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A developmental study of event representation in Haitian children

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A DEVELOPMENTAL STUDY OF EVENT REPRESENTATION

IN

HAITIAN CHILDREN

by

MARYSE NOEL ROUMAIN

A dissertation submitted to the Graduate Faculty
in Psychology in partial fulfillment of the
requirements for the degree of Doctor of Philosophy,
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Abstract

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Adviser: Professor Katherine Nelson

Two studies were conducted to investigate the development of event representation in Haitian children.

Study I explored levels of representation of the daycare center and school experiences among Haitian children aged 3.6 to 6.6. It was found that the older children's scripts referred more to collective actions, were more elaborated, better interconnected, had more slot fillers, and contained more references to infrequent acts. Very few children used the impersonal *you* to recount their experiences.

Study II compared the narratives of children aged 4,6, and 8. The children were interviewed on two events: their school and their after school experiences, and the results were compared to determine if the objective nature of these two real world events is reflected in the children's

narratives. An elicitation procedure was also used to determine if younger children would be able to access infrequent acts. The findings are that event type and elicitation procedure are more likely to affect the six and eight year olds.

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Introduction

> We first undertook this project because we were interested in certain phenomena of cognitive development in early childhood. In particular, like a number of other investigators a decade or so ago, we were struck by the discrepancy between young children's apparent competence in everyday activities and their apparent incompetence on certain cognitive tasks.
> ...we believed that understanding children's competence (rather than their failures) was the key to explaining the discrepancies in their performance.
> (Nelson, K. 1986, Preface ix.)

Developmental psychologists around the world have shown an interest in studying phenomena of cognitive development in early childhood. In particular, most Third World psychologists have been motivated to investigate the functioning of Third World children's minds in an attempt to uncover their strengths as well as their failures; their intrinsic competence or abilities within their socio-cultural context as well as their limitations.

This task however has been difficult due to the fact that the pioneers in the field of developmental psychology, who were interested in looking at universals or individual differences in cognitive development, have imposed a

comparative framework through which the performance of children from Third World cultures must be studied. Virtually all the research on Third World children has been conducted from that perspective.

This thesis breaks with this traditional approach. Although the population studied - Haitian children residing in New York -- is most differentiated in race, cultural practices, socio-economic status and otherwise, from the children who have been investigated in previous or concurrent research, the performance of the two groups of children is not here compared. The present sample is composed of Haitian children only. As in most of the developmental literature, the variable of comparison among the children is age. This, therefore, is not conceived as a cross-cultural investigation but as a developmental study of children growing up in a culture different from the American mainstream.

This investigation was undertaken to contribute to emerging knowledge about how young children represent familiar events or experiences. More broadly, it is an effort to contribute to research on the classification and categorization of events, their structures and processes in cognitive development. Do event representation structures

reflect real world structures, and if so, are younger children as equally able to incorporate these structures in their narratives as are older children? Can elaborated event structures be represented by younger children when an elicitation procedure is used to facilitate task interpretation and stimulate retrieval? Are events differentially structured when different languages are used, and if so, how does language make a difference for younger children as compared to older children?

All the above questions address issues of development of event representation structures in an attempt to find answers to what develops, how and what accounts for this development. In effect, Schank (1982) mentions that the research has ignored the problems of development of event representation structures, "the ability of such structures to change themselves", and "the problems of retrieval and storage of information posed by these structures" (p.2). While developmental research has not ignored these issues, much remains to be investigated. In particular, we know more about structural issues in event representation than we know about processing issues. And, among those structural issues, more has been revealed about schematic structures than

categorical structures. And, very little is known about the apprehension of low frequency act instances in an event representation.

This study is designed to contribute to the account of how event memories are organized in such a way as to be able to adjust initial encodings of the world to reflect growth and new understanding, thus to learn from new experiences and reorganize content and structures to reflect new generalizations on the basis of old ones.

The perspective adopted here relates to the research conducted in two areas:

1) studies that investigate the perception and cognition of natural categories; and,

2) studies of event representation.

The following sections provide the background for the present research in these areas.

I. Prototype Classification: Theory and Research

The prototype theory of classification has been developed in a series of papers published by Rosch and her colleagues. Rosch (1977) has proposed some general principles that account for the function and structure of categories: 1) categories serve a cognitive economy function, i.e., they provide maximum information with the least cognitive effort; 2) there is structure in the world and categories reflect the co-occurrence of attributes in the real world; 3) categories exist at different levels of inclusion and abstraction; they have embedding properties. However, not all levels are equally useful: the most useful level is the most inclusive level at which the structure of attributes that are perceived in the real world is mirrorred. While superordinate categories share few attributes and subordinate categories have overlapping attributes, category membership is best represented at the basic level.

In a series of experiments, college students were asked

to list all the attributes they could think of as true at different levels. They listed a greater number of attributes for basic level objects and few for superordinates. Similarly, images of basic level objects were found to be the most prototypical of the whole class. Experiments also showed that the first categorizations of young children are made at the basic level.

Rosch and her colleagues argued for continuity between categories. According to their view, category membership is not determined by necessary and sufficient criteria as the proponents of a formal logic view would propose, since these features are not present to the same degree in each instance. Rather, categories are composed of members that share overlapping features organized around prototypes. Prototypes are the clearest cases of category membership, as determined by people's judgments. They are the best exemplars of a category. Prototypes have been found to play a role in various psychological processes. In experiments that test the psychological reality of semantic networks, it has been shown that reaction time is faster for prototypical category members. For example, subjects agree more rapidly that a robin is a bird than that a chicken is a bird. This finding

opposes views related to hierarchical models of semantic memory which predict that subordinate instances are linked to their superordinates through an ISA link with activation spreading equally from nodes representing specific instances to type nodes. Speed of processing studies have thus shown that prototypical members of categories are not as distant from their superordinates as are non-prototypical members. These findings about the role of prototypicality in classification tasks have been confirmed by researchers such as Smith (1983), and Mervis and Crisafi (1982).

Findings on the role of prototypicality in psychological representation and processes have challenged the classical view of categorization; the logic of classes and relations predicts that all instances of a category have equal value and that, consequently, sentences such as "a robin is a bird" and a "penguin is a bird" are equally true. But these findings imply that psychologically this is not so: a robin, being a good exemplar of the category of birds is more rapidly accepted and represented to be a bird than is a penguin.

However, the prototype notion of classification

seriously challenges the classical view only to the extent that equal value of category members is interpreted to mean equal access time. The classical view never predicted that this would be the case. It only proposed that a complete and accurate representation of a category should logically include all of its members. It was never claimed that such logical representation implied equally ready access for all members.

Smith and Medin (1981) share the same view: typicality, they state, is an inverse measure of complexity; since atypical probes contain more features than typical ones, atypical probes will require longer comparison stages. The fact that typical concepts are learned before atypical ones becomes just another example of simple concepts being mastered before complex ones.

Such constructive criticisms have led to a revision of the prototypical view. Gleitman (1981) showed that the prototypicality description of concepts, although real, is less of the whole picture than might have been hoped. In a series of experiments, Armstrong, Gleitman and Gleitman (1981) showed that when subjects are asked to rate exemplars of categories such as odd numbers, which should not differ in

their degree of typicality since there is an exhaustive logical definition of the category- those subjects were able to do so. They concluded that "exemplariness ratings and differential reaction times to verification are as reliable and often as powerful for well-defined, even mathematical concepts, as they are for the everyday concepts that seem to intuition to be ill-defined or prototypical" (pp. 8-9). It is one thing to think about membership in a category. It is quite another matter to judge good exemplars of a category. "Exemplariness, in short, is not the same as class membership" (p. 11); "prototype theories say no less but no more than that all concepts have central and peripheral instances" (p. 13).

Finally, Rosch (1981) suggested that, rather than being mutually exclusive, the two types of reasoning, that is, logical reasoning and reasoning from reference points (as shown in judgments of representativeness) are possible. However, both types of reasoning may lead to errors: reference point reasoning when it is used in a domain where it is inappropriate, such as judgments of probability, and logical reasoning when the facts or the presuppositions on which the reasoning is based are incorrect. Both forms of

reasoning can tell us something about the structures and processing of categories.

The research on the prototype theory of classification has been conducted mostly with adults. However this theory is related to issues of acquisition and development of categorical thinking in young children. The literature suggests in effect that children's first categories are made at the basic level and that typical concepts are learned before atypical, more complex ones. While these findings have been suggested for object knowledge, they remain to be demonstrated for event knowledge. Further, a lot more remains to be known on the development of this knowledge.

II. Studies of Event Representation

Schank (1975) was concerned with the elaboration of a theory for understanding how information is represented in memory and how that information is used in the processing of inputs, e.g., stories or events. One of Schank's first assumptions relates to the role of episodic experiences in memory representation. According to his view, the definition of a nominal concept is a functional description of its use

within an episode in memory. Objects cannot be separated from action sequences. Schank thus distinguishes a lexical memory for words and a conceptual memory organized around episodic experiences, the most simple kind of episodic sequence being the script that organizes information about everyday causal chains.

According to Schank (1980), for the purpose of economy of storage, we need not remember the details of every event. The function of a script is to "mush" similar experiences. Scripts are thus rituals and represent the simplest kinds of explanation or representation for events. A script serves as an organizational tool by which episodes that have predictive value in processing can be stored. A script is, in essence, a generalization. It says, something has happened many times in a similar way and thus, I will expect that thing to happen in the same way next time. The importance of script-based knowledge has further been emphasized in a more recent book: "We like to think of ourselves as rational creatures who reason from sets of rules appropriate to the situations we encounter. But the evidence indicates otherwise. Experts who make decisions, surgeons in the operating room, judges imposing sentences, admission officers of universities, all

have rules they can cite as to what it is they should do in a given situation. But, an examination of their reasoning indicates that they are more likely to use a past experience to determine a present case...We reason according to the particulars of our experience" (Schank, 1982 pp. 122-123).

Schank (1979) presents other forms of representation that are not script-based: he explains that we cannot get away with simply applying a script. Rather, we will have to consult many levels of information; inside the guts of a script, we find all the pointers to every memory experience we have had that has been organized in terms of that script and that has not been obliterated by multiple identical experiences. Script application is embellished by going down paths which the script itself organizes, that contain all prior deviant (i.e., not completely standard) experiences. Every deviation from the standard script is stored as a modification of the particular scene in which the deviation occurred.

This new scheme allows for the use of all prior experiences in the interpretation of new experiences rather than a reliance on only standard normalized experiences. If similar deviation has been met before, at some point, these

experiences are collected together to form a generalized event whose predictions are disembodied from actual episodes: "a very important part of understanding is the analysis of what is happening to you now with respect to the issue of how a newly relevant encountered event might be for predictive purposes...We are not born knowing such things; what forms such knowledge takes and how we go about acquiring it, is one of the very big issues for future research" (pp.39-40).

Schank's work contains several interesting suggestions for the study of the acquisition and development of event representation in young children. First, because scripts are "the simplest kinds of representation for events" (Schank 1979), we may hypothesize that this organizational format is available to very young children. Second, since the theory predicts many levels of information or representation rather than a reliance on standard experiences only, it can be expected that representational format other than a "script" may become available to children, allowing them to take into account prior deviations that do not constitute a standard expectation.

Nelson's work centers precisely around the acquisition and development of concepts of objects and events. Nelson (1974) presents a critical review of theories of concept formation: natural language concepts rarely have well-defined boundaries and inclusion rules, and are therefore much closer to the preconcept of Piaget's preoperational child. She notes that Rosch's research has shown that adult categories as well as children's, in the diverse areas of colors, forms and natural language structures such as animals and diseases, are open and unbounded, somewhat amorphous and tend to be built around prototypical members on which there is strong agreement within the culture. These internally structured categories seem to be experientially based, giving rise to particularly strong representative instances. (Nelson, 1975, 1977).

Nelson (1979) investigated children's long-term memory for routine events. She described the knowledge system of the young child as script-based, where script is used as a frame defining an expected sequence of actions in a given context involving props, scenes, and actors. Forty children ranging in age from two years, eleven months to five years

and six months, divided into younger (under 4.5) and older (over 4.5) reported twice on six events selected to reflect differences in familiarity, social character, centrality of child's role, affectivity and the basis for variability in the temporal structure. These events were: getting dressed in the morning, making cookies, going to the grocery store, going to a restaurant, going to a birthday party and having a fire drill. Results indicated that in comparison with younger children, older children reported more acts and events low in personal involvement and/or familiarity, and younger children reported fewer acts than older children. There was no overall age difference for act consistency; however, there were age differences for individual events; both groups showed few errors on acts sequence consistency. Temporal terms were used by younger children only when temporal structure was compelling, while older children used temporal terms for all events.

Gruendel and Nelson (1979) investigated the development of event representation and concluded that a more interesting change involves the type of act-sequence structure which can be seen to characterize the children's output. In their analysis, four types of structure categories were identified:

at the simplest level, the child is observed to employ a single act to describe an event. At the next level, the child produces a simple sequence of acts linked by order of mention or by a variety of temporal connectives. Development within this level of structure included an increase in the number of acts mentioned and the explicitness with which temporal order was designated and manipulated. At a somewhat more complex level is the "conditional" structure. An event description is said to fall into this category when one of the following conditions is met: 1) the child employs an "if-then" or a "when" clause to qualify an act; 2) the child specifies that all or certain acts may occur in an alternate order. A final category perhaps more complex than that of the conditional sequence is the act-embedded sequence, in which the child gives verbal evidence that one or more acts are embedded in a hierarchical relation to other acts. The major change in act sequence structure is found to occur in the period from four and a half to six and a half years, and to be characterizable in terms of length of act sequences, decrease in simple sequencing, and an increase in the use of increasingly complex sequential and hierarchical structures. Analysis revealed that while 12.5% of the

preschool protocols contained conditional information, 34% of the six years olds' and 48% of the eight year olds' descriptions were conditional. However, it was noted, these values may actually constitute a rather conservative finding, for the children were not asked to produce conditional information. Perhaps more conditional information would be found at earlier ages if it were asked for directly.

Nelson's work has been instrumental in providing empirical validity to the view that children represent events in a script format, producing generalized accounts of their experience. The significance of the generality of young children's scripts is seen as going against the notion that children are drawing on a store of accumulated episodes that are remembered in detail and from which a more abstract structure is eventually derived. Young children are already categorical in the sense of producing general sequences with examples of what can fill slots. "When a situation is understood sufficiently well that an adequate script has been developed for it, the script user can predict all of the necessary components and has expectations about optional components even when they are not explicitly stated. Those that are not specified in a particular instantiation will be

filled in with default values. That is to say, the user will assume that the standard components apply in this case, whether the missing component is a role-filler, a situation prop or an action." (Nelson and Gruendel, 1981, p. 12).

The developmental research has clarified a number of issues that relate to the acquisition and development of event representational structure. However, how much prior event experience is embedded in a "script" remains unclear. Is all prior event experience incorporated in a script even if not stated? Or, does a script contain repeated experiences only? How does a young child treat an infrequent experience? Is it taken into account and when?

Summary and Relevance of Literature

The studies of event representation in the fields of artificial intelligence, cognitive psychology, and developmental psychology, all converge on certain basic findings that can be summarized as follows: 1) event experience is represented by young children in a script format; 2) the script format organizes particular experiences as well as a group of particulars; 3) scripts are general accounts of experience, and details are omitted in event narratives; 4) non-standard, atypical features of events do not necessarily appear in younger children's event narratives - especially when they are not directly elicited; 5) the schematic representation of events may not be exclusively dependent upon age since adults are also prone to reason according to central tendency or prototypicality effects.

The research on event representation has greatly contributed to the understanding of how children organize and verbalize their everyday experiences. More importantly, theoretical constructions about the evolution of event representation into more abstract structures are in process

(see Nelson, 1986). The author feels, however, that further clarifications are needed on the degree of generality of younger children's scripts as compared to those produced by older children. In effect, Schank has argued for representational formats that use all prior experiences in the interpretation and representation of new experiences rather than a reliance on standard or typical instantiations alone. The evidence suggests, however, that younger children do not spontaneously represent or report deviations, i.e., non-standard or atypical occurrences. One thus needs to know what cognitive abilities a child requires in order to take account of such deviations. The roles of age, nature of task, type of event and language still need to be investigated.

The purpose of this study is to contribute to this understanding.

Although her research was predominantly based on the investigation of object concepts, Rosch's view of natural object categorization, is relevant to the study of event representation in children. The two areas share in common the theoretical interest in cognitive structures, processes, and abilities that underly class-inclusion tasks in general.

And, in effect, prior investigation has demonstrated the existence of general rules and structures for synthesizing all types of concepts. Such general representational structures are referred to as "schemata": "Schemata are data structures for representing the generic concepts stored in memory. They exist for generalized concepts underlying objects, situations, events, actions, and sequences of actions." (Rumelhart and Ortony, 1977, p. 101).

In the present work, two studies were conducted to describe event representational structures at different ages, and to explore some of the factors that account for these structures, such as: experience or familiarity with an event, type of event, task interpretation, and language used.

In recent years, studies of classification and categorization in young children have gone beyond the world of objects to embrace the world of events or action sequences from which object knowledge is derived. Developmental psychologists must in effect fill the gap left by the classical view of categorization on the one hand, and by the empirical view on the other hand, none of which seem to grasp the complexities of the psychological structures and

processes that are involved in young children's categorical thinking.

This study investigates event representation among Haitian children in an attempt to identify the issues presented above. There is no claim here to either universality or cultural specificity. However, psychologists who are interested in cultural comparisons will probably find in here implications for both cultural universals and cultural specificities.

This study aimed to explore event representational structure among children of different age groups. The questions of interest were the following: are older children's event narratives similar in generality to those of younger children? Do younger children take account of frequent or typical occurrences only while older children include in their representations instances that are infrequent, atypical or optional, as well? Are younger children's scripts more skeletal while the scripts of older children are more elaborated and more inclusive? The study was thus primarily of a descriptive nature.

The previous literature had established certain findings that helped to formulate a certain number of predictions as well. For example, it was known that younger children's narratives were shorter, and contained fewer connectives and fillers than those of older children. It had also been found that younger children did not spontaneously report occurrences that contained unusual features. However, age differences in degree of generality were suggestive but not conclusive and needed to be further explicated.

Method

Subjects Twenty-three children from two public daycare centers and a public school in the same neighborhood were interviewed. The age range was 3.6 to 6.6 years old. All the children were of Haitian descent and had been exposed to both English and Haitian Creole in their community.

Procedure All the children were asked: What happens when you come to the daycare center or to school? When necessary, the question was formulated in Haitian Creole. All the narratives were tape recorded and transcribed for analysis.

Scoring Each narrative was analyzed in four major components: 1) actors, 2) acts, 3) connectives, 4) fillers.

Actors Studies by Nelson and her associates have conceived the terms used by children to refer to actors (I, we, you, etc...) in an event, as indicators of the degree of generality of their representations. The pilot study aimed at investigating further the role of choice of pronoun in event structure: an important question was what exactly constitutes the most basic features of event narratives and

whether choice of pronoun was related to generalization.

Acts Four types of acts were identified in the children's narratives: 1) specific, 2) schematic, 3) optional, and 4) conditional. A specific or episodic act is an individual act as experienced in a single instance of a class of events. Specific acts can be carried out by many actors or by one actor. They convey idiosyncratic information and verbs are mostly in the past tense. Examples of a specific act are: "I was crying", "I was sleeping". A schematic or typical act is one that refers to common, frequent actions. These acts can be carried out by the child, a third peson or the whole group. Examples of schematic acts are: "write, I write, we write what day it is", or "play, I play, we play". An optional act refers to a variable action across event instances. In effect, within a class of events, there are similarities and differences among instances, frequent occurrences as well as ones that are only occasional; optional or alternate acts are those that are not as typical but that are nonetheless periodically recurrent actions; they are introduced in child discourse by expressions such as "sometimes", "or". Examples are: "we watch TV sometimes"

(age 6), "sometimes we have snack" (age 5.6). Conditional acts are introduced by "if--then" or "when" and specify occurrences that take place on occasion or under specific circumstances. Like optional acts, conditional ones are not as frequent as the typical acts, but nonetheless may be an intrinsic component of an event. These acts also constitute the defining features of a class of events; despite their atypicality, they are still as relevant to the event as those acts that occur on a regular basis. One example of a conditional act is: "when it's raining, we go to the playroom" (age 5). Another example is: "if the teacher is absent, we sit on the floor and the substitute reads us a story" (age 6.6).

Connectives In order to talk about a class of events, children must be able to represent a sequence of acts and recombine them into a whole, using connective expressions. Acts in an event may be linked by relationships of different sorts: temporal, enabling or causal (cf. Nelson, 1979, 1981). Spatial-temporal or empirical knowledge as well as logical understanding may underly the ability to talk about a succession of acts which compose a class of events. This ability is expressed by the use of linking, or connective

terms such as and, then, and then, after that, when, sometimes, if...then, etc.... The use of those terms indicates that the child is able to organize event experience as an interconnected whole.

Fillers Fillers complement an act, making explicit the actions in events. In grammatical terms, they are verb complements. Besides the fact that some verbs do not take complements (e.g., I sleep, I sit down), children do not always find it necessary to provide fillers in their narratives, especially the younger ones. Fillers can be provided without the mention of examplars such as in: "we have snack" or "we hang up our clothes"; there are also cases when the different possibilities that can fill slots are specified, as in: "when we wake up, we have our snack - I mean juice and crackers, sometimes milk". When variables that can fill slots are reported there is evidence of higher order knowledge or of the construction of event categories within an event representation (see Lucariello and Rifkin, 1985; and Nelson, 1986 for further details).

Results

It was found that children could be classified in three groups: a) the youngest group (3.6 to 4.6) combined actors, acts and sporadic fillers into a fragmented representation. They talked about their day at the daycare center in terms of what they personally did, using the pronoun I predominantly. Only schematic and specific acts were mentioned; few connective terms were used and those children needed probing in order to access acts in succession. These narratives can be designated as fragmented/specific. b) at the second representational level (4.7 to 5.0), the children organized event experience in a schematic narrative. Like the first group, they did not mention acts that occur infrequently or atypically. However, there was a significant progression toward the use of the pronoun We and the verbalization of acts in their succession. More fillers were provided at this level. These narratives can be designated as interconnected/schematic/collective. c) At the third representational level (5.1 to 6.6), the children took into account acts that remain invariant as well as optional and conditional acts that are non-standard. Successive acts were spontaneously connected into a whole and fillers were always

provided. Examples of narratives at different levels are shown in Table 1. Specific components are detailed in Table 2 .

Older children's representational structures for events were found to be highly related to the way in which they treated the odd, or atypical features of event instances as evidenced by the production of atypical, optional and conditional acts above age 5. Examples of the inclusion of optional acts are shown in Table 3. Children who reported atypical actions have more inclusive knowledge, provide more complete scripts and account for the diversity of school days.

TABLE 1

Examples of Narratives at Each Representational Level

Level I

I read a book. I write. I play. Nothing. Write. I sleep. Sit. Go outside. Nothing. (age: 3.4)

Level II

I play. Take off my coat. Play. And then I sit down. We have our lesson. And we have our snack. We go outside. And then we come back and eat. Then we go to bed. And then we wake up. Then we go home. (age: 4.9)

We write what day it is. Then we have playtime. And then we have snacktime. Then we have water. Then the children go home. (age: 4.7)

Level III

We cross off the date, then we hang up our clothing. The teacher calls our rows and then we hang up our clothing. And then we start writing today's news. After that we take out our mathbooks. Sometimes we have snack. And then we take out our notebook and we write (we write certain things you know). And on Fridays we have spelling test and math test and after that the bell rings to have lunch. And then we go downstairs to have lunch and after we do that we do some more work and then she calls our rows to get back our clothing and then we pack our bookbag and we leave. (age: 6.0)

First we watch TV sometimes. And then we eat our breakfast.

TABLE 1 Continued

And after that we play. And then we take our coat and we go outside. And then we come back and have our lunch. And we go to bed. When we wake up, we have our juice, I mean milk and crackers. And then our parents come and pick us up. (age: 6.5)

TABLE 2

Percentage of Event Statements Containing
Different Event Markers

	PRONOUNS				ACTS		CON.	FIL.
Ss	I	We	You	s/he	Schem.	Opt.	(all)	(all)
Schema Level I								
	Age Range: (3.6 - 4.6)							
1	100	0	0	0	100	0	33	50
2	83	0	0	17	100	0	16	84
3	100	0	0	0	100	0	0	13
4	50	0	50	0	100	0	0	40
5	100	0	0	0	100	0	25	60
6	80	20	0	0	100	0	11	12
7	75	0	0	25	100	0	7	77
8	90	0	0	10	100	0	20	70
Mean	84.75	2.5	6.25	6.50	100	0	14.0	50.75
Schema Level II								
Ss	Age Range (4.7- 5.0)							
1	30	70	0	0	100	0	40	70
2	77	0	0	23	100	0	80	75
3	25	79	0	0	100	0	64	86
4	30	66	4	0	100	0	40	86
5	14	86	0	0	100	0	60	63
6	90	10	0	0	100	0	80	91
7	0	94	0	6	100	0	96	76
8	0	80	0	20	100	0	80	100
Mean	33.2	60.62	0.50	5.38	100	0	67.5	79.62

TABLE 2 Continued

Schema Level III

Ss Age Range: (5.1-6.6)

1	0	90	0	10	90	10	100	90
2	100	0	0	0	92	8	75	100
3	10	80	10	0	95	5	60	95
4	46	27	27	0	92	8	76	97
5	33	16	51	0	84	16	25	92
6	10	75	15	0	90	10	75	100
7	7	76	14	3	97	3	40	93
Mean	29.43	52.0	16.71	1.86	91.43	8.57	64.43	95.29

CON= Connectives, FIL= Fillers, Ss= Subjects, Schem=Schematic,

Opt= Optional

TABLE 3

Sentences with Optional Acts

1. First, we watch TV sometimes. (age: 6)

2. I say (sic) Mrs. X good morning. Sometimes I don't say good morning. (age 6.2)

3. Sometimes, Miss Lucas is not here. Sometimes, she is here, sometimes she is not here. (age: 5.1)

4. And then we go to the park. And sometimes, when it's raining, we go to the playroom. (age: 5.1)

5. Sometimes, the teacher says I learn (sic) those kids a song and I paint sometimes on a piece of paper. (age: 5.6)

6. Sometimes we have snack. (age: 5.1)

7. On Fridays, we have spelling test and math test. (age: 5.1)

In contrast, younger children's scripts were found to have a skeletal, schematic or even a fragmented character. Those children classified on the basis of frequency rather than by giving every instance of the category equal value. What developed then is the integration of successive acts into a connected sequence, the addition of slot fillers, and higher inclusiveness in the way acts are reported and slot fillers provided.

Overall, the preliminary study reaffirmed the findings of previous researchers who studied the development of familiar event representation. One major confirmed result was that event structure develops from a schematic account to a narrative in which optional and conditional acts are reported. This finding is in agreement with Schank's (1973) remark about incomplete versus complete scripts that in the restaurant script studied, they had over-simplified the issue as well as arbitrarily decided the kind of restaurant they were dealing with and, that a complete script would have at each juncture a set of what-ifs which would serve as options for the customer if some sequence did not work out. And, other kinds of restaurants could have been accounted for in one script by having choice points in the script.

Similarly, Gruendel and Nelson (1979) conceived the development of familiar event representation as evolving from simple sequences of acts to conditional sequences where children specify alternative acts or order within an event using an "if-then" or "when" clause (p. 21). They also stated that structural complexity and increasing explicitness are important facets of event representation development (Nelson and Gruendel, 1981).

There were, however, some surprising results that were not anticipated in the previous research. The first finding is related to the term used to refer to actors: an age progression was found where younger children (mean age 4) used I predominantly and older ones (mean age 5) used we. You and One were used infrequently even by the older children. This finding was unexpected and contrasted with previous studies which showed that even three year olds referred to actors by using general pronouns such as you or one. It is important to note however, that choice of pronoun may not be a very important feature of event structural representation. Instead, the structure of event narratives may be centered around more basic components such as: type of acts, tense of verbs, presence of fillers and use of

connective terms. Furthermore, task interpretation could very well have influenced the choice of pronoun by the children since the question "what happens when you" could have been interpreted as referring to what the children personally did as well as to what they did together. However, the discrepancy with the results of other studies requires further investigation.

Another surprising result was the significant failure on the part of the youngest children to use connectives to link successive acts. Those children needed extra help to retrieve the information and to interconnect the different parts of events into a whole sequence.

Study I clarified existing knowledge on the development of familiar event representations. More specifically, it helped to identify event representional format in Haitian children aged three and a half to six and a half, and contributed to clarifying important features in event representation for these children such as types of acts, presence of fillers and connectives.

However, many issues were left undecided. First, while it was clear that older children used more connectives and fillers, the differential usage of these components was not

explored. In other words, there had been no attempt to investigate whether older children used different types of connectives and fillers. Second, since a day in nursery school or in school is highly routine, there is a possibility that the results might have been related to this particular type of event. Events of a different type that contain more variability might be represented in different ways. Third, the effect of task interpretation was left open. This could have affected the findings in two ways: Younger children may have used the first person singular because the question was understood as a request to access personal experience. And, the elicitation of infrequent acts was not explicit, making it more unlikely for younger children to produce this information. Finally, an hypothesis that remains to be further explored is language difference: in effect, variation in performance may be related to the use of a different language.

Study II

It is the purpose of the present study: 1) to describe the format for representing familiar events across ages; 2) to investigate variations in the representation of different events; 3) to explore variations that may be due to the use of different languages; 4) to describe the effect of an elicitation procedure. Through the elicitation of more inclusive acts, young children are encouraged to report non-standard , atypical occurrences of event instances.

The present research aims at describing structures and processes of event representation in a group of Haitian children aged 4 to 8. The children come from families who have migrated to the United States and they differ in socio-economic conditions, in race, and cultural practices, from the children studied previously by Nelson and her associates.

Two events were selected for study: the school day, and the after school period. Both events were familiar to the children. Contrasting the results for these two events will allow us to investigate whether representational format, content, or language use, are determined by the objective nature of the event in the real world.

The children were also explicitly asked to report variable acts to determine if younger children differ from older ones because of differences in task interpretation. Finally, the two languages were compared to determine if there is a language effect.

A. Age Effect

On the basis of previous and concurrent research, and the findings of Study I, it was predicted that the organizational format for the youngest children would be less affected by either the elicitation procedure, the type of event, or the language used, since these children's representations are based on acts that are frequent, and are generally less complex and elaborated than those of older children.

Since experience was controlled through the administration of the questions after sufficient exposure to the event, it was assumed that age differences could not be attributable to this variable for any of the children.

B. Effect of Event Type

The children were interviewed about two events: their school day and their after school experience, the underlying assumption being that these two events vary: 1) In the actors involved (in school, a whole group is acting whereas at home, there are only and eventually sibblings, family members, and perhaps, friends), 2) In the actions performed

(in school, the actions are collective whereas at home, actions are performed mostly individually); 3) In action sequencing and temporality, assuming a more fixed routine in school than at home.

Ideally, for the purpose of this study, we would have liked to contrast two events that differ in amount of atypicality to investigate if greater exposure to peripheral instances leads to representational structures that incorporate them. However, since there was no prior determination or measure of differences between these two naturalistic events, it was difficult to predict with precision which variables would be affected.

The previous research reported an age by event type interaction for event with which children have varying amounts of experience, and that varied in type and degree of invariant structure (Nelson, 1986). This study showed that for the younger children, there were fewer significant differences between events.

In the present study therefore, it is predicted that when events in the real world vary in the types of actors, actions, sequencing of and relations between actions, the six

and eight year olds will more likely pick-up the differences than the four year olds.

C. Language Effect

The previous research did not make any predictions about the possible effect of language. Although it appeared in Study I that this variable would not have a significant effect on event structure, the possibility that language could affect the content of the narratives, their length, or the terms selected to express diverse relations, is not however discounted. It is hoped that this study will contribute to defining with more precision the effect of language difference on event representation. In order to appear in the analysis however, a language effect attributable to Haitian Creole would have to be strong since the two languages are not equally represented in the sample (there are four English speakers for each Creole speaker).

D. Effect of Elicitation Procedure

In the previous research, children were often prompted by the interviewers who asked them at the end of their stories: "tell me more" or "did anything else happen?" (see Nelson, 1986). However, there had been no attempt to elicit

atypical acts prior to the present investigation. Since the embeddedness of low frequency acts requires the construction of an event category, it is expected that the elicitation procedure will be less likely to affect the youngest children.

Method

Subjects Fifty-four (54) children aged 4, 6, and 8 participated in the study. Eighteen (18) children were from a Brooklyn public daycare center, and thirty-six (36) from a public primary school in the same neighborhood. Both the daycare center and the school are attended by children from low and low-middle socio-economic backgrounds.

Among the kindergarten children, 8 were girls and 10 were boys. Three children were interviewed using Haitian Creole, having been exposed to English for less than a year. Their average age was 4 years and 6 months and their mean length of utterance in words was 3.7.

Among the 6 year olds, 10 were boys and 8 girls; 5 used Haitian Creole for the same reason. Average age and mean length of utterance for this group were 6 years 7 months and 5.8 words respectively.

Eleven (11) of the 8 year olds were boys, 7 were girls, and 2 used Haitian Creole. The average age was 8 years 7 months and the mean length of utterance was 7.3 words.

Overall, the ratio of English speakers to Creole speakers is 4 to 1.

Design and Procedure

The children were interviewed individually by the author on one occasion each. The interviews took place in a quiet room in the daycare center and the school. The children were asked to report on two events: a day in school and after school time. Although they reported on two different events, it was possible that the way in which the children communicated and structured the first event might affect the linguistic content and organizational format of the second. To control these possible effects, half of the children were asked the school question first, and half were asked the after-school question first.

The interviewer formulated the question as follows: "What happens when you come to school", and "what happens when you go home after school". Encouragement was provided to the children by saying: "and then, what happens". After the production of each narrative, an elicitation procedure was introduced in which the children were asked: "Tell me what happens sometimes or once in a while".

The children who were not fluent in English were allowed to use Haitian Creole. Lack of fluency was determined by

teachers' reports of language scores on standardized test. Apart from the language used in reporting the two events and the length of stay in the U.S., the Creole speakers were similar in other respects to the English speakers. The Creole speakers had been in the U.S. less than three years and the English speakers had either been born in the U.S. or had resided there over 3 years. Exposure to the school environment was controlled through the administration of the question in the Spring semester, thus allowing sufficient exposure for both Creole and English speakers.

Interview time lasted eight minutes for each child on the average. These eight minutes included a brief warm-up period to put the child at ease. The children were all interviewed in the Spring and were all familiar with the two events.

All interviews were tape-recorded and transcribed for analysis.

Coding

One hundred and eight (108) protocols were coded. The narratives were first broken down into their component propositions.

A model proposition includes an actor (or pronoun), an act (or verb), a connective (or conjunction), an act specification (or verb complement). Any of these elements but the act can be omitted from a proposition. In other words, a proposition could be any of the following:

Elements	Examples
Connective/actor/act/act specification/	"And we eat lunch"
actor/act/act specification/	"we eat lunch"
Connective/actor/act/	"And we eat"
Actor/act/	"we eat"
Connective/act/act specification/	"And eat lunch"
Act/act specification/	"eat lunch"
Connective/act/	"and eat"
Act	"eat"

Actors or pronouns can be first person singular (I), third person singular (s/he or third party), third person plural (they or other parties), first person plural (we), or collective (you, one).

Acts or verbs can be episodic (anecdotal, idiosyncratic actions), typical (frequent actions), atypical (infrequent actions), conditional (specifying an alternative action that could occur in the same time frame).

Act specifications or verb complements can be unspecified (when the object of action is not specified), simple (when the action is specified by a one or two word utterance); elaborated (when the action is specified by a relative or a compound verb phrase); embedded (when the object of action is further defined by a list of possibilities).

Connectives are linking terms or conjunctions that express the following meanings: succession (and, and then, then, after that), temporality (when), frequency (sometimes, usually, once,), conditionality (when, if...then), precedence (first, before, after), consequence (so, so...that), option (or), restriction (but), and, causality (because).

The inteviews were independently coded by two persons who achieved 95% agreement after discussion.

The results section examines the narratives produced by Haitian children aged 4, 6 and, 8 for school and after school events. It was expected that younger children would differ from older children in the number of propositions, use of first person singular versus referral to others, the number of atypical, conditional, and optional acts, the occurrence of potential slot fillers, and in the relationships between propositions such as expressions of temporality, frequency, conditionality. It was also expected that the two event contexts, school and after school, would produce differences in narrative structure both within and between age groups. Further, it was expected that direct questioning of the children would elicit more atypical acts.

There were no discernible effects of question order or language. These two factors were not considered further and the groups were combined for analysis.

Data analysis examined the effects of age, event type and, questioning procedure on narratives for familiar events.

Analysis of Event Type, Age, and Procedure:

1. Number and Length of Propositions. The totals and mean number of spontaneous and elicited propositions by age for

school and after school events are provided in tables 4 and 5 and, mean length of utterances in words for both events is presented in table 6. The 6 and 8 year olds produced longer narratives (more propositions) for the school event than for the after school event. This might be expected in that the school day occupies most of the children's waking hours and also provides a series of varied events. There was little difference between events for the 4 year olds.

2. Actors/Pronouns. The mean percentages of pronoun use are shown in Table 7 by age and event type. Here it can be seen that there was differential use of the first person singular (I) referring to self as actor and the first person plural (We) referring to action by a group inclusive of self, by both age and event type. As shown in the table, the 4 year olds made little distinction between events in the use of I, whereas the 6 and 8 year olds were highly differentiated. They used We about 2/3 of the time for the school event , and I about the same amount for the after school event, reflecting the different social contexts of the two event settings. The 4 year olds used I and We about the same amount for the school event (45% and 40% respectively)

As can be seen in Table 7, children at all ages used

TABLE 4

Number of Propositions by Age, Event, and Procedure

Age Groups		School			After School		
	N	Spont.	Elic.	Total	Spont.	Elic.	Total
4	18	108	42	150	90	37	127
6	18	197	132	329	113	109	222
8	18	209	88	297	126	87	213
Tot	54	514	262	776	329	233	562

Grand Total 1338 propositions (spontaneous and elicited)

Table 5

Mean Numbers of Propositions in Narratives

		School			After School		
Age	N	Spont.	Elic.	Total	Spont.	Elic.	Total
4	18	6.0	2.2	8.2	5.1	2.1	7.2
6	18	10.9	7.3	18.2	6.2	6.0	12.2
8	18	11.7	4.8	16.6	6.4	4.8	11.2

Spont= Spontaneous Propositions, Elic=Elicited Propositions.

Table 6

Mean Length of Utterance

by Age and Event

Age	N	School	After School
4	18	3.7	3.5
6	18	6.0	5.6
8	18	7.6	6.7

first person references overwhelmingly, rather than 2nd or 3rd person (You, He, She, They). The infrequent use of You differs from previous reports of similar research (e.g. Nelson & Gruendel, 1981), in which this pronoun was relied on extensively, and was taken to indicate children's report of a general or normative event representation. There is no evident explanation for this difference between samples. When children in this study used You, it was used consistently within a narrative as shown in the examples in Table 8.

3. Verb Tense. In all three age groups, the children overwhelmingly (92% or more across ages and conditions) used the present tense rather than the past. Use of the present tense has generally been found to be characteristic of children's script reports (Nelson & Gruendel 1981); thus, the present results are generally in accord with prior research. However, the percentage of present tense usage is even higher than that generally reported.

4. Act Types/Verbs. The mean percentages of acts by age, event type, and questioning procedure are provided in table 9. In all three age groups, the children reported few episodic, conditional and, optional acts. Children at all ages used

Table 7

Mean Percentages of Pronominal Reference
(Spontaneous and Elicited Utterances)

AGE	N	FPS	TPS	TPP	FPP	SPP	TOTAL
School Condition							
4	18	45	8	2	40	5	100
6	18	16	16	1	64	3	100
8	18	18	8	4	66	4	100
After School Condition							
4	18	50	20	2	12	16	100
6	18	65	15	0	16	4	100
8	18	75	9	4	12	0	100

FPS= First Person Singular; TPS= Third Person Singular
TPP= Third Person Plural; FPP= First Person Plural;
SPP= Second Person Plural.

Table 8

Consistent Use of You by Some Children

You eat and after you eat you finish your milk and you go to bed, go to sleep, eat your food, eat your dessert and you go to bed. (girl, 4.6).

You play and you go to sleep you wake up you eat your snack and your drink your milk and your mommy come to pick you up. (girl, 4.7).

You play and you sit down and you eat your food and you eat your chicken first, you watch tv, and we play and we go upstairs and you play with the toys and you go to sleep (ibid).

You eat then you have to tell your mommy you have homework and you have to go to bed and if you hang out the window you're going to fall out (boy, 6.11).

We have to do classnews and then if you finish before, you can take a book and read and when the teacher is ready, she tell you to read the cards. Sometimes you do tictactoe and then we do our goal book and when we finish doing the goal book work we take out our homework book and we put in our homework then some of us might want some water we get some water and we can do some more work and then we have snack and then we go home (girl, 6.11).

Each morning we come to school we have to do work and after you finish your work you have to do the math rexo then after that you let your teacher check your math and the teacher check our homework and then we start doing the class news after that we get more books to write in and then we read a story after that we have to find the second dictionary and after that I finish all my work and after that I watch the blackboard and then after that I sit on my desk and I hold my head (boy, 8.8).

Table 9

Mean Percentages of Spontaneous Acts

Age	N	Epis.	Typ.	Atyp.	Cond.	Opt.	Total
School Event							
4	18	4	95	1	0	0	100
6	18	10	84	3	2	1	100
8	18	1	70	23	5	1	100
After School Event							
4	18	7	90	3	0	0	100
6	18	5	80	8	5	1	100
8	18	0	84	14	2	0	100

Mean Percentages of Elicited Acts

School Event

Age	N	Epis.	Typ.	Atyp.	Cond.	Opt.	Total
4	18	7	25	56	12	0	100
6	18	4	32	64	1	0	100
8	18	8	18	72	1	0	99

TABLE 9 Continued

After School Event

4	18	2	20	64	14	0	100
6	18	3	21	76	0	0	100
8	18	3	4	92	1	0	100

Epis.= Episodic Acts; Typ.= Typical Acts; Atyp.= Atypical Acts; Cond.= Conditional acts; Opt.= Optional Acts.

typical acts overwhelmingly across event types and conditions. However, the 4 year olds' narratives contained proportionately more typical acts than those of the 6 and 8 year olds. (percentages for the two events and the three age groups are respectively 95% and 90%, 84% and 80% and, 70% and 84%). Inversely, atypical acts were referred to in higher proportions by the oldest children: 23% for the school event and 14% for the after school event among the 8 year olds; 2% and 5% among the 6 year olds; 1% and 3% among the 4 year olds. Between event differences were small for all the children.

These results are in agreement with previous reports (see Nelson, 1986) in which acts that recur across event instances formed the core of actions reported by the children.

The children were all able to access acts that occur infrequently when they were explicitly asked to do so. They all responded positively to elicitation reporting more atypical acts than were produced without this procedure. As can be seen in table 10, the 8 year olds who were already reporting proportionately more atypical acts spontaneously were also the ones to mention them in higher proportions with direct questioning. Within events comparisons reveal that atypical acts are reported proportionately more for the after

Table 10

Effect of Elicitation Procedure

Percentages of Atypical Acts in Elicited Propositions

		School		After School	
Age	N	Spont.	Elic.	Spont.	Elic.
4	18	1	55	3	62
6	18	3	64	8	76
8	18	23	72	14	92

school event; however, no inferences are made from this difference since when the children were probed to produce acts that occur only sometimes, they also reported acts that were classified as typical - although to a much lesser extent than when they were spontaneously evoking these two event types . This was particularly true for the after school event where acts such as "watching TV" or "playing" were mentioned as occurring only sometimes by some children. There were thus instances in which it was difficult to distinguish what is an atypical act in this event type and, therefore, these results are not considered in this analysis. (Table 11 provides examples of low frequency acts reported in the school event).

5. Connectives and Conjunctions. The children relied on a variety of connectives and conjunctions to express relations between propositions. These relationships conveyed meanings of concurrence (and), simple succession (and, and then, after, after then), temporality (when), frequency (sometimes, once), conditionality (if...then), precedence (before, first), consequence (then), restriction (but), and, causality (because). It can be seen from Table 12 that the children used connectives that express relations of

Table 11

Examples of Low Frequency Acts
for the School Event

Atypical Acts

Sometimes the boys do bad stuff (4.10)

Sometimes the kids don't want to stay still.(4.11)

Sometimes we have to wait a little while and then the flag comes on. (6.0)

Sometimes I go to the park. Then I have playtime. (6.5)

Gen de fwa l} nou sot nan lunch nou fin manje, nou al' deyo. Apre,gen de fwa l} nou fin manje nou al' nan twal}t, apre nou al' nan klas la.

(English: sometimes, after lunch, when we finish eating, we go outside. Sometimes when we finish to eat we go to the bathroom, after that, we go to the classroom (6.6).

Sometimes we work in our mathbook, we do science, religion. Sometimes we write slanted letters and we do reading in the library.(6.10)

Sometimes I might go home alone because it's around the block.(6.11)

Sometimes we do something different. Sometimes we have art. Sometimes we go to the gym.(8.0)

Sometimes we do math and sometimes we correct homeworks. Mr. M. lets us draw in class sometimes and sometimes we do Christmas cards and after sometimes we go out on trips or we go to the park and sometimes we have parties.(8.5)

Sometimes we do French. Sometimes we have art and Science. Sometimes we have to go upstairs to do math. Sometimes we go to science and to gym, like yesterday we went to the gym and

fights and we have to call the teacher, she has to come and stop the fight. Sometimes, when we are in school, we don't have any friends to play with, they all want to play with big kids and I have to play with other kids.(8.6).

Sometimes when we finish doing our work, he lets us draw in our notebook. Sometimes we go to music. Sometimes I get a little bad.(8.7).

Almost every day, she reads us about Jury Duty. Each day we do our math. Every Thursday our art teacher comes and do art with us.(8.7)

Sometimes I do my classnews then I play a game (8.8).

Sometimes the class is bad. Sometimes the teacher is there and he gives us a lot of punishment.
Sometimes there is a fight in the class and the teacher has to stop and call Mr. X.(8.9)

Sometimes I get to school late because I take the bus with my mother. Once in a while he (the teacher) comes to see if I am there and then he lets me in the class. Sometimes some of the children and me sneak upstairs. Sometimes I go to the store. Sometimes I go outside and play with my friends (8.9).

Sometimes I get into a fight. Sometimes I be jumping people. Sometimes I sit down in my class and do work. Sometimes I do my homework at home. Sometimes I go to my father's house.(8.10)

Sometimes the teacher forgets to do the math classwork. Sometimes she forgets and we have to go to the auditorium. Sometimes I get into fights and people talk in class and people come in to visit.(8.11)

Sometimes Mr. M. comes. Sometimes he comes so we have science. Sometimes he brings books so we could read. When we finish sometimes we make a lot of noise. Sometimes we get the commendation cards.(8.11).

TABLE 11 Continued

Conditional Acts

After she gets our books, if you did it wrong you get a check, if you did it right you get a star... we have a movie or we go outside (6.0).

I usually go to the daycare...We read a book or color...On Fridays we play with table toys. If we don't be good we don't play with table toys...If your parents come to pick you up late, that's okay with them...When it's summer, we go upstairs on the roof (6.3).

Si'm pa f} devwa mwen, mwen leve nan maten mwen f} devwa m' anvan m'al' lekol (English: If I don't do my homework, I wake up in the morning I do my homework before I go to school) (6.5).

If you don't do your homework, you get a "U'. (6.7)

If my friends want to play with me, I play (6.10).

If you be bad, you go to the principal's office.If you hit somebody you stay in the corner. If you bring candy to school your teacher will tell you to put it in the garbage. If you bring toys in school your teacher will take it away and she will give it back to you at 2:00 o'clock. If you be good you get a pretzel to take home and you get a lullipop. If you're sick you have to stay home. If you throw garbage in your classroom your teacher will tell you to pick up the garbage. If you make a mess at your hourse your mommy will tell you to clean it up and you could go outside (6.11).

We have to do our classnews and if you finish before you can take a book and read (6.11).

I wait for my teacher. If my teacher is not here, I stay in line (8.2).

Si nou gen devwa pou nou f}, nou f} devwa nou. (English: if we have homework to do, we do our homework). (8.5).

TABLE 11 Continued

Sometimes the train has problems. So if your uncle come and pick you up it will be better...when the library is closed, we go straight home...If we go straight home, we get home at 5:00 o'clock. (8.5).

If you want, you get a pass to go upstairs early... and we do our word like match or reading or science. (8.8).

...when I am late, my teacher let me stay outside in the hallway...when I come in early, the teacher let me stay in. (8.10)

Optional Acts

You go to music, you see somebody dancing or you're on the stage, you're singing. (8.6)

...we do math or reading... (8.9).

Table 12

Mean Percentages of Connectives and Conjunctions

Age	N	C	S	T	F	C	P	C	O	R	C	TOT
School Condition												
4	18	8	64	5	16	7	0	0	0	0	0	100
6	18	8	65	10	10	6	0	0	0	0	0	100
8	18	10	36	21	26	2	1	0	1	1	1	100
After School Condition												
4	18	18	35	10	27	8	1	1	0	0	0	100
6	18	12	50	10	15	6	4	2	0	1	0	100
8	18	10	36	21	26	2	1	0	1	1	1	100

C= Concurrence; S= Succession; T= Temporality; F= Frequency C= Conditionality; P= Precedence; C= Consequence; O=Optionality; R= Restriction; C= Causality.

precedence, consequence, optionality, restriction and, causality in about the same proportions. The 6 and 8 year olds expressed more temporal and frequency relations than the 4 year olds. However, these productions were few and thus do not permit to conclude to a developmental course in the usage of these relational terms.

6. Slot Fillers/Verb Complements. The mean percentages of the fillers provided by the children are presented in Table 13. In some instances (such as in I eat), the action was left unspecified and no slot fillers were reported. In other cases, simple verb complements specified the action (such as in I drink milk) and, finally, different possibilities that can fill slots may be mentioned (such as in: I eat snack, cookies or pudding). The results show that a greater proportion of actions are specified by the older children.

Embedded slot fillers were of two sorts: in some instances, the children first mentioned a general act, then after, gave instantiations of those acts such as in: I play, I play puzzles, I play pegs. In other instances, the children only mentioned subordinate acts without mentioning the general act such as in: we cut, we draw, we color, which refer to art work. About the same proportion of the children used

Tables 13

Mean Percentages of Fillers

Age	N	Unspecified	Simple & Elaborated	Embedded	Tot
School Condition					
4	18	46	53	1	100
6	18	23	76	1	100
8	18	15	83	2	100
After School Condition					
4	18	27	71	2	100
6	18	20	80	0	100
8	18	17	83	0	100

embedded slot fillers in the three age categories (38% of the 4 year olds, 44% of the 6 and 8 year olds). This result is indicative of an early grasp of the various possibilities that can fill slots. (See Table 14 for examples).

The above findings are in agreement with previous research which reported the usage of more elaborated propositions by older children and an early awareness of slot fillers possibilites by young children.

In summary, the proportions in which the children referred to 2nd and 3rd persons as agents of actions, present and past tenses, episodic, typical, conditional, and optional acts, relationships between propositions and embedded slot fillers were about the same across ages, and event types. Furthermore, in all three age groups, elicitation resulted in the retrieval of a much higher proportion of atypical acts.

Differences among the children across ages and between events were as follows: younger children made no differentiation between the school and the after school event The 4 year olds focused on individual actions to the same extent in both events while the 6 and 8 year olds mentioned collectively shared actions in the school situation and individual actions in the after school context. There was a

greater degree of focus on atypical acts both spontaneously and with elicitation on the part of the 8 year olds, and they mentioned simple and elaborated slot fillers more.

Table 14

Examples of Embedded Acts

I play. I play puzzles, I play pegs.
I eat. I eat spinach, I eat vegetables (4.2)

I do works. Writing my name, do my big ps, small ps, big rs, small rs (4.3).

I play teacher I play He-Man (4.4).

Nou manje sereyal, av}k makaroni, av}k spageti (English: we eat cereal, with (sic) macaroni, with (sic) spaghetti (4.5).

I play with my toys, my truck, my car (4.10).

We cut, we draw, we color (4.10).

Sometimes my brother is not nice to my sister- he hit her and punch her so she tell pappy...Sometimes my cat be nice to me - everytime he wants to go outside to play and he tries to make a snow man (4.11).

I eat potato chip, I eat spaghetti (6.2).

Nou rantre pou nou gad' movie - pou nou gad' cartoons ak movie (English: we go home to watch movies - to watch cartoons and movies) (6.2).

Play I play ball go to the park swing...play baseball, basket ball (6.5).

I work in my notebook - math, reading, phonics - (6.5).

Ou konn al jwe - ou konn al jwe boul (English: sometimes you go play - you go play ball) (6.8).

And we start doing a lot of stuff - we start doing math, we start playing with toys, we start playing a game (6.10).

At night, I watch Different Strokes, Give me a Break...take a piece of paper and cut it, and play with clay (6.10).

TABLE 14 Continued

Play hide and go seek with my sister, play in my dollhouse, play with games (6.11).

In the morning we do French and some children might do English (8.6).

Apre, nou f} adisyon, nou f} milliplikasyon (English: after that, we do additions, we do multiplications) (8.11).

And I go to my seat and do works - substract, timetable, add - (8.2).

And the second graders do math - plus, take aways and all those things (8.5).

You go to music - you see somebody dancing or you're on the stage, you're singing (8.6).

Sometimes we go to science and to gym, like yesterday we went to the gym and we had a race and we had to run fast (8.6).

When we get in the classroom we wash the board and sweep the floor and put down the chairs, and do our work like math or reading or language (8.8).

Sometimes I be bad and I have to stay home. Like yesterday, I couldn't go out because my cousin got me in trouble and then my mother she made me take my bath and I had to go to bed right away (8.7).

CONCLUSION

Building Event Categories

These studies demonstrated in younger children an early ability to represent and narrate action sequences omitting details and the report of anecdotal information. Relations between propositions, although many times skipped, included relations of succession and temporal relations, and occasionally frequency relations. Study II also revealed that very young children are aware of various slot filler possibilities. These children also demonstrated an early ability to generalize and to transcend and coordinate specific spatial contexts and time references.

These achievements represent developmental continuities which imply the availability of the cognitive processes for schematic organization in very young children. This early schematic representation ability has been previously documented in the developmental literature (Piaget, 1962; Inhelder and Piaget, 1959; Inhelder, Sinclair & Bovet, 1974).

Piaget (1962) mentioned that from age 2, the child uses pre-concepts (or schemas) which are a beginning of generalization: a child of this age does not have a fixed

definition of concepts; an instance of a class is for this child a prototype which represents all the others. Children have schematic representations which are half-way between the individual and the generic.

But, according to Inhelder and Piaget (1959), in order to truly generalize, children must be able to go beyond the prototypical notion of a class: subjects must give definitions of a class in terms of a more general class (intension), and they must handle class extension in accordance with the structure of inclusion as evidenced by the mastery of quantifiers such as all, some, one, and none. Subjects must also be able to understand that each element belongs to both a sub-class and a general class (Inhelder, Sinclair, & Bovet, 1974).

In relation to the representation of a class of events, this theory means that in order to have a categorical representation of events, all event instantiations -- including those of low frequency -- must be incorporated in the event representation, or to paraphrase Schank (1982): at some point, every deviation from the standard script must be stored as a modification of initial information, thus allowing for the use of all prior experiences in the interpretation of new

experiences, rather than a reliance on only standard, normalized experiences.

Both previous and present data indicate that the 4 year olds do not yet meet these criteria. The studies presented here provided evidence of an increasing ability on the part of six and eight year olds to incorporate variable event instantiations, even those that are not prototypical, into their representations. These children are also better able to reflect differences in real world events and they are more receptive to cognitive intervention through the elicitation procedure than are the four year olds. However, Study II also showed that a complete and automatic generalization, that would include all prior experiences and peripheral instances, is not found even among the older children of our sample. The difficulty in representing atypical and conditional acts may be explained by the fact that real world experience constrains the number of times these acts occur, thus making them less probable, less salient and less necessary in a standard representation, especially for the youngest children. The elicitation procedure proved that for all the children, the information is not forgotten. However, in order to be recalled spontaneously, more specific cues are required.

Although cueing had the same effects in the three age groups - that is, it enhanced retrieval of information- there was a developmental difference in the magnitude of the effects.

It appears that language development, the nature of real world events, and explicit cognitive cueing, are factors that play a role in allowing older children to have representations that come closer to the ideal. However, the study demonstrated that a complete (logical in Piaget's words) generalization - as proposed by Piaget and Schank - is not found even among the older children of our sample. Although there was evidence of improved generalization with explicit request, event representational structure appears to be unbounded and unfixed, especially in early childhood, but also in middle childhood.

Appendix

Mean Numbers and Percentages of Pronominal Reference (Spontaneous and Elicited Utterances)

Pronouns	School		After School	
4 year olds (N= 18)	#	%	#	%
First Person Singular	2.27	45	2.16	50
Third Person Singular	.44	8	.88	20
Third Person Plural	.11	2	.11	2
First Person Plural	2.05	40	.50	13
Second Person Plural	.27	5	.66	15
Total	5.14	100	4.31	100
6 year olds (N=18)				
First Person Singular	1.77	16	4.22	65
Third Person Singular	1.77	16	1.05	15
Third Person Plural	.11	1	.00	0
First Person Plural	6.66	64	1.11	16
Second Person Plural	.33	3	.33	4
Total	10.64	100	6.71	100
8 year olds (N=18)				
First Person Singular	2.55	18	5.83	75
Third Person Singular	1.22	8	.72	9
Third Person Plural	.50	3	.33	4
First Person Plural	9.22	67	.94	12
Second Person Plural	.61	4	.00	0
Total	14.1	100	7.82	100

Mean Numbers and Percentages of Verb Tenses
(Spontaneous and Elicited Propositions)

Verb Tenses	School		After School	
4 year olds (n=18)	#	%	#	%
Present	5.72	98	4.38	92
Past	.11	1	.22	4
Other	.05	0	.22	4
Total	5.88	100	4.82	100
6 year olds (N=18)				
Present	10.83	98	6.66	98
Past	.00	0	.00	0
Other	.16	1	.16	2
Total	10.99	99	6.82	100
8 year olds (N=18)				
Present	13.88	96	7.66	97
Past	.27	1	.11	1
Other	.27	1	.11	1
Total	14.42	98	7.88	99

Mean Numbers and Percentages of Acts
(Spontaneous Propositions)

Acts	School		After School	
4 year olds (N=18)	#	%	#	%
Episodic	.27	4	.38	7
Typical	5.33	95	4.55	90
Atypical	.11	1	.16	3
Conditional	.00	0	.00	0
Optional	.00	0	.00	0
Total	5.71	100	5.09	100
6 year olds (N=18)				
Episodic	1.05	10	.38	5
Typical	8.50	84	5.27	80
Atypical	.16	2	.30	8
Conditional	.22	2	.38	5
Optional	.16	1	.11	1
Total	10.09	99	6.64	100
8 year olds (N=18)				
Episodic	.22	1	.00	0
Typical	8.33	70	6.27	84
Atypical	2.61	23	1.00	14
Conditional	.72	5	.22	2
Optional	.16	1	.00	0
Total	12.04	100	7.49	98

Mean Numbers and Percentages of Acts
(Elicited Propositions)

Types of Acts	School		After School	
4 year olds (N=18)	#	%	#	%
Episodic	.16	7	.05	2
Typical	.55	25	.38	20
Atypical	1.22	55	1.16	63
Conditional	.27	12	.27	14
Optional	.00	0	.00	0
Total	2.2	99	1.86	99
6 year olds (N=18)				
Episodic	.27	4	.16	3
Typical	1.83	32	1.11	21
Atypical	3.66	62	3.88	75
Conditional	.05	0	.05	0
Optional	.00	0	.00	0
Total	5.81	98	5.24	99
8 year olds (N=18)				
Episodic	.38	8	.16	3
Typical	.83	18	.16	3
Atypical	3.27	72	3.94	92
Conditional	.05	1	.05	1
Optional	.00	0	.00	0
Total	4.53	99	4.31	99

Mean Numbers and Percentages of Conjunctions
(Spontaneous and Elicited Propositions)

Conjunctions	School		After School	
4 year olds (N=18)	#	%	#	%
Concurrence	.22	8	.61	18
Succession	1.88	64	1.11	34
Temporal	.16	5	.33	10
Frequency	.50	16	.94	27
Conditional	.22	7	.27	8
Precedence	.00	0	.05	1
Consequence	.00	0	.05	1
Option	.00	0	.00	0
Restriction	.00	0	.00	0
Causality	.00	0	.00	0
Total	2.98	100	3.36	99
6 year olds (N=18)				
Concurrence	1.11	8	1.00	12
Succession	8.05	63	3.72	50
Temporal	1.11	8	.77	10
Frequency	1.27	9	1.16	15
Conditional	.88	6	.50	6
Precedence	.11	1	.33	4
Consequence	.05	1	.22	2
Option	.05	1	.05	0
Restriction	.05	1	.11	1
Causality	.05	1	.00	0
Total	12.73	99	7.86	100

8 year olds (N=18)

Concurrence	.50	3	1.05	10
Succession	6.55	52	3.61	34
Temporal	2.33	18	2.22	22
Frequency	2.22	17	2.72	26
Conditional	.50	3	.27	2
Precedence	.05	1	.16	1
Consequence	.16	2	.05	0
Option	.27	3	.11	1
Restriction	.05	1	.11	1
Causality	.00	0	.16	1
Total	12.63	98	10.46	98

Mean Numbers and Percentages of Fillers
(Spontaneous and Elicited propositions)

Types of Fillers	School		After School	
4 year olds (N=18)	#	%	#	%
Unspecified	2.27	46	1.33	27
Simple & Elaborated	2.60	53	3.43	71
Embedded	.05	1	.11	2
Total	4.92	100	4.87	100
6 year olds (N=18)				
Unspecified	2.33	23	1.22	20
Simple & Elaborated	7.27	75	5.11	80
Embedded	.16	1	.05	0
Total	9.76	99	6.38	100
8 year olds (N=18)				
Unspecified	1.44	15	1.22	18
Simple & Elaborated	8.38	83	5.66	82
Embedded	.22	2	.05	0
Total	10.04	100	6.93	100

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