A LONGITUDINAL ANALYSIS OF YOUNG CHILDREN'S USE OF COHESION IN ORAL NARRATIVES

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BY

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Abstract

The early development of nine cohesive devices (pronominal reference, demonstrative reference, comparative reference, clausal ellipsis, verbal ellipsis, nominal ellipsis, substitution, conjunction and lexical cohesion) was examined in an 18 month longitudinal study of narratives in 10 children from approximately age 2 to 3 1/2 years. The types of noun errors made in their narratives were also explored. The study shows that the total number of cohesive ties used increased with both increasing age and mean length of utterance (MLU). The children showed an increase in the use of pronominal reference and conjunctions as they matured and a decrease in verbal and clausal ellipsis. Furthermore, specific cohesive devices were acquired at different times with substitution the last to appear, preceded by comparative reference and nominal ellipsis at a lower MLU. The remaining six cohesive devices were present in the earliest speech samples elicited. The total number of noun and pronoun errors declined with increasing age and MLU. Specifically, inferable and non-inferable omissions declined over time. However, it was found that when children introduced new nouns and pronouns into their narratives, approximately one out of five remained ambiguous throughout the course of the study. In general, the children's stories become more

comprehensible as the children mature because their use of cohesion improves and error production declines. However, they still have difficulty in properly introducing new nouns into their narratives at 3 1/2 years of age.

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The ability to narrate is a skill which is valued both academically and socially. From the earliest grades children are often called upon to construct narratives in school. This is a skill that is especially important in developing their writing and reading. In addition, people of all ages use narratives to talk about past experiences when involved in conversation. It has been suggested that the ability to narrate is a basic human trait (Gee, 1985). Perhaps as a result of their importance in society narratives have been the subject of numerous research projects. There are several different analyses that have been proposed in the literature in which a number of narrative characteristics have been identified. These characteristics include the following: (1) presence of plot structure, which refers to the way the plot is developed throughout the narrative; (2) a particular syntax that influences the structure of the narrative; (3) specific production schemas, i.e., the processes used in planning and producing a narrative; (4) orientation to the listener, which consists of providing the listener with the information needed in order for him/her to understand the narrative, such as who the participants were and where the events took place; (5) coherent organization, which involves relating utterances to the overall content or theme of the narrative so that a unified topic is presented

and (6) the presence of cohesion, which consists of using cohesive ties such as anaphoric pronouns (using 'he' to refer to a previously mentioned person), to semantically relate elements within the text. Each of these characteristics is important because all contribute to the success of the story. The focus of the present research is the development of cohesive relationships in children's narratives. As well, other approaches to narrative analysis presented above will be briefly reviewed.

Plot Structure Analysis

The only characteristic of narratives to have received much attention is plot structure. It has been the focus of a number of investigations and this has led to the development of several different models of what constitutes the ideal narrative structure. Four of the approaches that have been applied to the plot structure of children's narratives are outlined below.

Applebee (1978) based his analysis on concept development. Two mechanisms, chaining and centering, are emphasized. With chaining, elements are linked one to another based on similarity. Centering involves linking each event to one special aspect which is held constant throughout the story. These mechanisms underlie the six stages that he found children to progress through when telling stories between the ages of 2 and 5. The stages consist of heaps, sequences, primitive narratives,

unfocused chains, focused chains, and true narratives in order of increasing sophistication.

Heaps refer to virtually unrelated sentences about characters and events that appear to be the product of immediate perception by the child. The child simply talks about whatever comes to mind, as in the following example:

> Dog fell in the fence. I got a big fence.
> Daddy broke my fence. I hurt my knee.
> (2 year old boy, Pitcher & Prelinger, 1963, p. 31)

The next stage, sequences, is characterised by narratives in which events are linked together because they share something with a common centre. The events display no causal relationship with each other nor the centre of the story. A superficial sequence in time, such as what one did on a particular day, is a typical production. The following example illustrates this:

> Little boy played. He cried. He's alright.
> He went home. He went to bed. (2 year old
> boy, Pitcher & Prelinger, 1963, p. 30)

Primitive narratives still involve a concrete core but now display links to this centre based on causality as well as similarity, as seen in the following example:

> A little girl drawed her mommy. Then the
> mommy got mad at her and she cried. She lost
> her mommy's cookies. She got mad at her again.
> And she drawed her mommy again. (3 year old girl,

Pitcher & Prelinger, 1963, p. 62)

In the next stage, unfocused chains, the incidents of the narrative lead directly from one to the other but the beginning is unrelated to the end. There is no longer a centre or focus to the story but it is the first use of chaining as a structural device in narration. This is shown in the following example:

> Once there was a fish named flower. She went down in the water and said, "Oh my gosh where's my lover?" She went down in the cellar where my house is. She saw a big father fish which had a sword in his nose. She ran away from the house and hid in another house. (4 year old girl, Pitcher & Prelinger, 1963, p.101)

Focused chains, on the other hand, involve chaining and centering within the same narrative. The centre is usually the main character who engages in a series of adventures linked together as in the unfocused chains, as in the following example:

> Davey Crockett he was walking in the woods. Then he swimmed in the water to get to the other side. Then there was a boat that picked him up. Then he got to the other side. He went into the woods. He was in the place where Indians made. The Indians came and got him. Then pretty soon he got loose. (4 year

old boy, Pitcher & Prelinger, 1963, p. 83)

True narratives allow for an abstract or concrete centre to be developed over the course of the story telling. Each incident develops out of the previous one and at the same time elaborates on the theme of the narrative, as in the following example:

> Once upon a time there was a little pussy cat that wanted to be a Christmas present. He went to Mr. Rabbit's house and said, "I want to be a Christmas present." And he said, "Lets go ask Mr. Squirrel." And then he said, "We shall go to the bear's house: They probably will know." The bear said, "Today's not Christmas-tomorrow will be Christmas." In a minute Santa Claus came dashing through the sky and the kitty called up, "I want to be a Christmas present." And then Santa said, "I think I know where to put you." So the next morning he wasn't in Santa's sleigh any more, he was in a little girl's house. (5 year old boy, Pitcher & Prelinger, 1963, p.135)

This last narrative structure is used most often by five year olds. Applebee contends that children move through these stages as they grow older but that some stages do overlap.

In contrast to Applebee, the following analyses take a closer look at the cognitive aspects of narratives by concentrating on the goals and plans of the main character. Dyadic structure, which views stories as consisting of conflict and resolution pairs (Botvin & Sutton-Smith, 1977; Leondar, 1977; Sutton-Smith, Botvin, & Mahony, 1976), and episodic structure or story grammar (Glen, 1978; Johnson, 1985; Mandler, 1978; Mandler & Johnson, 1977; Schank & Abelson, 1977; Thorndyke, 1977) are two very similar methods of analysis that were derived from the work of Propp (1968). They view narratives as composed of episodes involving a protagonist and his/her actions. The development of stories progresses through several levels. The ideal narrative structure (episodic structure is described here but dyadic structure is very similar) is composed of hierarchically organized components. Initially a setting is provided where the main character and context are introduced. This is followed by one or more episodes where events lead to an emotional or cognitive reaction from the protagonist. He/she formulates a goal or plan for dealing with the events, followed by a series of actions by the main character to accomplish this goal. There is then a node which indicates whether the attempt was successful, the outcome. This is followed by an ending which conveys the protagonist's reaction or that of other characters. Kemper (1984) and Leondar (1977) found that children appear

to gradually master this structure with increasing age, with ideal narratives appearing at about age 10. However, Peterson and McCabe (1983) report that ideal structure occurs at earlier ages.

A third approach for analyzing plot structure is high point analysis (Labov, 1972; Labov & Waletzky, 1967) which takes into account the emotional aspect of story-telling and emphasizes the importance of having a point or reason for producing a narrative. The elements of a fully formed narrative under this system are organized around one or more of these stressed points or emotional high points. Initially an abstract consisting of one or two clauses summarizing the story is provided. This is followed by orientation where the narrator identifies the time, place, persons and their activities or situation in the story. Such information is often placed at the beginning of the narrative but can also be placed strategically throughout. Much of the narrative is comprised of a series of events, termed the complication, consisting of information components which lead up to the high point of the story. The most important feature of the narrative under this system is the evaluation section. The point of the story is conveyed during this period. Labov (1972) contends that a narrative becomes meaningless and difficult to understand when this element is missing. The evaluation is followed by a resolution of the high point action. Finally the

listener is returned to the present time or signalled that the narrative is over by the use of a coda such as, "And that was that." Not all narratives end with codas, as some end with the resolution. Research has shown that the narratives of young children conform more to this ideal structure with increasing age (Kemper, 1984; Peterson & McCabe, 1983).

A fourth model, dependency analysis, was developed by Deese (1984) to examine discourse in general and was used by Peterson and McCabe (1983) to analyze children's narratives. This approach examines narratives primarily with respect to their syntactic form rather than focusing on content. It examines how coherent a given discourse is. Dependency analysis uses the syntactic proposition as its unit of analysis and identifies the relations among propositions which specify the way the narrative is told. It views discourse as a hierarchy of propositions with the most dominant proposition (the one which organizes the discourse) at the first level and subordinate propositions below it. As in the other analyses described above, there is an ideal structure or hierarchy in this system. The more ideal the hierarchy the more intelligible the discourse is. In an ideal hierarchy a given statement or proposition is not dependent on more than one statement for meaning at one time since this can lead to confusion. For example, if a person said, "I have a coat. My mother has

some mittens. They are red.", it is not clear if the coat and the mittens are red or if just the mittens are. As well, repetition (talking about the same thing at different times) is absent, since it endangers the organization of the narrative. Clear discourse is also fully explicit whereas poor narratives require too many inferences from their listeners. Statements are ordered logically in an ideal hierarchy. A well constructed discourse also shows a lot of elaboration of propositions throughout its development. Peterson and McCabe (1983) found that children's narratives become more intelligible with age and tend toward ideal hierarchy.

Each of these analyses which centre on plot structure looks at narratives from a different perspective. In general, the approach stressed depends on what aspect the researcher is interested in exploring. Applebee's system takes a conceptual approach and addresses the relationship or coherence between events, but is limited as it does not consider the narratives of children over five years of age. Kemper (1984) found the system very useful for discriminating among the stories told by children between the ages of 2 and 5. However, she demonstrated that the dyadic and episodic approaches, which concentrate more on the cognitive aspects of story-telling emphasizing the goals and plans of the main character, are more effective for capturing the structure of older children's narratives.

Weaver and Dickinson (1982), on the other hand, consider story grammar to have limited application as it is insensitive to individual and developmental differences. Mandler (1982) also concedes that the theory could use further work in this area. The advantage of high point analysis is that it looks at the emotional aspects of narratives and points out that the narrator must have a purpose for telling his/her tale. This approach is also useful for studying the narratives of children over a large age range. The strength of dependency analysis is that it takes the closest look at how coherent a narrative is and does so on a syntactic rather than on a content level. It is also useful for studying a wider age span in children. The four systems described above each look at different aspects of the narrative and are therefore complementary in achieving a complete picture of narrative structure.

Narrative Syntax

It has been argued that narratives, in addition to having a characteristic structure, also have special syntax which is very important structurally (Labov, 1972; Labov & Waletzky, 1967; Longacre, 1983). Narratives are customarily told in the past tense and narrative clauses ordered in the temporal sequence in which the events occurred. Moreover, narratives contrast with ordinary conversation in that they have a much simpler syntax. The basic narrative syntactic pattern (Labov, 1972) is as

follows: (1) conjunction ('and' or 'but', for example), (2) simple subject ('my father' for example), (3) the underlying auxiliary is a simple past tense marker incorporated into the verb (such as 'was' or 'had'), (4) a past tense verb (hit or grabbed for example), (5) direct and indirect objects (such as 'me' and 'ball'), (6) instrumental adverbials (such as 'all'), (7) locative adverbials ('on the sidewalk' or 'down', for example) and (8) temporal adverbials, (such as 'ever since then'). This simple syntax, as well as the use of chronological sequence, is only characteristic of event-line utterances (backbone material or main points) of the narrative. Departures from these conventions are introduced in order to present supportive, background, and explanatory material of the narrative (off-line sentences). The verb 'to be' is used when presenting background and descriptive material, for example. Thus, the presence of simple narrative syntax and chronological ordering indicates that event-line material is being discussed in contrast to off-line material which has a more complex syntax.

Production Schemas

Rather than examining the structure of narratives or plot structures, some researchers have looked at the process of planning and producing a non-fictitious story in conversation. This planning process has been referred to as a production schema (Gulich & Quasthoff, 1985; Quasthoff

& Nikolaus, 1982). It involves several steps which are outlined below. Initially the narrator checks the current situation by assessing the listener's values and expectations in order to take them into consideration when constructing the intended narrative. The next step involves retrieving the mental representation of the event that is available at the time of narration. The intended communicative and interactive goals of the narrative are planned and the present situation is assessed to see if the plan is appropriate. A humorous story would be inappropriate at a funeral, for example. Then one can attempt to change the situation to an appropriate one if it does not currently exist and it is possible to do so. Alternatively, the narrator could decide not to tell the story. If the narrative is to be told, all the information about the episode is retrieved from memory and desired parts are selected and verbalized. Listener reaction is assessed and a new situation is created leading to the activation of the planning cycle once again. This process occurs for each episode of the narrative.

This analysis was developed on the basis of adult data and as a result it is not clear if it can be applied to the production of children's conversational narratives. It is doubtful though that children use such an elaborate process until their narrative skills are well developed.

Orientation

Brown (1973) has stressed that the most important task of language-learning for children is to become independent of the here-and-now. Rather than merely talking about the objects and events that children currently see, they must be able to discuss things that are removed in time and space. In order to accomplish this and still be understood, children must create a verbal context for what they are saying. In other words, children must specify who they are talking about, what objects were present, when and where the events took place, and how and why the events happened. It is no longer adequate to simply say 'He dropp i it' but instead 'he' and 'it' must be identified by the child. That is, the child must provide orientation.

Orientation is an important feature of the well formed narrative. In order for a narrative to be successful, the speaker must provide the listener with the proper orientative information, consisting of who the participants are, where the events occurred, what props were involved, when the events took place, and how and why the events occurred. Labov and Waletzky (1967) noted that adults typically place such clauses at the beginning of their narratives, which orients the listener with respect to person, place, time and behavioral situation. However, they found that orientation sections were usually lacking from the narratives of young children. However, a study by

Perner and Leekam (1986) indicates that children as young as three can adjust their verbal responses to the listener's knowledge. Although they dealt with description of objects rather than production of narratives, earlier research by Menig-Peterson (1975) confirms that children do the same when telling stories about their past experiences. Menig-Peterson and McCabe (1978) found that children from the ages of 3 1/2 to 9 1/2 provide their listener with orientative comments when narrating about personal experiences. This was not only the case for all ages studied but the study also showed that the proportion of the narrative that was devoted to orientation remained constant across age. Although no developmental change was observed for proportion of orientative comments, they did find that older children were concentrating their orientation comments at the beginning of the story more than were younger children. Orientation is most useful to the listener in this position since it is important information for interpreting the rest of the narrative. Older children also provided a larger variety of orientation categories and therefore had a more detailed and embedded context for their narratives. All age groups provided sufficient orientation about the props used and how the events occurred but were less explicit about who, where and why and seldom told when the events occurred. Information concerning the use of who, what, where and why

did become more complete with age.

In conclusion, the research to date suggests that children as young as three are capable of adjusting their verbal responses to their listener's knowledge. This includes providing at least some orientation when relating a personal narrative, but the orientation provided by younger children is by no means adequate for a listener to fully understand what the child is talking about. This ability becomes more sophisticated with age in a number of ways as outlined above. No information is currently available on the presence or absence of orientation in the narratives of children under three.

Coherence

Coherence is a method of narrative analysis that emphasizes content relationships in discourse. In order for discourse to be coherent it must possess a set of coherent relations which link the utterances (Hobbs, 1979, 1983). Hobbs proposes four such relations. These include strong temporal relations between events, evaluation by the participants to determine if intended goals are reached, linkage between the message and what the listener can be expected to already know, and whether the current segment of discourse expands on the previous segment.

Agar and Hobbs (1982) have expanded the approach to coherence outlined above to include three kinds of coherence. Global coherence, in which the speaker is

assumed to have global goals when talking, refers to the speaker's attempt to relate individual utterances to this overall plan. Local coherence is when the speaker relates his present utterance to what has previously been said (this is based on the coherent relations described above by Hobbs, 1979). Thus, when telling a narrative, in order to maintain global coherence the speaker decides what to say next to serve the overall goals of telling the story. In contrast, with local coherence the speaker chooses what to say next so that it is related to the utterance that has just been said. Themal coherence refers to recurrent themes throughout the discourse. Different utterances throughout the narrative may convey a morality theme, for example. Downing (1980) describes three similar factors which influence lexical choice when producing a coherent narrative. She proposes that a narrator decides what to say to achieve the goals of the narrative, that the choice of words is conditioned by the words immediately preceding it and that narratives have thematic unity. The definitions of a coherent narrative given by the above authors are based entirely on work with adults.

Cohesion

Another method of analyzing narratives, determining how cohesive they are, originated from adult data but has been applied to children's discourse. The terms coherence and

cohesion are often used interchangeably throughout the literature. Although they are similar in that they are both concerned with relations in discourse, they actually emphasize different aspects of text. As mentioned above, coherence concentrates on content relationships, describing how utterances are related to the overall plan of the narrative. It is a cognitive approach to discourse relations, in contrast to cohesion which is more linguistic. Cohesion focuses on the semantic relations within discourse and takes a more detailed look at text. The following examples illustrate the different emphasis of the terms.

(1) I walked to school yesterday. It was so cold the ground was frozen.

(2) John went to visit his sick wife every day. He was at the bank for a long time.

The sentences in example 1 are coherent but they contain no cohesive ties. However, in example 2 the utterances are not coherent but the cohesive pronoun 'he' is present. An analysis of cohesion is the focus of the present research and is described in more detail below.

Cohesion refers to relations of meaning that exist within text and occurs when the interpretation of some element in the discourse is dependent on that of another (Halliday & Hasan, 1976). A single instance of cohesion, where there is one occurrence of a pair of cohesively

related items, is called a tie. Five major types of ties (with subcategories for two of them) have been identified by Halliday and Hasan (1976) and are described below.

(a) Reference includes those ties which rely on reference to something else for their interpretation; they are not resolved semantically on their own. There are three types of reference: (1) Personal pronouns can be used cohesively in the following way: "My grandma went to the hospital. She was very sick." Here the anaphoric pronoun 'She' refers to 'grandma.' (2) An example of a demonstrative reference is as follows: " Yesterday I went to school. I didn't really want to go there." The reference demonstrative 'there' refers to 'school'. (3) Comparatives are used to provide comparison. For example, if one said "My cat died last week. Yesterday daddy got me another one." 'another' is used as a reference comparative to compare the two cats.

(b) Substitution is a tie which replaces one item with another and which has the same structural function in language as the category it replaces. An example of this cohesive device includes 'one', which can be used in the following way: "Yes, I've been to a birthday party. I had one." Here 'one' substitutes for 'birthday party'.

(c) Ellipsis contributes to cohesion by leaving something unsaid which "goes without saying" but is understood and presupposed by the listener. For example if

someone said "When did you go to the beach?", an acceptable reply might be, "Yesterday.", rather than "I went to the beach yesterday". It is not necessary to repeat the question to be understood. There are three types of ellipsis: (1) Nominal (ellipsis of a nominal phrase). For example in the following: "It was a motor boat. I think there were two."; the noun 'motor boat' is ellipsed in the second sentence. (2) Verbal (ellipsis of part of the verbal phrase). For example in the following: "She didn't cry. No she didn't.", the main verb 'cry' is ellipsed in the second sentence. (3) Clausal (ellipsis of a clause). For example in the following a person asks, "Have you ever been to a party?" and the listener replies, " Bill's party." the clause 'I've been to' is ellipsed.

(d) Conjunctions are cohesive devices which tie linguistic elements that occur in succession. Examples of conjunctions include 'and', 'but', and 'then'. An example would be: "We went to the store and then we went home."

(e) The final cohesive tie, lexical cohesion, concerns the effect achieved due to selection of vocabulary. It includes using synonyms (such as 'car' and 'automobile'), repeating the same words throughout the discourse, using words that contrast (such as 'wet' and 'dry') and using words that commonly occur together (such as 'doctor' and 'hospital'). An example would be: "I went to the hospital. I had to see a doctor." where 'doctor' is

lexically related to 'hospital'.

To summarize, Halliday and Hasan (1976) specified 5 categories of cohesive ties, with two of them (reference and ellipsis) containing subcategories. Since the different subcategories may well have different developmental histories and ages of acquisition, they will be considered separately here. Thus, a total of nine cohesive ties will be considered.

Much of the research on cohesion has been done with adults (Halliday & Hasan, 1976; Longacre, 1983; Marslen-Wilson, Levy, & Tyler, 1982; Prince, 1982; Rochester & Martin, 1977; Werth, 1984). This work consists mainly of describing and defining the types of cohesive ties used in written and oral discourse (Halliday & Hasan, 1976; Prince, 1982; Werth, 1984), outlining the retrieval processes made by the speaker in choosing certain ties (Marslen-Wilson, Levy, & Tyler, 1982; Rochester & Martin, 1977) or specifying cultural differences in the use of cohesion (Longacre, 1983).

A number of investigators have studied the use of cohesive relations in children's narratives. Much of the investigative work has concentrated on school aged children. Johnson and Johnson (1985) studied children's comprehension of cohesive ties in written narratives taken from school readers. Cohesive devices were identified by the experimenter and the subjects were asked 'wh'-type

questions (such as, Who is 'he'?) about the ties after they read the story. They found that sixth graders had better comprehension than third graders but that neither age group displayed complete understanding. McCutchen and Perfetti (1982) found similar results for the written productions of second to eighth grade students with respect to all the cohesive ties described above. Children at all grade levels were able to use each cohesive device but younger students made greater use of pronominal and demonstrative reference than older ones who tended to rely less on one particular tie. The students in the higher grades seemed to have a better understanding of the cohesive devices and therefore used them all with more confidence. It appears that school age children do have some comprehension of cohesive ties in written stories but that this understanding is not yet fully developed by the eighth grade.

It appears that this comprehension is also reflected in children's use of cohesion when producing oral narratives, as well. Research has shown that school aged children do in fact use the cohesive ties of pronominal reference and conjunction appropriately when asked to tell a story from a series of pictures (Stenning & Michell, 1985) or retell the plot of a movie (Klecab-Aker & Lopez, 1985). It was also found in these studies that this ability became more sophisticated between the ages of 5 and 10 (inappropriate

use of pronominal references decreased and the variety of conjunctions used increased), with the development of referential skill progressing faster than that for conjunctions. Pellegrini (1984) also found that, in addition to using pronominal, demonstrative and comparative reference appropriately, school children use clausal, verbal and nominal ellipsis when retelling a narrative.

It seems that school age children do use cohesive ties when telling narratives and that this use becomes more sophisticated with age. Younger children rely more on the use of pronominal and demonstrative reference than older school children. Children in the higher grades appear to have a better understanding of the cohesive devices so use a greater variety. An important question is whether younger children also display use of cohesion in narratives.

Investigations with young children not yet in school have been mainly restricted to the study of conjunctions and pronominal and demonstrative reference, omitting the other cohesive devices used in adult discourse. These studies have shown that young children are capable of using these three ties. McTear (1984) contends that by age five children are able to use pronouns to link utterances together but that very young children have difficulty establishing discourse referents in conversation. Pellegrini (1982) also found that 4 and 5 year olds use

pronominal and demonstrative reference in discourse as a cohesive device. Dore (1985) found that even as early as age 3, in addition to using pronominal reference effectively in conversations, children also display lexical cohesion. There is evidence to suggest then that 3, 4 and 5 year olds are capable of using at least three and perhaps four of the nine cohesive devices discussed above. However, these investigators were not dealing with narratives per se, the interest of the present research, but with conversation in general. It seems reasonable to assume though that these devices are also used in narration since general conversation often consists in part of narratives about past experiences. One study which deals specifically with the telling of stories is consistent with this assumption. Pratt and MacKenzie-Keating (1985) conclude that four and five year olds make few pronominal and demonstrative referential errors and that the incidence decreases with age when retelling a narrative that they have previously heard. Other research in which the children told stories based on a series of pictures (Gopnik, 1986) found that children 4 to 6 years old used both pronominal reference and conjunctions and that this use became more sophisticated with age (appropriate use of reference increased and the number of conjunctions employed rose).

It appears that preschool children are capable of using

pronominal and demonstrative reference, conjunctions and lexical cohesion in narratives. Once again this use seems to become more sophisticated with increasing age. Appropriate use of reference and the variety of conjunctions employed increases.

Work done with children under three years of age lends further support to the assumption that young children have the ability to use cohesive ties when telling stories. This research has shown that children, even as young as two, are capable of using pronominal and demonstrative references (Bennett-Kastor, 1983) and conjunctions (Bennett-Kastor, 1986) in their invented oral narratives. It has also been shown that the ability to use reference improves with age and that the variety of conjunctions used increases, with "and" being the most common conjunction at all the ages studied (age 2 to 5). Hedberg and Stoel - Gammon (1983) studied the use of all nine cohesive ties for children age 2 to 5. They found that the most commonly employed links for all subjects were pronominal and demonstrative reference and lexical cohesion. Conjunctions were also common overall. However, ellipsis and substitution were infrequent. They also found little change with age in the total ties used as a percentage of the total words in the narrative. There was, however, a decrease in unsuccessful attempts at cohesion with increasing age. In contrast to the research reported

above, another study by Hedberg (1983) revealed that there was a significant positive correlation between age and total cohesive links as a percentage of total words in the children's narratives. So it is not clear whether children use more cohesive ties in their narrative as they become older. Also, even though the latter two studies examined all nine links, mention was not made of how old the children were when they were using specific ties. Results were only given for the age group (2 to 5) as a whole. Further research is needed to determine what cohesive links are used before age three and if the utilization of total links does change with age.

All of the above studies with children under 4 years of age involved cross-sectional investigations of children and therefore failed to address the developmental acquisition of each of the cohesive ties. It is not known at what age and in which order each cohesive device is acquired. In order to systematically examine this issue it is necessary to sample children's narrative skills at regular longitudinal intervals from the point of initial ability to talk about past events. This will allow one to track the emergence and development of individual cohesive ties in children's narratives.

The use of cohesive ties by the narrator facilitates the listener's comprehension of the story. However, in order to present a successful narrative, the speaker must

also clearly identify the characters, places and things that are talked about. Failure to properly identify these nouns and pronouns causes confusion for the listener and makes it difficult to understand the story. Research has shown that young children often produce ambiguous referents when speaking (Flavell, 1985). For example, a child may say in the opening sentence of a narrative, "He went with Mommy to the show.", and fail to inform the listener who 'he' is. Halliday and Hasan's system is useful for identifying the cohesive ties that young children are employing in their narratives. However, it does not capture the failure by children to clearly specify the nouns and pronouns they are referring to. Halliday and Hasan's system is based on adult narratives, where such errors are not as common (and if present, the adult listener is usually quick to ask for clarification, which may not be the case where children are involved). It thus fails to provide a means for detecting this ambiguity. Therefore, if only Halliday and Hasan's system were used to score cohesion in young children's narratives they might appear more competent than they actually are. For this reason another scoring procedure is needed to score the nouns and pronouns in the narratives to account for young children's use of ambiguous reference. Such a system was developed for the data analyzed here and is described in the methods section.

Thesis Overview

The focus of the present study is children's narratives about past personal experiences as told by the child. Research based on the development of a few children has placed the age at which children begin to talk about past experiences at approximately 26 months of age (Eisenberg, 1985; Sachs, 1979; Sachs, 1984). For this reason the children recruited for this study were as close to their second birthday as possible in order to capture their earliest narrative abilities. The children were tested at one month intervals over a period of 18 months in order to examine the development of narrative skills over time.

Of interest is the ability of such young children to construct cohesive narratives. As mentioned above, most of the research on cohesion has focused on adults or school aged children. Research on children under three years of age has either been restricted to the observation of the use of conjunctions and reference or has only reported results for all the children in a certain age range (2 to 5), and failed to mention what ties were used at specific ages. Thus, this study focuses on the construction of cohesive narratives by children under three years of age. Halliday and Hasan's (1976) method of scoring was used to analyze the data elicited. Utilization of all nine cohesive ties discussed above was investigated.

The hypothesis proposed is that children are able to

provide some degree of cohesion in their early narratives and that this skill will become more sophisticated (both in terms of number of ties and variety) with increasing lexical complexity of the child's speech (determined by measuring mean length of utterance from each session).

Most importantly this study attempts to map the developmental order of acquisition of the ties that provide proper cohesion in young children's narratives. The purpose is to determine if there is a consistent developmental progression in terms of which cohesive ties are acquired at different ages and levels of lexical complexity. That is, do children consistently learn to use some skills before others and what is the sequence of acquisition?

Another goal is to determine what types of noun errors children make when producing narratives. Of interest is whether their nouns are understandable or not. In addition, an attempt was made to follow any changes that might occur in error frequency with increasing age and mean length of utterance (MLU). It is predicted that the number of errors will decrease as the subject's age and MLU increase.

METHOD

Subjects: The subjects were 10 children (5 boys and 5 girls). Two of the children were 25 months old at the

beginning of the study, five were 26 months old and three were 27 months old. All subjects were from middle class, two - parent families living in St. John's, Newfoundland. They were recruited through daycare centers and preschool library groups. Table 1 describes their MLU level and age at the beginning of the study.

Procedure: Initially rapport was established with the children individually by having the experimenter visit them in their homes until they appeared comfortable with the adult (played and talked freely with the experimenter for at least a period of an hour and a half). The children were then visited once a month in their home for a period of eighteen months. During these visits the experimenter gave the children verbal prompts intended to elicit narratives about novel and routine past experiences (for example, "Have you ever been to the doctor?"), some of which were obtained by having the parents indicate beforehand activities in which the child had previously engaged. Other prompts were the product of the immediate conversation. The prompts were embedded in normal conversation so as not to appear as interrogations. Narratives produced by the child, either in response to prompts or spontaneously volunteered, were maintained by nonspecific prompts such as 'uh huh', 'and' or repeating verbatim a portion of the child's last utterance. This technique has been used effectively by other researchers

(Peterson & McCabe, 1983). Each session was one hour in length and was tape recorded.

The taped conversations were transcribed and scoring of all of the transcripts was done by the experimenter. The transcripts were randomly ordered for scoring. To establish reliability 20 percent (randomly selected) were scored by another individual. The narratives were scored for use of cohesion and ambiguity of nouns and pronouns. In addition, mean length of utterance was determined for each session. For this, and all other calculations involving utterances, an utterance was defined as an independent clause. MLU was calculated by dividing the child's language into utterances and then dividing those utterances into morphemes. The number of morphemes in 100 fully transcribed utterances was counted and then divided by 100.

Cohesive Links

Cohesion was scored based on the procedure developed by Halliday and Hasan (1976). All nine cohesive devices, consisting of reference (with differentiation made between pronominal, demonstrative and comparative), substitution, ellipsis (discriminating between nominal, clausal and verbal), conjunction and lexical cohesion were scored. Although in the Halliday and Hasan system the pronoun 'I' was only scored as such when the speaker was quoting another person, it was scored here every time it occurred.

The reason for this is that the topic of children's narratives is usually themselves and they use 'I' as a cohesive device to tie the narrative together. Also Halliday and Hasan describe the use of 'yes' in response to a question as an instance of ellipsis. However, such instances were scored as 'agreements' in the present study. This was done because prompting by the experimenter generated many 'yes' responses from the subjects. If these instances were all scored as ellipsis the incidence of this tie in the children's narratives would be inflated.

The nine cohesive ties were identified if present in the narrative and scored as exophoric, endophoric, cataphoric or other. A cohesive device was termed exophoric if it referred to the environment or situation rather than something previously mentioned in the text. For example, in the sentence "I painted that" where 'that' refers to an object in the environment or situation of the speaker and listener, 'that' would be scored as exophoric. Exophoric items are not cohesive. However, endophoric and cataphoric elements are. Something was scored endophoric if identifying its meaning required looking to the prior text of the narrative rather than the situation. In the comment "He went to the store," if 'he' refers to a person previously mentioned in the text of the narrative, it is endophoric. Cataphora occurs when the element that is presupposed follows the identified cohesive tie. For

example, in the statements "This is the best medicine. Walk two miles a day", 'this' is scored as cataphoric since it refers to the following sentence. The category 'other' was used to score words which were not exophoric, endophoric or cataphoric. These were found to be ambiguous uses of referents. For example, in "At school they hit me" if the child has not previously identified who 'they' are, this is an ambiguous referent and would be scored as 'other.'

In addition, three categories for utterances were developed that reflected the constraints of ongoing dyadic interaction. They were 'unrelated to story', 'did not hear' and 'self repetition'. Clauses were scored as 'unrelated to story' if they were an interruption that was not part of the story, such as if the child stopped to talk about what he/she was doing and then resumed the narrative a few minutes later. 'Did not hear' was used to score lines which were repeated by the narrator because the listener had not heard or understood what the narrator had said. Self repetition was scored when the children repeated themselves, providing no new information, without being prompted by the adult to do so.

To establish reliability 20 percent of the transcripts (randomly selected) were scored by another individual. Reliability was calculated by means of number of agreements over number of disagreements plus agreements. The

reliability determined for each of the nine cohesive ties is as follows: pronominal reference 95%, demonstrative reference 97%, comparative reference 87%, substitution 82%, clausal ellipsis 92%, verbal ellipsis 80%, nominal ellipsis 81%, conjunctions 96%, and lexical 85%. Reliability for the scoring categories is: endophoric 98%, exophoric 92% and ambiguous 78%. Cataphora was infrequent so reliability was not determined for this category.

Reference System

Another system, termed the reference system, was also developed, by the author and Dr. Carole Peterson, to score all the nouns and pronouns in the narrative. It identified ambiguous referents and other errors that the children were producing. This system attempts to give an overall picture of their cohesive competence. As previously mentioned, Halliday and Hasan's method is useful for identifying the cohesive ties used by children but it is limited as it does not address the presence of ambiguous or otherwise confusing usage of nouns in children's story telling.

The categories used to score the nouns in this system are as follows: reasonable new introduction, unreasonable new introduction, ambiguous noun or pronoun (with differentiation made between ambiguous person, place, object and multiple referent), pronoun error, and pronoun or noun omission. A reasonable new introduction was scored when the child introduced something new into the narrative

which was reasonable and required no inference from the text. For example, if a child introduced 'my daddy' into a story, this would not present any problem to the listener and requires no further explanation. A noun was scored as an unreasonable new introduction if it appeared to be unrelated to the narrative, such as the introduction of 'gun' in "I caught the fish with a gun." Ambiguous nouns or pronouns were those which required further explanation but were related to the story. For example, if a child said, "He rode on a ferris wheel" and did not indicate who 'he' was, it was scored as ambiguous. Pronoun errors were instances where the child used one inappropriately, such as a pronoun that did not agree in gender and/or number with the noun previously used. For example, if the child said "She ran away. He never came back" and 'he' and 'she' referred to the same dog, the use of one of these pronouns would be an error. A pronoun or noun omission occurred when the child failed to use a pronoun or noun when one was required. For example when a child says, "Well I didn't spill anything. Sometimes get a little accident. Where I spill.", the subject pronoun 'I' is missing in the second sentence. These omissions were classified as either inferable or non-inferable. An inferable pronoun or noun omission occurs when reference to the missing element is clear, such as in the previous example where it is clear that the child is omitting reference to himself/herself.

In contrast, non-inferable omissions are not readily retrieved by the listener. For example if the experimenter says, "What happened to give you that bruise?" and the child replies "Gave me a big bite", a subject noun or pronoun is missing in the child's utterance and it is not clear who the child meant.

Other categories used to score the nouns in the reference system include endophoric, cataphoric, and exophoric reference. These categories are assigned based on the same terms as those defined in the Halliday and Hasan system.

Reliability was obtained for the reference system in the same manner as it was for the cohesive links. The results are as follows: reasonable new introductions 92%, endophoric 92%, exophoric 88%, ambiguous 80%. The other categories were too infrequent to calculate reliability.

RESULTS

The children readily produced narratives during the taping sessions. Table 2 shows the number of narratives and the average number of utterances per narrative for each child in each of their 18 samples. Over the period of study the stories generated by the children increased in number as well as length. This is shown in Table 3.

Changes in the data associated with age and MLU were examined. Since these variables were used as separate developmental markers throughout the study a correlation coefficient was calculated to determine how highly they are correlated. The correlation across the sample as a whole was, $r = .49$. Therefore, approximately 24% of the variance in MLU is associated with age.

The data were grouped according to age scores of the subjects and individual sessions were averaged across 6 month intervals to give three age levels for each child. This was undertaken to reduce variability in the data. In initial analyses gender was included as a factor. However, since there was no effect for this variable the data were collapsed over sex in further analyses.

Cohesive Links

To determine if the total number of cohesive ties changed with age the mean number of links per utterance was calculated for the three age intervals for each subject. A one way analysis of variance with age as a within - subjects factor was then performed. This was significant, $F(2,27) = 5.35$, $p < .05$, reflecting an increase in the total number of cohesive ties used per utterance with rising age. A post - hoc Newman - Keuls procedure revealed that use of total cohesive ties increased significantly from age level 1 to age level 2 and between levels 1 and 3 ($p < .05$). However, there was no significant difference

for levels 2 and 3.

In order to see how the use of specific cohesive ties changed with age the average number of each type of link per utterance was calculated. The totals were then multiplied by 100 for analysis because the number per utterance was small. A one way analysis of variance with age as a factor was performed for each type of cohesive tie, and there was a significant increase in the use of reference pronouns with age, $F(2,27) = 8.05$, $p < .01$, and of conjunctions, $F(2,27) = 5.09$, $p < .05$. There was a significant decrease in verbal ellipsis, $F(2,27) = 3.95$, $p < .05$, and clausal ellipsis, $F(2,27) = 6.20$, $p < .01$. There were no significant changes in use of the remaining five links. Table 4 shows the means at each age level for the individual and total cohesive ties. Post - hoc Newman - Keuls tests were also performed on these data. For all four significant ties the significant differences lie between age levels 1 and 2 and between levels 1 and 3 in the direction of the main effect. Although no statistical analysis was performed on the use of the subject pronoun 'I' and exophorics (since they are not considered cohesive ties in Halliday and Hasan's system) the data indicate that the incidence of 'I' increases with age; the use of exophorics rises up to age level 2 and then begins to decline between level 2 and 3. This trend can be seen in Table 4.

Besides changes in cohesive links with age, changes associated with MLU were also examined. These changes were calculated based on the actual MLU at each session. Statistical analysis was not performed on these data due to absence of scores for some subjects at some MLU levels. The mean number of cohesive links per utterance for MLU levels of <2.5, <3.0, <3.5, <4.0 and >4.0 are as follows: 1.74, 1.70, 1.95, 2.03, and 2.18 respectively. Thus, there appears to be an increase in the number of cohesive ties used per utterance with increasing MLU. In addition to an increase in the number of ties, there appears to be a greater variety of links employed as each child's MLU goes up. This can be seen in Table 5. As well, for the ties individually, the only ones which seem to follow any consistent pattern are pronominal references and conjunctions, which increase for most of the children with higher MLU, and verbal ellipsis and clausal ellipsis, which decline with increasing MLU. These are the same results that were seen with age.

When MLU is calculated for a series of sessions, sometimes children show a temporary decrease in MLU which quickly recovers. Such dips in MLU are commonly seen (Brown, 1973), such as when a child's MLU lies between 3.0 and 3.5 for three sessions, drops to below 3.0 for one session and then returns to a higher level. In order to identify the MLU levels associated with the earliest

appearance of each cohesive tie, such temporary MLU dips were ignored and instead tie appearance was analyzed based on the point at which the child first attained each MLU level. It was assumed that each session after that would be at that level until a sample appeared at a higher level. The earliest appearance of each cohesive tie for any child is presented in Table 6. There seems to be evidence to suggest that some ties are acquired before others. Six of the nine links are present at an MLU level of < 2.5, including pronominal reference, demonstrative reference, verbal ellipsis, clausal ellipsis, conjunctions, and lexical cohesion. Three of the ties do not appear for any child until his or her MLU passes 2.5. Two of these, comparative reference and nominal ellipsis, first appear at an MLU of <3.0. The final link, substitution, is not evident for any child until he or she has obtained an MLU above 3.0. (When calculated based on actual MLU for each session, only one child used substitution before this and did so at an MLU of <3.0. The results for all other links were the same using both methods). These data suggest the following developmental acquisition sequence. Reference pronouns, reference demonstratives, verbal ellipsis, clausal ellipsis, conjunctions and lexical cohesion are acquired first. The present study was not able to determine developmental order of acquisition among these cohesive links because the MLU levels of the subjects were

too high at the beginning of the study. To track the initial appearance of these links, children younger than 2 years of age need to be studied. Returning to the results of the present study, the appearance of the above six links is followed by comparative reference and nominal ellipsis. The last tie to be acquired appears to be substitution. The data in Table 7 support the above order of acquisition. This table shows the number of subjects who used each cohesive link of the total number who had samples in the MLU level indicated. Of the two subjects who had data at an MLU of < 2.5 neither used comparative reference, nominal ellipsis or substitution. However, both employed all six of the remaining ties. At an MLU level of < 3.0 some subjects were using comparative reference and nominal ellipsis but substitution was present in only one child's narratives. However, by the time their MLU had passed 3.0 many children were using substitution. As MLU rises the percentage of children who use comparative reference, nominal ellipsis and substitution seems to increase until at MLU levels of greater than 4.0 all children were using all nine links.

Summarizing the results for cohesive links it was found that the total number of cohesive links used increased as the children got older and seemed to do the same with increasing MLU. For age the differences were found to lie between age levels 1 and 2, with little change between

levels 2 and 3. The cohesive ties that showed significant changes with age were reference pronouns and conjunctions, which increased, and verbal and clausal ellipsis, which declined in use over time. Once again, the differences were found to lie between age levels 1 and 2. Changes with MLU appeared to show the same results as those for age. Not only did the total number of cohesive ties increase as MLU went up, but the variety of links used became greater as well. There also appears to be evidence that some ties are acquired before others.

Reference System

In the discussion of cohesive links above, the number of links per utterance were analyzed because of interest in determining whether the children's utterances became more cohesive with increasing age and MLU. The discussion now turns to the reference system which focuses on the nouns and pronouns used by the child, in particular the number of errors per nouns (or pronouns). The average number of errors per nouns used was determined and this mean was multiplied by 100 because the number of errors was quite small. To test whether the number of errors changed significantly with age a one way analysis of variance was calculated. The results showed that the main effect of age was significant, F (2,27) = 8.53, $p < .01$, indicating a decrease in the number of errors associated with increasing age. This is shown in Table 8. A post - hoc Newman Keuls

procedure showed that the difference was from age level 1 to level 3, $p < .01$, although the adjacent ages did not differ. Thus there is a gradual decrease in the number of errors over time. Table 8 also shows changes in all the other nouns scored in the reference system (endophorics, cataphorics, reasonable new introductions and exophorics) with increasing age.

Changes with age with respect to occurrence of the different types of errors was also examined using a simple analysis of variance on each type of error. Table 9 shows the means for the analyses of individual errors with respect to age. The only errors which showed significant changes were inferable omissions, $F\ (2,27) = 4.97$, $p < .05$, and non - inferable omissions, $F\ (2,27) = 6.08$, $p < .01$. They both showed decreases with increasing age. Post - hoc Newman - Keuls tests revealed that for inferable omissions the significant difference lies between age levels 1 and 3, $p < .05$. For non - inferable omissions the significant differences exist between age levels 1 and 3, $p < .05$, as well as levels 1 and 2, $p < .01$.

Significant age changes were not found with the other individual types of errors, nor with the composite number of all types of ambiguous referents added together.

Changes in errors with MLU were also examined and the results are shown in Table 10. Statistical analysis was not performed on these results due to missing data for some

subjects at some MLU levels. However, the total number of errors seems to decrease as MLU level goes up. Changes with MLU for the other nouns classified in the reference system are also shown in Table 10. The results for individual errors seem to suggest a decrease in the presence of most errors with increasing MLU. This is shown in Table 11.

In addition to determining changes in errors over time, another question considered was whether the children were introducing new nouns and pronouns into their narratives appropriately. That is, when they introduced something new was it a reasonable new introduction or did it tend to be an unreasonable new introduction or ambiguous referent? To explore this question the percentage of reasonable, ambiguous, and unreasonable new introductions of all those mentioned for the first time was calculated at the different age levels and MLU ranges. The results shown in Table 12 indicate that when the children are introducing something new approximately 1 out of 5 are either ambiguous or unreasonable nouns or pronouns. This trend does not appear to change with age levels or MLU. The latter data are provided in Table 13.

To summarize the results for the reference system, the total number of errors gradually declines with increasing age and MLU level. This is due to decreases in both inferable omissions and non - inferable omissions. There

is no significant change in total number of ambiguous referents over time. Finally, when introducing new nouns or pronouns the subjects seem to have approximately one out of five of them as either ambiguous or unreasonable new introductions, and this does not change over the year and a half of the study.

DISCUSSION

In the data collection procedure adopted for this study, the technique used to elicit narratives from the children was successful. Of a total of 180 sessions there were only two in which no narratives were produced. In addition, even the youngest children (25 months) told stories about past events. This suggests that previous estimates that reference to past events begins at 26 months of age (Sachs, 1979, 1984) are too high. The data in this study indicate that children's earliest narratives about past events may possibly be found before age two. Furthermore, as the children in the present study became older they told more and longer narratives. This reflects an improvement in their ability to relate stories about past experiences as they matured.

Cohesive Links

One purpose of the present study was to determine what cohesive links children younger than three years of age use in their invented oral narratives. The data indicate that

all of the cohesive devices described by Halliday and Hasan (1976) are present before the age of three. Even the youngest children (25 months) used cohesion to some extent. Clearly then, two year olds are capable of producing cohesive links in their narratives.

Also of interest was whether any changes in the use of cohesive links occur as children become older and the lexical complexity of their speech increases. The results of the present study indicate that changes do in fact take place. The subjects show an increase in the total number of cohesive ties used per utterance as they become older. This is consistent with research by Hedberg (1983) which reports a positive correlation between age and total links for children between the ages of 2 and 5. The same trend is apparent in the present study with respect to rising MLU. So over time, as the children's narratives become longer they also become denser with cohesive elements. Recall that for age the increase in cohesive ties was only significant between age level 1 and both of the higher age levels. This suggests that the greatest development in use of cohesive ties occurs during the first half of the child's third year, from about 2 to 2 1/2 years of age, and that development is less pronounced thereafter. With respect to rising MLU not only do the total number of links appear to increase but the variety employed also seems to become greater. Therefore, the sophistication of the

different types of cohesive devices improves both with rising age and MLU. The children increasingly use a greater variety of ties and their narratives become denser with cohesive links. Given the assumption that text that is more cohesive generally leads to more efficient comprehension than that which is not very cohesive (Irwin, 1986), it is reasonable to expect that the narratives should also become easier for the listener to understand as the children mature.

Changes in utilization of specific cohesive devices are demonstrated in this study. Reference pronouns and conjunctions increase in frequency as the children become older, whereas verbal and clausal ellipsis become less frequent. The remaining five links show no significant changes. Results with respect to rising MLU appear to follow the same pattern as those for age. Again, the differences for age lie between level 1 and both of the higher age levels.

The increase in the use of reference pronouns is consistent with the finding of Bennett - Kastor (1983) who reports that as children get older they tend to talk more about one topic. As a result, after a topic is introduced they mention it over longer stretches of discourse and across more clauses. This accounts for the increase in reference pronouns.

The increase in conjunction use in this study is

consistent with the results from another study by Bennett - Kastor (1986). She also found an increase in conjunction use between age 2 and 3. It seems then that as children become more mature language learners they tend to connect their utterances more explicitly through the use of conjunctions. This should also lead to increased ease of comprehension for the listener. The processing needed to infer missing connectives may consume processing capacity needed for other aspects of comprehension, thereby potentially decreasing comprehension (Clark, 1986). Thus, a more explicit use of conjunctions would tend to make the children's narratives easier to understand.

The decrease in clausal and verbal ellipsis may be related to an improvement in a young child's willingness and ability to produce narratives (indicated by an increase in the number and length of narratives produced per session over time). These two forms of ellipsis are seen most often in response to requests for further elaboration or clarity by the listener. For example, in the following exchange between the researcher (R) and Gary (S) at 2;1, the experimenter prompted for all the information supplied by the subject:

R: Did you have a party?

S: Yeah.

R: You did?

S: And Laurie.

R: What did you do at the party?

S: Ate cake.

In the second response the child uses clausal ellipsis to reply to the experimenter and then uses verbal ellipsis to reply to the next prompt. For children at younger ages more prompting was often needed to induce the child to begin narrating. The same child at 3;2 provides more information with less prompting, as can be seen in the following example:

R: Are you going to tell me about your birthday now?

S: Well lots of people came to my birthday.

R: Lots of people came to your birthday?

S: I had cake but I wasn't interested in eating it so I just went, I don't like this piece, so I went blah, blah, blah, blah, blah.

This narrative contains no ellipsis. As the narratives became longer and the children became better story tellers, less prompting was required by the researcher to encourage them to narrate. This tended to result in a decline in the use of ellipsis.

The presence of the subject pronoun 'I' appears to increase with age. Recall that children are more likely to talk about the same subject for longer spans of discourse as they get older. If the child is the subject of the narrative, which is usually the case, this would result in an increase in the occurrence of 'I' with rising age.

The children in this study appear to show an increase in the use of exophorics from about age level one to two. After approximately age 3 the use of exophorics begins to show a decline. As children become older they generally tend to talk more about events and objects outside the situation and use more endophoric links. This may account for the decrease in the number of exophorics used in their narratives. Other research indicates that children from 4 to 6 years use fewer exophoric pronouns (Gopnik, 1986). In the present study it may be that the initial increase in exophorics is due to the increase in utterance length and that the children have not yet started to talk a great deal about things outside of their immediate environment. But as they get older their world broadens and an increase in reported away-from-home experiences is paralleled by a decrease in the presence of exophorics in their narratives.

An important question is whether there is a developmental progression in terms of when cohesive ties are acquired. In terms of age no pattern is evident. However, in terms of the more sensitive measure of MLU, the data suggest that some ties are acquired before others; specifically, pronominal and demonstrative reference, verbal and clausal ellipsis, conjunctions and lexical links are all acquired at an MLU level below 2.5. Because they were present in the youngest children's narratives, determining order of acquisition among them was not

possible. To do so requires testing of subjects at an earlier age. These early links are followed by comparative reference and nominal ellipsis which do not appear until the children have reached an MLU greater than 2.5, and by substitution which is not present until the children have passed an MLU of 3.0. Clearly the children in the present study display a developmental progression in terms of the order in which the cohesive ties are acquired with respect to MLU. That this sequence of acquisition is present in terms of MLU and not age is not surprising since the former has been shown to be a better predictor of language development than the latter (Brown, 1973; Rondal, et al., 1987).

The order of acquisition seen in this study with respect to ellipsis is paradoxical, however. It does not fit with what would be expected based on linguistic theory. From a linguistic point of view a noun phrase generally involves just one main category - a simple noun or pronoun. Verbal phrases, on the other hand, usually contain a main verb plus other elements such as auxiliary verbs, and direct object noun phrases and/or indirect objects. Alternatively, a clause consists of several major categories and structurally would be the most complex of them all. In order for each structure to be a plausible candidate for ellipsis it must first be mastered by the child. One would expect the most difficult structure to be

acquired last. Based on linguistic theory then, one would expect nominal ellipsis to be acquired first, followed by verbal ellipsis and finally clausal ellipsis. However, even the youngest children in this study used all three structures. For example, Nathan (S) at age 2;2 with an MLU of 2.29 told the following story to the researcher (R):

R: Did you go out and eat in a restaurant?

S: Yes.

R: Yeah. Where did you go?

S: To eat. I sit and I eat and I drink Coke.

This child has used all three structures and also used verbal ellipsis. He has mastered all the structures at an MLU of <2.5 but only uses verbal and clausal ellipsis at this level. Nominal ellipsis does not appear until he reaches an MLU of <3.0. The order of acquisition displayed by the children then, may reflect an ability to encode more components into their utterances as they mature. At early stages of language development children use only the necessary semantic components to encode their message and later as the complexity of their utterances increases they begin to modify nouns and pronouns (Slobin, 1979). The two cohesive ties which appeared second for the children in the present study involve the use of modifiers. This suggests that they first develop the ability to incorporate modifiers correctly into their utterances before they can use the cohesive ties of comparative reference and nominal

ellipsis where modifiers are used. Substitution may be acquired last because a 'counter' (such as 'one') is required to replace the substituted element. This counter is not semantically related to that which it replaces as it is for reference pronouns and reference demonstratives. Instead, it is related in a grammatical or linguistic way. The meaning of the reference pronoun 'he', for example, is some male person who has been previously mentioned in the text. Substitution, on the other hand, is a counter which is used in place of the repetition of an item. It is not connected with specifying or identifying a particular referent. Children may find this a difficult skill to acquire. The grammatical complexity involved in using substitution may account for the delay in mastering it until the child has reached an MLU of greater than 3.0.

In summary, as the children mature they produce more comprehensible narratives as both the number and variety of cohesive links that they use increases. They connect their utterances more explicitly through increased use of reference pronouns and conjunctions. There is also a developmental progression in terms of order of acquisition of the cohesive links.

Reference System

An analysis of cohesive links indicates ways in which children increasingly tie their utterances together. However, inexplicable changes in topic, the introduction or

use of pronouns that have unidentifiable referents, and insertions of unknown elements all lead to jarring noncomprehension by the listener or else demand greater effort to interpret. Such problems are not captured by focusing exclusively on cohesive links but instead require an analysis of errors in noun and pronoun use that the children make when telling narratives. The results of this study show that the total number of errors declines as the children become older. This is evidenced by the gradual decrease from approximately age two to three and a half since the significant difference lies only between age level one and three. The total number of errors produced also decreases with increasing MLU. Thus, not only do the narratives become denser with cohesive elements with age and greater lexical complexity but they also contain fewer reference errors. The children appear to be becoming more competent story tellers, producing narratives that are easier for the listener to understand and follow.

Also of interest was whether any of the specific errors showed changes with age and MLU. In terms of MLU there appears to be a decrease in most errors as the lexical complexity increases. However, the only errors to show a significant decline with increasing age were inferable omissions and non-inferable omissions. For inferable omissions the decrease was between age level one and three only, indicating a gradual decline over the period of

study. However, non-inferable omissions significantly decreased between the first and second age levels, showing a sharper decline. Since a non - inferable omission would lead to more difficulty in comprehension for the listener compared to an inferable omission, it may be that young children receive more feedback about the former and learn earlier to reduce these errors in order to be understood.

Although the children do show a decrease in the total number of errors present in their narratives over time, there are other difficulties which seem to persist. When new nouns and pronouns are introduced, approximately one out of five is either ambiguous or unreasonable and is a potential source of confusion for the listener. This trend does not appear to change with either MLU or age. The children show improvement in omission errors but still seem to have problems introducing new nouns into their narratives by the time they have reached an age of about three and a half. It is reasonable to assume that the children know what they are talking about. However, why they fail to make it obvious to the listener is not clear. Several explanations have been proposed to account for young children's inadequacy in this respect. For example, it may be that they do not realize that the listener does not have the same knowledge they do (Gopnik, 1986; Zammuner, 1986). However, other research has indicates that even young children display skill at nonegocentric

adaptation to listener characteristics and needs (Flavell, 1985). Alternatively, although they may know that the listener's knowledge differs, it may not always occur to them to attend to this differential -- a distinction Flavell (1985) labels existence versus need. The skill of constant monitoring needs practice and it is not surprising that children this young are not adept at doing it. Another explanation is that they may not know how to construct the narrative to convey the information unambiguously to the listener. As children get older they learn to use grammatical devices such as relative clauses to clearly specify their nouns and pronouns. This is a skill which is not fully developed for most children until they reach school age (Tager -Flusberg, 1985) so it would not be an available strategy for the children in the present study.

Conclusion

A striking result of this research is that children are capable of using all the cohesive ties described by Halliday and Hasan (1976) at an extremely early age. This utilization becomes more sophisticated with increasing age and MLU. The children's narratives become denser with cohesive ties and the variety of links employed rises. Further, there seems to be a developmental progression in

terms of the order in which some cohesive links are acquired.

Another means by which the children's narratives become more sophisticated over time is revealed by the decrease in noun and pronoun errors. Specifically, omission errors decline significantly with age, with non-inferable omissions showing the earliest decline.

Thus, in terms of cohesive linkage and noun errors, the children's narratives are becoming more sophisticated and more comprehensible for the listener as the children mature. However, they show no improvement in their ability to introduce new nouns coherently into their narratives. At all age and MLU levels approximately 20 percent of newly presented nouns are ambiguous or unreasonable. Therefore, although the narratives become more cohesive over time, there still remains a fair amount of ambiguity in the stories of children at approximately 3 and a half years of age. That is, they are still having difficulty making their narratives coherent.

The results of this study raise some questions and issues for further research. In the present study even the youngest children of 25 months told stories about past events. Research could be done with younger children to investigate when they first begin to make reference to past events. As well, the order of acquisition of pronominal and demonstrative reference, verbal and clausal ellipsis,

conjunctions and lexical cohesion needs to be examined using younger children, tested more frequently, than done here.

Since increased use of cohesion tends to make children's narratives more comprehensible, adult responses to children's story telling probably contribute to cohesive development. This development is also influenced by the child's cognitive ability. Further research could attempt to specify how these factors contribute to children's increasing use of cohesion.

One could also try to determine when children begin to show an improvement in their ability to introduce new nouns and pronouns into their narratives and what leads to this improvement. Social interaction and cognitive ability are contributing factors that could be explored here, as well.

Table 1
Description of MLUs and age of initial session for the speech samples

	Initial	Lowest	Number of Samples with MLUs				
Child	Age	MLU	<2.5	<3.0	<3.5	<4.0	>4.0
1	2;1	2.39	1	4	1	0	12
2	2;2	2.96	0	1	2	3	12
3	2;2	3.42	0	0	1	0	17
4	2;3	2.00	2	1	4	3	8
5	2;3	3.71	0	0	2	1	15
6	2;2	3.22	0	1	7	0	10
7	2;2	2.29	1	0	2	5	10
8	2;3	2.77	0	1	1	4	12
9	2;1	3.24	0	0	2	5	11
10	2;2	2.24	3	3	4	5	3

Table 2: **Number and average length of narratives produced by the children in each of their eighteen samples.**

Sample		Child									
		1	2	3	4	5	6	7	8	9	10
1	#	1	7	10	4	5	0	8	10	3	3
	Length	2.0	6.9	5.8	3.5	6.8	0	3.0	4.6	4.0	5.7
2	#	5	10	9	2	4	2	8	6	6	3
	Length	4.2	7.0	3.3	3.5	4.8	4.0	3.0	3.7	4.0	2.0
3	#	1	10	9	0	6	2	4	11	5	3
	Length	8.0	4.7	4.3	0	6.5	2.0	2.5	3.7	3.2	4.3
4	#	8	9	9	2	4	9	5	10	9	1
	Length	3.6	6.2	4.0	3.0	2.0	3.9	4.8	5.6	3.6	5.0
5	#	4	13	5	9	3	6	15	4	8	4
	Length	3.5	7.3	2.4	5.2	6.3	4.3	3.5	7.8	3.8	4.8
6	#	3	19	8	5	4	5	12	13	8	3
	Length	3.3	7.7	3.8	4.2	3.8	3.0	3.3	5.8	4.1	6.3
7	#	7	17	11	10	4	9	13	9	7	6
	Length	5.1	8.4	3.0	3.8	6.5	5.3	3.2	5.9	3.3	5.2
8	#	9	11	7	10	7	9	6	19	7	7
	Length	5.1	5.6	3.4	6.3	3.3	4.8	4.8	4.8	3.7	5.6
9	#	9	13	11	12	5	9	9	13	12	4
	Length	4.3	4.4	3.4	3.9	5.4	4.6	3.0	4.5	4.3	5.0
10	#	4	14	13	9	6	12	7	12	14	6
	Length	5.3	5.9	3.5	4.8	6.3	6.4	3.0	7.4	5.6	5.8
11	#	6	11	13	6	5	11	9	12	12	5
	Length	5.2	6.2	4.5	4.7	5.2	5.6	6.6	6.3	5.4	3.2
12	#	5	17	8	8	7	9	15	11	11	4
	Length	7.6	5.2	6.9	4.4	5.1	3.2	5.8	6.2	4.2	3.5
13	#	5	10	10	7	6	9	10	11	14	8
	Length	6.0	5.0	3.6	5.1	7.5	5.7	5.0	6.9	7.0	6.4
14	#	7	12	11	14	8	12	10	9	8	3
	Length	3.6	4.8	4.6	6.0	3.6	7.6	6.4	6.7	6.5	7.3
15	#	9	7	7	5	7	12	9	11	12	7
	Length	6.0	4.3	4.4	3.6	7.1	5.3	6.6	8.9	4.8	5.6
16	#	13	11	13	14	10	10	10	13	11	5
	Length	6.3	4.2	4.5	7.0	4.3	6.9	7.3	7.4	4.1	6.2
17	#	8	10	10	12	4	9	16	9	13	8
	Length	8.8	6.4	5.5	9.0	4.5	6.8	5.6	4.5	4.2	7.3
18	#	11	9	11	19	9	12	10	9	14	9
	Length	7.1	7.0	6.2	6.5	4.6	9.5	6.1	5.4	4.9	4.7
Total		115	210	175	148	104	147	176	192	174	89
Avg. Length		5.6	6.1	4.3	5.5	5.2	5.7	4.7	5.9	4.5	5.4
Max. Length		17	32	24	37	24	20	16	25	17	13

Table 3
Total number, average length (and standard deviation), and maximum length of narratives produced by the children in each sample.

	Total	Length of Narratives		Maximum
Sample	Narratives	Mean	S.D.	Length
1	42	4.23	2.2	6.9
2	55	3.95	1.31	7.0
3	51	3.92	2.18	8.0
4	66	4.17	1.25	6.2
5	71	4.89	1.67	7.8
6	76	4.53	1.55	7.7
7	83	4.97	1.71	8.4
8	92	4.74	1.00	6.3
9	97	4.28	0.71	5.4
10	91	5.40	1.33	7.4
11	90	5.29	1.00	6.6
12	95	5.21	1.43	7.6
13	90	5.82	1.18	7.5
14	94	5.71	1.46	7.6
15	86	5.66	1.57	8.9
16	110	5.82	1.38	7.4
17	99	6.26	1.73	9.0
18	113	6.20	1.47	9.5

Table 4
Changes with age for mean number of cohesive links (per utterance), and for individual links, I and exophorics (per 100 utterances).

	Age Level			
	1	2	3	
Total Links	1.92	2.09	2.17	$p < .05$
Reference				
Pronoun	20.0	27.3	29.2	$p < .01$
Demonstrative	7.9	10.2	11.4	NS
Comparative	1.8	1.9	2.3	NS
Substitution	2.7	3.5	3.6	NS
Ellipsis				
Nominal	1.2	1.9	2.3	NS
Verbal	6.2	4.2	4.0	$p < .05$
Clausal	23.8	15.6	16.8	$p < .01$
Conjunction	23.1	32.7	34.5	$P < .05$
Lexical	72.1	74.4	74.0	NS
Other				
'I'	33.0	37.4	38.9	
Exophorics	18.8	28.0	24.1	

Table 5
Number of different cohesive ties used at each MLU level

	MLU				
Child	< 2.5	<3.0	< 3.5	< 4.0	> 4.0
1	2	8	7	-	9
2	-	7	8	9	9
3	-	-	7	-	9
4	6	-	8	9	9
5	-	-	9	4	9
6	-	3	9	-	9
7	6	-	8	9	9
8	-	8	5	9	9
9	-	-	5	9	9
10	6	6	8	9	8

Note: - = missing data.

Table 6
MLU level and cohesive links first used

MLU				
< 2.5	< 3.0	< 3.5	< 4.0	> 4.0
Pronominal Reference	*	*	*	*
Demonstrative Reference	*	*	*	*
*	Comparative Reference	*	*	*
*	*	Substitution	*	*
*	Nominal Ellipsis	*	*	*
Verbal Ellipsis	*	*	*	*
Clausal Ellipsis	*	*	*	*
Conjunction	*	*	*	*
Lexical	*	*	*	*

* = No Data in the Cell.

Table 7
Distribution of cohesive links

	MLU				
	< 2.5	< 3.0	<3.5	< 4.0	> 4.0
Reference					
Pronoun	3/4	5/5	10/10	7/7	10/10
Demonstrative	3/4	4/5	9/10	6/7	10/10
Comparative	0/4	2/5	5/10	6/7	9/10
Substitution	0/4	1/5	7/10	6/7	10/10
Ellipsis					
Nominal	0/4	2/5	4/10	6/7	10/10
Verbal	3/4	4/5	8/10	6/7	10/10
Clausal	4/4	5/5	10/10	7/7	10/10
Conjunction	3/4	4/5	9/10	7/7	10/10
Lexical	4/4	5/5	10/10	7/7	10/10

Table 8
Distribution of changes with age of mean number of errors, endophorics, cataphorics, reasonables and exophorics of nouns

	Age Levels		
	1	2	3
Total Errors	11.0	9.0	6.8
Endophoric	48.6	50.8	53.8
Cataphoric	.8	.3	.6
Reasonable	27.8	26.2	26.7
Exophoric	11.2	14.1	12.3

Table 9
Distribution of changes with age of mean number of individual errors

	Age Levels		
	1	2	3
Ambiguous Refs.	6.7	6.3	5.1
Person	3.1	3.2	2.5
Place	1.3	1.2	.9
Object	2.3	1.8	1.6
Multiple Ref.	.04	.1	.1
Unreasonable	.6	.8	1.0
Pronoun Error	.3	.4	.2
Omissions			
Inferable	2.8	1.4	.5
Non-inferable	.6	.1	.03

Table 10
Distribution of mean number of errors, endophorics, cataphorics, reasonable new introductions, and exophorics per total nouns at the different MLU levels

	MLU				
	< 2.5	<3.0	< 3.5	< 4.0	> 4.0
Total Errors	13.7	13.5	9.1	9.7	7.6
Endophoric	47.4	50.5	47.5	50.4	53.2
Cataphoric	1.1	.3	.6	.4	.5
Reasonable	28.4	22.9	30.4	27.2	26.2
Exophoric	9.5	12.8	12.4	12.3	12.4

Table 11
Distribution of mean number of individual errors per total nouns at the different MLU levels

	MLU				
	< 2.5	<3.0	< 3.5	< 4.0	> 4.0
Ambiguous Refs.	7.4	6.4	6.1	6.6	5.5
Person	2.1	3.4	2.5	2.7	2.8
Place	1.1	.6	1.1	1.6	.9
Object	4.2	2.4	2.4	2.3	1.6
Multiple Ref.	0	0	.1	.1	.1
Unreasonable	1.1	0	.3	1.0	.9
Pronoun Error	0	0	.2	.4	.4
Omissions					
Inferable	4.2	5.5	2.2	1.6	.8
Non-inferable	1.1	1.5	.4	.2	.1

Table 12
Percentage of new nouns and pronouns that are reasonable, ambiguous, and unreasonable according to different age levels

		Child										
	Age	1	2	3	4	5	6	7	8	9	10	Mean
	1	87	85	83	76	75	80	74	72	77	78	79
R	2	86	81	77	88	68	71	91	70	77	77	79
	3	86	89	85	87	76	79	84	76	76	75	81
	1	13	12	16	20	22	20	25	25	21	22	20
A	2	13	15	20	11	29	27	6	27	22	23	19
	3	10	9	15	10	20	19	11	19	21	21	16
	1	0	3	1	4	2	0	1	4	2	0	2
U	2	1	5	4	1	4	1	3	4	2	0	3
	3	4	2	.5	3	5	1	5	5	3	4	3

Note: R = Reasonable New Introduction, A = Ambiguous, U = Unreasonable New Introduction.

Table 13
Percentage of new nouns and pronouns that are reasonable, ambiguous, and unreasonable at different MLU levels

	Categories		
MLU	R	AMB	UR
< 2.5	77	20	3
< 3.0	78	22	0
< 3.5	83	16	1
< 4.0	78	19	3
> 4.0	80	17	3

Note: R =Reasonable New Introduction, AMB = Ambiguous, UR = Unreasonable New Introduction.

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