Time, tense and aspect

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Abstract

The present paper investigates the use of French verbal forms by children between the ages of 2.11 and 8.7. An experiment is presented demonstrating that these Ss do not only use tenses to indicate the relationship of posteriority, anteriority or simultaneity between the events described and the moment of enunciation, but that aspectual factors intervene. Seventy-four subjects were asked to describe eleven actions performed by the experimenter with toys; these actions differed in: Type of result, frequency and duration. For all subjects the type of result influences the choice of the verb forms. More objective features (frequency and duration) exert an influence between the ages of 3 and 6; after that age, the use of tenses begins to resemble adult usage in which the different verb forms are mainly employed to express temporal relationships. Other aspectual and temporal markers show a similar development with age.

Recently the study of language has acquired new epistemological importance, since it has become widely accepted that every problem of language use and acquisition is a problem of cognition as much as of the mastery of verbal expressions. Experimental work on psycholinguistic problems is often done from a particular epistemological point of view, and to clarify our own theoretical position a few general remarks seem to be in order.

The basic assumptions underlying our psycholinguistic research have been mainly derived from Piaget's theory of cognitive development and may be briefly stated as follows:

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1) Starting from isolated action-patterns, more and more general coordinations are achieved, first on the level of pre-verbal practical intelligence, then on the level of intuitive thought, followed by a first period of thought operations based on a logically coherent, but still limited, system and later on the level of hypothetico-deductive thought.

2) These action and thought patterns have two aspects as far as the knowledge resulting from them is concerned. On the one hand, any particular action (perceptual, manipulatory or mental) can lead to better knowledge of the outside world, i.e., about properties of objects and their interactions. On the other hand, the coordinations of action and thought patterns have certain general characteristics, leading to reversibility, transitivity, commutativity, etc. These general features, not of the patterns themselves, but of the ways in which they can be combined, are the source of logico-mathematical knowledge, of the structure of the conceptual framework that permits coherent mental computations. The development of these two complementary aspects is itself contrastive and complementary. In fact, logical operations are more powerful the more general they are, whereas knowledge of object properties is more powerful when it is more specific. Classificatory patterns that can deal with the characteristics common to one class are less powerful than those that can deal with relationships between classes. By contrast, to know that some objects are ‘throwable’ and others are not is a less powerful physical concept than that of weight or that of density, which are more specific.

3) Verbal patterns are constructed in close connection with cognitive development (though certainly their construction cannot be reduced to cognitive development alone). Language proper starts after practical intelligence has reached both a certain level of knowledge of object-properties (e.g. their ‘retrievability’ as in Piaget’s object-permanency task) and a certain level of action-patterns (the recapitulation and coordination of the different movements by which the object was hidden in the same task). What permits the child of whatever culture to start language acquisition is the fact that he disposes of this heuristic model, which leads him to approach the data in a certain manner, and the fact that every language belongs to a class of possible languages, these similarly being determined by universal characteristics of the human mind.

4) During the first period of language acquisition the child elaborates the most fundamental grammatical relationships (apparently universal, cf. Slobin, 1973) as they are reflected in his mother tongue. After the elaboration of these fundamental grammatical relationships, the particularities of the mother tongue become more important. As happens with other cognitive acquisitions, morpho-syntactic patterns may at first form isolated totalities, applicable only to certain sentence-types. The treatment of flexions, desinences, etc., present in the mother tongue, demands a cognitive activity of pre-inferences and inferences, which depends on the child’s cognitive competence. Nevertheless, languages can present systems of very different complexity to express the same relationships; as Slobin (1973) remarks, the linguistic means can be extremely complex and the relationships expressed simple (such as the Arabic plural system, cf. Omar, quoted by Slobin, 1973); other linguistic sub-systems, though structurally simple, are used to express complicated relationships (such as logical implication or quantitative concepts).

5) As his cognitive competence grows, the child will make hypotheses about the meaning of linguistic features he encounters in adult speech. However, when he starts producing these features, one cannot conclude that his idea about their function conforms to the function these features present for adult speakers. Even when he ‘understands’ utterances comprising such features in everyday conversation (which is always underpinned by pragmatic and situational data) and even if he produces them in grammatically correct sentences, the child may very well have ‘understood’ them in a different way from the adult, a fact that can only be brought to light by careful experimentation. An example of this last point is provided by the way young children use the French verb system.

In several experiments we observed that young children seem to use French conjugation in a rather peculiar manner, even though at a very early age (three, or even before) most of the frequently used forms are morphologically correct. Observational records show present, past and some future tenses (cf. Grégoire, 1947); the absence of lesser-used forms such as pluperfect or preterite future need not surprise us. In experimental production tasks (description of certain events), however, we noted that children had a preference for certain tenses with certain verbs; e.g., they almost always said il *lave* la voiture (‘he is washing the car’) and *il a poussé la balle* (‘he kicked the ball’), though the description was always requested after the event had taken place. We also noted that in the description of simple events younger children seemed to single out different features from those most frequently described by older children. Three-year-olds, for example, after having been shown a red truck pushing a green car, would say ‘there’s a green car’; slightly older subjects were fond of announcing ‘there’s something wrong with the car’ or ‘the car is in the garage’. Such differences did not surprise us unduly; obviously any event has many features that can be chosen for description, and according to age and familiarity with the situation one of them may be much more interesting than another. The choice of specific linguistic means to describe the event, particularly the apparently deliberate choice of certain tenses, is more surprising.

The French verb-system is complex and provides the speaker with a choice of tense, voice and mood. No neutral form of the verb exists (in contrast with some other languages); a choice always has to be made among the different verb endings
possible, and this choice almost always implies the indication of temporal relationship (i.e., the speaker indicates the temporal relation between several events or between the moment of utterance and some event). By contrast, what are called aspectual functions are only rarely, and never obligatorily, expressed by verbal forms.

Time and aspect have been traditionally considered as constituting two distinct categories, the first accounting for relations of anteriority, posteriority and simultaneity, and the second being variously described as 'accounting for relations of the type perfective-imperfective' (Meillet, 1922) or 'expressing temporal contours of actions' (Hockett, 1958). Aspect comprises several distinctions (durative versus non-durative, perfective versus imperfective, etc.).

Adult speakers of French use verb endings almost exclusively to express temporal relationships; the latter can, of course, also be expressed by many other means. Aspectual shadings are introduced by adverbs, adverbal locations, and, up to a point, also by certain verbal forms, such as finir de, être en train de, and certain uses of the passé simple and the imparfait. However, the specific temporal function of these endings (which allows native speakers to start a sentence with a temporally posterior event and finish it with an anterior event while still making the correct succession clear) is not established until relatively late, as has been shown by Ferreiro (1971).

If the role of tenses as indicators of temporal relationship between events only begins to be apprehended from the age of six onwards, what is their role before that age? Do they belong to the deictic category (linking the description to the moment of utterance) before they can be used to indicate the temporal link between two propositions? Or are these tenses used more or less haphazardly? Or is the use of tense by young children an example of Slobin's (1973) dictum 'New forms first express old functions, and new functions are first expressed by old forms'?

Several observations, and especially some of Ferreiro’s results, seem to point to the possibility that verb forms are at first used to express aspectual features rather than temporal relationships. In certain situations, Ferreiro presented two simultaneous events: e.g., a boy-doll pushed a truck (long duration), and at some point during this action a cat knocked over a bottle (short duration). This was the only situation in which her youngest subjects systematically used two different tenses, a présent or imparfait for the long-duration event, and a passé composé for the short duration. The children never added any connecting words such as pendant que (‘while’), and from their responses in the other, successive situations, it did not seem as if they were trying to express a temporal relationship of simultaneity between the two events. Rather, they appeared to express what Hockett calls the ‘temporal contour’ of each event separately.

We therefore decided to study in detail the use of verb forms in the description of events, presenting certain situations comparable to Ferreiro’s simultaneous situations, but mainly concentrating on single events and the descriptions the children gave of these events, without the experimenter introducing any specific constraints. The events were either visually apprehended (movements of toys) or auditorily (sounds produced by dolls or toy-animals). They differed in certain characteristics: Some actions led to a clear result, others did not; some took a certain time, others were almost instantaneous; some actions were repetitve, others were not. All actions presented could be expressed by commonly used verbs of which past tense formation presents no problem and whose passé composé or imparfait forms have often been observed in spontaneous utterances of very young children. Though the full French verb-system is complex, especially as regards agreement constraints on coordinates and subordinates, our experimental procedure only concerned a small and simple part of this system, i.e., third person past or present indicatives.

1. Experimental procedure

1.1 Population

We interviewed 74 children between 2,11 and 8,7 from public nursery schools, kindergartens and primary schools of Onex (Geneva) constituting a homogeneous socio-economic group, of working class milieu. They can be divided into the following groups, corresponding generally to degrees of schooling.

Age group 1: 2,11-3,11 (average age 3,7); N = 15
Age group 2: 4,3-4,11 (average age 4,7); N = 15
Age group 3: 5,1-5,11 (average age 5,6); N = 16
Age group 4: 6,2-6,11 (average age 6,6); N = 15
Age group 5: 7,1-8,7 (average age 7,8); N = 13

1.2 Material

A collection of toys: Dolls (two boys and two girls and in addition one girl and one baby doll provided with a transistorized system to produce sounds of variable duration), five cars, two trucks, one cat, one sheep (which produces a sound when pressed), one duck, one fish, a basin of water, a farm with several animals (horse, cow, dog, etc.), several fences, a ram, a ball, several bottles and boxes, a football goal, a garage, etc.

1.3 Production task

The usual Geneva technique for obtaining utterances was employed, with a certain
number of special precautions. The experimenter first shows the toys to the children, asks them to name the toys, and explains what they are if the children do not seem to recognize them. Secondly, the experimenter says: 'I'm going to do something with the toys, and you are going to look carefully at what happens, and after that, you are going to tell me everything. Try not to forget anything.' The experimenter then proceeds to perform some actions with the toys (e.g., the dog knocks over the bottle, the horse jumps over the fence, the boy plays with the ball). He induces the child to give an adequate description of the event, and he makes it quite clear that the child has to wait till the action is finished before starting his description. Once the children have got used to this method, the presentation of the experimental situation starts, and from then on the experimenter performs the action, puts down the toys, and says simply raconte ('tell me' or 'tell me the story') — there is no current one-word English equivalent for this French expression). The systematic use of the simple imperative form avoids suggestions of the use of certain tenses which might be found in instructions such as 'What did you see?' or 'What happened?'. We noted, in fact, that young children tend to use the same tense as the experimenter when faced with such questions. After the child has given his first description, the experimenter asks whether he has anything else to add. If the first description does not mention the action (e.g., 'the horse is near the farm') the experimenter tries to obtain mention of the action (always taking care not to use any conjugated verb-forms). All utterances are tape recorded. Each child was also tested for his understanding of verbal forms in a comprehension task, but these results will be described and discussed in other papers.

1.4 Experimental design of the production task

Many of Piaget's and Inhelder's experiments (cf. 1946) have shown age differences in the way young children apprehend simple actions. Very often, only the end result is focussed on by the youngest children, followed by a focus on the initial state of affairs; only later will their focus shift to the transforming action itself. A subsequent mental link between the three different points of centration will result in an understanding of the problem. This general phenomenon in cognitive development led to the choice of three types of events:

1) Six actions which give a clear result, cover a certain distance in space, and terminate at a predetermined spot. These actions will be called perfective events.

2) Two actions which do not have any result, consisting of more or less circular movements of animals in their natural habitat. These actions will be called imperfective events.

3) Three events that are perceived auditorily rather than visually, consisting of animal or human cries. Since for this type of action the distinction between perfective and imperfective is not pertinent, they will be called aperfective events.

Inside these three categories, events varied in the following features:

- the duration of the action varied from 1/2 second to 15 seconds. Fraisse (1948) has demonstrated that actions lasting less than 3 seconds are apprehended in a very different manner from those lasting more than 3 seconds; the first produce a relatively simultaneous perception of duration, the latter lead to a quantitative or qualitative estimation of duration. Accordingly, events that last less than 3 seconds were called non-durative; those that last longer than 3 seconds were called durative.
- actions were either repeated or continuous and were called frequentative or non-frequentative.
- some actions attained an explicitly stated aim, others did not. This feature distinguishes events 3 and 4 from events 5 and 6 (see below) which in all other respects are similar.

We have thus eleven simple events. Eleven 'double' actions were also presented, but these will not be discussed in the present paper.

A. List of simple events.

1) P/D (10 sec.)/nF; a truck slowly pushes a car towards a garage.

2) P/nD (1 sec.)/nF; a car hits a marble which very rapidly rolls into a pocket.

3) P/D (10 sec.)/F/nS; the farmer jumps over ten fences and reaches the farm.

4) P/nD (2 sec.)/nF/S; the farmer's wife jumps in one big jump over ten fences and reaches the farm.

5) P/D (5 sec.)/F/nS; the cow jumps over five fences and does not reach the stable.

6) P/nD (1 sec.)/nF/nS; the horse jumps over one fence and does not reach the stable.

7) I/nD (3 sec.)/nF; a fish swims in the basin (circular movement).

8) I/D (15 sec.)/nF; a duck swims in the basin (circular movement).

9) A/nD (4 sec.)/nF; the sheep bleats once.

10) A/D (8 sec.)/F; the cat cries eight times (cries: 1/2 sec., intervals: 1/4 sec.).

11) A/D (8 sec.)/nF; the baby emits a long wail.

B. Order of presentation.

The eleven simple events are grouped into three series:

- actions 1, 2, 7, 8, i.e., non-frequentative perfective and imperfective events.
- actions 3, 4, 5, 6, i.e., frequentative, non-frequentative, successful or non-successful perfective events.
- actions 9, 10, 11, i.e., aperfective events.

All subjects are first presented with series 1, then with series 2, and finally with series 3. However, inside each series the items are rotated.

1. Key: P = perfective D = durative A = aperfective I = imperfective F = frequentative S = success n = not
2. Results

A small number of descriptions did not mention the action; e.g. (3, 10): *le camion et la voiture* ('the truck and the car'). A few of the youngest subjects gave such 'static' descriptions for certain actions, and no repetitions or suggestions by the experimenter could bring them to give 'dynamic' descriptions. Twenty-six static descriptions were noted, and all analyses of verb forms concern the 788 'dynamic' descriptions.

2.1 Analysis of tenses used for the three major categories of events

Four tenses appeared in the descriptions: passé composé (N = 465, 59%), présent (N = 286, 36%), and imparfait or plus-que-parfait (N = 37, 5%).

2.1.1 Perfective events

For these actions, we note a very frequent use of passé composé; 78% of all verbs used are in this tense, 19% are in présent and 3% in imparfait. Table 1 shows the distribution of these tenses in the six perfective events.

**Table 1. Distribution of tenses* in the description of the 6 perfective events**

<table>
<thead>
<tr>
<th>nD events</th>
<th>P-C</th>
<th>Pr.</th>
<th>I</th>
<th>T</th>
<th>D events</th>
<th>P-C</th>
<th>Pr.</th>
<th>I</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. P/nD/nF</td>
<td>61</td>
<td>8</td>
<td>3</td>
<td>72</td>
<td>1. P/D/nF</td>
<td>41</td>
<td>24</td>
<td>7</td>
<td>72</td>
</tr>
<tr>
<td>4. P/nD/nF/S</td>
<td>64</td>
<td>8</td>
<td>3</td>
<td>71</td>
<td>3. P/D/F/S</td>
<td>50</td>
<td>22</td>
<td>1</td>
<td>73</td>
</tr>
<tr>
<td>6. P/nD/nF/nS</td>
<td>67</td>
<td>5</td>
<td>1</td>
<td>73</td>
<td>5. P/D/F/nS</td>
<td>56</td>
<td>13</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>nD events</td>
<td></td>
<td></td>
<td>216</td>
<td></td>
<td></td>
<td></td>
<td>216</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T D events</td>
<td>189</td>
<td>23</td>
<td>4</td>
<td></td>
<td></td>
<td>147</td>
<td>59</td>
<td>9</td>
<td>215</td>
</tr>
</tbody>
</table>

* Note: In this and all following tables, P-C = passé composé, Pr = présent, I = imparfait.

Passés composés are used more frequently for the description of nD events than for D events (X² test shows a very significant difference). The differences between the results for the three D actions are significant, but those for the three nD actions are not.

The analysis by age groups (percentages of tenses used by each of these groups) shows another difference between D actions and nD actions (cf. Fig. 1). For nD actions, we note no developmental trend; all age groups give the same type of answers and the proportion of passé composé to other tenses remains constant (90%). In the description of D actions, children of the first age group produce, generally speaking, the same proportion of passé composé and présent, but the use of the present diminishes with age, whereas that of the passé composé increases.

**Figure 1. The proportion by age of the use of the P-C tense in the description of nD events (A) and D events (B)**

These results justify a subdivision of category A: Sub-category A1 comprises perfective non-durative actions, and A2 perfective durative actions.

In A1, we have thus an almost exclusive use of the passé composé; it is particularly clear for event 6 (P/nD/nF/nS). Some examples of descriptions given for this event at different ages are the following:

(2,11) *il est là ... il a sauté* ('he's there ... he jumped').
(4,5) *le cheval, il a sauté après la barrière* ('the horse, he jumped over the fence').
(7,8) *il a sauté la barrière d'un coup, et il attend un peu* ('he jumped the fence in one go, and now, he waits a bit').

For event 4 (P/nD/nF/S) and event 2 (P/nD/nF), results are almost identical, with two exceptions; for event 2, the use of présent increases in age group 4 to 30%, for event 4, the use of présent increases in age group 2 to 36%. This second increase may be due to the fact that this action took objectively more time (2 sec.) than the others (1 sec.). However, this does not explain why the increase occurs only at that age.
In A2, the descriptions given are mostly in passé composé, and sometimes in the present tense. The following are some examples of descriptions for event 3 (P/D/F/S):

(3,8) Y monte sur les barrières ... il est à la maison (‘he mounts the fences ... he is at home’).

(4,11) Il va chez lui, et il est là, là et là (‘he goes home and he is there, there, there and there’).

(3,5) Le monsieur, il a marché (‘the man, he walked’).

(5,2) Il a sauté sur chaque barrière et il est allé dans la ferme (‘he jumped over each fence and he went into the farm’).

Beyond the age of 6, all descriptions are of the following type:

(6,8) il a sauté sur toutes les barrières (‘he jumped over all the fences’).

For event 5 (P/D/FnS) and event 1 (P/DnF), the descriptions show the same pattern, with two exceptions; – event 1 gives rise to a considerable proportion of présent and imparfait in age group 4 (45%); for action 2, we noted the same phenomenon (see below); event 5 brings fewer présents and imparfaits than the other two actions in this category in each age group; this could be explained by the fact that this action take objectively a shorter time (5 sec.); further analysis will confirm this hypothesis.

2.1.2 Aperfective events

These events are described with equal frequency in the passé composé (52%) and the présent (45%); only 3% of all descriptions are in the imparfait. Table 2a shows the distribution of these tenses for the three aperfective events; it appears that the proportion of passé composé is more important for event 9 (A/nD/nF) than for 10 (A/D/F), and more important for event 10 than for 11 (A/DnF). However, this difference in the frequency of passé composé is statistically non-significant.

Table 2. Distribution of tenses in the description of the 3 aperfective events (A) and the 2 imperfective events (B)

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-C</td>
<td>103</td>
<td>16</td>
</tr>
<tr>
<td>Pr</td>
<td>98</td>
<td>106</td>
</tr>
<tr>
<td>I</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>T</td>
<td>217</td>
<td>140</td>
</tr>
</tbody>
</table>

The analysis by age group again shows a trend towards more descriptions in the past tense for the older subjects, and a corresponding decrease in present tense descriptions (cf. Fig. 2).

Figure 2. The proportion by age of the use of the P-C tense in the description of aperfective events

Examples of descriptions given for event 10:

(3,10) Il crie plein des fois (‘he cries a lot of times’).

(3,7) Il a parlé, il a crié (‘he said something, he cried’).

(5,3) Y fait de la musique (‘he makes music’).

(5,7) Il a miaulé beaucoup de fois (‘he miaowed many times’).

(7,6) Le mouton a crié (‘the sheep cried’).

2.1.3 Imperfective events

These two events give rise to 76% présents, 13% imparfaits and 11% passé composés. Table 2B shows very small differences (statistically non-significant) between the descriptions of the two events. As follows from Figure 3, no developmental trends are discernible except for the fact that from six years onwards, some children use the imparfait.
Examples of descriptions given for event 8 (I/D/nD):

3.7 Le canard, y flotte ('he's floating, the duck').

5.7 Il y a un poussin qui est sur l'eau, il s'amuse sur l'eau ('there's a chicken on the water, he plays on the water').

6.6 Le canard navigue dans l'eau ('the duck sails in the water').

7.5 Dans le lac, il y avait un canard qui nageait ('in the lake, there was a duck that was swimming').

2.1.4 Comparison between categories A, B and C

The division into A, B and C categories was based on the 'perfective', 'aperfective' and 'imperfective' character of the events presented; to these different action features correspond different description-patterns.

Actions that in our experimental situations always achieve a certain result (e.g., push, jump over obstacles) are mainly described in passé composé, whereas actions that are performed without any kind of observable result or final state (e.g., the gentle swimming of a duck or a fish) are described in the présent. The sound-producing situations are described in almost equal proportions in the présent and the passé composé. In category A, nD actions (A1) are to be distinguished from D actions (A2). It appears from Table 3 that the differences in the use of tenses in these four categories are very significant, especially for the two extreme categories (A1 and C).

Table 3. Distribution of tenses in the description of the 4 categories of events

<table>
<thead>
<tr>
<th>Categories</th>
<th>P-C</th>
<th>Pr.</th>
<th>I</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Rp.</td>
<td>189</td>
<td>23</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>X²</td>
<td>29,7</td>
<td>39,1</td>
<td>3,62</td>
</tr>
<tr>
<td>A2</td>
<td>Rp.</td>
<td>147</td>
<td>59</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>X²</td>
<td>3,2</td>
<td>4,6</td>
<td>0,2</td>
</tr>
<tr>
<td>B</td>
<td>Rp.</td>
<td>113</td>
<td>98</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>X²</td>
<td>0,2</td>
<td>4,7</td>
<td>1,7</td>
</tr>
<tr>
<td>C</td>
<td>Rp.</td>
<td>16</td>
<td>106</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>X²</td>
<td>53,7</td>
<td>60</td>
<td>19,9</td>
</tr>
</tbody>
</table>

| T.Rp.      | 465 | 286 | 37 | 788 |

Calculated by age groups, the differences between these categories remain very significant; we obtain the following X²'s: 39, 86, 40, 05, 2,404, 46, 47 and 76, 33 respectively for age groups I, II, III, IV and V.

In addition, two developmental trends are observable: 1) A slow progression towards the exclusive use of passé composé in perfective and aperfective situations (resp. 69% and 45% in the youngest age group and 94% and 74% in the oldest one); 2) the appearance of imparfaits in the oldest group (V) for imperfective situations for which the present tense is used exclusively by all other age groups (see Fig. 4, p. 120).

2.2 Analysis of the role of duration, frequency, success or failure

Inside each of our categories, perfective, aperfective and imperfective, events differ in

3. Crying, shouting or wailing cannot be considered as actions that can either have a clear ending or not, except, maybe, in the case of a sudden extinction of the shouter's voice. Therefore the experimental situations cannot be defined as either 'perfective' or 'imperfective'. However, the children often linked the action of crying to an 'extrinsic' aim, a result that could be obtained because crying may cause somebody else to do something. Many subjects expressed this idea, e.g. (5,11) Il appelle maman ('he's calling his mummy'). From this point of view one can suppose that the longer and the more differentiated the cry, the more the absence of a result will be noticeable; and indeed, for the long cries, the results are nearer to those for the imperfectives.
their total duration, in their frequentative or continuous character and in the failure or success of the action. What is the relative importance of these different dimensions?

2.2.1 Perfective events

Duration. Three events are considered as durative (D actions; 5 and 10 sec.), and three other events as non-durative (nD actions; 1 or 2 sec.). Table 1 showed that the use of passé composé is more frequent in nD actions than in D actions, and that this difference is very significant ($X^2 = 22.98$) for the total population.

The same statistical analysis shows a significant difference for age groups I, II and III, and no statistical difference for age groups IV and V (see Table 4). For reasons of statistical method, the rare imparfaits and extremely rare plus-que-parfaits had to be grouped with another tense. For all perfective events, both these rarely used tenses follow the developmental trend of the présent: If présent tenses are used, some imparfaits appear also; when the présent disappears, the imparfait no longer occurs. In Tables 4 and 5, plus-que-parfaits and imparfaits are therefore grouped with the présent (Pr+I) and compared with passé composé (P-C).

Two events can be compared which differ only in duration: Event 1 (P/D(10 sec.)/nF) and event 2 (P/nD(1 sec.)/nF). In both cases, the action is ‘pushing’ and the distance covered is 100 cm, but in event 1, the pushing action takes 10 sec., as against 1 sec. in event 2. Responses are distributed as follows:

Table 4. Distribution of P-C and Pr+I tenses used in the description of P/D/nF and P/nD/nF events by each age group

<table>
<thead>
<tr>
<th>Age groups</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,7</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tenses</th>
<th>P-C</th>
<th>Pr+I</th>
</tr>
</thead>
<tbody>
<tr>
<td>D events</td>
<td>39</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Events</th>
<th>Tenses</th>
<th>Tenses</th>
<th>Tenses</th>
<th>Tenses</th>
<th>Tenses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P-C</td>
<td>Pr+I</td>
<td>P-C</td>
<td>Pr+I</td>
<td>P-C</td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>7</td>
<td>37</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>15</td>
<td>34</td>
<td>10</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 5. Distribution of P-C and Pr+I tenses used in the description of P/D/nF and P/nD/nF events by each age group

<table>
<thead>
<tr>
<th>Age groups</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,7</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tenses</th>
<th>P-C</th>
<th>Pr+I</th>
</tr>
</thead>
<tbody>
<tr>
<td>D events</td>
<td>39</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Events</th>
<th>Tenses</th>
<th>Tenses</th>
<th>Tenses</th>
<th>Tenses</th>
<th>Tenses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P-C</td>
<td>Pr+I</td>
<td>P-C</td>
<td>Pr+I</td>
<td>P-C</td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>7</td>
<td>37</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>15</td>
<td>34</td>
<td>10</td>
<td>35</td>
</tr>
</tbody>
</table>

Differences shown are very significant in the first square, significant in the second, and non-significant in the three others.

From these two analyses by age groups, it appears that children below 5 or 6 use different verb forms to indicate differences in duration. From the age of 6 onwards, longer or shorter duration does not seem to influence the choice of verb forms for the description of perfective events. A different type of analysis confirms this conclusion; the six perfective events can be grouped as follows according to their duration:
events 2 and 6 (P/nD/nF and P/nD/nF/nS): 1 sec.
event 4 (P/nD/nF/S) : 2 sec.
event 5 (P/D/F/nS) : 5 sec.
events 1 and 3 (P/D/nF and P/D/F/S) : 10 sec.
As shown by the following Figure 5, the use of présent and imparfait increases with the increase of duration, and this increase is clearest between 3 and 6 years.

Figure 5. The proportion of P-C and Pr+I tenses is represented respectively by dark and blank columns for actions of 1', 2', 5' and 10' duration. Areas with full upper limit indicate this proportion for age groups I, II and III; areas with broken upper limit indicate the proportion for all age groups.

Frequence. The influence of frequence can be analysed only for the durative events, two of which are frequentative, and one non-frequentative; the three non-durative events are all non-frequentative. We saw (cf. Table 1) that differences in the use of tenses between the three D actions are significant. If we compare the tenses used for the two frequentative actions (3 and 5) with those used for the continuous action (1), we find a very significant difference ($X^2 = 6.6$). The continuous versus frequentative feature can thus influence the choice of tenses. When action 1 and 3, which only differ in the frequentative or continuous character of the action, are compared, a significant difference between use of Pr+I and the use of P—C appears only for age group IV, e.g., between 6 and 7; these children use the présent tense more often for continuous events than for frequentative ones.

Thus, duration influences the choice of tenses for children until the age of 6, whereas, between 6 and 7, frequence seems to become predominant. This shift could explain the increases of présent and imparfait in events 1 and 2 noted for age group IV (see p. 116).

Table 6. Distribution of P—C and Pr—I tenses used in the description of P/D/nF and P/D/F/S events by each age group

<table>
<thead>
<tr>
<th>Age groups</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P/D/nF</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>P/D/F/S</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Success or failure. This distinction cannot be separated from other features in our investigation, since the two failure actions take half the total time of the two success actions. The small difference in tense use observed may therefore be attributed to the difference in duration (see above). Moreover, from the children's comments it is clear that to them the failure of an action (e.g., the cow jumping over five fences without reaching the farm) is just as important a result as success.

2.2.2 Aperfective events

These events differ both in duration and frequency. As we noted before, in the description of nD event (9: ½ sec.) the proportion of passé composé is more important than in the two D events (10 and 11: each 8 sec.), and between these two D actions, the proportion of passé composé is more important in frequentative event (10) than in the continuous one (11). This confirms the results obtained for perfective events, but none of the differences are statistically significant.

2.2.3 Imperfective events

The two imperfective events only differ in their total duration. At no age does the difference in duration induce the children to use different tenses in their descriptions; probably, imperfective events are considered to be of indeterminate duration precisely because of the absence of any result whatsoever.
2.3 Other means of coding the dimensions of events

Apart from tenses, children use several means of expressing the different aspatial dimensions of actions: intonation, repetitions, gesture, choice of specific lexical items and adverbs.

Though it is very difficult to give a quantitative analysis of the use of those means, we can see a clear evolution, especially in the description of aperfective situations, and in the description of the four events of series B (e.g., the different jumps in actions 3, 4, 5 and 6).

For the events of series B, children from 3 to 5 vary their descriptions by gestures, intonation and repetitions; gestures accompany all four events, a particular intonation is introduced in event 4 (i.e., the long jump is described as il saute, with a gesture imitating the movement and a long drawn-out vowel sound), and repetitions for events 3, 5 and 6 (il est là, là, là, là → or il a sauté, sauté, sauté). Adverbs begin to appear in the descriptions from the age of 5, and after 6, typical descriptions are as follows: Il a sauté sur toutes les barrières et après il est rentré à la maison (‘he jumped over all the fences and then he went home’). For events 5 and 6, where the farmer only jumps over five of the ten fences and the horse only over one fence, numbers are already introduced in the descriptions from the age of 5 (Il a sauté sur quatre barrières – he jumped over four fences’ or Il n’a sauté qu’une barrière – ‘he only jumped one fence’). In fact, the failure-actions, far from being assimilated by the children to imperfective events, give rise to very detailed descriptions of the result: (7,6) Elle a sauté par trois barrières et s’est arrêtée à la quatrième (‘she jumped over three fences and stopped at the fourth’).

In the descriptions of aperfective events, adverbs are rare before 6 (though expressions such as un peu, ‘a bit’, are used for event 9). After that age adverbs appear, e.g. longtemps (‘for a long time’), and adverbial expressions such as une fois (‘once’) and beaucoup de fois (‘many times’).

(7,4) event 9 (short cry): Il a crié une fois (‘he cried once’).
(7,4) event 10 (series of short cries): Il a crié plus de fois (‘he cried more times’).
(7,5) event 11 (long cry): Il a crié plus longtemps (‘he cried a longer time’).

The youngest subjects up to the age of 5,6 tend to use in all their descriptions the same rather vague verbs: Il marche (he walks’), or Il va (‘he goes’) for all six perfective actions; Il fait du bruit (‘he makes noise’) for the three aperfective actions. From 3,6 to 6, many different verbs are used; Il tire (‘he draws’), Il dépanne (‘he repairs and sets going’), Il roule (‘he drives’), Il pousse (‘he pushes’), Il avance (‘he moves forward’), etc., for the description of the same event 1. After 6, standard verbs appear: pousser (‘to push’) for events 1 and 2, sauter (‘to jump’) for events 3-6, and crier (‘to cry’) for events 9-11.

It seems important to note that the use of different tenses to express different aspatial features of the events appears at the same age as that of detailed lexical distinctions. Between 3,6 to 6, the information seems to be concentrated in the verb, sometimes reinforced by more ‘primitive’ means of expression (intonation, gestures, repetitions). After 6, part of the information is expressed by adverbs or adverbial phrases.

2.4 Focus of attention

Children’s attention can be retained by different parts of the events; the different fociings vary with age and with the type of event. Our results confirm the evolution found by Piaget (1946) and Ferreiro (1971); children of 3 to 5 start their descriptions with the result.

(4,5) event 4: Elle se trouve devant la maison (‘she’s in front of the house’).
(3,3) event 1: La voiture qui était dans le garage (‘the car that was in the garage’).
(5,6) event 1: Une voiture avec un camion qui est dans un garage (‘a car with a truck that’s in a garage’).

For event 3 (arriving at the farm after many short jumps) the first focus is often on the aim rather than on the result:

(3,10) Il va à la ferme (‘he’s going to the farm’).
(3,10) Il va aller à la maison (‘he’s going to go home’).

This singling out of either the result or the aim as the first thing to be described (in the situations where this is possible) may already be followed by a different focus at an early age, even without encouragement by the experimenter; the sequence of description then no longer follows the actual time sequence of the event: e.g., (3,2) Elle a arrivé à la maison ... elle a suivi (‘she came home ... she jumped’). Older children either start immediately by describing the action itself, or, if they give a description in several parts, they meticulously follow the real time-sequence: (7,5) Une voiture était sur la route, un camion est venu et l’a poussée jusqu’au garage et est entré (‘there was a car on the road, a truck came and pushed it, and went inside’).

3. Discussion

The choice of tenses used in the descriptions shows that at all ages the subjects take into account the difference between perfective, aperfective and imperfective events. Actions that obtain a clear result are mostly described in the passé composé, actions without an intrinsic aim are described in the présent or the passé composé, and actions that do not lead to any result are described in the présent. Within the limits of the ages
observed, these 'subjective' aspects clearly influence the choice of tenses.

Other, more 'objective' features of the events presented (duration and frequency) have no influence on the choice of tenses for imperfective events and little influence for aperfective events, but they determine significant differences for the perfective events.

In the descriptions of perfective events, the use of passé composé decreases between the ages of 3 and 6, with the increase of the influence of the objective duration. Possibly, duration is not an 'aspect' by itself, but combined with other characteristics of the action, such as the distance covered, it gives the subject an important cue as to the interval between the start and the result of an action. If the action gives an immediate result (nD actions), the use of passé composé reaches its maximum because the observer can only focus on the result; if a certain time elapses before the result is obtained (D actions), the observer can either focus on the result or on the action process itself. The longer it takes to complete the action, the more probable becomes a focusing on the action and the use of présent. The distance covered by a moving object may have a similar influence.

With the 6-year olds, continuous D actions still give rise to an important proportion (40%) of présents, whereas frequentative D actions are described by passé composés. The frequentative feature also appears to favour a focus on the result rather than on the action itself.

After the age of 7, all perfective events are generally described in the passé composé. The same trend towards an exclusive use of passé composé appears after the age of 6 for aperfective events, and simultaneously some imparfaits are introduced for imperfective events.

How much light do these facts throw on the question of what determines the use of tenses in child language?

Spontaneous use of past and future tenses certainly indicates that relationships of posteriority and anteriority (i.e., of the event in relation to the moment of enunciation) play a part, but our results indicate that other factors also have their importance, at least until the age of 6. All descriptions were given about 7 seconds after the termination of the events; there was therefore a clear posteriority relationship, which adult French speakers generally express by the passé composé, imparfait, plus-que-parfait and the more recondite passé simple. In current use, the passé composé expresses perfective past actions, and the imparfait imperfective past actions. Consequently, we can conclude that from the age of 6, when the trend towards passé composés for all actions becomes clearly established, and when imparfaits begin to appear, children use tenses to express the same temporal relationships as adults.

Before the age of 6, however, the distinction between perfective and imperfective events seems to be of more importance than the temporal relation between action and the moment of enunciation. Imperfective actions are almost never expressed by past tenses, and for perfective actions the use of présents is the more frequent the greater the probability of taking into account the unaccomplished part of the action. This probability is partly determined by duration, frequency and maybe other objective features we have not investigated. However, the distinction between the importance of the result as against that of the process of the action itself is the predominant and may be the only aspeptual feature in the language of children below 6. Exclusive attention to the result of an action implies focusing on the 'past' character of an action; conversely, a focus on the process, without attention to the result, projects the action into a kind of perpetual present. For certain types of events, these early, incompatible focuses take on prime importance and lead the child to ignore the relationship of posteriority between enunciation and the termination of the action. Only when these privileged focuses lose their importance do children begin to express the temporal posteriority in the manner of adults, shifting attention from the character of the action itself to its temporal relation with the moment of enunciation.

Finally, the older subjects use different means to express aspeptual features. Young children use gestures, intonation and tenses, where 6-year olds use adverbial expressions; after a first period of using passé-partout words for the actions, our young subjects use different lexical items for the same actions where older children use the same verb for the same type of action, though the actions differ in duration and frequency.

Though we do not wish to argue that this developmental trend is simply the result of the cognitive development of such notions as time and duration as described by Piaget (1946), there is a striking parallelism with cognitive development in general, rather than directly with such operations as the coordination of time, speed and distance. In one of his latest works (1971), Piaget stresses the lack of differentiation between knowledge about physics and knowledge about logic, that exists during the preoperational period (from 2 to 7 years approximately). Both logical knowledge and knowledge about properties of real objects stem from actions (mainly those performed, partially or totally, by the child himself, but also those that are observed by the child); and every action has two aspects. There is on the one hand the dimension of that which is generalizable, i.e., the way actions are coordinated, the way they can annul or compensate each other. On the other hand, there is a specific dimension, i.e., the particular characteristics of the action and its result. According to Piaget, the obstacles to the formation of the first fully coherent logical system are at least partly a result of the primacy of the particular character of each action over its general, coordinative aspect. The child is mainly interested in the physical outcome of his actions and does not yet differentiate this dimension from the general coordinations he can already perform. Since actions are not done to be undone immediately afterwards, and since their aim is some kind of change in reality, it is not surprising that the main charac-
teristics of the first operations system, i.e., reversibility and conservation, are still absent during this period. Though the 4- or 5-year-old knows full well the different factors of a conservation experiment, for example, he can neither dissociate them, nor conciliate the different kinds of information he infers from them. In problems of time and duration these characteristics of the young child's thinking lead to typical errors. He cannot coordinate the times of arrival and departure if he has to compare two events as to duration; even when he can already recount the simultaneity of start and finish, he will still not conclude that therefore the two events must have taken the same amount of time - except if the two movements were of the same speed and covered the same distance. Focusing on the end result, speed and time will be considered as co-varying with the distance covered; focusing on speed, this factor will overpower and deform the role of the others. For correct judgments, in which duration is 'conserved', the factors first have to be dissociated and then their interaction will be understood: Equal duration, but different distances covered can be explained by different speeds. Similarly, in the descriptions the child gives of the events performed in front of him, we observed a frequent mention of aim or result, a global apprehension of the different characteristics of the event expressed by the verb form itself, and finally, a dissociation of features expressed by adverbial locutions and mainly temporal function of tenses.

Our knowledge of language acquisition is still far too fragmentary to allow us to do more than point out very general mechanisms of cognitive development that appear to have explanatory value for language acquisition phenomena. Nevertheless, several other experimental results also indicate the existence of underlying cognitive mechanisms which must be one of the factors that determine the often surprising course of linguistic acquisitions (cf. Ferreiro, 1971; Sinclair and Ferreiro, 1970).

A parallel of a very different kind can be found in historical linguistics. In this field it is becoming possible to go beyond the 'establishment of an arbitrary initial stage of a phenomenon' and to 'study the dynamic aspects of the process of linguistic development' (Watkins, 1969, p. 2, 3).

Several studies of the Indo-European verb system have led a number of authors (Kuryłowicz, 1964; Watkins, 1969) to surmise that initially this system did not comprise any temporal oppositions. There is, however, evidence of a very early opposition between injunctives and indicatives, and of the existence of the aspectual opposition between perfective and imperfective. This opposition can shift to a temporal function, by the opposition of past and present, and aspectual forms such as the desiderative can acquire a temporal function and fill the place of the future, thereby completing the temporal axis. Other aspectual distinctions such as accomplished versus generally ongoing can in their turn cause a rebuilding of the system, and certain forms (as for instance the -s aorist) may acquire a modal function. In this way, two distinct systems can emerge, one aspectual and temporal, the other modal. In the historically attested languages, such rebuilding did not necessarily take place in the same manner nor at the same time; but to all of them Slobin's dictum (1973) about language acquisition can be applied: 'New forms first express old functions, new functions are first expressed by old forms.'

Though such historical parallels are intriguing, we should evidently guard against attributing some explanatory value to them. Knowledge of cognitive development may help us to understand the course of language acquisition, but it can hardly be supposed that what we know about the way certain languages have changed in the course of their history can elucidate the acquisition process. In fact, if parallels such as the one we have referred to have a deeper significance than a chance resemblance, the relation may well take the opposite direction: The course of language acquisition may point towards some theory of historical development.

REFERENCES

Résumé

Ce papier a pour but de rechercher l'utilisation des formes verbales françaises par des enfants entre 2,11 et 8,7 ans. L'expérience présentée montre que les enfants n'utilisent pas seulement les temps pour indiquer la relation de postériorité, antériorité et simultanéité entre les événements décris et le moment de l'énonciation mais qu'interviennent des facteurs liés à l'aspect. On a demandé à 74 enfants de décrire 11 actions mimées par l'expérimentateur avec des jouets. Ces actions différaient selon leur résultat, leur fréquence et leur durée. Pour tous les enfants le type de résultat influence le choix de la forme verbale. Les traits plus objectifs tels que fréquence et durée exercent une influence sur les enfants de 3 à 6 ans. Au-delà de cet âge, l'utilisation des temps commence à ressembler à celle des adultes qui utilisent différentes formes verbales pour exprimer principalement les relations temporelles. D'autres marques d'aspect et de temps montrent un développement similaire avec l'âge.