(2,$

TABLE 4  
Distribution of Anaphora as a Function of Text Type; Scores per 100 Anaphora

	Argumentative Texts	Explanations	Personal Accounts	Stories
Personal	26.8	35.9	21.8	38.7
Demonstrative	7.7	9.5	5.1	1.4
3rd Per. Poss.	9.3	0.0	3.6	10.9
1st-2nd Per. Poss.	5.3	1.9	32.4	0.1
Relative	12.0	23.4	7.4	5.3
Indefinite	2.0	6.8	1.1	1.1
Repetitions	29.4	6.2	18.7	15.8
Definitivizations	0.5	2.0	2.7	18.0
Intersent. Deictic. Ref.	1.3	0.4	0.3	1.7
Substitutions	5.1	7.6	5.0	5.4
Nominalizations	0.5	6.0	0.9	0.8
Residual	0.1	0.3	1.0	0.9
Total Anaphora	100.0	100.0	100.0	100.0

349) = 3.30,  $p = .038$ ;  $F(2, 349) = 3.20$ ,  $p = .043$ ;  $F(2, 349) = 3.90$ ,  $p = .02$ , respectively. For the personal pronouns one can observe an effect of interaction,  $F(6, 349) = 2.70$ ,  $p = .016$ , due to an increase in argumentative texts and a partial increase in personal accounts and to a drop in explanations. In the nominal anaphora categories, two categories varied significantly as a function of grade level: lexical substitutions,  $F(2, 349) = 4.10$ ,  $p = .018$ , and nominalizations,  $F(2, 349) = 13.90$ ,  $p = .000$ . This was essentially due to a sharp increase in explanations and, only for the lexical substitutions, to a lesser extent in argumentative texts.

## DISCUSSION

We would like to first discuss the data as a function of text type. In our general hypotheses, we predicted an influence of text anchoring and type of text planning on anaphoric density and on the profile of categories of anaphora characterizing each text type.

From the point of view of text anchoring, the personal accounts most implicated in the actual material situation exhibit, in fact, a very low anaphoric density. The obstinate use of exophoric "JE" ("I") takes the place of anaphoric forms. In contrast, in the argumentative texts, which are intermediate between implicated personal accounts and autonomous explanations and stories, text organization is entirely governed by the enunciator, and new referents are constantly introduced; hence, anaphoric density is intermediate as well.

The characterization of the text types by the different categories of anaphora suggests the following remarks. Although it is accurate to say that pronominal anaphora taken as a category dominates clearly in the argumentative texts, one of the most recurrent features in the argumentative texts is nevertheless repetitions. There are however no demonstrative pronouns or nominalizations. In the explanations, the high proportion of personal pronouns was predictable, as was the number of relative pronouns. On the other hand, the high proportion of demonstrative pronouns is surprising. It can be attributed, in particular, to the 10- and 12-year-olds' frequent recourse to the expression "celui qui" ("the one who") to designate a person throughout the text. The relatively high proportion of nominalizations as compared to the other texts can be explained in a similar fashion: Instead of using the expression "celui qui cherche" ("the one who seeks"), the subjects create terms such as "le chercheur" ("the seeker") which are reemployed to establish referential links across spans of text. In the personal accounts, the high proportion of first-person possessives is the direct consequence of the type of anchoring present in this text type. There is also a high proportion of relative pronouns which provides a means of characterizing new elements introduced locally in the text ("the park that is behind my house," "my little brother who is three," "I was at my cousin's who lives at Chêne"). Only stories contain a low proportion of lexical substitutions but, in contrast, exhibit a relatively high

Anaphora	
al	Stories
ts	38.7
	1.4
	10.9
	0.1
	5.3
	1.1
	15.8
	18.0
	1.7
	5.4
	0.8
	0.9
0	100.0

proportion of repetitions. This phenomenon can be explained first of all by frequent recourse to proper nouns in particular by younger subjects and, second, by the fact that the subjects introduced new elements with a definite article (followed by a prepositional defining phrase: "The King of Denmark" or defined by the context: "a farm . . . the farmer's wife").

These findings are thus in line with our predictions: Text anchoring and type of text planning influence heavily the profile of anaphora. More generally, the following characterizations can be made for each text type:

1. Argumentative Texts—characterized mainly by repetitions as second mentions for an identical referent, which is necessarily introduced as a known element because the debate has defined them in the domain of the intertext: "pocket money," but also "parents," "students," "children."
2. Explanations—involving the necessity to specify, via various anaphoric devices, the new elements, such as "the person who," "the one who seeks," "the seeker," and to use personal pronouns as second mentions for the principal protagonists in a partially sequential structure.
3. Personal Accounts—with local anaphoric devices (in particular, relative pronouns), and with abundant use of first-person possessives characteristic of texts centered around the "I," cutting across temporal space and forming the only connecting link throughout the text.
4. Stories—defined by the hero and other characters referred to by personal pronouns and repetitions when introduced by proper nouns, or supposedly known figures and definitivizations when an imaginary world is created *ex nihilo*.

The developmental data provide further insights into the distribution of anaphoric devices per category across the four texts. In the argumentative texts, there is an increase of anaphoric density as a function of text length. Personal pronouns, but also, to a lesser extent, demonstrative and indefinite pronouns, and nominalizations are responsible for this fact. In the explanations, the increase of anaphoric density is exclusively due to the nominal anaphora. There is a sharp decrease in the proportion of personal pronouns, which are replaced by lexical substitutions, and nominalizations. It should also be pointed out that expressions such as "celui qui" ("the one who") which form the major part of the demonstrative pronoun category give way to constructions such as "celui-ci," "celle-ci" ("this/that one") or demonstrative "c'." Thus, despite a change in category, the proportion remains stable. In the personal accounts, the relative pronouns are more frequently used by older pupils to introduce new elements; the length of text calls for the use of more sophisticated means of cohesion like demonstratives and lexical substitutions. Finally, in the stories, the general tendency of decreasing anaphoric density is more marked in the nominal categories

(nominal anaphora) and among them, even if not statistically significant in our sample, in repetitions.

From the point of view of mastery of the different text types analyzed, the following general considerations can be made.

At age 14, the argumentative texts have still to be mastered. They progressively increase in length and thus require more cohesive devices in the argumentative sections. This explains the concomitant increase in text length and anaphoric density. It seems reasonable to assume that with age (or after special training at this age) the type of devices characteristic of argumentation will change even more, in particular in regard to the proportion of demonstrative pronouns and nominalizations.

The explanations are still being mastered in the age range we have studied. From essentially sequential, chronological texts (script-like), they develop into true explanatory texts with greater precision of second mentions of referents and greater flexibility in regard to changes of characters introduced in the stream of discourse (nominalizations, lexical substitutions). It is highly likely that this modification in anaphoric devices is due to changes in text superstructure (confirmed by the data on punctuation and connectors; Schneuwly, 1988).

The personal accounts exhibit little change. This is not due to a lack of evolution: On the contrary, the texts become longer and the sections more cohesive at a local level (relative pronouns, lexical substitutions). But it is likely that the constraints inherent to this type of text, and its stereotyped nature (script), prevent functions different from those prevalent at a very early age from emerging.

In stories, evolution is even less important than in personal accounts. The decrease of repetitions is due to the fact that children progressively introduce new elements by other means than proper names. However de Weck (1991) showed that changes occur inside the categories we have defined in the present study (change of function of determiners in definitivizations and lexical substitutions). The data confirm this point: Development is, as always, unequal and covers a long period. Each type of text has its own inner logic. It would be erroneous to put forward a hypothesis of a unitary development of anaphoric procedures. Our data thus brings new evidence in favor of the idea that intralinguistic units of reference are acquired relatively late.

To recapitulate, two facts emerge from the data we have presented above: (a) Each type of text, defined by its specific configuration of context values and by the choice of anchoring and planning type, can be characterized by a specific anaphoric profile, and (b) the acquisition of anaphora takes place in a specific manner for each type of text, that is, mastery is part of a more general acquisition of the particularities of the functioning of each type of text.

Numerous issues remain unanswered. How does anaphoric binding develop in argumentative texts? Which acquisitions take place in stories by children under

the age of 10? What is the specific effect of text planning on anaphora? The answers to these questions should lead to a better understanding of the use of anaphoric units as traces of the *cohesion operations* underlying them. The present study is only a first step towards this ambitious aim.

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