The early development of writing

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I declare that the composition of this thesis, and the design, execution and analysis of the studies reported in it are all my own work.

Minamola Jonas.
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ABSTRACT

The development of writing in young children was investigated by means of a two-year longitudinal study of children aged from three to six years. The children were visited every six or eight weeks, when their ability to produce writing was tested; and their comprehension of various aspects of the writing system was also assessed. A smaller sample of two-year-old children was studied similarly for nine months.

Five levels of understanding of written language were identified. At the first level children showed no awareness of writing as distinct from drawing. Children at the second level were beginning to understand that writing was something that could convey meaning, while at the third level their writing began to resemble handwriting or individual letters. By the fourth level they were producing recognisable letters or numbers, but without any understanding of conventional meanings. Finally, children at level five were attempting to write phonetically. The progress of the children over the period of the study was charted, and the development of writing in Scottish children was compared with that reported by other authors; in particular Ferreiro and her colleagues in South America.

Ferreiro had reported that children form several hypotheses about the nature of written language, before coming to understand that writing is in fact a phonetic representation of speech. But the studies reported here produced little evidence for the existence of these hypotheses. Most importantly, there was no suggestion that Scottish children passed through a syllabic stage, when they believed that each grapheme should represent a spoken syllable.

Therefore Ferreiro's claim that, in a Piagetian sense, children invent written language for themselves (and must go through a series of mistaken beliefs about writing) was rejected. Instead, it was concluded that most young children can and will learn to write phonetically if they are taught the nature of the writing system.
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CHAPTER 1: INTRODUCTION

"The history of writing in the child begins long before a teacher first puts a pencil in the child's hand and shows him how to form letters."  
A. R. Luria (1929)

Depending on his birth date, a Scottish child in the 1980s will start school aged between 4 1/2 and 5 1/2 years. During his first weeks at school, his teacher will give him a pencil and some paper and begin the task of teaching him to write. Correction: his teacher will help him to continue his discoveries in the field of written language. And it is obvious that this task will be facilitated if the teacher is aware of what the child understands and misunderstands about written language. As Clark (1976) pointed out in her study of young children who had learnt to read before starting school, the teacher should be "ready to receive the child on the level at which he is functioning."

We know that children in literate societies experience print in many ways from the earliest ages. They see it on the breakfast table: lying around the house: out in the streets: in shop windows: even on television they see print. And they see people writing: letters, shopping lists, or notes to the milkman. Work may be brought home from the office, or accounts brought up to date on the kitchen table. Perhaps someone in the house does a crossword, or the football pools. Big sister does her homework: and school entrants are neither blind nor deaf. Like Kipling's elephant's child, they suffer from "satiable curiosity" about all the things which big people do: and they probably have both crayons and felt pens at their disposal, along with scribble pads, colouring books, comics, library
books, and the bedroom wall, on which to develop and test theories on how to write.

Some of the earliest research into how preschool children begin to write is described by Luria in a volume edited by Cole (1978). In these experiments, children were asked to remember and repeat several sentences (which had been designed to be difficult to recall). Once they had failed at this task, the children were given pen and paper and asked to write down the sentences so that they could remember them better.

In the earliest phase of development – the pre-writing or pre-instrumental phase – children of three to five years produced scribbles, lines, or, most often, zig-zags in imitation of adult writing. These scribbles were entirely undifferentiated, bearing no relation to the sentence which the child was supposed to be writing. (Indeed, typical of this phase is the child who begins to "write" before he has been told what he is to write.) This kind of writing did not aid in the recall of sentences; in fact it often reduced the number of sentences which could be recalled.

In a slightly more advanced stage, the child began to use writing as a cue: although still appearing as undifferentiated zig-zags or lines, each sign indicated to the child that there was something to be remembered. Factors such as the position of the sign on the page seemed to assist the child to associate the sentence with the sign, although sometimes the sentence produced by the child bore little relation to the sentence dictated by the experimenter.

The next stage of development, found in children aged four to five years, was the beginnings of differentiation of the sign. For example, a short word or phrase would be represented by a short line, while a longer phrase would be given a longer line or a larger scribble. But,
according to Luria, this was a simple representation of the rhythm of the utterance; and a greater advance was seen when the child began to represent the content of the utterance. It was found that number or quantity (particularly contrasting amounts) was the most likely attribute to induce differentiation: eg a sentence which mentioned a large number of objects would be represented with a longer zig-zag that would the next sentence which described a small number. A second factor likely to induce differentiation was form. An object which had a striking colour, shape or size would be represented in some meaningful way. For example, one child drew particularly thick and heavy lines to represent a sentence about black smoke coming out of a chimney. At this stage, according to Luria, the child has essentially invented pictographic writing.

By five or six years, a child can successfully record and recall simple sentences about concrete objects. However, some things are impossible to record pictorially, or alternatively, would take too long. Luria describes children who, asked to write down "there are a thousand stars in the sky", had to be dissuaded from spending the next hour drawing a thousand stars. This sort of task may elicit symbolism: Luria claims that the child who draws two stars and says "I'll remember there are a thousand" is on the verge of symbolic writing.

Most children do not fully explore the possibilities of pictographic writing, because by this age they are beginning to learn alphabetic writing. However, as Luria points out, this does not result in the immediate adoption of culturally correct techniques of writing. Instead, he describes a transition period during which, although the child can produce many or all of the letters of the alphabet, he still has no idea of how the writing system functions. He has progressed beyond the representation
of things; but he has yet to understand that writing is a phonetic representation of speech. And so his acquisition of conventional alphabetic symbols is an advance which results in his returning to the earliest stage of undifferentiated writing: he writes letters which have no relation to the meaning of the sentences which he is to write and recall.

Luria describes a sequence in which children progress from undifferentiated scribbles to attempting to record some characteristic of an utterance (perhaps the rhythm, or the length, or some aspect of the meaning). But the next stage seems to be a regression, rather than a progression: conventional letters are used seemingly at random, and any attempt to record meaning appears to have been abandoned. This is then followed by the final stage of alphabetic writing. This seems to be an example of repetition or U-shaped curves in development, such as has been reported by conservation researchers and others. For example, conservation of weight can be inferred from the behaviour of children aged 1-2 years, who adjust the force they apply to lift an object according to their assessment of its weight (Mounod and Bower, 1974). It appears to be lost around age 4, but reappears and can be explained verbally at 7 or 8. Sheeran (1973) showed that the use of language caused children aged 3 to 5 years to fail weight conservation tests, even though they had previously succeeded when conservation was measured behaviourally. According to Bower (1979), children lose many well-practised skills when language develops, as correct preverbal concepts are replaced by erroneous verbal concepts. They begin to repeat errors which they had grown out of some time ago. As Piaget (1950) suggested, concepts cannot simply be transferred to new levels of understanding; they must be relearned at each new level.
This can be compared with the behaviour of the children described by Luria, where attempts to record meaning are abandoned in favour of using conventional letters in meaningless ways. An outgrown error is repeated during the consolidation of a new level of understanding. It seems that children become concerned with the mechanics of letter production, to the exclusion of any consideration of meaning. But eventually they learn to use the new medium to express meaning differently: using symbolic instead of iconic representation.

The research of Luria and his colleagues was for many years inaccessible to non-Russian speakers. In the West, the acquisition of writing received very little research attention, despite a short paper by Hildreth published in 1936. She noted that most children attending a middle/upper class nursery school in New York could make some attempt to write their names, and suggested that the maturity of the attempt could be used to indicate mental development. She found that uncontrolled scribbles were typical of the child before three years; but that children from three to four years tended to produce scribbles which resembled adult writing in that they were generally horizontal with a preponderance of vertical lines. By four years there was a suggestion of individual letters in the way the "writing" was separated into several discrete symbols. Recognisable letters, possibly those of the child's own name, began to appear with increasing frequency amongst the unconventional signs, until by five years names were written recognisably (with occasional letter reversals or malformations). At six years the child wrote faster, more neatly, with more control over the size and spread of the letters. He may even have been able to write his surname as well.
In the 1970s and '80s writing began at last to be a focus for research. After a long period of concentration on the acquisition of reading, the interaction between writing and reading became evident to researchers. Marie Clay (1975) suggested that writing was a 'necessary complement' to reading: reading involved focussing on word recognition, sentences and meaning, while writing meant that the child had to pay attention to sounds and letters. Carol Chomsky (1971) suggested that writing should come first; that children would teach themselves to read by writing.

Clay described the writing abilities (and the progress throughout the year) of a group of children starting school in New Zealand aged around five years. She described a number of principles which appeared to control writing production in young children.

The recurring principle allows a child to produce long messages by repeating a small number of symbols or words. Using the flexibility principle, children discover new letter forms (some allowable, some not) by experimenting with known symbols: rotating, reversing, adding bits on and chopping bits off. The generating principle allows the child to generate long statements by combining and recombining a small number of symbols.

The inventory principle means that children constantly make lists of what they know, be it letters, numbers, words or items. They may use the contrastive principle to list items which contrast in form, sound or meaning. And as they continue to write they will discover the directional principles: that (in English) writing begins at the top left, moves across to the right, and then sweeps back to the left to begin a new line.

Clay suggests that for young children, age norms in writing ability are inappropriate because progress is dependent more on chance exposure to
(or concentration on) aspects of writing than to age and intelligence. She suggests that different children may acquire the arbitrary conventions of written language differently; and therefore it is not possible to specify fixed sequences of learning through which all children are expected to pass.

Other researchers have described what they suggest is a developmentally ordered series of stages of writing development, through which all children will pass on route to alphabetic writing. The most extensive and influential series of studies to date on the acquisition of writing have been carried out by Emilia Ferreiro and her colleagues, mostly on Spanish-speaking children in Argentina and Mexico, and reported in Ferreiro and Teberosky (1982). Using a Piagetian framework, Ferreiro charts the development of the conceptualisation of written language during both the preschool years and the early years of formal education.

**Ferreiro et al: Comprehension studies**

Preschool children were shown pictures with accompanying text (either a word or a sentence). They were first asked where there was something to read, and then to read it. The youngest children did not differentiate between the text and the picture: when asked where there was something to read, they pointed at the picture as well as the text. When asked what it said, they simply described salient aspects of the picture.

Older or more advanced children distinguished between picture and text, seeing the text as a label for the picture: either the name of the object pictured, or a descriptive sentence. The elimination of the article was noted: a picture might be of "a tree", while the written text was reported as saying "tree".
Children at the next stage of development continued to predict the meaning of the text from the picture; but the properties of the text were also taken into consideration. For example, one child insisted that a one-word text could not say a sentence ("father is smoking a pipe") because it was too short. Another child, considering a picture of a toy car with the label "toy" said that it could not say "car" because there was no "cuh".

Finally, came attempts to locate a 1:1 correspondence between the graphic elements of the text and the sound segments of the meaning. Many children broke spoken words into syllables, relating each syllable to a written symbol or group of symbols. Sentences were segmented syntactically into either subject-predicate or subject-verb-object, and the children tried to find some relationship between the parts of the sentence and the different parts of the written text.

When this study was repeated using deprived first grade children, Ferreiro found an effect of formal education, and reading instruction which focuses on decoding skills. By mid-year many children ignored the picture and gave letter names or sounds for each of the letters in the text - but this was seen as an end in itself. They did not attempt to create any meaning from the sounds. More advanced children, sounding out the text, omitted, inserted or juggled fragments in order to achieve meaning; while others appeared to decipher the text correctly but did not seem to understand what they had read. In a transition phase, children fluctuated between trying to decipher the text exactly, and alternatively trying to find a meaning for it, based on the picture. Finally some children managed to achieve both meaning and correct decoding.

Ferreiro (1987) also studied children's reactions to text presented without pictures. A sentence, eg "Daddy kicked the ball" was first written
and then read in front of the child. (Remember that all these experiments were actually carried out in Spanish.) During the reading, a pointing finger moved smoothly along the text. The child was then asked questions such as "Where did I write ball?" or (pointing to a part of the text) "What did I write here?" They found that while the oldest children accepted the adult view that each spoken word corresponded to a portion of the written text, younger ones claimed that the article was not written. Some said that "la" (the), being composed of only two letters, was too small to be read; others divided "pelota" (ball) into two parts. "La" might say "pe" and "pelota" "lota". Alternatively "la" might say a part of "pelota" while "pelota" said the whole word.

And the youngest children had an even more restricted notion of what could be written: in their view, only nouns were represented in the written text. In a sentence such as "Daddy kicked the ball", then "Daddy" and "ball" were written down, but not "kicked" or "the". In their attempts to relate the written text to the spoken sentence, they often introduced new nouns (such as "Mummy", or "field", "trees", or "ground").

Some children found it quite impossible to segment the utterance. They insisted that no individual words were written, and that the sentence could only be located globally in the entire written text which was presented. A variant of this response was found in children who decided that the whole spoken sentence was located in one written segment. They then introduced related sentences and matched these to the remaining written segments. For example, a four-year-old girl, having claimed that the first word, "Daddy", said "Daddy kicked the ball", suggested three more sentences for the remaining three words: "Daddy is sick", "Daddy writes the date", and "Daddy goes to sleep". 
Ferreiro et al: Production studies

Ferreiro describes five levels of writing found in pre-infant-school children who were asked to write their name, simple words, and sentences. Children at level 1 produce either discrete letter-like shapes resembling print, or wavy lines which resemble cursive script. These children may have problems in differentiating between drawing and writing. Their "writing" is undifferentiated, with meaning lying in the intention of the writer; but they may attempt to reproduce some characteristic(s) of the represented object in the graphic string. Children who "write" using individual graphic characters tend to use a constant number of symbols (the number varying between children) and believe that one or two symbols are too few to be considered as writing. However, according to Ferreiro, a child may vary the number of symbols used to reflect size, number or age of the object or person whose name is being written.

Level 2 children produce graphic symbols which more closely approximate to conventional letters. The "minimum number of characters" hypothesis continues; and the children make a determined effort to vary the characters used, so that the graphic strings may be differentiated. If the child's repertoire of letters is limited, then variety is achieved by changing the order in which they are used.

At the same time as they produce strings of letters in response to a request for writing, these children are beginning to learn stable strings of letters whose order and meaning are fixed: they learn to write their name, and possibly the names of other family members. But in all their writing there is a global correspondence between the written text and the word, phrase or sentence which the text represents.
Children who have reached level 3 have according to Ferreiro invented for themselves the notion that writing represents the sounds of speech. Their first attempt to relate speech to writing is through the 'syllabic hypothesis': each letter in the written string stands for a syllable of spoken language. And the child may begin to apply stable, conventional sound values to at least some of the letters he uses.

When the syllabic hypothesis first appears, earlier hypotheses of minimum quantity and variety are temporarily in abeyance as the child concentrates on counting syllables. But when this procedure becomes more routine, the other hypotheses reappear and lead to conflict. For example, the writing of one- or two-syllable words would require 1 or 2 letters according to the syllabic hypothesis, but the minimum quantity hypothesis insists that a minimum of 3 or 4 letters are needed before the writing is complete. Various ingenious but on the whole unsatisfactory solutions to the conflict are found. Ferreiro (1984) describes how a child writes "barque" (boat) using 3 symbols, and then decides that what has been written is really "barquito" (little boat) so that the numbers of symbols and syllables will match.

Level 4 is a transition stage between syllabic and alphabetic hypotheses. Children in this phase may spend many minutes trying to write something, torn between the demands of the different hypotheses. For example, Maria Paula tries to write her name using moveable letters. (She has some idea of what the finished product should look like; and some half-learned notions about the sound values of letters.) She selects the letters she will use according to how she knows the name should look, and according to the sound values; but then she tries to read what she has written syllabically. She adds and takes away letters, and rearranges
them many times, without ever feeling satisfied with the results of her labours. These conflicts may result in the child refusing to even attempt to write.

Finally children achieve level 5. They understand that writing is a phonetic representation of speech; and so they can write anything simply by phonemic analysis.

In a paper presented to the International Reading Association in Chicago in 1982, Ferreiro describes a longitudinal study of children 3 - 7 years old. In particular, she followed the progress of over 800 children (median age 6 years 6 months at the start of school) from deprived areas of Mexico during their first year at school. She discovered in these children four developmentally-ordered systems of writing: pre-syllabic (ie levels 1 and 2 described earlier), syllabic, syllabic-alphabetic (ie the transition stage) and alphabetic writing. These children were seen four times during the school year, at eight or ten week intervals. Thirteen per cent did not show any significant advance during the school year, and another 16% jumped from pre-syllabic to alphabetic writing between visits; but the remaining 71% went through a stage of syllabic writing even though they were receiving instruction in alphabetic writing at the time. Ferreiro stresses that the syllabic hypothesis comes entirely from within the child; that literacy development is not due to children incorporating adult knowledge, but is rather a process whereby children invent and construct the writing system for themselves. Only thus do they achieve true understanding of the nature of written language.

Ferreiro's publications have stimulated further research. De Goes and Martlew (1983) carried out a study in which children aged three to six years were asked to write, to write their name, to write to dictation, to
copy printed words, and then to rewrite the same words without the original model. De Goes and Martlew described seven levels of conceptualisation of written language.

They found that most of the younger children would make an attempt to copy a word constructed out of alphabet bricks; but only some letters would be reproduced, with no attempt to place them in a line or to work systematically from right to left or left to right. When the model was removed and the child asked to rewrite the same word, these children would not use their first copy as a model for their second. Older children copied the letters of a word in correct sequence, and then copied their copy when asked to rewrite.

In general, the levels of conceptualisation of written language described by De Goes and Martlew are similar but not identical to the progression reported by Ferreiro and Teberosky. More advanced children refused to write (which was taken to indicate understanding of the principle that writing is a rule-governed activity, without knowledge of the rules), or had begun to use at least some letters with conventional sound values in an attempt at alphabetic writing.

A recent report by Tolchinsky-Landsmann and Levin (1985) describes the conceptualisation of written language in 42 Israeli preschoolers (aged 3:4 to 5:8). The children were asked first to draw, and then to write, four utterances: "a house", "a child playing with a ball", "sky", and "a red flower". After each production was complete they were asked to explain what they had drawn or written. And finally they were asked to write their name.

As was expected, the writing attempts showed more resemblances to conventional writing (in eg linearity, the presence of discrete units,
small size, and the inclusion of recognisable Hebrew letters) with increasing age. Many children were more advanced at writing their own name than in writing other utterances.

The youngest children consistently used either one or many graphemes, irrespective of the utterance they were writing. Older children generally used around three graphemes on each occasion. Again, there was no attempt to relate the number of written symbols to the utterance. However, a small number of older children did vary the number of graphemes according to the length of utterance.

Tolchinsky-Landsmann and Levin describe five modes of interpretation of writing shown by their subjects. The first was to offer something entirely unrelated to the utterance (e.g., "a whale"). These idiosyncratic interpretations were mainly found in the youngest group of children. Another mode was seen in children who changed the utterances but always preserved the nouns. For example, "a child playing with a ball" was read back as "a child and a ball". This type of interpretation was shown by 12% of three-year-olds and decreased with age. A third group of children gave an exact, global repetition of the utterance. This was seen in 55% of three-year-olds, but decreased with age. A mode of interpretation which became more common in older children was to segment the utterance and attempt to relate the segments to the written symbols. However, although some children used a phonetic segmentation to guide their writing, most segmentation was post hoc. This meant that the basis for segmentation was inconsistent, with phonemes, syllables, words or even larger units being used to make the utterance fit the text. One-third of five-year-olds attempted to segment utterances. The most common response, which increased with age and was seen in 62% of five-
year-olds, was to give letter-names or descriptions, while insisting that they did not know the meaning of the writing.

The research described above provides insights into the way the child explores the act of writing, both before and after receiving formal teaching. But it also raises further questions, in that there is not general agreement between researchers on how children progress in their understanding of written language.

Categorising children's responses generally involves the imposition of order; and children tend not to fit neatly into categories or stages. Ferreiro's research is exhaustive and meticulous; and it is no doubt the desire to describe fully and to include all responses in a coherent framework which results in some confusion. For example, Ferreiro claims that Level 1 children use a constant number of graphic symbols for each written message; but she also says that they vary the number of symbols to reflect physical changes in the object. The Israeli research suggests that the youngest children use either one or many graphemes, with older children using a constant (small) number for all utterances.

Ferreiro claims that children pass through a stage of syllabic segmentation before discovering alphabetic writing. De Goes and Martlew do not appear to find syllabic writing at all; and neither is it mentioned by Luria or Clay. Tolchinsky-Landsmann and Levin find that segmentation is generally used not in writing production, but in reading back what is written. The attempt to match utterance and text (especially when utterances are of varying length and texts all consist of three graphemes) means that syllabic segmentation is only one of many ways of dividing up an utterance.
Ferreiro describes a developmentally ordered series of stages of writing development, with children assumed to pass through all stages on their route to understanding. Clay however suggests that understanding of an arbitrary system such as alphabetic writing can be reached via many different routes, depending on the individual experiences of children.

Ferreiro's research has been conducted mainly on Spanish-speaking children in South America. Tolchinsky-Landsmann and Levin worked with Hebrew-speaking children in Israel; Luria's subjects spoke Russian. Clay studied children in New Zealand. While some aspects of the acquisition of written language are no doubt universal, it seems likely that the conceptualisation of written language may in some ways be affected by the language which is being written. For example, Ferreiro describes how children may convert a word into its diminutive (e.g. "barque" into "barquito" - boat and little boat) in order to achieve what they consider to be the right number of syllables. This would not be possible in English.

English and Spanish are written and read from left to right, while Hebrew directionality is from right to left. In Hebrew, vowels are not represented by graphemes, but are indicated by diacritic marks (dots and tiny lines) which are often omitted. Thus, Hebrew may be compared with the invented spelling described by Bissex (1980), Read (1971), Chomsky (1971b) and others, where children tend to record mainly consonants. This seems to suggest that vowels are not seen as salient by preschool spellers, and may imply that Hebrew is easier for young children to begin to write.

The acquisition of writing may also be affected by cultural differences, such as the age at which children start school. It may be that delaying
school entry until six years, or even later, allows children who have reached advanced levels of mental competence and metalinguistic ability to experiment with writing and produce hypotheses about written language, which younger children at school bypass. Teaching styles may affect progress once children reach school. Some teachers devote more time and attention to correct letter formation than do others. Some teach reading mainly by word and sentence recognition; others spend more time on phonics and decoding skills.

British children start school at around five years. And even before school, almost all children are regular viewers of television. Although most children's television is purely entertainment, there have for many years been a number of excellent programmes, aimed at the pre-school child, which frankly teach what might be described as 'advanced reading readiness': numbers, letter names and sounds, and even simple words. I do not know if such programmes are available in Spanish; and it seems likely that many of the poorer children studied by Ferreiro would not have been regular television viewers. Certainly British children may be assumed to have regular and early access to such information about writing. It seems likely that this might influence their thinking about written language.

Therefore it was decided to investigate the acquisition of writing in young Scottish children, looking at both the developmental changes in their production of writing, and at the progress in their understanding of the writing system. A pilot study involved two visits, a week apart, to two nursery schools in Edinburgh, when writing production and comprehension were tested in 55 children aged 3:1 to 5:1. Children on this occasion were found to be classifiable into stages of writing development similar to those
reported by other researchers. A longitudinal study was then planned and carried out at another nursery school in Edinburgh. Around 38 children were visited at approximately 6-week intervals for two years. The youngest group attended the nursery school for the entire period of the study; while the older children moved to Primary School after the first year, and were visited there. While this longitudinal study was in progress, a group of 12 pre-nursery-school children was also recruited (aged 2:4 to 2:10), and visited regularly for around 9 months. A control group of 28 children aged 4:7 to 5:6 was tested in their first weeks at primary school, to discover what effect if any the frequent visits with their focus on writing had had on the experimental group.

In particular, the research described in the following chapters was designed to investigate Ferreiro's claims about how young children come to an understanding of written language as an object of knowledge. Although these claims have dominated the field of written language acquisition research in recent years, there has been surprisingly little corroboration of the hypotheses described by Ferreiro: the name hypothesis, the text-reflects-the-characteristics-of-the-object hypothesis, the variety hypothesis, the minimum quantity hypothesis, and most significantly the syllabic hypothesis.
CHAPTER 2: THE PILOT STUDY

The pilot study was carried out at two nursery schools in Edinburgh. One was in a predominantly middle class area; 54 children (average age 4:1) were studied at this nursery. Another 16 children (average age 4:6) were taken from a nursery in a working class area of the city, making 70 children in all. Most children were seen twice, individually, at an interval of approximately one week (though some were unavailable the second time). The study was carried out in May and June, at the end of the school year, when the children’s ages ranged from 3:1 to 5:2.

SESSION 1

On the first visit the ability of the children to produce writing was tested. The children were brought, one at a time into a small room, sat down at a small table, and given a piece of paper and a pen. They were then asked "Can you do me some writing on here?" If the child responded with something which was or could be writing, we discussed what had been written. The child was then given a new sheet of paper and told "Now do me a picture." When the picture was finished he was asked "Can you do me some writing to go with that picture?" And again he was asked to explain what he had written. Some children responded to the first instruction to write by drawing a picture. They were then asked, as above, to do some writing to go with the picture.

The next task was to do some writing to accompany pictures which I provided. These depicted varying numbers of objects (one fish, two children, two ducks, three swans, three deer, and eight waterbirds) and were presented in random order. The children were asked, each time, "Can you do me some writing to go with this picture?" And when they had finished
writing they were asked "What have you written there? What does your writing say?" Some children asked for assistance in forming letters (eg "How do you do a duh?") and this was given.

The injured teddy game

In one corner of the room was a bed in which a heavily bandaged teddybear lay. Beside him was a doll. Across the room was a 'shop' containing various comestibles, all made of plasticine. There were large cakes, small cakes, sweets, fruit, loaves of bread, sausages, biscuits, and bottles which supposedly contained milk and Coca cola.

It was explained to the child that poor teddy had been very silly; he had run out on the road in front of a car, and the car had knocked him down. His head had been hurt quite badly, and he had to stay in bed until it was better. However, his friend Dolly was there to look after him. Dolly was going to go to the shop to buy some things to make him feel better. Teddy wanted to write a shopping list for Dolly, to make sure she brought him the things he wanted; but he was not feeling well enough to write. So he wondered if the child would write the shopping list for him.

This seemed to most children to be a convincing rationale for writing. They seemed to understand not only the reason for writing, but also the importance of getting it right so that Dolly would bring the right things from the shop. Some looked worried and protested that they couldn't write; but they were urged to have a try. If they asked how to form particular letters they were shown; if they asked how to write particular words they were first encouraged to attempt it unaided ("How do you think it goes?"); but if they insisted, or seemed upset at being asked to do something which was beyond their capabilities, they were given the help they had requested.
After the shopping list had been produced the children were then allowed to play for a time, taking the doll to the shop, selecting the goodies, taking them back to Teddy, and feeding them to him. (He soon began to feel a lot better.) If the children were willing, they were asked to do more writing: making a storybook for Teddy, making a sign saying SHOP to go in front of the shop, writing labels for the goods in the shop. However many children were becoming restive by this time and were not detained against their will.

Before being returned to the nursery, they were asked to write their names. If they made a reasonable attempt at their first name they were asked if they could write their surname as well. (Some had already written their name, in response to the earlier instruction to 'do me some writing'; they were not asked to repeat it.)

This order of task administration was followed for most children. However, a small number were extremely apprehensive about going off to another room with a stranger, and would not sit at a table and write or draw. These children were immediately introduced to Injured Teddy, and allowed to play with him, the doll, and the shop, (including the writing of the shopping list) until they had settled down. They were asked to write on the pictures, and to write their names, after they had finished playing with Teddy.

SESSION 2

Approximately a week later the children were seen again, and their understanding of the nature of written language was tested.

Five cards, 14 x 9 cm. were spread on the table in front of them. They showed examples of handwriting and typescript; the numbers 1 - 9, a large letter A. and a picture of an old car. They were asked "Can you see any writing here?" After they had pointed to examples of writing, each card was
indicated in turn and the child was asked "Is this writing?" If they said no, they were asked "What is it then?"

They were shown a full page colour advertisement taken from a women's magazine. It was a combined advertisement for Indesit washing machines and Ariel soap powder, and had several pieces of text arranged around and on a picture of a washing machine and a packet of washing powder. Writing was also visible on the soap powder box. The children were asked "Is there any writing here?" They were encouraged to find more than one example of writing.

They were shown, one at a time, three 9 x 14 cm cards, each showing a word which might have been familiar to the child: STOP, Playschool, and LADIES. For each card they were asked "Do you know what this says?"

Finally each child was shown the writing he had produced the previous week, and asked to read it. (E: "Do you remember doing some writing for me last week? Can you tell me what this says?"

RESULTS

On most tasks the performance of the children from the two nurseries did not appear to be significantly different. Data from the two groups was therefore presented in combined form, except for any tasks where the groups appeared to differ.

Of the 7 children in the pilot study, 55 received the instruction to 'do me some writing'. Of these, 11 wrote (or attempted to write) their own name, and another 19 made a writing attempt. Nine children refused, saying things like "I can't write", 'I don't know how to do numbers', 'I can't do writing', etc. Thirteen children drew a picture, and three produced a scribble which was
neither claimed to be writing, nor resembled writing. So right from the beginning, over 70% of children showed that they understood that writing was a specialised activity, different from drawing. And by the end of the session all children had produced something which was classifiable as an attempt at writing.

The writing attempts from all the tasks were considered, and each child's understanding of written language was assessed. A number of stages or levels of writing development were described, and each child was placed at a particular level on the basis of his writing production and the commentary he had given on his writing. The stages are listed in what is assumed to be an order of increasing sophistication and understanding.

It was frequently difficult to decide how to classify particular children, as to some extent the stages are imposed on a continuous flow of change and development. At what point, for example, does a squiggle become a controlled circle become a letter O? Is a short vertical line just that, or did the child mean it for the letter I or l, or the number 1? Some children clarify their productions verbally; but if a child is uncommunicative we are left to guess at his intentions. In one session a child may produce samples of different stages of development, in which case he was allocated to the most advanced stage at which he had performed.

Children were almost invariably more advanced at writing their own name than at writing anything else. In some ways name-writing is different from other writing: for example, an invariant sequence of letters is much more important. So children's attempts at writing their own names were considered separately from their other writing productions, and a separate series of developmental stages was described.
Fig. 1: Stage two writing. Lyndsay (3:3) shopping list.

Fig. 2: Stage three writing. Gordon (3:5) storybook.
Stage One

Some children, despite much urging, did not produce anything which either looked like writing or was claimed to be writing. They either scribbled, drew pictures, or coloured in the pictures provided. There were not very many children in this category, which probably includes both those who did not fully understand the instruction to write, and also those who were not able to verbalise their knowledge that they did not know how to write.

Stage Two

These children produced a scribble similar to a stage one scribble, with no apparent resemblance to writing; but they claimed that it said something. For example, Fig. 1 shows a shopping list produced by Lyndsay (3:3), who claimed that it said "oranges, apples, carrots, strawberries, potatoes, a little cake with a cherry, and orange juice".

This scribbling stage was not very common, and children who produced such scribbles seemed always to be capable of producing something more like writing.

Stage Three

Some children produced zig-zag lines which resembled 'joined-up writing'. Fig. 2 shows a storybook produced for Teddy by Gordon (3:5). It says "Teddy went to the shops".

Stage Four

By this stage children have begun to produce discrete symbols or graphemes which look as if they might be letters. Debra (3:7) wrote my name (quite unconcerned by the fact that she couldn't remember what it was), while Jenny (4:3) wrote a shopping list which supposedly said "medicine, tablets and sweeties". (See Fig. 3.) It can be seen that Debra used four different symbols, while Jenny repeated the same one (she said that
Fig. 3: Stage four writing.

a. Jenny (4/3) shopping list
b. Debra (3/7) my name
Fig 4: Stage five writing.
   a. Jenny (4:3) "all my names"
   b. James (3:9) shopping list
Fig. 5: Stage six writing. a. Gemma (4:3) shopping list  
b. Aileen (4:4) shopping list

Fig. 6: Stage seven writing. Andrew (5:0) shopping list
they were all 'ells') many times, until she appeared to get bored and ended with a few hastily executed zig-zags.

**Stage Five**

In the next stage, clearly recognisable letters or numerals can be seen amongst the others. Fig. 4 shows Jenny's response to the "do me some writing" command (she said 'this is all my names') and James' shopping list. When James (3:9) was writing this it said 'cake, two apples and two oranges, coca cola and fizzy juice'. But when he had finished I asked him to tell me again what it said, and he responded with 'I will eat coca cola today'.

**Stage Six**

In stage six writing, *only* recognisable letters and numerals are used. But they still say whatever the child wants it to say. Gemma's shopping list (Fig. 5) says 'juice, banana, orange, another banana, and a bottle of whisky'. She appears to use one line for each item, but the number of letters in each line varies and seems to be controlled merely by the amount of available space. Aileen's list, on the other hand, says juice, ice cream, crisps, cake, and two more items I couldn't catch. Gemma (4:3) has quite a wide repertoire of letters which she repeats and rearranges as required; Aileen (4:4) only has one letter - her initial - but this doesn't seem to restrict her in any way.

**Stage Seven**

Some children realise that writing obeys mysterious rules, and so they ask how to spell things. Andrew (5:0) told me right at the beginning that he couldn't write. When we came to do the shopping list he wanted to write 'bananas' so he asked me to tell him the letters. His initials were AB and so he managed to write most of it; I had to show him how to do N and S (see Fig. 6). The next item was 'cake' and this gave him quite a lot of trouble (even though I was showing him how to do the letters by drawing with my
Fig. 7: Stage eight writing
a. Kathryn (4:4)
b. Joanna (3:10)
finger on the table top) and he decided that Teddy wouldn't want anything more.

**Stage Eight**

Stage eight children have grasped the phonetic principle: that letters represent the sounds of spoken language. Their attempts to spell phonetically can result in the kind of 'invented spelling' described by Bissex (1980), Carol Chomsky (1971b) and Read (1971). Fig. 7 shows Joanna's and Kathryn's attempts at phonetics. Joanna (3.10) wrote 'CK' for cake, but found that rather hard work. For the rest she decided that initial letters would do: A for apple, d which was meant to be b for buns, and J (reversed) for juice. Kathryn (4:4) produced 'cf mh' which was 'cough mixture', 'cswt' for 'cough sweet', 'CK' for 'cake', 'LMNT' for lemonade, and 'LM' for lemon. She carefully sounded out each word, only asking for advice on whether she should do 'a kicking kuh or a curly cuh'.

**Refusals**

Some children positively refused to write, stating firmly that they did not know how to. This could perhaps be seen as a variant of stage seven; and yet somehow these children were different from those who were willing to write if they were told which letters to write. It was more a personality difference: they seemed absolutely unwilling to risk even thinking about the writing system, in case they got it wrong.

**Pictorial writing**

Another response which did not seem to fit into the series of stages in the development of writing was to produce pictorial writing. Especially in the 'Injured Teddy' game, the need to convey information resulted in several pictorial shopping lists, from children who had otherwise either told me they couldn't write, or performed at an early level of development.
Fig 8: Janet (4:4) pictorial shopping list

Fig. 9: Ruth (4:6) "Funny writing"
example, Fig. 8 shows the shopping list produced by Janet (4:4), who although she could write her name and surname correctly, had otherwise refused to even attempt to write. Her list shows two cakes (with cherries on top) and a sausage.

Some children were hard to classify. For example, Ruth (4:6) told me that she could do 'funny writing'; and corrected me when I referred to 'funny letters'. She knew very well that she was doing proper letters, but she knew that she couldn't read what she had written. When asked for writing to accompany pictures, she mostly wrote her name - but on one I asked her to do me some 'funny writing' (see Fig. 9). I asked her if it said anything. "Yes", she replied. "What does it say?" "I can't read it - but you can read it" she told me. Later, when asked to write Teddy's shopping list, she was initially reluctant - but we agreed together that Dolly would understand her 'funny writing'. So she wrote her list. After writing all the letters she could think of, she found inspiration for more around the room on posters, books, boxes, my sweatshirt, etc. When she had finished I asked her what she had written; but she reminded me that she couldn't read that either. But she thought that Dolly would be able to. I asked if her mother would be able to read it, and she said "Yes, I think so - she can read everything". I put Ruth in stage seven; although not totally appropriate it seemed the best available category.

The above stages covered general attempts to write. As mentioned earlier, writing one's own name is a special case, and name attempts were classified slightly differently. Stages one to seven were the same in both cases; but stage eight was not found in name-writing: no child attempted to spell his own name phonetically.

Stage eight (name-writing)

Some children wrote the first letter, or perhaps the first two letters, of
Fig. 10: Stage eight name-writing. a. Bruce (3:3)
b. Jill (3:11)

Fig. 11: Stage ten name-writing. Ryan (3:11)
their name, and then claimed to have written their whole name. For example (see Fig. 10) Bruce (3:3) said "That's my name finished", and Jill (3:11) said that her effort said Jill.

Stage nine (name-writing)

Other children still only wrote a few letters of their name, but knew that it was incomplete. Andrew (5:0) told me "I know what begins with my name", and wrote his initials (AB). He described these as 'the last letter and the first letter'.

Stage ten (name-writing)

Quite a number of children could write their name correctly, although poor motor control sometimes made the result virtually unrecognisable unless you already knew what it was (see Fig. 11: Ryan, 3:11). Some could write their surname as well.

Refusal

As with writing in general, some children refused to attempt to write their names, stating that they did not know how to.

These levels of writing production were assumed to be in increasing developmental order. Table 1 shows the number of children in each stage, and the average age of all the children at each stage, in the development of writing in general. Table 2 shows the stages, the number of children, and the average ages, in name-writing.

There are no children in stage two. As was stated earlier, all children who produced stage two writing also, on other tasks in the same session, produced more advanced writing. Children were allocated to the most advanced level at which they had performed.
<table>
<thead>
<tr>
<th>Stage</th>
<th>No. of children</th>
<th>Percentage</th>
<th>Average age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: No writing</td>
<td>5</td>
<td>7%</td>
<td>4:5</td>
</tr>
<tr>
<td>2: Scribble</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: Joined-up writing</td>
<td>3</td>
<td>4%</td>
<td>4:1</td>
</tr>
<tr>
<td>4: Looks like writing</td>
<td>14</td>
<td>20%</td>
<td>3:9</td>
</tr>
<tr>
<td>5: Includes real letters</td>
<td>16</td>
<td>23%</td>
<td>4:1</td>
</tr>
<tr>
<td>6: Only real letters</td>
<td>10</td>
<td>14%</td>
<td>4:6</td>
</tr>
<tr>
<td>7: &quot;Tell me the letters&quot;</td>
<td>4</td>
<td>6%</td>
<td>4:7</td>
</tr>
<tr>
<td>8: Phonetic</td>
<td>6</td>
<td>9%</td>
<td>4:3</td>
</tr>
<tr>
<td>Refuses</td>
<td>12</td>
<td>17%</td>
<td>4:8</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Stages in the development of writing
<table>
<thead>
<tr>
<th>Stage</th>
<th>No. of children</th>
<th>Percentage</th>
<th>Average age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: No writing</td>
<td>2</td>
<td>3%</td>
<td>4:9</td>
</tr>
<tr>
<td>2: Scribble</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: Joined-up writing</td>
<td>3</td>
<td>4%</td>
<td>3:2</td>
</tr>
<tr>
<td>4: Looks like writing</td>
<td>7</td>
<td>10%</td>
<td>3:10</td>
</tr>
<tr>
<td>5: Includes real letters</td>
<td>9</td>
<td>13%</td>
<td>4:1</td>
</tr>
<tr>
<td>6: Only real letters</td>
<td>1</td>
<td>1.5%</td>
<td>4:6</td>
</tr>
<tr>
<td>7: &quot;Tell me the letters&quot;</td>
<td>1</td>
<td>1.5%</td>
<td>4:8</td>
</tr>
<tr>
<td>8: First letter(s) - thinks that's it</td>
<td>9</td>
<td>13%</td>
<td>4:3</td>
</tr>
<tr>
<td>9: First letter(s) - knows it's</td>
<td>5</td>
<td>7%</td>
<td>4:4</td>
</tr>
<tr>
<td>incomplete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10: Knows whole name</td>
<td>27</td>
<td>39%</td>
<td>4:2</td>
</tr>
<tr>
<td>Refuses</td>
<td>5</td>
<td>7%</td>
<td>4:5</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Stages in the development of name-writing.
There are only 69 children in Table 2 because there was no tape recording for one hyperactive child, and no production which could be recognised as a name. It was not possible to remember whether one of his scribbles was his attempt at his name, whether he had been asked to write his name and refused, or whether he had been so obstreperous that he had not even been asked to write his name.

It can be seen that the age of the children at each successive stage does tend to increase; however there is not a smooth increase in age from the first stage to the last, and nor would this be expected. Children's progress in understanding is dependant on many factors, probably including both chance and personality, as well as age and intelligence. The average age of children in stage one is high, probably because (as previously mentioned) this is likely to include some children who really belonged in the refusal category: who coloured in the pictures, scribbled, or drew pictures because they knew they couldn't write, but who failed to verbalise this knowledge. The age at which children learn to write their names is also quite variable; many children learn this quite young, as a sort of parlour trick, without necessarily any real understanding of written language.

Recognition of writing

The children were shown five cards and asked to point to the ones which had writing on them. Table 3 shows the responses to this task.

All children, from both nurseries, picked out the handwriting and printing as being examples of writing.
Table 3: Percentage of children rating samples as writing.

However, the responses to the other three cards showed a clear difference between the two groups of children. Of the children from the mainly middle class nursery, 64% claimed that both the numbers and the large single letter A were writing (though these were not necessarily the same children; 11 distinguished between the two, claiming that one was and the other was not writing). Of those who said that the letter A was not writing, five said it was 'a number', seven called it 'a letter', three named it as 'A', one merely said it was 'not writing', and three made unintelligible replies to the question. Of those who claimed that the numbers were not writing, 12 called them 'numbers', one said they were 'how old you are', three said they were 'letters', one said they were 'not writing', and two replies were unintelligible. All the working class children thought that the letter A was writing, and only one said that the numbers were not.

The picture of a car was claimed by only 17% of middle class children, but 43% of working class, to be writing. The middle class children were mostly the youngest (average age 3:8); but the working class children's ages ranged from 3:3 to 5:0 (average 4:2).
These results suggest that the middle class children had a more sophisticated understanding of written language than did the working class children.

The children had been shown a full-page magazine advertisement, and asked to point out the writing. All but two children agreed that there was writing on the page, and correctly pointed to at least some of the text of the advertisement. One of these two children, Lyndsay, was young (3:3), but the other, John, was aged 5:1. Lyndsay's general writing and name-writing was either a scribble or a rough zig-zag (see Fig. 1); John could write his own name correctly but was placed in stage one for all other writing. However, both children differentiated between the five cards. Lyndsay said that the handwriting, printing and numbers were writing, the picture was not, and her response to the letter A was unintelligible. John said that the handwriting and printing were writing, the picture was not, and his responses to the other two cards were unintelligible. These unintelligible responses may reflect the uncertainty the children felt about writing.

The children were shown, in random order, three words which they might possibly have learnt to recognise: STOP (which is displayed on the 'lollipops' carried by school crossing attendants); Playschool (a popular television programme) and LADIES. Four children correctly recognised the word STOP, though as I discovered from their comments, it was not from the stop signs that they recognised it, but rather from another television programme called Stop-Go. None of the other words were recognised. Some children named the letters in the words; some pointed out letters from their own name or from the names of siblings. Having recognised or been told STOP for one word, they often suggested 'go' for the next; likewise having been told LADIES they
would suggest 'gentlemen' next time. A few, having been told the meaning of one word, would then suggest the same meaning for the next word.

Very few children could read back their own writing. Those who had claimed that they were labelling the pictures with names such as 'ducks' or 'fish' generally gave the same label a week later; but this was clearly not a case of them reading or even remembering what they had written. They were simply assuming that the text was a label for the picture. Only those who had reached the stage of attempting to spell phonetically could sometimes recall what they had written; though in Joanna's case (Fig. 7) having written 'b' (for buns) reversed as 'd', she could not then remember the buns. Kathryn (also Fig. 7) could read the cough mixture, the cough sweets, the lemonade and the cake, but not the lemon. Perhaps she was confused by the fact that a lemon would be an odd thing to eat. Those children who had confabulated imaginative meanings for their writing one week were likely to produce equally imaginative but different meanings the second week. Gemma (4:3) for example, when she wrote the text in Fig. 12, claimed that it said "Dear fish, we are going to the deep pond and I'm going to swim'. A week later this same piece of writing said "Dear fish, I'm a mother fish, I'm going to stay here all day hiding from the wolf". But most children wouldn't even hazard a guess at what their writing said, on the second visit.

The responses of the children at these nursery schools can be compared with those described by other authors. There are some similarities, but also quite a few differences.

The children that Ferreiro describes all seem to be producing letters or graphemes, many of them relating the number of graphemes to the number or size of objects. But many children in this pilot study seemed to be more
Fig. 12: Gemma (4:3)

Fig. 13: Ross (4:3) shop sign
like those described by Luria as producing many of the letters of the alphabet, but with no attempt to relate them to the text they were writing. There was little evidence of a relationship between the number of graphemes produced and the number of animals pictured. Just over half of the children (57%) were producing writing that involved discrete symbols without any phonetic rule to guide production; and the number doing this sort of writing to accompany pictures was less. Despite my request for writing 'to go with the picture', many children produced non-writing responses such as colouring in the picture, drawing a circle around it, copying or tracing over it, or adding detail such as sky, water, feathers on the birds, etc. Ten children refused the task. The most common response was to write, or claim to have written the name of the creature pictured; eg 'fish', 'duck' or 'girl'. (A few gave the creatures names such as 'John' or 'Mary'; and four children wrote their own name each time.) Of the 24 children who wrote non-phonetic graphemes, some wrote the same number (frequently one) for each picture, and others wrote what seemed to be a random number of graphemes each time. Some wrote one or more graphemes beside each animal in each picture. But this did not seem to reflect the kind of hypothesis that Ferreiro described; these children were not writing three symbols under a picture of three swans, and pronouncing 'swans'; they were rather writing three separate symbols and pronouncing 'swan, swan, swan'. The average number of symbols written for each picture was as follows:

- one fish 4.6
- two children 5.6
- three swans 4.6
- two ducks 5.0
- three deer 4.4
- eight waterbirds 5.9
Ferreiro found that many of her subjects used a syllabic hypothesis: each letter stood for a syllable in the word they wished to write. Some of the children in this study attempted to segment words (especially when asked to read back what they had written), and they often combined this with pointing at their writing. But they seemed to have difficulty in synchronising their pointing finger and their voice, in the same way as they would when counting. So these children could be seen pointing to their writing, and turning a one-syllable word into as many segments as required to keep them going until the finger reached the end. 'Swans', for example, might be read as 'ss-swuh-ons', and not necessarily to accompany three graphemes. They gave the impression that they had been watching older siblings with their first readers, and had deduced that to read, one pointed at the letters and also one somehow stretched the words out unnaturally. The behaviour of these children seemed more like that reported by Tolchinsky-Landsmann and Levin (children using either one or many graphemes for each utterance; segmentation post hoc and inconsistent) than that described by Ferreiro and Teberosky.

Many of these children seemed to be either approaching or already arrived at a phonetic theory of writing. Many of them knew at least some letter names and letter sounds. Even if they didn’t know them correctly, they appeared to understand that letters were supposed to represent sounds. For example, Ross, 4:3 (see Fig. 13) wrote a sign to go outside the shop, in the injured teddy game. When he had finished, he pointed to each letter, saying "shuh buh tuh luh oh ah shuh - that says shop". Earlier he had correctly named a letter O that he had drawn.

Ferreiro discusses the importance of children learning to write their own names. She suggests that names, being invariant sequences of letters, allow
children to falsify some of their earlier hypotheses about writing. Twenty-seven children in the pilot study could write their own name; and a further 14 could write at least some of it. Clearly, children see names as being of great importance, less a possession than an essential part of themselves. (My son once asked me how, when he was born, had I known that his name was Felix.) In most families a parent, grandparent or older sibling is available to teach children to write their name or initial. This gives the child the beginnings of a repertoire of letter shapes and perhaps the sounds as well, to experiment with. Almost all children in this study were at a more advanced level in writing their name, than in more general writing. But studying a cross-section of children like this does not provide information on whether learning to write his name affects a child's other writing. Nor can we tell from this study whether children go through all the stages described here, or whether some stages are skipped by some children.

The pilot study provided a fascinating but static view of children writing. The next stage was obviously to follow a group of children in order to chart their development over a period of years.
CHAPTER 3: THE LONGITUDINAL STUDY

A nursery school to the west of Edinburgh was used for this study. The nursery had two playrooms, one containing 30 children and the other 40. Children were allocated to each playroom randomly, except that adjustments were made to ensure a good spread of age and sex distribution. All the children in the larger playroom were the subjects for this longitudinal study, though one child positively refused to participate. One child moved out of the area quite early on (his replacement was recruited into the study). A child who moved out of Edinburgh later was not replaced; but those who moved within Edinburgh were visited at their new school or at home. Thus there were 39 children altogether (22 males, 17 females) who were visited at approximately six-weekly intervals (a maximum of 13 visits) and seen individually for around 20 minutes on each occasion. Sometimes children were ill, or away on holiday, during the week of a visit to the nursery. An extra visit would be made to catch a child who had been away for a day or two; but not if the absence was expected to be prolonged.

For the first six visits, all the children were attending nursery school. But after the summer holidays the oldest 23 children transferred to primary school. Most attended the primary school to which the nursery was attached; but six went to other local authority primary schools and one went to a private school. They were all visited at school during their first (P1) year. My visits were felt to be more disruptive to the routine of the primary school class than to the nursery; and also visiting several schools took a lot more time than just visiting one; and so the inter-visit interval was increased slightly for the school children who were visited six times in the second year compared with seven visits to the nursery school children.
Children who had begun to write phonetically had essentially passed beyond the scope of this study; and although those at the main school were still tested throughout the second year, the few children attending other schools were no longer visited once they had reached this stage. Ages of the children ranged from 3:2 to 4:9 at the start of the study, to 4:5 to 6:2 by the end.

On each visit the children were given pictures of animals, objects or activities, and asked to write the (specified) name of the animal or object, or a specific word, phrase or sentence about the picture (eg "Hanging out the washing", "The farmer drives the tractor" and "Eating watermelon"). Pictures of animals and objects were generally paired, with either size, length of name, or number being varied. So for example on one sheet of paper the child might be asked to write "elephant" and "ladybird"; or "bear" and "rhinoceros"; or "snails" and "frogs" (on a picture of 2 snails and 3 frogs). The pictures presented to the children were as follows (the text which the children were asked to write is given in bold type):

Visit 1. i) an elephant and a ladybird (elephant, ladybird)
    ii) a bear and a rhinoceros (bear, rhinoceros)
    iii) 8 ducks and a swan (ducks, swan)

Visit 2. i) a zebra and a squirrel (zebra, squirrel)
    ii) a mouse and a caterpillar (mouse, caterpillar)
    iii) a pair of scissors and three pencils (scissors, pencils)

Visit 3. i) a dog and a crocodile (dog, crocodile)
    ii) a fish and a whale (fish, whale)
    iii) 3 snails and 2 frogs (snails, frogs)

Visit 4. i) a sheep and an octopus (sheep, octopus)
    ii) a kangaroo and a butterfly (kangaroo, butterfly)
    iii) a watch and a bunch of 4 keys (watch, keys)
Visit 5. As for visit 1.

Visit 6. i) a group of skeletons - an adult, a child, and a dog (skeletons)
   ii) the skeletons swinging on swings (skeletons swinging)
   iii) the skeletons climbing stairs (skeletons climbing the stairs)
   iv) the skeletons asleep in their bed (skeletons sleeping)

Visit 7. i) a woman hanging washing out on a line (hanging out the washing)
   ii) a zebra and a squirrel
   iii) a mouse and a caterpillar

Visit 8. i) a girl eating a slice of watermelon (eating watermelon)
   ii) a dog and a crocodile
   iii) a fish and a whale

Visit 9. i) six different types of fruit (apple, banana, plum, strawberry, orange, pear)
   ii) a girl skipping with a rope (skipping)
   iii) scissors and pencils

Visit 10. i) a man driving a tractor (the farmer drives the tractor)
   ii) a sheep and an octopus
   iii) a kangaroo and a butterfly

Visit 11. i) a boy and a girl playing musical instruments (making music)
   ii) a koala, a penguin and a cat (koala bear, penguin, cat)
   iii) a snake and a worm (snake, worm)

Visit 12. i) 5 assorted objects (umbrella, boat, house, television, car)
   ii) snails and frogs
   iii) 3 skeletons
   iv) skeletons swinging

Visit 13. i) a woman hanging out washing (hanging out the washing)
ii) a watch and a bunch of keys

iii) skeletons climbing the stairs

iv) skeletons sleeping

We also played various games which involved the child doing some writing: eg the "Injured Teddy" game: producing a shopping list for a teddy who had been knocked down by a car and who was feeling too poorly to write it himself. (This game was used in the pilot study and is described more fully in Chapter 2.) One December the children all wrote a letter to Santa. We played a version of the "tins game" devised by Hughes (1986), in which toy animals were hidden in identical tins. The children tried to guess which animal was in each tin, and then wrote labels for the tins to improve their guesses. Even more popular than this game was "hide the Smartie" when two sweets were hidden in one of 6 different tins and a message written to say which tin they were to be found in. (If I found the sweets the children got to eat them.) They wrote labels for animals (a cow, a bull and a calf; a sheep and two lambs; pigs and piglets; a hen and chicks; a duck and ducklings) in a toy farm; they showed Teddy (now recovered from his head injury) how to write his name; and on each visit they wrote their own name (and any other names they knew) for me.

As well as being asked to produce writing, the children were on most visits given tasks designed to reveal the progress of their understanding of written language. They were asked to sort cards into those which showed samples of writing and those which did not. They were asked to locate particular words on cards which offered a number of alternatives. They were questioned about words formed from letter tiles; and they were shown pre-written sentences and asked about the relationship between the written text and the
spoken words. Children were tested on their ability to pick out the initial and final sounds of given words; and they were also asked to play the traditional game 'I spy' ("I spy with my little eye, something beginning with ...") to see if they were any more successful at identifying sounds in what was likely to be a familiar context. The children were shown two simple picture books which had many action pictures of a young child; accompanied by short texts. They were asked to suggest meanings for each text. Full details of each task testing writing comprehension are given in Chapter 5.
CHAPTER 4: WRITING PRODUCTION

The writing attempts of the children in the pilot study had been classified into nine stages of writing production. (See Chapter 2, pp 23 - 27.) For the longitudinal study stages were combined when they seemed to demonstrate essentially the same ideas about writing, to give five levels of understanding of written language. The texts produced by the children in the longitudinal study were classified as before on the basis of the style of the "writing", and also the child's intentions if any were expressed or inferred.

Children at the first level showed no awareness of writing. When asked to label a picture they would perhaps scribble over it, or try to colour it in. Some tried to copy the picture, or made appropriate additions (eg grass or sky). Some drew a large circle around the picture, or on a blank page drew a large circle, cross or straight line. These children seemed not to understand the difference between drawing and writing; and they did not claim to have written anything.

The productions of children at the second level: scribbles, circles, crosses and lines; were often not visibly different from those at level one. However, these children were beginning to understand the concept of writing as marks on paper that can convey meaning, in that they claimed with some confidence that they had written something. For example, Steven (4:2) scribbled over a picture of an elephant.

E: "Tell me what you've written there."
S: "Elephant."

Later, shown a picture of ducks and swans,
Fig. 14: Level three writing.
  a. Gail (3:5)
  b. Jamie (3:6)

Fig. 15: Level four writing.
Douglas (3:7)
E: "Can you write their names?"
S: "Yes", and he scribbled over each one.

**Level three** children are clearly differentiating writing from drawing or scribbling. Some produce zig-zags or wavy lines in imitation of handwriting; while others produce discrete squiggles or symbols that begin to look like real letters. Gail, 3:5 (Fig. 14) claims to have written 'elephant' and 'tiger'. Many children at this stage produce small circles, crosses, lines and dots (such as Jamie, 3:6, Fig. 14) which could be taken for the letters O, X, and I, or punctuation marks. But they could equally well be produced by accident; and so they were not included in this level unless the child specifically named them correctly as letters.

Children at both this level and the next are not prevented from writing by not knowing what it is that they are to write. As described by Luria, they will begin to write before they are given the text; and they frequently forget what they are supposed to have written and so cannot read back their writing unless they are reminded of the names of the animals whose names they have supposedly written.

By **level four**, the child's efforts approximate visually to real writing. They have come to realise that something more than a squiggle or a zig-zag is needed: recognisable letters and numbers begin to appear. Douglas, 3:7, (see Fig 15) wrote labels (for the 'tins game') saying 'dog', 'cow', 'pig' and 'horse'. Some children use letters or numbers in combination with idiosyncratic signs, while others confine themselves entirely to conventional symbols. But at this stage the children generally believe that their "writing" says what they want it to say. They are likely to produce imaginative
Fig. 16: Level five writing. a. Barbra (4:7) 
b. Susan (3:9)
accounts of what they have written; although a small number of children seem uncertain of the meaning of their written message.

At level five, children have achieved understanding of the phonetic principle of writing. Letters are no longer written at random, but are chosen according to the sounds of the word they are trying to write. Fig. 16 shows the fruit names written by Barbra (4:7). Barbra could not pronounce the letter R; and we had an interesting discussion about how her mother was mixed-up and thought that her friend's name Rory (pronounced Wowy) started with a R but it really started with a wuh.

However, children may grasp the phonetic principle before they have fully learned the letter-sound correspondences. Or indeed, they may not have been learned at all; although the child may think she knows them. Thus Susan, at 3:9 (see Fig 16) might appear to be writing at level three, except that as she writes each graphic sign she mutters to herself: "buh, eh, ih, ruh; huh, ih, puh, oh, tuh, uh, sss". (She has named the rhinoceros a hippopotamus.) Similarly Jennifer (3:8), given a picture of a crocodile and a dog, writes two inverted-U symbols, saying firmly "cuh for crocodile, duh for dog".

Some children at level five are happy merely to write the first sound of a word; others attempt the whole word. They may ask for assistance, eg "How do you do a huh again?" or "Is it a kicking kuh or a curly cuh?" Some children would write the phonetically correct initial letter of a word and then add more letters seemingly chosen at random to complete their message. It seemed that in some children at least the phonetic principle could co-exist with a level 4 belief that any letters could be used.
At the first visit to the nursery, the most common type of writing was level three. Fourteen children (average age 3:10) were producing zig-zags or squiggles that looked like writing. Another 11 children (average age 3:11) were producing level-four writing. Three (mean age 4:7) were writing phonetically; two wrote at level two and two of the youngest were at level one. One girl aged 4:5 demanded that I write everything for her to copy; two children produced pictorial messages, and two refused to attempt to write.

By the end of the first year of the study, five children (average age 4:11) were at level 5. Twelve (average age 4:7) were at level 4, and 17 (mean age 4:3) were writing at level 3. One boy aged 3:10 was at level 2, and two refused to write.

After two years, 11 of the 15 children still at nursery school (mean age 4:10) were producing level four writing; and three (average age 5:1) were writing phonetically. One child was still at level three.

Some responses did not fit into the above categories. Some pre-phonetic children, particularly when it was important to convey information, would produce a pictorial representation. Douglas, 4:10, told "You write down where you hid the Smarties", said "I can draw it" and drew a car. There were three tins shaped like cars; they were all different colours, but Douglas only had a black pen. As he coloured it in he told me "That's meant to be green". Thomas, 5:3, desperately wanted me to find the Smarties hidden in one of six tins; so he drew a large arrow on his paper and then placed it so that it pointed to the correct tin. Other children gave responses which indicated that they had realised that writing was a rule-bound activity, and that they also knew that they did not know the rules. Either they firmly
refused to do anything ("I can't write") or they demanded instructions ("You'll have to tell me the letters"). Classification of responses was often quite difficult. Some children produced easily recognisable letters; but others, especially the younger children whose fine motor coordination was still immature, were more problematic. Bill, for example, was left handed, and held the pen in his clenched fist. He frequently used his right hand to guide the point of the pen held in his left hand, which produced some very shaky-looking graphemes.

The child's commentary might reveal whether a series of squiggles were just that, or whether they were in fact intended to be specific letters or numbers; but if the child remained silent it was necessary to guess at the intention. In general, children were not asked specific questions about their writing, as it was found that questioning was as likely to suggest answers to an eager-to-please child, or to convince an unconfident child that his efforts were inadequate, as to elicit a reasoned reply. A child asked "Does that say elephant?" would gratefully reply "yes"; but if asked "What have you written there?" would probably either give no reply or respond with "I don't know". Peter, 3:10, said that a particular piece of writing said "what you said - that" and he pointed to the lamb whose name he had forgotten.

According to Ferreiro, children who had not realised that writing was a phonetic representation of speech formed several hypotheses about the nature of written language. In younger children she found the name hypothesis, and also the idea that characteristics of an object could be represented by the physical features of its name. Older children used the minimum-quantity hypothesis, the hypothesis of variety, and finally the syllabic hypothesis. The writing responses given by children in this study
were carefully studied in search of evidence that Scottish children followed the same path in learning to write. (The 'name hypothesis' is discussed in the following chapter.)

The written text reflects properties of the object

On each visit, children were asked to write the names of pairs of animals or objects. Sometimes the pairs differed in size (eg fish/whale, elephant/ladybird) and sometimes in number (eg 1 swan/8 ducks, 3 snails/2 frogs). There was very little evidence of children varying the number of graphemes to reflect the characteristics of the object. Most children tended to use around the same number of symbols for each response. When there were different numbers of objects, it was common for the child to write a name beside each object: eg when given the snails/frogs picture and asked to write "snails" and "frogs" the child would rather write "snail" three times and "frog" twice.

However, a small number of children did seem to believe on some occasions that the physical characteristics of the text could reflect those of the object. Neil announced that because an elephant was so big, his name would have to be written in large letters. But the wish was not father to the deed; when he had finished, there was in fact no noticeable difference in the size of the letters used for elephant and for ladybird. Martin, writing six letters for whale and three for fish, explained that this was because the whale was bigger. At the same session he had written fruit names; and I asked why he had given strawberry more letters than the others. He thought a while before replying "because it's red". Perhaps we can believe Neil and Martin, who proffered their statements unasked. I don't think we can believe Lara, who was asked why she had written "sheep"
Fig. 17: Stuart (3:10)
with more letters than "cow". "Because sheep is bigger than cow" she replied most untruthfully.

Questioning children about why they used the particular letters they did, or the number of letters they did, is more likely to produce a post hoc justification than evidence of prior planning. Gillian (4:5) was writing labels for farm animals; and when she had written 'sheep' I asked how many letters she had used. She counted them and replied "seven". "How many letters will you need to write lamb?" I asked, thinking that she might plan to use fewer letters for the name of a smaller animal. But her response suggested that her writing was not controlled by any such plan: she wrote, and then she counted the letters, and then she replied "five". Nor can one reliably make inferences about intentions from the writing samples which are produced by the child. For example, Stuart (3:10) wrote seven letters for crocodile and only three for dog. (See Fig. 17) Is this because he meant to? Or because he reached the edge of the page after three letters and was obliged to stop? Some children quite obviously get carried away when writing and continue making letters until they reach the edge of the page. Others, perhaps after having difficulty in forming the letters they want, clearly get fed up and stop prematurely. One cannot even be sure that children have written what they were instructed to write. Some children, shown a picture of a bear and a rhinoceros (selected as examples of large animals, one one-syllable and the other four) named the bear a 'teddy-bear' (ie a small and friendly animal with three syllables). Even though I explained that it was not a teddy but a large and fierce bear, and asked them to write "bear", some persisted in their miscalling. And when asked later to read what they had written, it would be "teddy-bear".
Children instructed to write 'dog' may claim to have written 'doggie', while 'television' may be rendered as 'telly'.

Even counting graphemes is not as simple as might be thought. I said that Stuart had used seven letters to write crocodile; but the first two letters are a rough circle and a line which he could well have intended to be joined together to make one letter such as a or d. Other children add dots or very short lines to their text; should these be counted as individual graphemes? Others write a row of symbols such as U or V; some of these appear to be joined together presumably by accident - or perhaps it was intended. Faint lines may be merely a slip of the pen; but they might have been meant.

The minimum quantity hypothesis

Many children in my study used a single grapheme to represent every word or phrase they intended to write. This was found both in phonetic children who wrote initial letters, and in pre-phonetic children. Tolchinsky-Landsmann and Lewin suggested that using only one grapheme was more common in younger children; this also seemed to be the case in the pre-phonetic children in this study.

The variety hypothesis

Children did tend if they could to vary the letters they used. For a long time Jamie, for example, only knew the letters of his name which he would use in different combinations for different texts. (See his fruit names in Fig. 18.) But this was not invariable. Jenny (4:3) used a row of inverted U symbols to say everything in her shopping list, while on another page she wrote "all her names" using quite a varied selection. (See Figs. 3 and 4, in Chapter 2.) Douglas had a large number of letters and symbols at his
The syllabic hypothesis

Quite often, either while children wrote or when they were asked to read back what they had written, they would attempt to break words up into smaller units, and to relate those units in some way to the written symbols. However, it is questionable whether they were trying to make the symbols fit the word, or the word fit the symbols. Short words might be 'expanded' to match a large number of symbols (e.g. "swoh - oh- oh- oh- oh- on" [swan]; or the variant "swoh -oh- oh - oh - swan"). Long words would be contracted to match a small number of symbols, as in "cat - erpillar. The pointing finger tended to move smoothly along the line of writing, and often the number of sounds vocalised would not match the number of graphemes. The important thing seemed to be to make the last spoken sound coincide with pointing to the last written letter. This of course is the type of behaviour commonly observed in young children counting. Some children achieved this by pronouncing the whole word for each written symbol, with an extra triumphant emphasis for the last symbol. Kamler and Kilaur (in Kroll & Wells 1983) report similar behaviour in Coline (aged 4 1/2), who 'writes' sentences and then reads them back, trying to achieve a match between voice and print. She writes groups of symbols (one group per line) and has to 'read' her sentence several times, adding either more symbols or more spoken words, and changing the way in which written text and spoken words are related, until eventually she manages to be speaking the final word while pointing to the final group of symbols.
In a specific attempt to find evidence to support Ferreiro's syllabic hypothesis, children were on two occasions asked to write several names of varying length on the same page. The first page showed pictures of several different kinds of fruit: apple, banana, plum, strawberry, orange, and pear. Five months later, they were asked to write (beside illustrations) umbrella, boat, house, television and car. The number of symbols used by those children who wrote discrete symbols (but excluding those whose writing was already phonetic) was counted. The average number of symbols used for each word is shown below.

<table>
<thead>
<tr>
<th>Word</th>
<th>Symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>plum</td>
<td>3.0</td>
</tr>
<tr>
<td>pear</td>
<td>2.9</td>
</tr>
<tr>
<td>apple</td>
<td>3.1</td>
</tr>
<tr>
<td>orange</td>
<td>2.8</td>
</tr>
<tr>
<td>banana</td>
<td>2.9</td>
</tr>
<tr>
<td>strawberry</td>
<td>2.9</td>
</tr>
<tr>
<td>boat</td>
<td>4.5</td>
</tr>
<tr>
<td>house</td>
<td>3.5</td>
</tr>
<tr>
<td>car</td>
<td>3.7</td>
</tr>
<tr>
<td>umbrella</td>
<td>3.5</td>
</tr>
<tr>
<td>television</td>
<td>4.1</td>
</tr>
</tbody>
</table>

It seems clear that the number of syllables in a word does not affect the number of graphemes used by these pre-phonetic children to write the word. (The increase in the average number of symbols per word on the second test is due to there being fewer single graphemes on this occasion; possibly an effect of increasing age.) Would it in fact be reasonable to expect these children to use syllables as a guide to the length of a word? In an American study, Liberman et al (1974) asked children to tap out the number of syllables in a selection of words. They found that just under half of four- and five-year-olds could do this correctly; it was not until first grade (six years old) that 90% success was achieved. In another study
Rozin *et al* (1974) showed children two words on a card: one short word and one long, eg mow and motorcycle. One of the words was spoken aloud and the child was asked which of the written words corresponded to the spoken word. They found that inner-city five-year-olds did not perform well: only 11% understood that the length of a spoken word would be reflected in the length of the same word when written. Suburban (middle-class) five-year-olds were 43% successful.

It seems therefore very likely that three and four year olds are not able to detect syllables with any accuracy. By five years old perhaps half the children would be capable of constructing a syllabic hypothesis; but by age five many of these children have begun to understand that writing involves phonetic, not syllabic analysis. It is true that phonemic analysis is an even more advanced skill than syllabic; but these young children do not in general attempt to identify all the sounds in a word. Many are content to record just the first sound, while others pick out a few sounds which are salient. This results in the kind of invented spelling described by Carol Chomsky (1971a and b) and Bissex (1980).

Ferreiro claims that 70% of the children she studied developed a syllabic hypothesis even though they were at school receiving instruction in the alphabet and alphabetic writing. I did not find this in the children I studied. The syllabic segmentation which I found was similar to that reported by Tolchinsky-Landsmann and Levin: generally *post hoc* and merely one of many alternative forms of segmentation used by the children.

Most children very quickly began to write phonetically once they reached primary school, while those who did not remained at level four: they used conventional letters and numbers in an unconventional way.
Fig. 19: Zak (5:11)
This was frequently interspersed with words that had been learnt in class, in a way which suggested that at some level the children were aware of the inadequacy of many of their responses. For example, Zak at 5:11 was one of the oldest in the group, but with extremely immature writing (and speech problems). At session 11 he had been writing at level four until asked to write 'making music'. "I want to write their names" he said, and (see Fig. 19) made a recognisable attempt at 'girl' and 'boy'.

Name writing

On my first visit to the nursery school, 11 of 36 children made a recognisable attempt to write their name. These were generally the oldest children, with an average age of 4:4. Another six refused the task, saying that they could not write their name. Looking at each child in his last month (June) at nursery before starting school the following August, 23 out of 37 could make at least a recognisable attempt to write their own name. Another five could get the first one or two letters of the name correct.

Ferreiro suggests that being taught to write their own name gives children much information about the writing system: information which frequently conflicts with the hypotheses they have formed and which may hasten progress towards a phonetic theory. For example, she describes Santiago, who worries because his name has eight letters but only four syllables. It may well be true that learning how to write their name causes children to reflect on writing in general; and that they apply information about the writing system contained in their name to their attempts to write other things. Certainly children are almost always more advanced in writing their own name than at writing other texts. However,
many children learn to write their name quite early on, without generalising to other writing. For example, Lara was 4 1/2 when I first met her. She could write her own name (Lara Walker), as well as the names of her two brothers Campbell and Alexander. But for the whole of her last year at nursery school she continued to write at level four, selecting letters at random to write whatever I suggested. She did not appear to reflect on the fact that her name-writing was rule-governed while writing other texts was not. This type of behaviour is also reported by Tolchinsky-Landsmann and Levin, who note that learning how to write one's own name does not immediately raise the level of conceptualisation of written language in general.

Many children in fact seemed quite capable of holding contradictory theories about written language, believing them all at once (or at least switching quickly from one to another). A quite common stage on the way to fully phonetic writing was to write the first sound of a word correctly; and then to add more letters which appeared to bear no relation to the sounds of the word being written. (Lara at 5:6, after a month at school, writes "miij" for mouse and "Cil8" for caterpillar.) A similar kind of dissociation is seen in Thomas, also 5:6. He has already written 'worm' and 'snake' using seemingly random letters. Then I show him a picture of a koala bear, a penguin and a cat, and ask "Can you write their names?" He replies "I know how to write a cat's name". The tone of his voice implies that he did not know how to write worm or snake, and that he does not know how to write koala bear or penguin. He writes 'c'; and then asks "What's next after the 'cuh'?" After I have told him, he then supplies the 't' himself. He then writes penguin ('ssil') and koala bear ('ooklon'). When he has finished I ask him to read me what he has written there. He
reads" "cat ... penguin ... koala bear", making no distinction between the one he could write and the ones he couldn't.

It is obvious that learning to write his name gives a child ideas about writing in general. For one thing, it gives him a repertoire of letters which he can then use for other tasks. But the extent to which it makes him question his previously-formulated hypotheses about writing is in doubt. Some children clearly do not worry that different kinds of writing appear to follow different rules. It may be that this is related to the way in which they are taught their name. Perhaps some teachers (ie parents, grandparents, siblings etc) write the name out in full and leave the child to copy and memorise it; while others teach it letter by letter (eg "sss ooh sss ah nnn, Susan"). As yet, we have no information on this point.

A cautionary tale

Earlier I mentioned some of the problems of working with young children. They do not always do what they are asked to do. Their explanations as to why they wrote in a particular way may really be post hoc justifications, or what the child thinks you want to hear. Counting the number of graphemes a child has produced may be influenced by how the counter defines a graphemes (so dots for example tend not to be counted). You frequently cannot believe what they say; and (as the tale of Jacqui shows) you cannot always believe what they write either.

Jacqui was one of the younger children, a quiet, timid girl who did not particularly want to go with me, but did not have the courage to refuse. Early in the study she learnt to write her name, her parents' names, and her sister's name. But whenever she was asked to write anything else she would produce a neat little zig-zag which I carefully recorded as level two. One day,
half way through the second year of the study, Jacqui had just returned to
the nursery after a session with me. A teacher asked her what she had been
doing with me; and Jacqui replied "Writing". "But you don't know how to
write," queried the teacher. "Oh", said Jacqui, "I just pretend."

The control group comparison

After attending nursery school and taking part in the study for two years,
three of the 15 children in the experimental group (average age 5:1) were
writing phonetically. Eleven (average age 4:10) were at level four; and one
(4:8) was at level three.

There were almost twice as many (28) in the control group. Nine (average
age 5:0) were writing phonetically, with another three (average age 5:2)
rated as being intermediate between levels four and five. Eight children
(average age 4:11) were at level four, one (5:3) was intermediate between
three and four, one (4:9) was at level three, and one (4:9) seemed to be at
level one. Five children refused to write.

It was impossible to deduce anything about the effect on the experimental
group of taking part in the study from these results. The control group had
greatly increased numbers of children either writing phonetically, or
refusing to write because they knew that they did not know how to; and
comments that they made suggested that the short time they had been
attending school had already taught them about the nature of the writing
system. Many asked questions such as "What letters do I need?" or "What
does that begin with?" The three children who were rated as in between
levels four and five asked such questions; but at the same time it was clear
that they didn't understand the significance of their questions. They seemed
to have learned that that was what you asked before writing anything; but they didn't know how to find out what letters were needed.

It would clearly have been better to use a control group of children who were also in their last weeks at nursery school, rather than to wait until after the summer holidays and use children in their first weeks at school. But at the time it seemed easier to use the school where I was already a welcome visitor, than to try and arrange permission to go into new nursery schools. I wanted to have children who were all around five years old, which would have meant that only the oldest at each nursery would have been usable, and so I would have needed to get permission to visit several new nursery schools. I hoped that I could save a lot of complications by using the school children, since I assumed that they would not have had much in the way of formal teaching in what was still a settling in period; but it seemed that I was wrong.
CHAPTER 5: COMPREHENSION STUDIES

As well as being asked to produce writing on each visit, the children were also given tasks designed to shed light on what they understood about written language.

Recognition of writing

The children were shown 15 cards, 14 x 9 cm, and asked to distinguish those which showed examples of writing from those which did not. The 15 cards (see Appendix) showed:

i. Several lines of handwriting.

ii. Several lines of typescript.

iii. A one-line printed sentence: A cat sat down.


v. A number of letters scattered randomly over the card.

vi. A line of letters arranged vertically.

vii. A line of nine identical lower-case letters: eeeeeeceee

viii. The numbers 1 - 9.

ix. A large letter B.

x. A line of small geometric shapes.

xi. A line of invented hieroglyphic symbols.

xii. A 'zig-zag' wavy line.

xiii. A line of stick figures in different positions.

xiv. Scribble.

xv. A picture of a car.

Instructions were given as follows: See my cards? They've got all mixed up. Can you help me sort them out? Some of them have got writing on, and
The child is handed the first card. Does this have writing on it?

The cards were presented in random order; except for the first two. In order to facilitate the establishment of two piles of cards, those with writing and those without, the first card presented was no. iii: the sentence "The cat sat down". This was followed by no. xv: the picture of the car. Almost all children classified the first as writing and the second as not.

If the child responded that the first card did have writing, E said: OK. Let's put that one over here, then. Let's put all the ones with writing over here.

Then, as soon as the child described a card as not showing writing, E said: Let's put that one over here (on the opposite side of the table). Let's put all the ones that don't have writing over here. And as each card was placed on the not-writing pile, the child was asked casually: That's not writing? What is it then?

The card-sorting task was administered twice; once on the second visit, in November, and again 10 or 11 months later on the seventh visit. Thus, in the table below, the second group of children (those aged 4:2 to 4:9) are actually the same children as those in the first group, but 10 months older. Similarly, the fourth group (those aged 4:11 to 5:7) are the same children as those in the third group. Variation in numbers between visits was due to some children being away sick on one or other visit, one child moving south and being lost to the study, and a couple being taken into the study after the task had been administered the first time.

It seemed likely that, after several sessions with an adult who asked them to write, questioned them about writing, and praised their replies and writing attempts, children would become more aware of writing in general, and more sophisticated in their conceptualisation of written language.
Therefore this card-sorting task was also given to a control group of older children who had not been involved in the study. Seventeen children, aged 4:11 to 5:6, were tested in their third week at school (which they had so far attended mornings only). Their responses were compared with those of the experimental group.

**Results**

Almost all children seemed to understand the task requirements, and carefully allocated the cards to one or the other pile. However the occasional child, especially in the younger age groups, seemed to be sorting at random, or alternatively putting all the cards in the same pile. One of the control group, two days short of her fifth birthday, said that none of the cards showed writing. She seemed to think that 'writing' meant the act of writing, since when questioned as to why none of the cards had been described as writing, she offered to do some more writing in order to demonstrate 'writing'.

Cards i and ii showed pages of close-written handwriting (card i) and print (card ii). Most children classified these as writing. But a curious response from a few older children was to look at the card, covered with small print or writing, and say "there's nothing there". It was as if these children had come to expect writing to be large and clear; as if they dismissed small print as being 'not for them'. Andrew (4:4) said that these two cards were not writing, but "stories".

Card iii did in fact present a sample of writing that might have been found in the sorts of books preschool children look through. "A cat sat down" was written largely and clearly in the centre of the card. Ninety-four
<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>i. [Handwriting]</td>
<td>94</td>
<td>90</td>
</tr>
<tr>
<td>ii. [Printing]</td>
<td>94</td>
<td>100</td>
</tr>
<tr>
<td>iii. A cat sat down</td>
<td>94</td>
<td>90</td>
</tr>
<tr>
<td>iv. Apneumoniakills</td>
<td>83</td>
<td>90</td>
</tr>
<tr>
<td>v. [Scattered letters]</td>
<td>78</td>
<td>70</td>
</tr>
<tr>
<td>vi. [Vertical letters]</td>
<td>89</td>
<td>70</td>
</tr>
<tr>
<td>vii. eeeeeeeeee</td>
<td>83</td>
<td>60</td>
</tr>
<tr>
<td>viii. 123456789</td>
<td>89</td>
<td>65</td>
</tr>
<tr>
<td>ix. B</td>
<td>72</td>
<td>50</td>
</tr>
<tr>
<td>x. [Shapes]</td>
<td>56</td>
<td>30</td>
</tr>
<tr>
<td>xi. [Hieroglyphs]</td>
<td>39</td>
<td>15</td>
</tr>
<tr>
<td>xii. [Zig-zag]</td>
<td>39</td>
<td>15</td>
</tr>
<tr>
<td>xiii. [Stick figures]</td>
<td>22</td>
<td>15</td>
</tr>
<tr>
<td>xiv. [Scribble]</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>xv. [Car]</td>
<td>22</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 4: Percentage of children rating cards as showing samples of writing.
percent of the youngest children, and 100% of the oldest, agreed that this was writing. The control group child who said that none of the cards showed writing reduced the figure to 94% for this group. Card iv, Apneumoniakills, had no spaces between the 15 letters; and slightly fewer children (at all age groups) said that this was writing.

Cards v and vi showed letters scattered over the page (card v) or arranged vertically (vi); while card vii had a horizontal row of identical letters. Rating these as writing rose to 100% in the third group of (naive) children (aged 4:2 to 4:9), but then fell slightly. Older children, and children in the second group who were the same age but had been part of the study for almost a year, made comments such as "it's not writing, it's just letters"; while some who had classified it as writing pointed out that it was not the sort of writing which said anything. These children reveal an extremely mature understanding of the fact that the word 'writing' may have more than one meaning. A collection of letters may be considered to be writing (especially if contrasted with a picture, or a scribble); but at a higher level the ability to convey meaning would be important to the definition of writing.

Card viii showed numbers, 1 - 9. Rating these as writing tended to decrease with age (only around half the oldest group thought that numbers were writing). But 71% of the control group rated numbers as writing. Card ix (a large letter B) was thought by around three-quarters of the older children to be writing, with others saying that it was not writing, it was just a letter. Again, there was a difference between groups 2 and 3, with the retest group giving more sophisticated responses to these two cards.
Half the youngest children thought that card x (a line of hieroglyphs) was writing; but this declined to only 24% of the oldest. Geometric shapes (card xi) were less likely to be classified as writing, especially by the younger children. Card xii (a zig-zag line) was classified similarly to card xi.

The three final cards were the row of little men, the scribble, and the picture of a car. Around a quarter of the youngest children thought that these were writing, and this decreased further with age and experience.

On the whole there did not seem to be much difference between the control group and the equivalent experimental group (each of which contained 17 children) on this task. The greatest discrepancy was on the number card: 9 of the oldest experimental group, compared with 12 if the control group, said that numbers were writing. It had been expected that the control group would be more inclined to rate the 'controversial' cards (scattered, vertical and repeated letters, along with the single letter and the set of numbers) as writing. However on average this tendency was slight. Perhaps two weeks of mornings-only school had had more effect on the control-group children than had been assumed. As discussed in the previous chapter, it might have been better to catch the control group in their last weeks of nursery school, before the summer holidays, rather than allow them any experience of infant school. But there would not have been enough children of the appropriate age at the nursery school where I was working. Getting official approval for using children from other nurseries would have been a cumbersome, lengthy procedure, which was why it was decided to use the intake class at the primary school.
The results of this card-sorting task confirm the findings of Lavine (1972): that many preschool children as young as three years have a substantially correct concept of writing. They do not classify pictures as writing; and they use criteria such as linearity, variety, and multiplicity to differentiate writing from writing-like displays. Around a quarter of the youngest group (though not necessarily the same children each time) said that the last three displays (the stick figures, the scribble, and the picture of a car) were examples of writing. It is hard to know if this is the result of confusion about what is and what is not writing, or whether the children were finding it difficult to understand the task requirements. Two of these children said that all but the picture of the car were writing; this did seem to be the result of a broader definition of writing. Another said they were all writing. Perhaps he believed that any kind of marks on paper equals writing. But others gave the impression that they were uncertain. One child began by sorting apparently at random, until, half way through the task he suddenly seemed to realise what he was supposed to be doing and began to differentiate. Others began by sorting carefully, but appeared to get bored and finished off by putting all the cards in the one pile. It is clear that although success at a task implies the ability to perform that task, failure may not necessarily be due to lack of ability.

Lavine found that recognition of writing improved with age, and was also affected by culture: children from more literate cultures showed a more advanced knowledge of writing than did those from cultures which gave them less exposure to writing. She suggested that the influence of culture was as strong as, and sometimes stronger than, the effect of age. Results from this study seem to agree that in most cases the increased exposure to writing which resulted from taking part in the study had a greater effect.
than increased age. Presumably, the focus on writing which the children experienced during the experimental sessions caused them to be more ready to assimilate information about writing in other situations - an idea which has extremely important educational implications. However, although the more experienced younger children seemed to understand more about writing than the naive children, the oldest group did not seem to be significantly better than the control group. Perhaps by five years children are able to learn quickly, and catch up with other children who have moved ahead because of their prolonged early experiences of writing.

Tolchinsky-Landsmann and Levin (1985) correctly point out that the child's discriminations are constrained by the experimenter's choice of samples. The children may well be capable of making even more complex discriminations than they showed here. But this kind of card-sorting task is not particularly enjoyed by children; so there is a limit to the number of stimuli they can be offered.

**Phonemic Analysis Test**

Before children can progress from the idiosyncratic use of letters to phonetic writing they must be able to analyse speech into sounds or phonemes.

Liberman et al (1974) asked children to tap out the phonemes in a number of words. (They were allowed several practice/training attempts.) None of the four-year-olds in this study were successful at the task, and only 17% of five-year-olds could correctly identify phonemes. Even the six-year-olds were only 70% successful. This study would seem to suggest that no four-year-olds, and very few five-year-olds, would be capable of writing phonetically.
However, when children first begin to realise that writing is a phonetic representation of speech, they do not generally attempt to record each individual sound. Instead, they write the sounds which are salient. For many children, this means only the first sound of a word; while others pick out some later sounds as well. It seems that consonants are more salient for young children than are vowels; thus Jill, at 5:2, writes "scrl" for squirrel, and Kathryn (4:4) writes "LMNT" for lemonade. This results in the sort of invented spelling described by Carol Chomsky (1971b), Read (1971), and Bissex (1980); and may also be compared with written Hebrew. In Hebrew, vowels are not represented by graphemes, but are indicated by diacritic marks (dots and tiny lines) which are often omitted. It may, indeed, be easier for children to begin to write Hebrew than English, for this reason.

So, rather than asking children to give all the phonemes in a word, it would be more relevant to their ability to begin to write phonetically to find out at what age children are able to give the first sound, and any other sounds, of a word.

On the third visit to the nursery, when the children were aged from 3:4 to 4:11, they were tested on their ability to give the first and last sounds of a number of words. The test was also given to 28 children, aged 4:6 to 5:5, who had just started at primary school. (They were in their third week of school, and as yet were attending mornings only.) Altogether 65 children were tested.

They were first asked to give the initial sound of a word. Since it was assumed that this would be a difficult task, which might not be easily understood by the younger children, instructions were given several times in different forms, an example was given, and the child was corrected if he
gave an incorrect response to each test word. The word used for the practice example was *red* and the four test words were *coat, dig, pen and lamb.*

Instructions were given as follows. "If I were to say a word ... like 'red' ... can you tell me the sound that 'red' begins with? ... What sound comes at the beginning of 'red'?" A correct response to the practice example was praised, and an incorrect response was corrected: "'Ruh'. 'Red' begins with 'ruh'. Now, how about 'coat'? What sound comes at the beginning of 'coat'?"

After the four test words had been presented, the children were then asked to give the final sound of four words: *moon, gate, sad and lock.* Again, *red* was given as a practice example, with the following explanation. "Now, this time; I want you to do something harder. I want you to tell me the sound that comes at the end of the word. Like if I said 'red', what's the sound that comes at the end of red? ... Do you know? ... 'Ruh' comes at the beginning; at the end of red comes 'doo'. Now, can you tell me what comes at the end of 'moon'?"

The second part of this task (giving the final sounds of words) was not given to those children who had failed all four test items in the first half of the task.

**Results**

As expected, many children found this task difficult. Some merely repeated the stimulus word, while others gave another word related in some way to the stimulus. For example, Kevin (4:7) gave "write" for pen and "baa" for lamb. Others gave inappropriate letter names: Martin (4:7) used "double-you" several times, while Thomas (4:4) preferred "aitch". Some gave incorrect sounds, and a few gave correct sounds. Some could not always separate the initial consonant from the following vowel, and might for example give 'peh' instead of 'puh' as the first sound in 'pen'. This was
accepted as a correct response. It was much easier for children to give the first sound than the last; many children continued to pronounce the initial phoneme even though they were reminded at each attempt that it was the final sound which was required. Some, having given the initial phoneme, were able if encouraged to give the final sound (or sounds: for example, the child may give 'ate' for gate). But they were only credited with a score if the final phoneme had been their first response.

Each child was given a score out of 4 for the first half of the task (initial sound) and again for the second half (final sound). Total scores earned by children at different ages are shown in Table 5.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Total score</th>
<th>% children scoring</th>
<th>Average score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>initial</td>
<td>final</td>
<td>initial</td>
</tr>
<tr>
<td>3:4-4:0</td>
<td>18</td>
<td>10</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>4:1-4:7</td>
<td>16</td>
<td>22</td>
<td>1</td>
<td>44</td>
</tr>
<tr>
<td>4:8-4:12</td>
<td>15</td>
<td>26</td>
<td>4</td>
<td>53</td>
</tr>
<tr>
<td>5:0-5:6</td>
<td>16</td>
<td>41</td>
<td>10</td>
<td>81</td>
</tr>
</tbody>
</table>

Table 5: Children's scores on a phonemic analysis test.

It can be seen that success increases with age. The number of children who achieve a score greater than zero on the initial sound test increases from 3
(17%) in the youngest age group, to 13 (81%) in the oldest. The final sound test is much more difficult: only 31% of the oldest children achieved any score on this task; and the children who did score tended to have lower scores than on the initial sound test.

I Spy

On the visit following the phonemic analysis test, we played the traditional game "I spy with my little eye". It was thought that if the children were familiar with this game, they might be more able to identify initial sounds than they were in the phonemic analysis test. The game was played with 34 nursery school children; and the percentage able to give a correct clue is given in Table 6. The success rate is in fact very similar to that in the phonemic analysis test.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>% giving correct clue</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 - 4.0</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>4.1 - 4.5</td>
<td>11</td>
<td>45</td>
</tr>
<tr>
<td>4.6 - 5.0</td>
<td>13</td>
<td>54</td>
</tr>
</tbody>
</table>

Table 6: Children's success in giving clues when playing 'I Spy'

Liberman et al found that none of his four-year-old subjects could correctly tap out all the phonemes in a word; but almost half (48%) of four-year-olds in this study could give the initial phoneme of a word. Some could give more than one sound. These children have demonstrated an ability prerequisite to the understanding of the phonetic nature of written language. Indeed, this may be an underestimate of the ability of this group
of children; since one boy aged 4:7 scored zero despite writing the initial letters of a number of words correctly earlier in the session.

Find the word

Ferreiro et al suggested that pre-phonetic children might use more letters to represent a large object or animal than a small one. It is also possible that even pre-phonetic children might have some understanding of the relevance of the length of a spoken word to its written representation.

The effect of the size of an animal or object, the number of objects, and also the length of the name of the object, was looked for in children's writing productions. But writing production may be affected by other factors. For example, a child may get bored and write only a few letters; or he may perseverate and write on until he has filled the page. Some children may not be able to form letters or letter-like shapes; but may still have ideas about what words should look like. Therefore, in this task, children were shown cards which showed a number of alternatives, and asked to choose which one was a particular word.

The words used in this task were nouns in four categories:

a) a small object with a short name: cat, worm, flea
b) a large object with a short name: bull, tree, bus
c) a large object with a long name: dinosaur, steamroller, giraffe
d) a small object with a long name: bumblebee, dandelion, tadpole.

The alternatives offered on each card were:

i) the correctly spelt word;
ii) a nonsense word beginning with the same letter, but short if the correct word was long, and long if the correct word was short;
iii) the initial letter only;

iv) the initial letter repeated 3 or 4 times.

The alternatives were printed, one underneath the other, on white cards approximately 14 cm x 9 cm.

The order of the alternatives was varied systematically between cards, and the order of presentation of cards was randomised. This task was presented on the fourth visit, to 38 children aged from 3:6 to 5:1.

For this task, it was important for the children to be aware of the relative sizes of all the animals and objects named on the cards. Therefore, each card was introduced with an explanation or reminder which contained either a word such as little, small, tiny or wee; or a word like great, big, enormous or tall. For example, the child was asked: *Have you ever been to the zoo and seen the big tall giraffe? There’s a word on this card which says giraffe. Which one do you think it might be?* Another card was introduced with: *Do you remember, last year we had tadpoles in the nursery? Do you remember, the wee black things swimming around in the water? There’s a word on this card...... If a child was uncertain, he was prompted with: *Which one do you think says ......? Is it this one? Or this one? Or this one? Or this one?* as the experimenter pointed to each alternative in turn.

Results

Most children made some kind of choice for each card; though not always on the basis of what was written. For example, David, the youngest at 3:6, always chose the bottom line, and so did Ailsa (3:9) 11 out of 12 times. Susan (4:2), Thomas (4:2) and Scott (4:10) preferred the top line; while Lesley (5:1) chose the second line every time except once. The number of choices for each alternative can be seen in Table 7.
Table 7: Children's choices on a word recognition task

A small number of children chose the initial letter. (It was selected 41 times, around 10% of possible occasions.) The relative unpopularity of this option agrees with Lavine's (1972) finding that multiplicity is one of the criteria used by prereading children to distinguish writing from non-writing. It also agrees with Ferreiro et al and Tolchinsky-Landsmann and Levin, who
found that children, especially older pre-phonetic children, believe that three or four graphemes are needed in order to write something.

A surprising result of this task was that quite a large number of children chose the repeated initial letter. Both Lavine and Ferreiro suggest that variety of graphemes is as important as multiplicity in denoting writing; yet 29% of choices were for this option. Lesley (5:0) explained (when choosing wwww for worm) that that was the correct choice because it looked like a worm; but her explanation is suspect because she almost always selected the second-line option. This suggests that her explanation is more likely to be a post-hoc justification.

Children chose the correct word on 128 occasions. Some used phonetic clues, such as Neil (4:11) who began by noting that all the alternatives on one card began with the same letter. He then looked for other sounds in each word. For example, he said that beaminfoo could not be 'bus' because 'it didn't have a ssss'. He chose 'worm' correctly by the 'muh' at the end. But he also justified his correct choice of 'giraffe' by saying "because it's got an 'eh' at the end", which suggests that on at least some occasions he may be giving a post hoc justification for a non-phonetic choice. As when he chose tus for 'tadpole' "because it's got a 'suh' at the end".

Children were more likely to choose the correct word in the two long word categories (88 choices, compared with 40 correct short words). They were also more likely to choose long nonsense words (94 choices) than short (37 choices). This suggests that they tend to prefer a larger number of letters - not the 3 or 4 suggested by other research.

Relatively unsuccessful attempts were made to question children about their choices. Some, such as Neil, were able to explain why they chose some options and rejected others; but most children were not so competent. Many,
asked “Why did you choose that one?” took this as implying that they had chosen wrongly, and altered their choice. An alternative question: “How did you know it was that one?” generally produced either a “because I did”, “because it says ‘tree’ (or dinosaur, or cat)”, or a smirk and “because I’m a clever girl”. Suggestions that some children may not be giving their full attention to a task which they probably considered boring come for example from Peter (3:7), who chose the correct word for ‘dandelion’. When asked why he had selected that option he replied: “because it says ‘lionbosher”’. Having attended a birthday party recently he claimed that many of the options, on several different cards, said ‘Peter come to Lara’s party’. Others were described as saying ‘Pee for Peter’.

Some children made comments about the relationship between the length of a word and the size of the object; or about the relationship between the length of a word in speech and writing. Neil, for example, talks about his correct choice of dandelion: “that one [the short nonsense word] ‘s too short, and that one’s just the right size, dan-de-li-on; that one [the short nonsense word again] just says dandeli because it’s too short - it doesn’t say the right words”. Neil appears to be confusing the meaning of ‘word’ and ‘letter’, in a way first described by Reid (1966). Dennis (4:5) chooses ‘steamroller’ correctly “because it’s quite long, that word - steam-roll-er”. But he chooses beaminfoo for ‘bus’ “because that’s a long word too”. He is questioned: “Is bus a long word?” “Oh yes” he replies confidently, “cause it says buh buh sss sss sss, bus.” Does Dennis mean that ‘steamroller’ is a long word because it has three syllables? Or is he saying that ‘steamroller’ and ‘bus’ are both large objects, therefore must be long words; and then he uses either syllables or phonemes to segment the words to prove his point? I suspect the latter. Dennis also uses phonetic clues: he chooses the correct word for ‘tadpole’,
rejecting *tus* "because it doesn’t have a sss at the end". Martin (4:9) clearly states his belief that the length of a word is related to the size of the animal. He chooses *briggled* for 'bull' "because that’s the longest one". When asked "Why does it have to be the longest?" he replies "Because it’s a big animal". Later he chooses *tus* for 'tadpole' "Because it’s wee". At a more immature level Peter (3:7) chose the initial letter for 'giraffe'. He then explained that it said 'giraffe'; that the correct word said 'big giraffe' and that the short nonsense word said 'wee giraffe'.

This task suggested that children tend to choose longer words rather than shorter, when given a number of alternatives. To investigate this possibility further, the task was simplified and readministered. Each card offered two alternative choices: the correct word; and a nonsense word beginning with the same letter, short if the word was long, and long if the word was short. The nonsense words were altered slightly so that as well as beginning with the same letter as the target word, they also ended with the same letter, to make phonetic deductions more difficult. As before, the words used were nouns in four different categories, with the addition of an extra word in each category making 16 cards in all.

a) A small object with a short name: cat, worm, flea, mous

b) A large object with a short name: bull, tree, bus, hous

c) A large object with a long name: dinosaur, steamroller, giraffe, elephant

d) A small object with a long name: bumblebee, dandelion, tadpole, hedgehog

Note that both 'mouse' and 'house' were spelt without the final 'e'. This was in order both to make them shorter words, and to make the final sound the one that the children might have expected.

The first task had been given to 38 children, on the fourth visit to the nursery. It was readministered on the eighth visit, around seven months
later. By this time more than half the group of children had moved on to primary school, where they had had three months of instruction in reading and writing. They were therefore assumed to be too sophisticated for this task, which was given only to the 15 children remaining in the nursery school and aged from 3:10 to 4:8. (But owing to a problem with the tape recorder, the choices made by one child were not recorded. Also, by an oversight, one of the children was not shown the 'steamroller' card; and so the long word/large object column is short one choice.)

**Results**

<table>
<thead>
<tr>
<th>Word categories</th>
<th>short word</th>
<th>long word</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>small object</td>
<td>large object</td>
<td>large object</td>
</tr>
<tr>
<td>long choice</td>
<td>33</td>
<td>34</td>
<td>42</td>
</tr>
<tr>
<td>short choice</td>
<td>23</td>
<td>22</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 8: Children's choices on a simplified word recognition task.

Apart from David (who at 4:1 was still choosing the bottom line each time) the children seemed to be making real choices. Jamie (4:6), for example, correctly located 'bumblebee' on the top line, explaining that it had to be the one on the top "because it flies". It couldn't be the one on the bottom line "cause it doesn't go on the ground". But there was still a clear preference for the longer word, which was selected 142 times compared with 81 times for the shorter option. However, it is when the size of the object or animal, and
the length of the word, are both large, that children are most likely to select the longer word. It is interesting to note that there seems to be no corresponding desire to choose the short option for small animals with short names.

A 2-way ANOVA was performed on the scores. The effect of word length was not significant, $F(1,13) = 1.072$, $p < .2$. The effect of object size was similarly not significant, $F(1,13) = 2.273$, $p < .12$. The interaction between word length and object size also failed to achieve significance, $F(1,13) = 2.537$, $p < .11$.

Noun or verb

According to Ferreiro et al., young children tend to believe that only nouns, or names, can be written down. The following experiment was designed to test this hypothesis. It was carried out on the fourth visit to the nursery, with the 38 children aged from 3:6 to 5:0.

A large matchbox containing letter-tiles (1" square) taken from a Junior Scrabble game was emptied on to the table in front of the child. (The letters were all lower case.) We played with the tiles, arranging them in rows or piles, selecting letters which the child recognised, etc; and then I formed a word using the letters. The child was told: *Look, I've made a word here. It might say 'kick' or it might say 'kite'. Which one do you think it says?* Each time, the child was offered a choice between a noun and a verb: kick/kite; climb/clay; hurry/honey; and swim/swan. (In fact, each verb can also be used as a noun naming an action; but I suspect that such words need to be preceded by an article before they are seen as nouns. Certainly children who used the words used them as verbs; and one child mimed each action as it
was presented. Each time, the word I constructed was the verb of the pair (but the order of presentation of choices was varied, so that for example half were told *it might say kick or it might say kite* and the other half that *it might say kite or it might say kick*.)

If Ferreiro is right, and young children believe that only nouns can be written, then in this situation they should be more likely to suggest nouns than verbs. Most children agreed to choose one of the alternatives suggested; though Peter (3:7) as usual found it hard to restrict his ideas. Offered *clay or climb* he suggested 'claire', or perhaps 'Pee for Peter' before finally choosing 'climb'. He found it even harder to choose between *swim or swan*, offering first 'lion' and then 'swom' which he refused to change. Some older children were not very happy about choosing, because they knew that the answer was not a matter of free choice but of knowledge. But most eventually agreed to make a guess.

**Results**

The children chose as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>kite</td>
<td>23</td>
<td>kick</td>
</tr>
<tr>
<td>clay</td>
<td>13</td>
<td>climb</td>
</tr>
<tr>
<td>swan</td>
<td>11</td>
<td>swim</td>
</tr>
<tr>
<td>honey</td>
<td>18</td>
<td>hurry</td>
</tr>
</tbody>
</table>

Total nouns 65  Total verbs 65

When making their choices, children spontaneously gave reasons such as "We had clay in the nursery", or "I went swimming yesterday", or "I had honey on my toast". They were obviously searching their own recent experience for any relevance to the current task, much as children
questioned by Hughes and Grieve (1980) had searched their environment for some way of making sense of nonsensical questions such as "Is red heavier than yellow?". The results of this experiment do not give any support for the hypothesis that young children do not believe that verbs can be written.

**Did Daddy kick the ball?**

Ferreiro's hypothesis that young children do not believe that verbs can be written came from an experimental task where children were shown written sentences such as 'Daddy kicked the ball' and then questioned about the sentences. When they were asked where each part of the spoken sentence was written, Ferreiro found a fascinating progression of responses, from the youngest who seemed to suggest that only nouns were written down, to the oldest who understood that each part of the written sentence corresponded to a word in the spoken sentence.

The previous study found that children were as likely to suggest verbs as nouns for the meaning of a word. And in the writing production tasks, children had been in general quite willing to write verbs when requested. It was decided to test the children on a version of Ferreiro's task, to see if her results could be replicated.

The task was administered on the eighth visit to the nursery. Fifteen children were still in the nursery, aged from 3:10 to 4:8; but owing to a problem with the tape recorder the comments made by one child are not available. The older children, who had progressed to infant school, were not given this task. The children were shown five sentences, already written on 14 x 9 cm cards, and questioned about them. The sentences were:

**Daddy kicked the ball**
The boy ate a cake
The baby is asleep
My dog chased a cat
The baby cried

The children were by the eighth visit quite used to seeing cards, sorting them, finding words on them etc. This particular task was introduced as follows: *See the cards I've got today. I've been doing some writing on these cards, and do you know what I wrote on here? It says Daddy kicked the ball.* The child was encouraged to repeat the sentence; and then questioned about how the parts of the written sentence related to the segments of the spoken sentence.

Ferreiro had questioned children in two ways about the written sentence. She had pointed to parts of the written sentence, and asked what they said; and she had spoken parts of the sentence, and asked if and where they were written. However, the first method of questioning was found to be inappropriate for many of the children in the present study. Despite having repeated the sentence after me, many children (especially the younger ones) could not remember it well enough to reply to such questions. And the second method of questioning was not much more successful. The children appeared to dislike the whole task extremely; some of them asked to go back to the playroom (or just voted with their feet, without asking); while others gave the impression that they were saying whatever they thought would get them out of an unpleasant captivity as soon as possible.

Some of the responses from these children did resemble the results reported by Ferreiro. David (4:1), for example, said that each word in the written sentence said the whole sentence; while Peter (4:3) introduced new ideas so that each written word said a new sentence. However, he was
fixated on Daddy kicking the ball and also on the Teddy, who had frequently taken part in the experimental sessions; so that words from later sentences still said things like "Daddy kicked the ball up in the air"; "Daddy kicked the ball into the teddy"; "Teddy blow up like a rocket" and "Teddy pull the curtains down". In fact, Peter did not give the impression that he really thought this is what the written words said. It was more that he was trying to enliven a desperately boring task with exciting ideas plucked from the ether.

Some of the older children successfully matched the written and spoken texts word for word. Others attempted to do so, but got confused, with the result that some words were given two meanings and others none. Stuart (3:10) found himself in this position; when all the parts of the spoken sentence had been allocated to pieces of written text there was one left over, which he claimed said 'Stuart'. But no child claimed that verbs could not be written; though Andrew (4:3) said that 'dog' wasn't written (but 'my dog' was) and 'Daddy' wasn't written (but 'Daddy kicked' was). He also said that 'a' was not written, in the sentence 'My dog chased a cat'; but it was written in the sentence 'The boy ate a cake'. All in all, the data from this experiment were unsatisfactory and confusing, as can be judged from the following excerpt from the transcript of the session with Peter (4:3).

M: See the cards I've got today. I've been doing some writing on these cards, and do you know what I wrote on here? It says "Daddy kicked the ball". Can you say that?

P: Daddy kicked the ball.

M: What do you think this bit might say, the first bit? [points]

P: I don't know
M: What about this bit? [points] What might this say?
P: I don't know.
M: What did the whole lot say, do you remember? It said "Daddy kicked the ball"
P: Daddy kicked the ball.
M: So what do you think this bit at the end might say? [points]
P: I don't know.... Daddy kicked the ball.
M: You think this bit at the end might say "Daddy kicked the ball"? What about this bit here? [points] What do you think it might say?
P: Daddy kicked the ball up in the air.
M: And what about this bit? [points]
P: Daddy kicked the ball into a teddy.
M: What about this first bit? [points]
P: Rocket flour [?] into a teddy.
M: OK; here's another one. "The baby is asleep". Can you say that?
P: Baby go to sleep.
M: *The* baby *is* asleep. Can you say it like that?
P: Baby goes to sleep.
M: No, that isn't what it says. It says "the* baby *is* asleep.
P: Baby *is* asleep.
M: *The* baby is asleep. Can you say "*The* baby is asleep"?
P: No.
M: OK. What do you think this first bit might say? [points]
P: Daddy kicked the ball up in the air.
M: And what do you think this bit might say? [points]
P: Teddy blow up like a rocket.
M: And what about this little one? What does that one say, do you think?
P: The rocket painted Cuddles. [Cuddles is Peter's rabbit.]
M: And what about this last bit. What does it say?
P: Cuddles eat his food.
M: Do you know what it says on here? [new card] It says "My dog chased a cat".
P: My dog chased a cat.
M: What do you think this first bit says then?
P: Teddy blow up in the air.
M: And what about that bit [points], what do you think that says?
P: Teddy paint the rocket.
M: What about the dog chasing the cat, does it say anything about that?
P: Yes - ell keeay.
M: What about this bit there, what do you think that might say?
P: Teddy pull the curtains down.
M: What about that little bit [points], does that say anything?
P: Yes [thinks] Rocket paint the Cuddles.
M: And what about the last bit?
P: I don't know.
M: You don't know what that one says?
P: Rocket play up in the street.
M: OK. Here's another one. That one says "The boy ate a cake". Can you say that?
P: Boy eat the cake.
M: No - *The* boy ate *a* cake.
P: A boy eat the cake.
M: What do you think the first bit says? [points]
P: I just had that one and I don’t know what - Cuddles blow up the Teddy.
M: What about this last bit - what do you think that says?
P: Teddy blow up in the air and pull the curtains down.
M gave up at this point.

Peter could not be said to be giving any serious thought to the questions he was being asked about the meaning of written text. He was obviously answering at random, and by the time the task was abandoned he seemed to be getting a bit desperate for inspiration. One can certainly not conclude anything about a child’s understanding of what is written in a written sentence from the answers of children like Peter.

Suggesting meaning for text

On the eleventh visit, 11 nursery school children (aged 4:2 to 5:0) were shown two simple picture books ("Sunny Days" and "Mealtime") in which a young, sex-indeterminate child was shown engaged in various activities: running, swimming, splashing, drinking, eating, etc. The pictures were accompanied by short simple texts. The children were asked to read the books. *See my book* here. *Can you read it to me?* None of the children were able to read; and most reminded me of this fact. I encouraged them to guess at likely captions for each picture. *Can’t you? Well, what do you think this might say, here?* (pointing to the text above the first picture). *And what about this one?*
Despite their initial protestations, the children all suggested texts for most of the pictures. The "Sunny Days" book had most action pictures; the breakdown of responses was as follows:

- Noun (includes two nouns joined by 'and', and a noun with an adjective) 94
- Verb 36
- Clause or sentence 21
- No response/"don't know" 9

There were 14 pictures in the book, of which eight were clearly depicting an action. The number of suggestions which included a verb (57) is less than the number of nouns (94); but does not suggest that the children were avoiding verbs. The text 'boy/girl' beside a picture of a child running would be equally as appropriate as a verb such as 'running'; and all children suggested at least some verbs. Again, this task does not provide any support for Ferreiro's 'name hypothesis'.

Interestingly, there were no comments about the length of texts. Children did not seem to be making any effort to relate their suggestions to the physical characteristics of the printed texts, as Ferreiro and Teberosky had suggested that they might. The first two pictures and captions in the "Sunny Days" book gave a useful contrast: the first picture, of a child running, had the two-line text 'On sunny days there's lots to do.', while the second picture, on the facing page, was of the child in the water, with the caption 'Swimming'. Eight children gave one-word responses to each page, and a
ninth gave a "don't know" to the first and one word to the second. Two boys suggested three words for the first text: one tried "running about hopping" and the other "can't stop me". This may have been a recognition of the fact that the first text contained seven words on two lines; but it may equally well have been due to chance.
CHAPTER 6: THE PRE-NURSERY GROUP

Although children in Edinburgh are eligible to begin nursery school as soon as they reach age three, in practice at the time this research was carried out they mostly started in the August following their third birthday and stayed for one or two years. Thus the children who took part in the study were aged from 3:1 to 4:8 on the first visit, and many of even the youngest were already quite knowledgeable about written language.

It was therefore decided to extend the age-range of children studied, to include children who were not yet three. A convenient source of children who were comparable to those already at the nursery was found in the nursery waiting list. (Parents could put a child's name down on the nursery waiting list as soon as he reached the age of two.) Twelve children, around the age of 2 1/2, (age at first visit ranged from 2:5 to 2:10) were enrolled in the study and visited in their homes at intervals of approximately six weeks over a period of nine months. Most children were visited six or seven times. However, one child moved without leaving a forwarding address, and another moved out of Edinburgh, during the course of the study. These children were not replaced as there were no more children of the right age on the waiting list. (It had been quite difficult assembling the first group of 12, and some of the children were older than would have been wished.)

During the early visits a parent (usually the mother) would remain in the room, often sitting at the table in order to encourage the child to carry out instructions. Later on, as the children grew more secure, some mothers would take advantage of my presence to get some peace and quiet elsewhere in the house.
As with the older group, these children were asked to draw and write; to write on pictures (the same pictures as had been used in the nursery school); and to talk about writing. However, the data are much less complete for this group, as a result of the difficulty of working with such young children. Two were extremely quiet and timid, and would rarely vouchsafe an answer to questions. Another was verging on the hyperactive and tended to spend most of the experimental sessions running around the room pretending to be an aeroplane. It was very difficult to get him to sit at the table and write. Another boy was not interested in writing, and on a couple of visits he would not put pen to paper at all.

It is not possible to detail the exact instructions given to this group, since each session was controlled by the child to a variable degree. Some children would concentrate on the task they had been set; but most tended to do what they wished, rather than what they had been instructed to do. And obviously, the parents of these children would only tolerate my visits as long as the child continued to enjoy them. Therefore the experimental sessions followed a predetermined plan only as far as was permitted by the child.

**WRITING PRODUCTION**

All sessions began with the children being presented with a blank piece of paper, along with crayons and felt pens. They were asked to draw a picture. Next they were given a sheet of paper on which was printed a simple drawing, as might be found in a child's colouring book. The first picture shown, on the first session, was of a woman hanging out washing on a line. This was an activity which seemed to be familiar to all the children, and led to a discussion of who the woman was, and whose were the various articles she had pegged on the line. The children were then asked if they could do
some writing on the picture - if they could write "hanging out the washing". Later the children were shown two other pictures: a zebra and a squirrel; and a mouse and a caterpillar. They were asked if they could write their names: zebra, squirrel, mouse and caterpillar.

On subsequent visits, the pictures presented were as follows:
Visit 2: i) a girl eating a slice of watermelon ["Can you write eating watermelon?"
ii) a bear and a rhinoceros
iii) an elephant and a ladybird
Visit 3: i) a girl skipping ["Can you write skipping?"
ii) different types of fruit: pear, plum, apple, orange, banana, strawberry
iii) three pencils and a pair of scissors
Visit 4: i) a farmer driving a tractor [Can you write the farmer drives the tractor?"
ii) a sheep and an octopus
iii) a kangaroo and a butterfly
iv) eight ducks and a swan
Visit 5: i) an umbrella, a yacht, a house, a television and a car
ii) a watch and a set of keys
iii) a snake and a worm
iv) a boy and a girl playing musical instruments ["Can you write making music?"
Visit 6: i) two snails and three frogs
ii) three skeletons
iii) the skeletons swinging on swings ["Can you write skeletons swinging?"
iv) the skeletons climbing stairs ["Can you write skeletons climbing the stairs?"]

v) the skeletons sleeping ["Can you write skeletons sleeping?"]

Visit 7. i) a fish and a whale

ii) a dog and a crocodile

Unless otherwise specified (in bold type), the children were simply asked to write the names of the animals or objects as given.

The writing efforts of these children were classified into the five levels of understanding of written language described in detail in Chapter 4. In summary these were as follows.

Level one: No awareness of writing. Children do not seem to understand the difference between drawing and writing.

Level two: Beginning to understand the concept of writing. Their 'writing' still looks like scribbles, but the children claim they have written something.

Level three: Clearly differentiating writing from drawing or scribbling. Children produce zig-zags, discrete squiggles, circles, crosses, lines and dots.

Level four: An approximation to conventional writing. Recognisable letters and numbers appear, and gradually oust idiosyncratic signs. But letters are used without any understanding of their conventional sound values.

Level five: Phonetic writing. Children attempt to record the sounds of speech.

Table 9 shows how the children progressed in their understanding of the written language system over the period for which they were studied. Classifying these young children was even more difficult than classifying the nursery-school children; and many were allocated to intermediate stages between the above levels.
Fig. 20: Adam (2:10)

Fig. 21: Louise (3:2)
<table>
<thead>
<tr>
<th>Visit</th>
<th>Level of understanding</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>one 1/2</td>
<td>two 2/3</td>
</tr>
<tr>
<td>First</td>
<td>8 1 1 2</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>6 1 3 2</td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>5 2 4</td>
<td></td>
</tr>
<tr>
<td>Fourth</td>
<td>3 2 1 4</td>
<td></td>
</tr>
<tr>
<td>Fifth</td>
<td>2 1 4</td>
<td></td>
</tr>
<tr>
<td>Sixth</td>
<td>2 1 4 1 1</td>
<td></td>
</tr>
<tr>
<td>Seventh</td>
<td>1 1 1</td>
<td></td>
</tr>
</tbody>
</table>

Table 9: Pre-nursery children's progress in writing (by visit)

(R - refuses to write)

Note that the total number of children at each visit gradually decreases. One child moved out of Edinburgh after the second visit, and another moved after the third. Although I began visiting these children in September, I was still recruiting to the study until December, trying to get the numbers up to 12; and it was not possible to continue visiting after the beginning of the
summer holidays at the end of June. Thus one child recruited late received only five visits; most of the rest received six; and three received seven visits.

On the first visit, most children were at the very first level of understanding of written language: i.e. they showed no awareness of writing. They made a more or less accurate attempt to colour in the pictures, and seemed not to realise that this was not what they had been asked to do.

However, four out of twelve children did appear to have begun already to understand the significance of writing. One was classified as level two, one as intermediate between two and three, and two as level three. They scribbled on or around the pictures, or made small squiggles or lines that began to resemble letters; and when questioned claimed that they had written words or phrases as requested. Adam (2:6) put on a special squeaky voice, giving a commentary as he wrote, as if to differentiate written from spoken language. (See Fig. 20. Adam: "Mouse mouse mouse mouse; caterpillar caterpillar caterpillar caterpillar caterpillar")

By the sixth visit, all children had begun to show some understanding of writing. Two were at an intermediate stage between levels one and two; one was clearly level two. Four were at level three; one was intermediate between three and four, and one was at level four. This is quite an achievement, considering that the children were aged between 3:1 and 3:4.

It is possible to follow the progress of individual children, over the nine months they were studied. The changes in their levels of understanding are detailed in Table 10.
Table 10: Pre-nursery children's progress in writing (by child)

<table>
<thead>
<tr>
<th>Name</th>
<th>Age at first visit</th>
<th>Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Debbie</td>
<td>2:4:19</td>
<td>1</td>
</tr>
<tr>
<td>Shona</td>
<td>2:5:7</td>
<td>1</td>
</tr>
<tr>
<td>George</td>
<td>2:5:24</td>
<td>1</td>
</tr>
<tr>
<td>Adam</td>
<td>2:6:1</td>
<td>3</td>
</tr>
<tr>
<td>Louise</td>
<td>2:6:10</td>
<td>3</td>
</tr>
<tr>
<td>Laura</td>
<td>2:6:17</td>
<td>2/3</td>
</tr>
<tr>
<td>Emma</td>
<td>2:6:22</td>
<td>1</td>
</tr>
<tr>
<td>Joanne</td>
<td>2:7:8</td>
<td>1</td>
</tr>
<tr>
<td>Michael</td>
<td>2:8:2</td>
<td>1/2</td>
</tr>
<tr>
<td>Ben</td>
<td>2:8:5</td>
<td>1</td>
</tr>
<tr>
<td>Gavin</td>
<td>2:8:15</td>
<td>1</td>
</tr>
<tr>
<td>Jessica</td>
<td>2:10:8</td>
<td>1</td>
</tr>
</tbody>
</table>

(R = refuses to write)

Emma is the youngest of two children; her brother is at school. Her mother had been a teacher before the children arrived. While waiting for her place at nursery school, Emma attends a small local playgroup. On the first visit, she ignored instructions to write, and simply coloured in the pictures. On the second visit, she did some tiny lines on a picture, and also some scribble, and claimed that these were writing. On the third visit, her mother greeted me on arrival with a page of 'writing' which Emma had produced (discrete
squiggles, a bit like shorthand symbols). She wrote names as requested on the pictures: either squiggles or zig-zags; and also wrote zig-zags for the names of family members. On the fourth visit, her mother took me into the bathroom to show me one of Emma’s attempts at labelling her environment: there were five squares of paper, each with a circular squiggle on it, stuck onto the basin. According to Emma, this said ‘sink’. She continued for a couple of months to write squiggles and zig-zags; until the sixth visit, which occurred shortly after her third birthday. She had received birthday cards to mark the event; and among the ‘writing’ she produced on this visit were the recognisable letters H and B. (Her mother had not noticed this, and was surprised when I pointed it out.) By the seventh visit, “B” had disappeared (it is a difficult letter for children to produce) and Emma used either H (in differing orientations) or O (sometimes not very circular) to write everything.

Louise was in many ways similar to Emma. She was the youngest of two (a sister at nursery school) and her mother had been a teacher. On the first visit she was already producing short lines, on the pictures, and claiming them to be writing. By the second visit she wrote, recognisably, the letter L. L, sometimes reversed or rounded, said everything: bear, rhinoceros, eating, watermelon, Louise, Gillian (sister), Mummy, Daddy .... Sometimes the letters were placed on the picture and sometimes underneath. As well as L she wrote crosses which she said were ‘kisses’. On the third visit there were no more Ls; instead she wrote –. This time – said Louise and Gillian. She also drew circles and crosses and named them correctly. By the fourth visit she wrote small squiggles or lines, and tried to segment words. For example, three lines said ‘ski-skip-ping’, one squiggly line said ‘banana’ and two squiggles said ‘a-pple’. One squiggle said ‘sci-ssors’ and another said ‘pen-
cils'. Three squiggles said Louise ('Loo-wee-weese') and four said Gillian; none of these looked particularly like an L. On the fifth visit her 'writing' had become all zig-zags; everything was written this way, including her own name, and words were not segmented at all. There is unfortunately no tape recording of the sixth visit. This is particularly unlucky as she had suddenly begun writing quite a few letters. (It looked as if someone had been teaching her to write her name.) She wrote L, but wrote it upside down so it looked like a 7. She wrote O, and i, and l. There was an upside down U, and something which was a cross between a lollipop on a stick and a Q. There was more segmentation of words: four symbols said "skele-tons-slee-ping". For the final visit Louise had clearly been working hard on her name (see Fig. 21); she wrote from right to left, muttering to herself "I need a sss at the end ....... I need ell for Louise....." She told me that she couldn't write "the farmer drives the tractor"; but everything else was written with the lollipop symbols.

Gavin was the older of two boys. Both parents were chartered accountants (though his mother was not working at the time). On the first four visits he covered all my pictures, and many sheets of paper, with scribbles, ignoring any instructions about writing. On the fifth visit he either scribbled over the pictures again, or told me that he couldn't write whatever it was he had been asked to write. Towards the end of this visit, hunting through a pencil case which contained a mixture of felt pens, pencils, and ballpoint pens, he picked out a biro and announced that this was the sort of pen which his father used. He then demonstrated the sort of writing which his father did: a line of zig-zags. On the sixth and final visit he once again scribbled over the proffered pictures; but this time he seemed to be claiming that his scribbling was the writing which had been requested.
Debbie was the older of two girls. Her mother had been a secretary and her father worked for the Post Office. She was another enthusiastic scribbler, covering pictures and paper, and seeming to ignore instructions to write. Her mother said that she had plastic letters and numbers in her toybox, but she was more interested in the numbers. When shown letters or written text she described them as 'twos and threes' (on the second visit), 'numbers' (on the third visit) and 'one two three four five six seven eight' (on the fourth visit). On the sixth visit she began to obey instructions to write, producing discrete squiggles or vertical lines. However, despite having agreed to write eg 'Daddy', 'Debbie', or 'snails', she later claimed that she had written 'one two three four' or some other number series. On the seventh visit she insisted, whenever asked to write, that I should do the writing for her.

These children are fairly typical of the whole group: some who advanced steadily in understanding of written language; and others whose progress was slow. Sometimes it is possible to recognise events in a child's life which have acted as a stimulus to writing, such as the birthday cards which presumably resulted in Emma writing the letters H and B. But mostly there seems to be no obvious cause of a sudden advance in understanding. Perhaps constant observation might provide information about the types of experiences which cause a child to reflect on and draw conclusions about written language; but the possibilities are very large and might easily be overlooked. Inspiration might come from specific teaching, or from educational television programmes; or it might occur through casual questions while a child is being read to, or watching someone else read or write. It might even come from something overheard, or seen in passing; something which an observer might not notice, but which in some way attracts the child's attention, and sticks in his mind. Events such as these -
the chance exposure to aspects of writing suggested by Clay (1975) - may appear to have no effect at the time, but may actually be the cause of a major intellectual leap.

It seems likely that the concentration on writing produced by my visits may have greatly contributed to the high levels of understanding of written language exhibited by this group of children (who were certainly more advanced than the youngest of the nursery group were on my first visit there.) The mothers were mostly very interested in the children's progress, and it seems likely that the children began to ask, and the parents began to teach the children about writing, before they would have done without the stimulus of my visits.

COMPREHENSION STUDIES

As well as being asked to write, the pre-nursery children were also given various opportunities to demonstrate their comprehension of written language.

Labelling animals

On the first visit, the children were shown four red-painted tobacco tins, each of which contained a plastic animal: a tiger, a cow, a pig and a gorilla. They were also shown small pieces of card with the names of the animals written on them. The children were asked which names might go with which animal. Later, if the child's interest was still sustained, it was intended to move the labels around. The child would then be questioned to see if he believed that the meaning of the written text remained constant, or changed to suit the new context. However, during the course of the visits, this began to seem inappropriate.
Many of the children (aged from 2:5 to 2:10, and as yet unused to the experimental situation) could not be persuaded to give their attention to my writing. They were interested only in playing with the animals. And some were too shy to respond to questioning. The responses of those who did pay attention were as follows.

Louise (2:6) described the labels as saying "guh for monkey; guh for lion; cuh guh for cow; guh for cow again". However, she soon lost interest. Emma (2:7) at first suggested that all the labels said "Emma". But with a little persuasion she was ready to accept that they were the names of the animals; and she allocated a label to each animal seemingly at random. The labels were then moved around. Emma began by believing that the meaning was attached to the text, but then seemed to change and claim that the meaning was dependent on context. Listening to the tape of the session later, and noting that she changed her response during the questioning, it seemed to me that she said this not so much because it was what she believed, but more that the questions I was asking made her think it was what I wanted to hear. Like Emma, Gavin (2:8) began by suggesting that the writing was the names of family members. But he then agreed to allocate the labels to the animals (seemingly at random).

It has been suggested that for young children, the meaning of written text depends on the context. For example, Reid (1966) found that when picture and text did not agree, young children believed the text to be in error; while older individuals saw the picture as an inaccurate representation of the text. Ferreiro (1982) found that 76% of four- to six-year-old children considered the text to be a label for the picture, when they were presented together. She also suggested (p. 64) that altering the accompanying illustration would change the meaning of a particular text. However, it is difficult to imagine a
method of testing this hypothesis which would not be in danger of suggesting the expected answer to the child, as seemed to happen with Emma.

Recognition of letters

On the second visit, I took a large number of small wooden bricks which had letters (capitals and lower-case) written on the sides. On the third visit I took a large matchbox full of letter tiles taken from a junior Scrabble game. (These were mostly lower-case letters, but I had put some capital letters on the blank tiles which were provided.) The children were offered the bricks and tiles to play with, without comment; but as they played they were questioned casually about the letters.

Five children described the letters as numbers. Debbie said that the brick-letters were "twos and threes", while six weeks later the tile-letters were described as "numbers". Shona gave no response to the bricks but called the tile-letters numbers. George again gave no response to the bricks, but described the tile-letters as "fours and threes". Louise called the letters numbers on both occasions; as did Emma.

Five children seemed to recognise the symbols as letters (though only one used 'letters' as a general description). Adam said that the bricks had names on them; and called individual letters the names which they represented to him: A was "my name"; B was Ben (his brother) and F was Fiona (the lodger). But he was more interested in building towers and roads than in talking about the letters. Joanne showed no recognition of the brick-letters; and at first described the letter-tiles as conkers. However when asked about individual letters she called them all "eee". Michael announced "oo ah oh" when he saw the bricks; and described the tile-letters as "names". He also
gave interesting letter-sounds such as "mleel" and "sofe". Gavin called the brick-letters "bee for snow, bee for Mummy and Gavin". (His mother told me that he could correctly name all his plastic letters as "a for apple" etc.) He seemed to recognise the tile-letters as letters, asking what they were in a way that I took to be a request for the letter-names. Jessica called the tile-letters letters, and recognised the 'm' as "Mummy's".

Two children did not give any response to questions about the letters. Laura was exceptionally timid and never spoke anyway; and Ben mostly ignored my questions and carried on with his chatter about other things.

Suggesting meaning for text

Ferreiro claimed that young children tended to believe that writing represented the names of objects (the 'name hypothesis'). When she showed them a written sentence, told them what it said, and then questioned them in detail about it, only the oldest understood that every word of the spoken sentence was to be found in the written text. Some believed that articles were not written, while the youngest seemed to think that verbs could not be written either.

On the fourth visit, when the children were aged from 2:9 to 3:1, they were shown two picture books. Most of the pictures were of a young (sex indeterminate) child, involved in activities. The first book, *Sunny Days* showed the child running along a beach, in the water, and then in the water with presumably the mother, splashing. Later pictures showed the child wrapped in a towel, playing with a bucket and spade, sailing a small boat, picking flowers, stroking a cat, and drinking. There were also pictures which did not show activity: the bucket and spade, a large cabin cruiser, a field of daisies, a kitten, and a jug of juice, with a cup. The second book, *Mealtimes*...
showed the same child holding a bottle of milk, licking a spoon, playing with a plate, drinking from a cup, eating a banana, and climbing out of a highchair. Other pictures showed static objects: the bottle of milk, a bib, a spoon, a plate, a cup, a banana, and a highchair. The children were asked what they thought the text which accompanied each picture might say.

Some children did not suggest words or phrases for the meanings of the texts. Gavin (3:1) either said that each piece of text was 'a name' or that he did not know what it said. Debbie (2:9) either replied that she did not know, or gave numbers, such as 'one two' or 'one two three four five six seven eight'. (One more interesting response, to a picture of a bib, was 'five six seven eight and a bib'.) Michael (3:1) gave garbled sounds such as 'handshooeyooeyooey' or 'peeah' for the few texts to which he could be persuaded to pay attention. Jessica (3:1) thought that each piece of text said 'jay'.

The first picture, of a child running, elicited three meaningful responses. Two children suggested the verb 'running', while one suggested the noun 'boy'. The second picture, of the child swimming, was awarded one verb, 'swimming', three nouns, 'seaside', 'boy', and 'water', and a phrase, 'in the water'. The third picture, of Mother and child splashing in the water, elicited two verbs ('splash' twice), two phrases ('with the lady' and 'in the water again') and from the fifth child 'Mum and seaside'. Similarly the next activity picture, of the child filling a bucket with sand, produced a good number of verbs. The children suggested 'putting in sand', 'at the beach making a sandcastle', 'sand in this bucket', and 'cleaning up'. Some children tended to suggest nouns each time; but others were happy to suggest verbs or phrases or even sentences. They did not seem to avoid articles or function words, either.
It may be that the tendency (if such exists) to believe that writing consists of nouns as labels for pictures stems from exposure to the kind of early picture book where in fact the text does consist of nouns which are the names of pictured objects. The Ladybird series of First Picture Books comes to mind. But these children seemed to be quite willing to suggest verbs as the meaning of text, if that was appropriate to the illustration. Perhaps action pictures and text are more common in books designed for very young children than they used to be. It would be easy to design an experiment to test the hypothesis that children's expectations of the meaning of text was dependent on their previous experience of pictures with accompanying text.

Recognition of writing

Towards the end of the study, the children were shown 15 cards and asked to distinguish those which showed examples of writing from those which did not. These were the same cards which the nursery school sample had sorted, and the administrative procedure was the same. Results for 9 children, aged 3:1 to 3:4, are given in Table 11 (2 children had left the study and a third would not cooperate in such a dull task), compared with the youngest group from the nursery school.

The main difference between the pre-nursery group and the youngest nursery children seems to be that the pre-nursery children are slightly confused about the definition of writing. They are slightly less likely to correctly identify writing, and slightly more likely to label non-writing as writing, than the older group. But the difference is not marked.
<table>
<thead>
<tr>
<th>Age N</th>
<th>Pre-nursery group 3:1 - 3:4</th>
<th>Youngest nursery group 3:2 - 3:11</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. [Handwriting]</td>
<td>89</td>
<td>94</td>
</tr>
<tr>
<td>ii. [Printing]</td>
<td>78</td>
<td>94</td>
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<tr>
<td>iii. A cat sat down</td>
<td>89</td>
<td>94</td>
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<tr>
<td>iv. Apneumoniakills</td>
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<td>83</td>
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<tr>
<td>v. [Scattered letters]</td>
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<td>78</td>
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<td>vi. [Vertical letters]</td>
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<td>89</td>
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<td>vii. eeeeee</td>
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<td>83</td>
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<td>viii. 123456789</td>
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<td>89</td>
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<td>ix. B</td>
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<td>x. [Shapes]</td>
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<td>xiii. [Stick figures]</td>
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<tr>
<td>xiv. [Scribble]</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td>xv. [Car]</td>
<td>22</td>
<td>22</td>
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Table 11: Percentage of three-year-olds rating cards as showing samples of writing.
Looking at individual pre-nursery children, it seems that in general they have a broader definition of writing than do the older children (apart from Jessica, who at 3:4 said that only handwriting was writing). Ben, also 3:4, said that everything was writing, while Debbie (3:1) and Emma (3:2) said that everything except the picture of the car was writing. George (3:1) thought that everything except the car and the scribble was writing.

This group was of course quite experienced in writing by the time the task was administered. It is unfortunate that such a task becomes difficult to present to younger children. My attempts to make card-sorting acceptable to younger children were not particularly successful: I created two 'monsters', one of whom ate writing and the other didn't, and asked some children to feed them appropriately; but I found that the children were more concerned to ensure that each monster got his fair share of the meal than to decide which card should be fed to which monster. On the whole I felt that those children who were mature enough to sort cards would do so better without any embroidering of the task, while those who could not sort cards cold would not be made to think any more about what they were doing by embedding the task in an interesting context.
I have described different types of writing, and different beliefs about writing, found in children of varying ages. Can we assume that children progress through the stages listed here, arriving finally at alphabetic writing after testing out a number of incorrect hypotheses about writing on the way? Perhaps some stages are alternatives to others; or possibly children tend to jump straight to an understanding of phonetics from an early stage. By looking at how the writing productions of a few representative children change over two years we should gain some understanding of how alphabetic writing is achieved.

Jennifer

On my first visit Jennifer was 3:5, a confident and intelligent child. Asked to do some writing she said "I fink, I fink I can do something ...." and produced a scribble-picture described rather mysteriously as "a fing that goes pss pss pss". But asked to write the names of the animals in the pictures she 'wrote' zig-zags which she announced to be bear, rhinoceros, ladybird and elephant. Teddy's shopping list was four separate zig-zags which represented five items: bananas, apples, pears, grapes and cooking apples. Her name was another zig-zag.

On the second visit (at 3:6) her writing had changed, and seemed to resemble Hebrew script. (She was not Jewish.) But her definition of writing was still broad; asked "What are you going to write today?" she replied "I can write a walking stick", and drew two. (One was "a little walking stick for little children"). Asked to write 'Jennifer' she said "First I do ...." and
produced a letter T which she obviously intended for a J. Her commentary continued: "And then a .... a bit like that .... Jennifer", as she added (on both sides of the T) first something which looked like an 'n' and then some more unrecognisable graphemes. Her letter to Santa, written from left to right and from top to bottom, was extremely polite and said "Please may I have a doll's pram, Spiderman's tee shirt to wear out in the street, and a Spiderman mask, and Spiderman trousers ...... Please may I have a pretend little girl's teapot ...... Please may I have one of those teddies"; and then she wrote her name ("Jennifer Niven") at the bottom using two graphemes. Caterpillar, mouse, zebra, squirrel, scissors and pencils were written in her 'Hebrew' script; and then she sorted cards very competently into those which showed writing (all those with either letters or numbers) and those which didn't. One card had the letters 'mprfgi' arranged in a vertical line; starting at the bottom she named them as "jr, granny, fish, road, daddy, mummy".

On the third visit Jennifer was 3:8. I asked what she was going to write, and she drew windows, which turned into a bus - but she did not at this point say whether she thought she had written them or drawn them. When asked if she knew how to write her name she said "No, I can only write .... this bit, I can only write that bit", and (like last visit) she wrote a T which she meant for a J. I asked if that was the only bit she could write. She continued writing: "And a huh. and a buh - Jenn- ifer Niven ...... and for baby". "Can you write baby?" I asked. "Yeah, these two words", she replied. I suspect that the middle letter, which first belonged to her name, is now part of 'baby'. She then drew a line to connect the bus and the baby, saying "And we're drawing a bus, and the baby".

Then came the pictures. She wrote two inverted U symbols on the first, claiming that they were "cuh for crocodile, duh for dog". Then came the fish
and whale sheet. Another inverted U said "fff for fish", but for the whale, which she had named a shark, she had two attempts at writing a "sss for shark". The second attempt was reasonably successful, and she commented on the resemblance between her S and a 2. Finally she was asked to write 'snails' and 'frogs'. She wrote "sss for snails" and then reverted to an inverted U to write what she described as "fff for throgs". (This provides an interesting contrast to Barbra, described in Chapter 4, whose speech impediment caused her to insist that her friend Rory's name began with 'wuh'.)

Next we played the tins game, which required Jennifer to label tins 'dog', 'pig', 'horse', and 'cow'. She obviously knew that her writing wasn't all that reliable, because she asked me to write it for her. But I was hardhearted and so she wrote them, with the commentary "duh for dog, duh for dog; puh for pig, puh for pig; puh for pig, puh for pig; huh for horse, huh for horse, huh for horse, huh for horse; cuh for cow, cuh for cow, cuh for cow, cuh for cow, cuh for cow, cuh for cow, cuh for cow, cuh for cow, cuh for cow, cuh for cow", Her first guess using labelled tins was correct ('pig'); but later guesses were wrong.

Finally came the phonemic analysis test. Jennifer correctly gave the initial sounds of the four words; but could not give any final sounds.

It can be seen that Jennifer has made enormous advances between the second and third visits. She is beginning to understand the distinction between drawing and writing; she knows that she can only write the first letter of her name; and she knows that writing involves a phonetic representation of speech sounds - this before she can write more than one or two letters correctly. She has an older sister who (the nursery school staff
tell me) was also very bright - she is obviously picking up a lot of information about writing at home.

On the fourth visit Jennifer's first action was to announce "I can write Jennifer now". (She was 3:9.) And she made a very creditable attempt at it. But she could not write any other names. Asked to write 'octopus' and 'sheep' she wrote with commentary: "ih for octopus, and a sss .... sh, sss for sheep". She has written the initial and final sounds of octopus, as she perceives them. (Many children in fact seemed to hear an initial vowel as 'ih'.) But asked if she could write 'butterfly' and 'kangaroo' she replied "no". I asked "Can you write butterfly?" She responded "Buh for butterfly", and wrote a letter which was a cross between a d and a reversed h. "What about 'kangaroo?'", I asked. "How does that begin?" "I don't know how to ...." she replied. "You don't know how to do a kuh for kangaroo? Shall I show you? .... Like that." I wrote a k in pencil in the page, and she traced over it with her pen. Then we came to watch and keys. She wrote an inverted w, describing it as 'wuh', and then said "I don't exactly know how to do that, keys." I reminded her that kuh for keys was the same as kuh for kangaroo, and she wrote a k along with (for some unknown reason) another inverted w.

The next task on this visit was to locate particular words on 12 cards which offered four alternatives: the correct word; a nonsense word beginning with the same letter, but short if the correct word was long, and long if the correct word was short; the initial letter; and the initial letter repeated several times. Jennifer chose the correct word four times: flea, tree, bumblebee and dandelion. Questioned about her choices, she replied that she had chosen 'bumblebee' "because it had a buh" (so did all the other alternatives) and 'tree' "because it said tree". She chose the short nonsense
word for 'giraffe', the repeated initial letter once (for 'bus') and the initial letter six times.

We then played a short game of "I spy'. Jennifer's guesses almost always began with the appropriate letter; and when it was her turn to spy she claimed to spy something beginning with "weese" This turned out to be 'waste paper basket'.

We played with a matchbox full of letter tiles; Jennifer was asked to say whether I had formed the word kick or kite, climb or clay, swim or swan, and hurry or honey. She guessed kite, clay, and swim. Asked to choose between honey and hurry she first said it was both, but when I insisted she choose she decided on honey. Thus she chose three nouns and one verb.

On the fifth visit Jennifer was 3:11. She wrote her name quite well, but then scribbled over it a bit. I asked her to write 'elephant' and 'ladybird'. She wrote something like a 2, and told me "I only know how to do a fff; can you show me how to do the other bits of elephant?" I asked what else was needed; she replied "el - uh - funt". "And you've done the fff?" I asked. "I can only do the fff" she reminded me. She then switched her attention to 'ladybird', and told me that she couldn't write it. I asked how it began; she thought for a while before replying "buh", and then told me that she couldn't write buh either. (She had attempted b last session; this time she seemed to be less interested in writing.) I showed her how to write b, and asked what else went in 'ladybird'. She said she didn't know, and asked to see another picture. We looked at the bear/rhinoceros sheet, and she told me she didn't know how to write bear. But when I asked how it began she wrote a b. She ignored my instructions to write rhinoceros, and just coloured in part of the animal. When I showed her the ducks/swan sheet she was clearly bored and
so we abandoned writing for that session. Before leaving I administered the BAS Vocabulary test; Jennifer scored at the 90th centile.

At the sixth visit Jennifer had just had her fourth birthday, and her writing had suffered an interesting relapse. The first picture was of skeletons: man, boy and dog. She told me "I can't write skeleton" but when I urged her to have a try she produced a zig-zag which she claimed said skeleton. She then said "I will write dog skeleton", and wrote a smaller zig-zag under the first. For the next picture I asked her to write 'skeletons swinging'. She said "It's just the same as that one but it's longer". (I assume she was referring to the earlier zig-zag which had said 'skeleton'). She drew two large scribbled zig-zags each of which, she claimed, said "skeletons swinging". Next I asked her to write 'skeletons climbing the steps'. "It's longer", she said. I asked why. "Cause it's just longer", and she drew three zig-zag lines across the page. One of these lines was described as "stairs", though whether she was saying that she had written the word 'stairs', or drawn the stairs, was unclear. The final picture was of the skeletons sleeping in bed. "Can you write 'skeletons sleeping'?" I asked. "That's shorter", she replied, and drew a small zig-zag beside the picture. She then wrote her name correctly; but reverted to zig-zags for the names of the farm animals arranged on the table. She drew lines under her first zig-zags (for sheep) and commented that she had turned them into party hats. She wrote undifferentiated zig-zags for the other animals in the farm.

There was a long gap, occasioned by the summer holidays, between the sixth and the seventh visit. Jennifer was now 4:3, and had recovered her writing skill. She said she couldn't write 'caterpillar'; but I asked if she could write mouse and she said "mmm" and wrote 'n'. She then interrupted to say "I'll show you how to write 'Jennifer Niven'". The following dialogue ensued.

* British Abilities Scale (Elliot, Murray and Pearson 1983)
M: Can you write 'Niven' as well? Here's some paper.

J: I can't write 'Niven', I can write 'Jennifer Niven'. ..... You don't put that - what am I doing? [The first 'e' had accidentally been written upside down and reversed.]

M: Oh dear, it turned into a 6. You'd better start again down here .... that's better. ........ Have you finished writing 'Jennifer' yet? .... Good ..... And can you do 'Niven'?

J: I can't do 'Jennifer Niven', just 'Jennifer'.

M: I see ..... Don't you have a sister whose name you can write?

J: Elaine.

M: Can you write her name?

J: That's what's at the beginning.

M: And what comes next, can you remember? ...... You can't? ...... How about 'Mummy' and 'Daddy', can you write 'Mummy' and 'Daddy'? .... No? OK .... Did you finish doing 'mouse'?

J: Cah - terpillar.

M: That's right.

J: How does 'caterpillar' go?

M: What does it begin with?

J: Cuh.

M: That's right. Can you do a 'cuh'? A curly 'cuh', like this? ..... Good girl, there's cuh for caterpillar.

And so the session continued. For the zebra/squirrel sheet she asked "How does zzz go?" and "How does squirrel go?" She said she couldn't write 'Hanging out the washing', agreeing that it was too difficult but unable to explain why it was difficult.
We then played the 'tins game'. This time the animals hidden in the tins were a gorilla, a cow, a pig and a tiger; and this time she did not ask me to write for her. She wrote p for pig, asking "How does a puh go?" For cow she decided to do a "broken-chair kuh". (This was a new term to me; most children talked about 'curly cuh' and 'kicking kuh'. But indeed her k looked very like a chair with a crooked leg.) "How does tiger go?" she asked, and told me "tuh" when I asked how it began. I showed her how to do a t. "How do you write gorilla?" she asked next. "What does it begin with?" I queried, and she replied "grrrr". (She had a beautiful Scottish accent in which the letter R had great prominence.) I told her it was a guh she needed, and showed her how to write it. She then proceeded to guess the contents of the tin correctly every time.

At visit 8 Jennifer was 4:4. She showed Teddy how to write his name "tDz" (I'm not sure where the z came from.) She then wrote her own name (still couldn't manage Niven) and attempted her sister's name - but had to ask for assistance once she'd done the E. I asked her to write 'eating watermelon'. She wrote 'ih' and 'eee' and said "I only want to do the beginnings". Then she wrote 'wuh'. She announced that she was writing "crrrr", and produced an r, for crocodile, followed by a duh for dog and fff for fish. "Shark" she mused, emphasising the sh. "How do you do a sh?" I explained that it required a sss and a huh; she wrote z and h from right to left.

We then considered written sentences such as "Daddy kicked the ball". Jennifer was one of the few children who cooperated on this task, and she said that each written word corresponded to a spoken word, in the correct order. (But she changed 'kicked' to 'kicking' in the first sentence.) The tape in my tape recorder ran out in the middle of this task, so most of her answers were lost.
Finally came the word choice task where Jennifer had to say which of two alternatives (one short, one long) said a particular word. There were 16 cards; Jennifer chose the correct word 12 times, presumably using phonetic clues. The first word was 'steamroller'; she claimed that the top word ('stir') said 'steam', while the bottom word ('steamroller') said 'roller'. The other three words she chose wrongly were dandelion, bus, and bumblebee.

On the ninth visit (at 4:6) Jennifer continued to write the appropriate initial letters of whatever I asked her to write. She told me "I can't write skipping but I can do a sss" and also said "I can write other words but I've got to copy them". She still could not write Niven, nor get any further than E with Elaine; but she wrote 'Mark'. When I asked who Mark was she said "Mark in G-Force" which I presumed to be a television programme. On this visit we again sorted cards into those which showed writing and those which did not. Last time she had said that anything which had either letters or numbers was writing; this time she modified her writing category slightly by saying that the card eeeeee was not writing - "just ehs". Other cards, such as the numbers, the scattered letters and the vertical line of letters, were called writing, but she qualified this by saying that the writing didn't say anything.

At visit 10 Jennifer was 4:8. I asked her to write 'The farmer drives the tractor', but she said that she couldn't. Nor could she write 'farmer' - "I can just write fff". I managed to extract a t for tractor, but she said she didn't know what else was needed for tractor. Then I asked her to write 'kangaroo' and 'butterfly'. She said "I can't properly do a kuh like adults do 'cause I can only do it like that", and had two attempts at writing a k. She didn't know what else went into kangaroo, so we moved on to butterfly. "Buh, I'll just do a buh"; but she wrote 'd' and had to scribble it out and try again. I asked
"What else goes in butterfly?" and she replied "Buh - tuh" and wrote t. I asked "What else?" but she said "I was going to write butterfly but look" [she indicated that she was at the edge of the page] "but now I've forgotten." She did not seem to like my continued questions about what came next - this was obviously quite difficult for her. So we hastily dealt with octopus and sheep (she still heard 'oh' as 'ih') and moved on to 'Hide the Smartie'. She hid the Smarties in the white car tin, and then wrote 'wi' to tell me where they were. (She asked my advice on what letter to use for the vowel sound.) Then I hid Smarties in the tiger tin, and wrote 'tiger' for her. She correctly deduced that it was the tiger tin from the initial letter.

At 4:9 (visit 11) she was slightly more prepared to analyse and to write whole words. We began with the snake/worm sheet.

M: Can you write snake?
J: No, not all - I can't write properly because I'm not at school.

M: You're very smart though.

J: sss snnake sss nnn .... nnn

M: Good girl ....

J: sss nnn ay kuh sss nnn ay - how do you do ay?

M: An 'ah' says ay.

J: That's all I can do of snake.

M: OK, how about worm. How much can you do of worm?

J: Wuh first ....... worrrr ....... two wuhs?

M: No, just one .... then oh.

J: An oh.

M: Mm hm ...

J: I think I'll draw on my hand.

M: What comes after that in worm?
J: Worrrm worrrm ... a mmm at the end.

M: That's right.

Jennifer had written 'wom' from right to left, and the 'm' did not seem to be related to the 'wo'. This effort had obviously exhausted her interest in writing for the day; on the next sheet all she did was to draw a giraffe. I gave her two picture books ("A Sunny Day" and "Mealtime") and asked her to read them to me. "I can't read", she said. "What do you think that might say there?", I asked, pointing to the first piece of text. She provided appropriate captions for each picture, using verbs (e.g. running, swimming, drinking) where appropriate.

On the twelfth visit Jennifer was 4:11. She wrote initial letters for umbrella, yacht, house, television and car. I asked if she could write all of car, but she said no. By continually asking "What comes next?" I managed to extract 'sil' for snail and 'fog' (written from right to left) for frog. She had been going to write 'ih' for the vowel sound of frog, but I corrected her. I repeated the BAS vocabulary test which I had first administered on the fifth visit; this time she scored at the 80th centile.

The thirteenth visit (the final one) took place on Jennifer's fifth birthday. She wrote k for keys, and y (which she claimed was a w) for watch. With some urging she wrote 'hw' for 'Hanging out the washing'. (She has the w correct this time.) And finally she wrote 'sin' for skeletons. We played a farewell game of 'Hide the Smartie'; she wrote 'ci' to tell me she had hidden the sweets in the cat tin.

Jennifer was obviously a very bright and responsive child who enjoyed showing me how clever she was. She began to understand the phonetic nature of writing very early, and her progress from 3:8 to 5:0 consisted
Jennifer (3:5) First visit
Jennifer (3:5) First visit

(3:6) Second visit

letter to Santa

name ("Jennifer")

ame ("Jennifer Niven")
Jennifer (3:6) Second visit

[Diagram of a zebra, a squirrel, a mouse, and a caterpillar]
Jennifer (3:8) Third visit

"Jennifer Niven / baby"

bus
dog  pig  horse
cow
Jennifer (3;8) Third visit
Jennifer (3:8)  Third visit

(3:9)  Fourth visit

schniefen
Jennifer (3:9). Fourth visit
Jennifer (3:9) Fourth visit

(3:11) Fifth visit
Jennifer (3:11) Fifth visit
Jennifer (4:0) Sixth visit
Jennifer (4:0) Sixth visit
Jennifer (4:0) Sixth visit
Jennifer (4:0) Sixth visit

sheep

ducks and chickens

lambs

bull

pigs
Jennifer (4:3) Seventh visit

1

C

S

S

S

Zebra

Squirrel
Jennifer (4:3) Seventh visit

Jennifer

P H T G

(4:4) Eighth visit

Dz Jennifer

Elain
Jennifer (4:4) Eighth visit
Jennifer (4:4) Eighth visit

(4:6) Ninth visit

Jennifer

Mark

E
Jennifer (4:6) Ninth visit
Jennifer (4:8) Tenth visit
Jennifer (4:8) Tenth visit

wi
Jennifer (4:9) Eleventh visit

Twelfth visit

(t)
Jennifer (4:11) Twelfth visit

1) Thirteenth visit

(5:0) Thirteenth visit
Jennifer (5:0) - Thirteenth visit

The image contains a drawing of a person hanging laundry on a clothesline and a skeleton walking up a staircase with a dog following. The text below the drawing reads "zin."
merely in refining her understanding, in learning how to form more letters, and learning which sounds they could represent.

**Jamie**

Jamie tended to be a fairly timid boy who initially needed much encouragement to come into a private room with me; and who, unlike Jennifer, was never very forthcoming about his thoughts and beliefs. He was a month older than Jennifer, and left-handed.

On the first visit he was 3:6. He 'wrote' quite willingly, using small circles to say everything: bear, rhinoceros, ladybird, elephant, ducks, swans, and Teddy's shopping list (banana, milk, and juice). He wrote his shopping list from right to left, and it was unclear which graphemes corresponded to which items - or if indeed there was any particular correspondence. He wrote his name with two circles.

By the second visit (at 3:7) his graphemes had become like a reversed C or an inverted U. I greeted him with "Are you going to do some writing this morning?" "Yes" he replied, and began producing these graphemes. "What are you doing?" I asked. "I'm drawing", he replied. I showed him the pictures; and he used one symbol to write each name: zebra, squirrel, mouse, caterpillar, scissors and pencils. Then he wrote a letter to Santa, requesting among other unclear items a gun, a garage, a house and a tray. During the writing of the letter, as with Teddy's shopping list last session, it seemed that his writing was not synchronised with his intention to write a particular item. Somehow, a pencil, scissors and a caterpillar found their way into the letter to Santa. Finally I suggested he write his name at the bottom, and he did so. I gave him the card sorting task (writing or non-writing) but
unfortunately forgot to note the contents of each pile at the end. He impressed me early on by naming the numbers as '1 2 3 4 5' but later described several other cards showing writing as also saying '1 2 3 4 5'.

On the third visit (3:9) his graphemes had become circles again. He wrote his name ('Jamie') using four circles, and then wrote the names on the pictures (crocodile, dog, fish, whale, snail (three times) and frog (twice) using one grapheme each time. We played the 'tins game'; he wrote labels for the tins, using one circle for dog, a large circle for pig, two circles for horse and four for cow. But these labels did not help him to guess what was in the tins. In the phonemic analysis test he could not give any initial sounds of any words.

By the fourth visit Jamie (at 3:10) has made a great advance: he no longer uses letter-like graphemes, but uses two letters: J and T. However, his J has a line across the top and is just like a T with a curly tail. He wrote a J for Jamie, and a T for Teddy; and then either J or T seemingly at random to say Mummy, Daddy, Grandma, other Grandma, etc. He used either J or T to write the names on the pictures. Asked to select a particular word from four alternatives, he instead pointed to an individual letter each time. We tried to play "I Spy", but Jamie's guesses were not related to the clue I had given (eg for "something beginning with 'duh'") he suggested chair and string) and he could not 'spy' himself. Shown the letter tiles he called them 'numbers', and suggested kick, climb, swan, and honey. (Two verbs and two nouns.)

At the fifth visit (at 3:12), when I asked "What are you going to write for me today?" Jamie replied "Jay". He wrote a number of graphemes in the style of his square-looking J, naming one of them (an H on its side) as "eee". He could not write any more of his name. He now had three letters at his disposal for writing names; and he continued to use one letter each time to
write ladybird, elephant, bear, rhinoceros, and swan. He used two letters to write ducks - but it could have been that he wrote duck twice, especially as he used the same letter twice.

On the BAS Vocabulary test he scored at the 68th centile.

At the sixth visit Jamie (4:1) was asked to write 'skeletons'. He wrote an E on one side of the picture, and a J on the other; both letters were described as saying 'skeletons'. For the next picture he was asked to write 'skeletons swinging': Again he wrote an E and a J; this time he claimed that each letter said 'swinging'. Next he was asked to write 'skeletons climbing the steps'. This time his E (reversed) and J both said 'climbing up the steps'. The final picture was of the skeletons in bed; he was asked to write 'skeletons sleeping'. Again he wrote the same two letters; this time each said 'sleeping'. Then he wrote his name for me: JAE(reversed). And finally he wrote farm labels.

With the summer holidays intervening, Jamie was 4:4 by the seventh visit. He had obviously spent some time on his writing, as he could now write his name correctly using capital letters. I asked if he could write any other names, and he offered "I can draw my new name - it's got a different jay". And this time he wrote Jamie again, using mostly lower case letters. He now had more letters at his disposal for writing other words; as well as the letters in JAMIE he had acquired an O, and he used these to write 'mouse', 'caterpillar', 'zebra', 'squirrel', and 'hanging out the washing'. (Actually he said he had written 'hanging the washing'.) Four (plus or minus one) seemed to be his preferred number of graphemes for these texts. He did appear to be using some kind of 'variety' hypothesis, in that he seemed to try not to repeat the same sequence of letters.
We played the 'tins game' and Jamie labelled the tins 'gorilla', 'tiger', 'pig' and 'cow'. This time he used widely differing numbers of letters; I asked him “How come it took so much to say pig, and only a little bit to say cow?” but got no reply.

At visit eight Jamie was 4:6. He was unwilling to show Teddy how to write his name, saying he didn’t know how to. He wrote his own name twice, in capitals and lower case (but writing JAMEE instead of JAMIE). I asked him how he knew what letters to write, but he didn’t know. He wrote names on pictures: crocodile, dog, fish and shark (as he insisted the whale was called). This time he used two, three or four letters.

We studied the written sentences (eg 'Daddy kicked the ball') and I tried to find out what (if anything) he thought about the relationship between speech and written text. The following transcript suggests that Jamie was very unhappy about this task, probably because he had no idea what I wanted.

M: Do you know what it says on here? It says 'Daddy kicked the ball'. Can you say that?
J: Daddy kicked the ball.
M: Do you think I wrote 'kicked' on there?
J: [shakes head]
M: OK, do you think I wrote 'ball' on there?
J: [nods head]
M: Whereabouts do you think it says 'ball'?
J: Don’t know.
M: What about 'Daddy'? Do you think I wrote 'Daddy' on there?
J: [shakes head]
M: What did I write? Do you remember what I told you it said?
J: [no reply]
M: 'Daddy kicked the ball'. Can you say that again?
J: Daddy kicked the ball.
M: So you said I might have written ball somewhere? .... What about 'Daddy', do you think I wrote Daddy?
J: [nods]
M: Whereabouts do you think it says Daddy?
J: Don't know.
M: What about 'the' - do you think I wrote 'the'?
J: What?

Jamie clearly did not understand what I was talking about, and (always a bit on the timid side) he was not enjoying himself. But halfway through the seemingly interminable task he realised the sort of answers I was looking for, and began telling me that each spoken word was present, and was located in a particular written word (not in spoken order). But obviously this was not an idea that had come from Jamie; he had got it from me, and I suspect that he didn't care what he said as long as he was released from a highly aversive task.

Finally I asked Jamie to choose one of two alternatives (long or short) for particular words of varying length, and representing objects of different sizes. His method of responding seemed to be to choose the top line and the bottom line alternately. He was occasionally able to justify his choice: he said he chose the top line (the correct word) for 'bumblebee' "'cause it flies - it's not the bottom one 'cause it doesn't go on the ground". He chose the top line again for 'tree' "'cause it's stuck".

At the ninth visit Jamie was 4:7. He wrote as before, using (usually) three or four letters for each piece of text. He sorted cards into those which
showed writing and those which didn't. He said that the handwriting, the vertical line of letters, and the large letter B were not writing, as well as all the cards which did not have letters or numbers.

By the tenth visit he was 4:9. His writing had not progressed - in fact he seemed to be using a smaller repertoire of letters. He followed my instructions to write 'The farmer drives the tractor', 'kangaroo', 'butterfly', 'sheep' and 'octopus', using two or three letters each time. He wrote his name in capitals, with the J reversed. I asked what would happen if we put the letters of his name in a different order, and I wrote 'AMIEJ'. "Would that still say Jamie?" "No", he replied, "it wouldn't say anything."

We played 'Hide the Smartie'. He wrote AAM to tell me he had hidden the Smarties in the tiger tin. My message to him said 'green car', but he totally ignored it, looking in all the tins in turn until he found the sweets.

At visit 11 Jamie was 4:10. He wrote as requested, generally using two or three letters. Perhaps it was coincidence, but the three letters he used to write 'cat' were 'CrA'. "Making music' took five letters.

I asked him to read the two picture books ('Sunny Days' and "Mealtimes"). "I can't read books" he said, but suggested appropriate texts and used verbs to accompany action pictures.

Still no change at visit 12. At 5:2 he still used three or four letters for everything. He could not write his surname. He scored at the 65th centile on a repeat of the BAS Vocabulary test.

At our last meeting (visit 13), at 5:1, he said that he could write his name a new way. But this turned out to be the same as his 'new name' he had written for me on visit 7: a lower case version. We played 'Hide the Smartie'; he wrote 'JHA' to tell me he had hidden the sweets in "the spotty one", ie the leopard tin. My message saying 'tiger' did not help him to find the Smarties.
Jamie (3:6) First visit

- Bear
- Rhinoceros
- Ladybug
- Elephant
Jamie (3:6) First visit

shopping list

(3:7) Second visit

"drawing"
Jamie (3:7) Second visit

![Zebra](image1)

![Squirrel](image2)

![Mouse](image3)

![Caterpillar](image4)
Jamie (3:7) Second visit

letter to Santa
Jamie (3:9) Third visit
Jamie (3:9) Third visit

name
Jamie (3:9) Third visit

dog

pig

horse

cow

(3:10) Fourth visit

I J J T - T T T - T
Jamie (3:10) Fourth visit

[Diagrams of an octopus, a sheep, a kangaroo, and a butterfly]
Jamie (3:10) Fourth visit

(3:12) Fifth visit
Jamie (3:12) Fifth visit

- Ladybug
- Elephant
- Bear
- Rhino
Jamie (3:12) Fifth visit

(4:1) Sixth visit

ame
Jamie (4:1) Sixth visit

E

J

E

J
Jamie (4:1) Sixth visit
Jamie (4:1) Sixth visit

sheep

lambs

pigs and piglets

ducklings and duck

hen and chickens

calves

cows

"just a line"
Jamie (4:4) Seventh visit

"my new name"

JAMIE

JAMIE

"my new name"

JAMIE

JAMIE

"my new name"

JAMIE

"my new name"

JAMIE

"my new name"

JAMIE

"my new name"

JAMIE

"my new name"

JAMIE

"my new name"
Jamie (4:4) Seventh visit

JAEM TIMEA

IMA
Jamie (4:4) Seventh visit

Tiger

Gorilla

Pig

Cow

(4:6) Eighth visit

Alligator

Dog
Jamie (4:6) Eighth visit

JAA

IEIE

JA MEE

JQ MIQ
Jamie (4:7) Ninth visit
Jamie (4:7) Ninth visit

JEJE
JEJE
JEJE
JEJE
JEJE
JEJE
JEJE
JEJE
JEJE
JEJE
JEJE
Jamie (4:7) Ninth visit

JIEE E10

(4:9) Tenth visit

AE
Jamie (4+9) Tenth visit

EIE

AIE

IAM

EAA
Jamie (4:9) Tenth visit

(4:10) Eleventh visit

TOMAI
Jamie (4:10) Eleventh visit

IMA

J M

JAMIE

(4:12) Twelfth visit

JAMIE
Jamie (4:12) Twelfth visit

MAIL

IMA
Jamie (5:1) Thirteenth visit

T i H

H i i

[Drawing of skeletons and a dog ascending stairs]

[Second drawing of skeletons in bed]
Jamie (5:1) Thirteenth visit

"the spotty one"
Jamie's lack of progress at writing resembles Jennifer's, in that both children acquired a style of writing very early on in the study, and then did not change. Jamie and Jennifer were younger children who spent the two years of this study attending nursery school. We will now follow the development of two children from the older group, who spent a year at nursery followed by a year at Primary School.

Karin

At my first visit Karin was 4:4. Asked to do some writing, she drew a face. I asked her for "some writing that goes with that picture" and she added two squiggles which looked like a figure 2 on its side. These she named as "em dee". I then asked her to write the names of the animals in my pictures. ("Can you write ducks/swan/elephant/ladybird/bear/rhinoceros?") Her response appeared to be to draw each animal - though her pictures were rather peculiar, and tended to look more like slugs or millipedes than anything else. I then asked Karin to write Teddy's shopping list. She began by writing a vertical line of squiggles which, she said, said "Teddy and all that". (By 'all that' she meant all the items in the shop.) With a little urging she added a few individual items: milk, juice, and more milk. Finally she wrote her name with four squiggles ("Karin .... Daly ..... Karin Daly").

At the second visit (at 4:5) her squiggles had become recognisable letters, with an inverted A being the favourite. She wrote zebra, squirrel, mouse, caterpillar, scissors and pencils, using two, three or four symbols for each. She then wrote a letter to Santa, muttering ".... bike ..... puppet ...." as she wrote. When I asked for more details about what she was writing she pointed to her graphemes and said "I want that and that and that and that
I pointed to a pair of graphemes and asked what they were; she said "Please could you bring me a teaset kettle". I reminded her to put her name at the end of her letter and she wrote two symbols, saying "Ka - rin Da - ly".

She sorted cards competently into writing and non-writing. All those which showed either letters or numbers she said were writing.

By the third visit (at 4:7) she had learnt some new letters. I asked her to do some writing and she drew what she described as a caravan. I asked for some writing to go with the picture, and she wrote E and b. She named the E 'em' but did not know what the b was (and sighed heavily when I asked her). She wrote her name with three graphemes but no commentary. She wrote 'crocodile', 'dog', 'fish', 'whale', 'frog' (twice) and 'snail', using one letter each time. We played the 'tins game', but her written labels did not help her to find the horse, pig, cow or dog. In the phonemic analysis test Karin could not give the initial sound of any word.

By the fourth visit she was 4:8, and there was further improvement in her writing. She began by writing a large E, and naming it "a suh". A large P was called "a cuh" and a strange grapheme bearing some resemblance to an h was called "a suh". I asked what else she could write and she replied "Daddy ..... that's his moustache" as she drew a face. I then asked to write her name, as well as 'Daddy' and 'Mummy'; and she did so. Unfortunately I have no note of which group of letters was meant to be which name. She wrote names for the pictures, using two, three or four letters (except for the baby kangaroo in its mother's pouch, who only received one letter).

On the word choice task she chose the long alternative three times and the short twice. She selected the repeated initial letter five times and the initial letter twice. She seemed to be choosing alternatives at random, with a slight preference for the top two lines.
We played 'I spy with my little eye'. Last visit Karin had been unable to supply the initial letter of any word, but this time she guessed words which began with the correct sound, and at her second attempt at spying she managed to give the correct clue. (Her first try was to spy 'something beginning with sss' which turned out to be pipes.)

On the fifth visit (at 4:10) Karin began by writing 'Daddy', 'Gypsy' (her dog) and 'Karin'; but she ran the three words together so it is impossible to tell where one stops and the next begins. She began to write names on the pictures using two or three letters each time; but for the picture of eight ducks she wrote 'duck' eight times, and possibly from boredom or fatigue the number of letters she used quickly fell to one. Unlike Jamie, she did not seem to make any attempt to use different letters, or a different sequence of letters, for each text.

Given the letter-tile task it took her a while to understand that she was to choose between the two offered alternatives. Given 'kite or kick' she first suggested 'Karin'; and when asked 'climb or clay' she tried 'steps'. But in the end she chose kite, climb, honey and swan: three nouns and one verb.

Karin scored at the 65th centile on the BAS Vocabulary test.

At the sixth visit Karin was 4:11. On the first picture I asked her to write 'skeletons'; but she wrote three separate groups of graphemes which she claimed said "skeletons ... doggy skeletons ... skeleton". For the next picture she wrote "skeletons swinging" twice. The next picture was of the skeletons climbing the steps. As she wrote she claimed that her writing said "skeletons climbing .... skeletons swinging .... skeleton .... doggy skeleton climbing up .... doggy running". This all seemed a bit confused so when she had finished I asked her to tell me again what each piece of writing said. Now it seemed that she had written "skeleton climbing" three times. For the final picture
she wrote "skeleton sleeping" twice, though there was a moment of confusion when she thought she had written "skeleton climbing". She entered with enthusiasm on the writing of signs for the toy farm, producing 'lamb', 'sheep', 'cows', 'bulls', 'calves', 'cockerel', and 'chickens'. As she wrote 'bulls' she commented "buh". She then wrote 'piglets' (three times, for the three piglets), and 'pigs' (likewise). Then she became dissatisfied with the sign she had written, saying 'lambs' and 'sheep'; she decided that it said 'lambs' twice, and she wrote a new sign saying 'sheep' three times for the three sheep. Finally she wrote a sign which began by saying 'duck and ducklings', but by the time she had finished it had become writing for the duck and ducklings. At the end of the session she wrote her name, using three letters ("non").

At the previous visit I noted that she did not seem to feel obliged to use different letters to write different texts; it also seems, from her productions on this occasion, that she doesn't mind writing the same word with different letters.

By the seventh visit Karin (5:2) had been attending Primary school for around three weeks. I asked what she had been learning in school; she told me that her teacher had said "Always write when you're big." She wrote some letters (variations on o, n and h) and named them "double-you, em, bee ..., ess, bee, ess ... and double-you". She wrote her name "o h x". She wrote mouse, caterpillar, zebra and squirrel, using three, four or five letters; and used seven to write 'hanging out the washing'.

She sorted cards in to writing and non-writing, competently (saying that everything with either letters or numbers was writing) except that she described the zig-zag as writing. She named the numbers as "ess and double-you" and the large letter B as "ess".
We played the 'tins game'. Karin wrote labels saying 'gorilla', 'tiger', 'pig' and 'cow', using four or five letters; but the labels did not help her to guess the contents of the tins.

At the eighth visit Karin was 5:5, and approaching the end of her first term at school. I asked her if she could show Teddy how to write his name, and prompted her with "How does it begin?" "Tuh" she replied, and said that she had forgotten how to do a tuh. I showed her, and asked what else she would put in Teddy. "Tuh" she said again, "No, I've done tuh ..." I suggested a duh, and showed her how to do that. Then I asked her to write her own name, which she did. (But the final n looked like an Â.) I then showed her the page of fruit, and asked her to write all their names. She wrote the initial sounds for each, except that for strawberry she said "stuh" and then wrote t. As she wrote b for banana she commented "Buh, it seems like bus" (which was a word they had just been learning in class). She then wrote d for dog, asking "Is it like a buh?" and r for crocodile, saying "Croh, is it like a rabbit?". Fish was written 'f', but having named the whale a shark she was stumped until I told her that sh was written with "a sss and a huh".

Karin's progress continued. At the ninth visit (5:7) she made a creditable attempt to write 'the farmer drives the tractor', with accompanying dialogue.

M: Can you write 'the farmer drives the tractor'?
K: I can try to spell it ... farmmmm [she writes F and m] ... farmerrrr, rrr rrr rrr. [She seems puzzled.]
M: eh rrr.
K: rrr.
M: OK, what about 'drives'?
K: Duh .... drives zzz zzz zzz .... that goes with 'soldier'. [She writes 'ds with the s reversed.]
Karin’s teacher, in trying to explain the concept of initial sounds of words, had said that eg buh goes with bell, sss goes with soldier.

M: How about 'the tractor', can you write that?

K: Tuh, tuh, tuh .... how do you write tuh?

M: Like this [demonstrates with finger] ... a curly tail and then across.

K: [writes f] A curly tail - down the bottom?

M: Yes...... What’s next?

K: Drives, sss, sss.

M: You’ve finished 'drives'; you’re doing 'tractor' next, aren’t you? So what comes next in tractor?

K: Tuh.

M: You just did a tuh.

K: Ooh .... tractorrr Ill Ill Ill, luh, that’s a hard one, I forgot that one .... Ill .... Lesley .... Ill.

M: Anything else in 'tractor'?

K: Dri - vssss, sss.

M: You’ve done that. Let’s have another picture.

Karin went on to write kangaroo (‘croo’), butterfly (‘bFa’), and skipping (‘spin’). She wrote her name, including surname (‘Karin aly’ - I think the ‘a’ was meant for a D). We played 'Hide the Smartie'; her first message to me said ‘Lp’ but in fact this was only written to fool me - she hadn’t hidden the sweets in the leopard tin. She then wrote ‘tgr’ because they were really in the tiger tin. She could not decode my message (‘green car’), suggesting first ‘tiger’ and then ‘cat’.

At 5:9 (visit 10) she wrote snake (‘sic’), worm (‘wim’), making music (‘mic mic’), koala (‘clul’), penguin (‘pieg’), and cat (‘cat’), as well as her name (‘Karin dly’).
Karin (4:4) First visit

shopping list

name
Karin (4:5) Second visit
Karin (4:5) Second visit

letter to Santa

(4:7) Third visit

"Karin Daly"
Karin (4:7) Third visit
Karin (4:7) Third visit

horse  pig  dog  cow

(4:8) Fourth visit

[diagram of a face with 'E' over it]
Karin (4:8) Fourth visit
Karin (4:10) Fifth visit

"Daddy, Gypsy, Karin"
Karin (4:10) Fifth visit

hoh

hoh

hoh

hoh

hoh
Karin (4:11) Sixth visit

The image contains a cartoon drawing of two skeleton figures and a small cat. One skeleton figure is standing and appears to be speaking, while the other is sitting on a swing, also speaking. The bones are outlined, and the drawing style is simple and cartoonish.
Karin (4:11) Sixth visit

Non, Non, Non,
Karin (4:11) Sixth visit

- cows
- bulls
- calves
- lambs
- pigs
- piglets
- sheep
Karin (4:11) Sixth visit

duck and ducklings

cockerel and chickens

(5:2) Seventh visit
Karin (5:2) Seventh visit

A woman is hanging up laundry on a line. Below the drawing, there are handwritten words:

- Gorilla
- Tiger
- Pig
- Cow
Karin (5:5) Eighth visit

Karin

"Teddy"

KARIA

Karin
Karin (5:5) Eighth visit

D

D

F

S

H
Karin (5:7) Ninth visit

Spin

Karin aly
Karin (5:9)  Tenth visit

Karin dly
Karin (5:9) Tenth visit

mic    mic

(5:12) Twelfth visit

snail    frog
Karin (5:12) Twelfth visit

Sceltn

Sceltz  Swigin
Karin (5:12) Twelfth visit

- Twelfth visit

- Umbrella

- Boat

- House

- TV

- Car

- Kain Dly

- ubelo

- bot

- hos

- tvln

- crs
Karin was not at school for my eleventh visit. At visit 12 (5:12) she made reasonable attempts to write the words I asked her to, and to write her name; though she still misspelt her surname. Perhaps the similarity of the first two letters (D and a) confused her into thinking they were the same and therefore need only be written once. She even misspelt her first name on this visit; rather surprising considering her age.

On a retest with the BAS Vocabulary test Karin scored at the 36th centile. (Previously she had scored at the 65th centile.) I suspect that the retest result gave a truer picture of her ability level.

Karin’s progress towards understanding the writing system was typical of a number of children: she began to use conventional letters quite early on, but made no further progress until she started school. There she learnt to write phonetically. She did not at any stage appear to be working with a syllabic hypothesis of writing.

The final example is of a girl who did not seem to make much progress at writing even after she started school.

Lynsey:

On my first visit Lynsey was a friendly child of 4:2. Asked to do some writing she drew a picture; asked to do some writing to go with the picture she added another picture (of a telephone). But asked to write names on the pictures she produced letter-like graphemes. Whilst writing 'bear' her commentary was "beh, bear"; for 'rhinoceros' she said "noh uh suh". While writing one symbol for 'elephant' she commented "eh luuh fuh, fink"; and 'ladybird' (one symbol again) was described as "eh, luuh, lady-bird. She wrote one symbol for 'ducks' and a similar one for 'swan'. Both resembled an S, and it might have seemed that she was trying to write S for swan; but she
claimed that each letter said 'duck'. I then asked Lynsey to write Teddy's shopping list.

M: You write down all the things Teddy wants to have from the shops ................
What are you writing there?
L: Numbers.

M: Yes, are you writing the things Teddy wants to have from the shop? What does he want to have? ..... What's that one? ..... What have you written there?
L: A camel.

M: A camel? What about Teddy's shopping list? You need to write down all the things Teddy wants to have.
L: A duck.

M: What do you think Teddy would like to have from the shop?
L: Cake, custard ...

M: Cake and custard? Can you write those down on the shopping list? Write them over here.
L: Cuh, luh, cuh, lus, suh ...... cuh luh suh custardl

M: Good girl, and what else are you writing? What's that?
L: Custard.

M: And does Teddy want anything else from the shop?
L: [Shakes head.]

Finally I asked Lynsey if she could write her name, and she produced a line of writing that by its degeneration into scribble looked as if she was getting bored. Her commentary was “Juh oh dee oh see”. I asked “What does that say?” and she replied “loss”. (I don't know if that had any significance.) I asked “How about Lynsey - can you write Lynsey? ........ What does all that say?” "Guh - jawch" seemed to be her reply.
On the second visit Lynsey was 4:3. Again, when asked to write, she drew a picture (of a man). Asked to do some writing to go with the picture, she produced some graphemes written down the man's body. She wrote the names of the animals and objects without commentary, and began her letter to Santa by drawing an armchair. She then wrote 'buggy' from right to left along the armchair, and then her name from left to right also along the chair.

Finally came the card sorting task. The cards which Lynsey said were not writing were the hieroglyphs, the shapes, the zigzag and the scribble. Surprisingly, she claimed that the picture of the car and the row of little men were writing. She described the large B as 'a letter'.

At the third visit (aged 4:4) Lynsey again responded to "What are you going to write today?" by drawing a picture. She wrote her name along the top of the page, using a curious mixture of letters and lines. I showed her the first pictures, and asked her to write 'crocodile' and 'dog'. Again, she produced a continuous line of writing which stretched right across the page, and told me that it said "dog and crocodile". I asked which part of her writing said 'dog', and which part said 'crocodile', but she seemed to point to the whole text each time. The next picture (fish/whale) produced the following dialogue:

L: That's a fish, and a shark.
M: Can you write their names?
L: Not really. [But she began to write anyway.]
M: No?
L: Can't do crocodile.
M: You mean the shark? You can do the fish, can you?
L: Yes, I can easily do the fish.
M: Why is the shark harder?
L: 'Cause it's too hard for me.
M: Why is the shark harder than the fish?
L: 'Cause ... I just [couldn't catch this bit] the fish, and I can't do this.
M: I see, OK.

The final names, 'snails' and 'frogs', were written without difficulty, and then we played the 'tins game'. Lynsey wrote labels saying 'pig', 'dog', 'horse' and 'cow', but they did not seem to help her to guess the contents of the tins. At the beginning of the session she had used quite a selection of letters and letter-like graphemes, but through the session the choice became more restricted until by now she used one sign only: a reversed 7. (Once she used it the right way round.) Of course she may have used this symbol as an upside down and reversed L - her initial (and she did use it as the first grapheme in her name).

Finally I tested her ability at phonemic analysis. She did seem to have some idea of what I wanted; asked for the sound which comes at the beginning of 'coat' she replied "key"; and she gave "dog" for the sound that comes at the beginning of 'dig'. But she did not attempt the other two words.

At the fourth visit Lynsey was 4:6. Again she began by drawing a picture (of a robot), and then wrote her name - which began with the same two letters she had used last time. This might suggest that she did see the first symbol as an L. But her later writing used several numerals: 1, 4, 6, 7. This perhaps makes it more likely that the upside-down/reversed L is actually a 7.

Next she was asked to locate a particular word among four alternatives. She seemed to be selecting at random, choosing the initial letter twice and the repeated initial letter four times. She chose the long nonsense word twice, and the short nonsense word once. She selected the correct word three
times: worm, tree and bumblebee. For 'bumblebee' I asked how she had known that was the right one. "Because I can read", she lied. After she had correctly chosen 'tree' I pointed to each of the other alternatives in turn, and asked if it could have been that one. She agreed that it could have been the long nonsense word, or the initial letter - but it could not have been the repeated initial letter "cause there's two lots of rounds in that one". I don't know what she meant by that.

Finally we played "I spy..." Lynsey twice guessed bag and box, although I had spied something beginning first with 'wuh' and then with 'duh'. She spied something beginning with 'ess' which turned out to be 'chair', and then something beginning with 'sss' which was 'switch'. It was impossible to tell whether this was a fluke, or whether she was beginning to get the idea.

By the fifth visit (at 4:7) Lynsey had learnt some more letters. She used four to write her name, in which the contentious reversed 7/upside-down L had begun to resemble many childrens' attempts at 'r'. She wrote the names of the animals and birds on the pictures without comment, using two, three or four symbols.

Given the letter-tile task, Lynsey chose kick, clay, swim and hurry: three verbs and one noun.

On the BAS Vocabulary test she scored at the 36th centile.

At the sixth visit, in Lynsey's final month at nursery school, she was 4:9. She wrote 'skeletons', 'skeletons swinging' etc, using letters, dots and dashes; and wrote her name. She pointed to the first letter in her name ('P') and said "That's a luh". She wrote labels for the toy farm; but her writing was frequently constrained by the watermark (which said SCOTSCRIPT) in the paper we were using. When she could see the watermark she put her writing on top of it and seemed to be trying to trace the letters. (Since she often had
the sheet of paper wrong side up she was frequently trying to trace reversed letters.)

Lynsey did not attend the primary school attached to the nursery; she went to another Local Authority school nearby and was visited there. She was 5:0 at the seventh visit, and showed signs of having learnt some lowercase letters. She wrote her name (which again began with P), and the other words and phrases I requested. I tried to question her about writing.

M: How do you know which letters to use?
L: Em ... the teacher shows me.
M: How did you know, here, which letters to do? .... Do you think it matters which letters you use? .... Or can you just do any letters?
L: You can do any letters.
M: And it would still say 'caterpillar', would it, no matter which letters you used?
L: Yes.
[Later]
M: Does it matter how many letters you do?
L: Yes.
M: How do you know how many you should do? ..... How many letters did you do for zebra? ..... [counts] one, two, three, four. How about squirrel? .... One, two. Why does squirrel need two letters, and zebra need four, do you know?
L: Yes, 'cause that's got a zebra.
M: How do you mean?
L: 'Cause all its family has.
M: [totally confused] I see. So why does squirrel only need two letters?
L: 'Cause it didn't know which friend to play with.
Perhaps Lynsey didn’t know what I meant by 'letters'. Or perhaps she just didn’t know the answer to my question. She appears to be using the technique described by Hughes and Grieve (1980), of importing some sort of context in order to make sense of (to her) bizarre questions. She certainly did not appear to have any conscious rule for deciding which and how many letters to use in her writing.

She sorted cards into those which showed writing and those which didn’t. All the cards which showed either letters or numbers she described as writing.

We ended by playing the 'tins game'. She wrote labels saying gorilla, cow, tiger and pig; but was not able to use them to guess the contents of the tins.

On the eighth visit Lynsey was 5:3. Asked to show Teddy how to write his name, she wrote 'Lyl24' without comment. She then wrote her own name correctly (but the 'e' was reversed and upside down). I asked her to write fruit names; at first she said she couldn’t, but when I urged her to have a try she did so using four, five or six graphemes (letters and numbers mixed). When she had finished I asked her to read it all back to me and she did so, with no attempt at segmenting the words into either sounds or syllables. After she had written 'crocodile' and 'dog' I asked "How come it took four letters to say dog, and six for crocodile?" "Because that's a short name and that's a long name" she replied. The effect of learning to write her name (she said her teacher showed her how) was noticeable: many of Lynsey's words began with L or Ly, and 'crocodile' even began 'Lyns'. I also deduced that the class had been learning numerals from the numbers which appeared in her texts.

The ninth visit occurred during Lynsey's second term at school, when she was 5:4. She did not seem to have made any progress at all. She still wrote
letters and numbers mixed, and seemingly at random, for anything I asked her to write. She could not attempt her surname or her sister's name. Playing 'Hide the Smartie' she wrote 'LiSh' to tell me the sweets were in the white car; and my message saying 'green car' did not help her to find the Smarties.

By the tenth visit Lynsey was 5:7 and had still not progressed (although the numbers had disappeared from her words). I spoke to her teacher after the session; she agreed that Lynsey was the poorest in the class 'by a long way'. But the teacher expressed surprise at the writing I was asking Lynsey to do, saying that she was still working through the alphabet in class, and 'didn't believe in rushing it'. Since this was April, and the school year three-quarters over, I felt that this teacher was perhaps overdoing the 'slow but sure' approach. At other schools children who initially seemed equally as slow as Lynsey were learning to write whole words at the same time as they were being taught individual letters and their sounds. For example Zak (Fig 19) who mostly wrote gibberish used the 'making music' picture to write 'boy' and 'girl'.

About the only change on the final, eleventh visit, was that at 5:9 Lynsey's letters had become slightly neater. She seemed to use more letters on each occasion, possibly because her improved control made it easier for her to produce them. But there was still no sign of any understanding of phonetics. She could still not write her surname, or any other names. I readministered the BAS Vocabulary test and Lynsey scored at the 86th centile (compared with the 36th a year ago). This was a surprising result, and possibly an overestimate of her ability - although it is hard to argue with the fact that she correctly named 17 out of the 20 items pictured in the test.
Lynsey (412) First visit
Lynsey (4:2) First visit

shopping list

name
Lynsey (4:3) Second visit

man, with graphemes

armchair/letter to Santa
Lynsey (4:3) Second visit
Lynsey (4:14) Third visit
Lynsey (4:4) Third visit

pig  dog  horse  cow

(4:6) Fourth visit

name

![Keychain and watch drawing](image)
Lynsey (4:6) Fourth visit
Lynsey (4:7) Fifth visit

- Some writing and drawings of birds and a goose.
- A bear and a rhinoceros are also drawn.
Lynsey (4:7) Fifth visit

O N F

G E

name
Lynsey (4:9) Sixth visit

17

170
Lynsey (4:9) Sixth visit
Lynsey (4:9) Sixth visit

PRO* name

00 7802 sheep and lambs

09 10 40 cows and calves

FLOT duck and ducklings

hen and chicks

DA72 pigs and piglets
Lynsey (5:0) Seventh visit

<drawing of a woman hanging up clothes>

<drawing of a mouse and a caterpillar>

PTB

name
Lynsey (5:0) Seventh visit

- Zebra
- Tiger
- Pig
- Gorilla
- Cow
Lynsey (5:3) Eighth visit

L52M 0123

LYNSII 12FL
Lynsey (5;3) Eighth visit

LYOOL!

LYH4 "Teddy"

LYHSEY
Lynsey (5:4) Ninth visit

LOT

PLOT

I34
Lynsey (5:4) Ninth visit

Lynsey

Lish "white car"

Opi

Logi
Lynsey (5:7) Tenth visit

Lioho

Sex

List
Lynsey (5:7) Tenth visit
Lynsey (5:9) Eleventh visit

doiaco


poada ilo 9900
Lynsey (5:9) Eleventh visit

yi WVAO

oipy WN.

Tol WA

IMIN 00 0

0? -

Lj5eSi

Lynsey (5:9) Eleventh visit

uoqio

plaoa

delti

TOI IWA

odad

LYNSEY
These four children did not show any steady progress through different types of writing. Jennifer learnt that writing was a phonetic representation of speech very early on. Jamie soon began to write using random letters, and did not move on from there. It seems likely that he was a younger version of Karin, who started school at the random letters stage but quickly learnt to write alphabetically. And finally Lynsey, who did not initially stand out as being slow to learn, but who made very little progress in her first year at school.

Evidence from this study suggests that children can be divided into three groups. First, those who begin to write phonetically before starting school. Three children in the study were attempting to write phonetically right from the start; and another six (for example, Jennifer) began to write phonetically while still at nursery. The second group consists of those who, like Karin, used conventional letters without reference to their sounds until they started school. Here they made rapid progress in alphabetic writing, under the tutelage of their class teacher. There were eleven of these children in the study. Finally there were six children like Lynsey, who in primary school were very slow to learn to write phonetically - but who did not appear to have formed any alternative hypotheses about how the writing system worked.

Another twelve children, who attended the nursery school for the whole of the period of the study, remained pre-phonetic. (Jamie was an example of this group.) Further research might lead to the identification of factors which would predict which of these children would learn to write rapidly at school, and which would be slow learners. And if the children who are likely to have difficulty learning to write could be located at nursery school, then some
form of remedial action might be possible at that stage, before they have fallen behind at school.
CHAPTER 8: SUMMARY: EXPERIMENTAL TASKS AND RESULTS

The research described in this volume investigated two aspects of the development of writing in young children. Firstly, their ability to produce written language was charted; and secondly, their progress in the understanding of the nature of written language was explored.

The Pilot Study

A total of 70 children, from two different nursery schools, were visited twice at an interval of around one week. One nursery school was situated in a predominantly middle class catchment area, and the other was in a strongly working class area. The children were aged from 3:1 to 5:2, with a mean age of 4:2.

On the first visit, the children were asked to produce samples of writing: on a blank sheet of paper, and to accompany pictures. They were asked to write a shopping list for a teddybear who was not able to write for himself (see The injured teddy game, p.20). Finally they were asked to write their name.

It was found that although 17% of children specifically refused to attempt to write, and another 7% did not produce anything that might have been writing, the remaining children complied with the request to write. Some (24%) produced graphemes which resembled writing; another 37% used recognisable letters, either alone or in combination with letter-like shapes. Four children (6%) demanded to be told which letters to use; and 9% made creditable attempts to write words phonetically.

Even more children were able to make an attempt at writing their name. Thirty-nine percent could produce their first name correctly; and another
20% wrote one or two letters of their name. One child demanded to be told the letters; and another 28.5% wrote letters or letter-like graphemes which they claimed represented their name. Three percent did not produce any writing, and 7% stated that they were unable to write their name.

On the second visit, the children's comprehension of writing and written language was tested. They were given five cards which showed handwriting, printing, numbers, a single letter, and a picture of a car; and asked to distinguish between those which showed writing, and those which did not. They were asked to point out writing on a full-page advertisement which had several pieces of text superimposed on a picture. They were shown three printed words and asked if they could read them. Finally they were asked if they could read back what they had written on the previous visit.

All children from both nurseries, recognised the handwriting and printing as writing. All but one of the children from the working class nursery also thought that the numbers and the large single letter were writing; but only 64% of the children from the middle class nursery claimed that these were writing. The picture of a car was thought to be writing by 17% of children from the middle-class nursery and 43% of children from the working class nursery. All but two children could correctly locate writing on the advertisement page. Four children could recognise the word 'STOP', because it was featured in a current television programme, but neither of the other words ('Playschool' - another television programme - and 'LADIES') were recognised.

Very few children could read their own writing. Those who had attempted to write phonetically were sometimes successful at deciphering their text, but those at earlier stages could only guess at what they had written.
The main study

This was a two-year longitudinal study, of 39 children attending an Edinburgh nursery school. At the start of the study, the children were aged from 3:2 to 4:9. They were visited at six- to eight-week intervals. The younger children attended the nursery throughout the two years, while the older ones moved on to primary school and were visited there during the second year. At the end of the study, after a maximum of thirteen visits, the children's ages ranged from 4:5 to 6:2.

At each visit, the children's ability to produce writing was noted. They were given pictures of animals, objects or activities, and asked to write the name of the animal or object, or a phrase or sentence about the picture. Various other tasks or games were devised to elicit writing: they wrote letters and labels, played the injured teddy game, and also versions of the tins game (see p. 41). They were asked to write their name on each visit.

The writing attempts of the children in the study were classified into five levels of understanding of written language.

At the first level, children showed no awareness of writing. They did not produce anything which looked like writing, and they did not claim that anything they had produced was writing.

At the second level, children were beginning to understand the concept of writing as marks on paper that convey meaning. Their attempts still did not resemble writing, but these children claimed to have complied with the request to write.

By level three, children were clearly differentiating writing from drawing. They produced wavy lines which resembled handwriting, or discrete graphemes in imitation of letters.
Level four children's writing includes, or even consists entirely of, real letters or numbers. However, they are used in idiosyncratic ways which bear no relationship to conventional meanings.

Finally, at level five, children attempted to write phonetically. Most were content to record the initial letter of each word, but some tried to write the whole word.

On the first visit to the nursery school, 14 children (average age 3:10) were writing at level three, and 11 (mean age 3:11) were at level four. Three (average age 4:7) had reached level five, while two were at level two and another two of the youngest children were still at level one. Two children produced pictorial messages, one insisted on copying everything, and two refused to attempt to write.

By the end of the first year of the study, five children (mean age 4:11) were at level five. Twelve (average age 4:7) were at level four, while 17 (average age 4:3) were at level three. One was at level two, and two refused to write.

In the second year of the study, 15 children were still pre-school. By the end of the year, three of these (mean age 5:1) were at level five, and 11 (average age 4:10) were at level four. One was writing at level three.

Twenty-three children (62%) could write their name before starting primary school. Another five could write the first one or two letters of their name.

The pre-phonetic texts were examined to see if the Edinburgh children appeared to be using any of the hypotheses described by Ferreiro (the name hypothesis, the text-reflects-the-properties-of-the-object, the minimum quantity and the variety hypothesis, and the syllabic hypothesis) to control their writing production. In general it was found that the number of
graphemes used by the children to write the name of an object or animal did not seem to bear any relationship to either the size of the object or animal, or the number of syllables in its name. Many children used one grapheme for each text. Of those who used more than one grapheme, some appeared to try and vary their symbols or the order in which they were written; but others used the same sequence repeatedly. It was not possible to infer anything about the name hypothesis from the writing productions, since the children were frequently asked to write names.

During the study, the children were given various tasks which were designed to reveal their understanding of the nature of written language.

**Recognition of writing**

The children were shown 15 cards and asked to sort them into those which showed writing, and those which did not. There were three cards which definitely showed writing: handwriting, typescript, and a one-line printed sentence. Six cards were doubtful: 15 letters without spaces, scattered letters, a vertical line of letters, nine identical letters, numbers, and one large letter. The final six cards did not show writing: geometric shapes, hieroglyphic symbols, a wavy line, stick figures, a scribble, and a picture of a car.

This card-sorting task was administered twice, towards the beginning and the end of the study. It was found that the children's judgements became more sophisticated both with increasing age, and with participation in the study. Most children rated the 'definitely writing' cards as writing, even at the youngest ages. The 'doubtful' cards produced a less clear response: younger and less sophisticated children tended to rate them as writing, but this decreased slightly with age and experience. Some of the older children said that these cards showed writing, but that the writing didn't say
anything. The non-writing cards were described as writing less often by all children, and particularly the older ones, with the picture of the car receiving the lowest ratings.

**Phonemic analysis test**

The children's ability to identify phonemes in given words (a prerequisite for phonetic writing) was tested by asking them to name the initial and final sounds of four words. They scored one point for every correct sound.

Very few three-year-olds could give the initial sound of a word. The average score of 18 children in this age group was 0.6. None could give the final sound correctly.

Four-year-olds (N = 31) performed slightly better, averaging a score of 1.5 for the initial sound, and 0.2 for the final sound.

By five years, over 80% of children could give at least one initial sound correctly. Mean scores for 16 children aged 5:0 to 5:6 were 2.6 for the initial sound and 0.6 for the final sound.

The nursery school children were also asked to play the traditional game "I Spy" (p. 70). The number of children able to give a correct phonemic clue at different ages was very similar to the number who were able to give initial sounds in the phonemic analysis test.

**Find the word**

Children were told a number of words, and asked to locate each word on a card. On the first version of this task, there were four alternatives on each card: the correct word, a nonsense word beginning with the same letter (but short if the correct word was long, and long if the correct word was short), the initial letter, and the initial letter repeated 3 or 4 times. The words used were 12 nouns in four categories: a small object with a short name; a large
object with a short name, a large object with a long name, and a small object with a long name.

Ten per cent of children's choices were for the initial letter. Surprisingly, 29% were for the repeated initial letter. On 30% of occasions, the correct word was selected; but children were twice as likely to choose the correct word if it was a long word, than if it were short. They also seemed to prefer long nonsense words to short: the long nonsense word was chosen 22% of the time, but the short nonsense word only received 9% of choices.

In order to investigate the suggestion that children preferred long words to short, the second version of this task gave the children only two alternatives on each card: the correct word; and the nonsense word. Again, the nonsense word began with the same letter, and was short if the correct word was long, and long if the correct word was short. As before, the stimulus words were nouns in the same four categories; but the number of nouns was increased to 16.

This version of the task revealed a clear preference for longer words, which for most categories of objects were chosen around 60% of times, with the short word (correct or nonsense) receiving 40% of choices. However, when the object named was both a large object and the possessor of a long name, long choices increased to 76%. This difference in the number of long and short choices in each category was not significant.

**Noun or verb**

A number of tiles each bearing a lower-case letter was placed on the table in front of each child. After allowing the child to play with the tiles for a while, E formed a word using the letters. The words formed were the verbs *kick, climb, swim, hurry*. The child was then asked which of two
alternatives (the verb, and a similar noun - kite, clay, swan, and honey) had been formed.

Sometimes children seemed to prefer the noun, and sometimes the verb. But overall, they suggested 65 nouns and 65 verbs.

**Did Daddy kick the ball?**

An attempt was made to replicate Ferreiro's 1978 study which reported that young children did not believe that verbs could be written. Fifteen children were shown pre-written sentences (Daddy kicked the ball; The boy ate a cake; The baby is asleep; My dog chased a cat; and The baby cried) and questioned about how each spoken sentence related to the written text.

Some of the children's responses resembled those reported by Ferreiro. A few older children said that each written word corresponded to a spoken word; while others said that each written word said the whole sentence. Some, having claimed that one written word said the given sentence, then invented new sentences for the remaining written words. But none seemed to believe that verbs could not be written; and, more importantly, none of the children were happy with the task. Some insisted that the task be abandoned before it was completed, while others responded in a way that did not give confidence in their replies.

It was concluded that this task, at least in the way it was administered in Edinburgh, did not give any useful information on what children thought about the way written text and spoken language correspond.

**Suggesting meaning for text**

Eleven pre-reading children were shown two books which contained many action pictures, accompanied by simple texts. They were asked to suggest meanings for each text. There was no evidence that they were avoiding
verbs; although 59% of responses were nouns or phrases, 22% were verbs and 13% were clauses or sentences.

The pre-nursery study

It was found that at the beginning of the main study many children in Edinburgh already knew quite a lot about written language. Therefore another twelve children (seven girls and five boys) were recruited from the nursery waiting list. These children were initially aged around 2 years 6 months, and were visited at home at six-week intervals over a nine month period. As with the older children, these pre-nursery children were asked to produce writing, and were also tested for their comprehension of written language.

Writing production was categorised into the same levels of understanding as had been used for the older children. On the first visit, eight children were classified as being at level one, ie not writing. One child was at level two, two at level three, and one was intermediate between levels two and three. By the sixth visit no children remained at level one. Two were at level 1/2, one was at level two, four were at level three, one was at level 3/4 and another at level four. (Three children did not receive six visits, either through being recruited late, or through leaving the study early.)

Recognition of letters

The children were given, on separate occasions, small wooden bricks with letters on each side, and letter tiles taken from a Junior Scrabble game. As they played with the items they were questioned about the letters. Five children described the letters as numbers (four used the word 'numbers' while the fifth said they were 'fours and threes'). Another five said they were letters - but only one child used the word 'letters'. The others used
specific letter-names to describe them. Some children seemed to use 'names' as a synonym for 'letters'.

**Suggesting meaning for text**

This was the same task used for the older children; but the younger group gave far fewer meaningful responses. Those few children who did suggest meanings for the written texts did not appear to avoid verbs, or any other category of words either.

**Recognition of writing**

Nine children were asked to sort a set of 15 cards into those which showed writing and those which did not. (These were the same cards which the older group had sorted.) Although such a task is more difficult to administer to younger children, it seemed that the younger group were less clear about the definition of writing: they were less likely to rate the 'definitely writing' cards as writing, and more likely to rate the 'definitely not writing' cards as writing.
CHAPTER 9: DISCUSSION

"Speech makes us human and literacy makes us civilised."
David Olson (1977)

The acquisition of written language is perhaps the most exciting achievement of the school years, being the basis for all further academic progress. The effect of literacy on the intellectual functioning of both society and the individual has been discussed by many authors, including Olson, with the general conclusion that learning written language is essential for the development of such 'civilised' skills as logic, mathematics and science.

There is a wealth of research, and theories, on how children learn to read, ie to understand written language. But the topic of how children learn to produce written language - to write - has received much less attention. There are many publications whose titles (along the lines of "Children Learning to Write") seem to imply that they deal with the acquisition of writing; but on closer inspection they turn out to concern themselves with how children who can already write plan and produce written texts. The actual process of learning that writing involves the representation of speech sounds using arbitrary symbols has been until recently taken for granted. Kress (1982) pointed out the discrepancy between the amount of research on reading and the amount into writing; but he gave implicit approval to this view of writing by dismissing the simple day-to-day writing activities of most people as 'minimal', and implying that only the production of new texts could be considered as 'real' writing.

What research has been carried out on the acquisition of writing has been dominated by Emilia Ferreiro and her colleagues. Using a Piagetian
framework, they describe what they consider to be a sequence of developmentally ordered stages of writing development: pre-syllabic, syllabic, syllabic-alphabetic (a transition stage) and alphabetic. During the syllabic stage, according to Ferreiro, children believe that each written symbol stands for a syllable of spoken language. Ferreiro and her colleagues also describe a number of hypotheses about written language which, they claim, are used by children during the pre-syllabic phase in their attempts to make sense of the writing system. Using the name hypothesis, children believe that a written text accompanying a picture is actually the name of the object pictured. This brings with it the related idea that the written text should reflect the characteristics of the object named: that for example a large animal should have a long or a large name. The variety hypothesis (that texts with different meanings should be made up of different letters, or at least should use the letters in different orders) and the minimum number hypothesis (that you need at least two or three symbols in order that a text should have meaning) are also, according to Ferreiro, shown by pre-syllabic children.

But the present study provides only limited support for Ferreiro's hypotheses. Some children showed evidence for some of these beliefs on some occasions; but there was no systematic use of such hypotheses by any Edinburgh children.

Pre-nursery children in Edinburgh, when asked to 'read' picture books with short texts on each page were as happy to suggest verbs as nouns for texts to accompany action pictures. (See Chapter 6.) Nursery and infant school children did not object to writing verbs as picture captions - they wrote texts such as 'skipping' and 'skeletons sleeping' without complaint. When they were shown written sentences such as 'Daddy kicked the ball'
and asked to relate the written text to the spoken words there was no discernible tendency to suggest that verbs could not be written. (See Chapter 5.) Shown words constructed out of letter tiles, and asked to guess whether each word was a specified noun or verb (eg kick/kite), children suggested nouns and verbs in equal numbers. (Chapter 5.)

A few children seemed to believe on some occasions that the characteristics of the text should correspond with those of the object named by the text. Martin, for example, suggested that it would take more letters to write 'whale' than to write 'fish' (see Chapter 5); and Jennifer (Chapter 7) seemed to match her writing of 'skeletons climbing the stairs' to the picture of the stairs. But in general there was no relationship between the size of an object and the number of graphemes used to write its name. There was no tendency to choose a longer word to represent a large object. (Children tended to prefer long words to short, even for small objects; though it was noted that the tendency to choose the long alternative increased non-significantly when the object was both large and had a long name.)

Some children seemed to try and vary the written symbols they used; but others seemed to have no objection to using the same sequence of symbols over and over again. And even the children who sometimes seemed to be trying for variety would not do this consistently. Some children used three or four symbols for each text, and some used many; but others used only one each time; and they did not voice objections to one- or two-letter words.

Ferreiro's most radical suggestion, and the main plank of her argument that children reconstruct written language for themselves using internally generated theories about how the writing system works, is that children go through a stage of syllabic writing: believing that each written symbol stands for a syllable of spoken language. She points out that there is no way that
this theory could come from outside the child; indeed, she reports it in 70% of a group of children in their first year at school, where they were receiving instruction in alphabetic writing. Thus the syllabic hypothesis supports the Piagetian idea that knowledge has to be reinvented by a child before it becomes part of the belief system.

But evidence supporting the syllabic hypothesis was not found in any of the writings of children in the Edinburgh study. Pre-phonetic children did not use more letters to write multi-syllable words than to write short words. Although children were frequently observed to segment speech, and to try to match the segments to the written symbols, the unit of segmentation was variable. Rather than counting the number of syllables in a word and then writing the same number of symbols, children seemed instead to write an arbitrary number of symbols, and then segment (or augment) the text in any way which would fit the symbols. This finding confirms the work of Tolchinsky-Landsmann and Levin (1985), who reported that speech segmentation was mostly *post hoc* and that syllables were only one of the units of segmentation used. Such behaviour can be compared with that shown by young children attempting to count a known number of objects. If the child knows that the correct answer is ten (or if he or she has arbitrarily decided that the answer is ten), then he or she will make sure that "ten" is the final number proclaimed even if this involves counting some objects more than once, or skipping some, to compensate for earlier inaccuracies.

Ferreiro emphasised the point that the syllabic hypothesis was internally generated: that no-one had taught the child to relate symbols to syllables. But in fact the attempts of pre-phonetic pre-school Edinburgh children to segment speech in relation to writing reminded me of five-year-olds learning to read. And all over Scotland infant schoolchildren take home their
first readers and read them slowly and painstakingly, a sound or a syllable at a time, to an admiring family audience. I would conclude that the children who were observed segmenting speech were doing so in imitation of older siblings or friends; because this is the way they have learnt that one deals with written text.

According to Ferreiro, even children who are receiving instruction in alphabetic writing at school will pass through a syllabic stage. But this was not confirmed by the present study; Edinburgh children who arrived at school still writing pre-phonetically were generally very quick to learn the principles of phonetic writing. Those few children who made slow progress in writing did not invent syllabic writing; they continued to use graphemes randomly, whilst at the same time learning to write a few words as units (without any phonetic analysis).

Why did Edinburgh children not conform to the syllabic hypothesis, while the Latin American children studied by Ferreiro appeared to do so?

One reason could be the age of the children. It may be that younger children are more receptive to phonetic instruction, especially as at five years most are not capable of segmenting words into syllables. Perhaps leaving children naive for an extra year, during which time they acquire metalinguistic skills not present previously, allows them time to invent a syllabic hypothesis?

There may also be an effect of language. Perhaps Spanish, with which I am not familiar, emphasises syllables in a way which English does not. However, Tolchinsky-Landsmann and Levin did not report findings supporting a syllabic hypothesis in Israeli-speaking children; nor did Luria (1978) in Russia. Ferreiro described how one child changed a one-syllable word (barque -boat) into a three-syllable word (barquito - little boat) in order to
match a text of three graphemes. This kind of alteration would not be possible in English. There are some situations in which syllabic variations of a name are possible: Tom can be changed into Tommy, or dog into doggie or puppy-dog, for example; but I found no instances of children choosing an alternative form of a name because they were working with a hypothesis that required a specific number of syllables.

It is possible that Ferreiro was mistaken in suggesting that children invent a syllabic hypothesis. It is certainly difficult to discover what is in the minds of young children, and (the Heisenberg principle) easy to accidentally instil ideas by the very act of exploration. Questioning young children is frequently counter-productive; either one asks a very open question which elicits no reply; or one asks a more specific question which suggests the answer to the child.

It makes children very uneasy to be questioned, especially when they do not know the answers to the questions they are being asked. As Rose and Blank (1974) pointed out, they will use their skills at picking up clues from conversation and context to try to discover what it is that the questioner wants to hear, and then give that as an answer. If they cannot decide what sort of answer is required, they are likely to say anything that they think will release them from an awkward situation. So it is hard to know how much credence to give to children's replies to questions about their reasons for writing as they do. The alternative, to wait for spontaneous comments about why they wrote a particular piece of text the way they did, may give more reliable information - but does not give very much information.

Much may depend on the relationship between the researcher and the child. The kind of response elicited in the first sessions with a child will be very different from that on the tenth or twelfth session, after one has
become a part of the nursery school scenery. It may be possible to question a child then in a way which would have been perceived as extremely threatening at an earlier visit. But of course this may also lead to the problem that children learn what they think is wanted (or acceptable) early on, and then continue to produce it. For example Peter, always a keen volunteer, would follow me around the nursery saying "I'll come and do some writing for you". And Jacqui, a shy girl who was described in Chapter 4 as always writing zig-zags even though I knew, and she knew, and she knew I knew, that this was only pretend writing! By the final sessions she was comfortable enough in the experimental situation to produce, under pressure, some phonetic writing; but one could have never applied such pressure in the first year of the study. The study from which Ferreiro reported syllabic writing in most of a large group of deprived children during their first year at school involved around four visits during the year; I would not have considered this enough to produce a relaxed relationship. And many of the tasks which Ferreiro used in her studies seemed to be of the kind that children dislike; with the result that they might well have said anything in order to escape.

So there are two possibilities. Spanish-speaking children, in a Latin-American culture, may learn to write in a different way than do British, Israeli and Russian children. But as the language difference does not seem sufficient to explain the lack of support for Ferreiro's hypotheses, we should consider the possibility that Ferreiro and her colleagues may have misinterpreted the responses of the children they studied. This is an easy thing to do, given the difficulties inherent in working with young children. Indeed, Ferreiro's theories received general acceptance because they had a strong face validity. Gelb (1952) lists the historical stages in the
development of written language, and shows that syllabic writing (as used by the Semitic peoples) predated the phonemic alphabet invented by the Greeks. Ferreiro and Teberosky appear to have succumbed to the temptation to believe that this progression from syllabic to phonemic writing appears in the individual as well as in the development of the species; to say with the developmental biologists that "ontogeny recapitulates phylogeny". However, I do not believe that it is true.

The notion of children as competent hypothesis testers is also appealing. However, children show in exaggerated form a kind of behaviour also found, according to Kuhn (1962), in mature scientists: they desire to confirm their hypotheses. While most scientists do use scientific rigour in their attempts to do so, this is frequently not the case with very young children. They are very prone to the kind of behaviour I have described in several contexts: they will alter the facts to fit their ideas; rather than changing their ideas to suit the facts. They also seem to be able to believe in more than one theory of writing at the same time.

As Popper (1972) points out, scientific advances are made through disconfirming hypotheses. A successful scientist, having hypothesised, should then think of ways in which his hypothesis could be disproved, and attempt to disprove it. But children will live for quite long periods with evidence which would disprove their supposed hypotheses, without seeming to be at all disturbed. For example, in an experiment where children were asked to balance blocks on a narrow bar, Karmiloff-Smith and Inhelder (1974/5) found children's hypotheses persisting in spite of repeated failure to balance according to the theory.

In the present study one child, Lara, could write several long and difficult names correctly for many months before she began to learn that writing
obeyed phonetic rules. (Ferreiro claimed that learning to write their name gave children information about the writing system which enabled them to falsify earlier hypotheses and progress to a more advanced level of understanding.) When Lara began to learn to write she would write the first sound of a word phonetically but then finish it using random letters or numbers. Two other children, Thomas and Zak, also wrote using random letters, until they came to simple words which they had been taught in class: cat, boy, girl. These words were written (almost) correctly. This is not the behaviour of children who are working hard to break the code of writing; more that of children who are waiting to be given the key to the code.

Writing for many young children may be seen more as a motor skill than as a meaningful method of communication. They may initially learn to form letters in imitation of parents and older siblings, without bothering too much about which letters to use when. The achievement of filling page after page with letters and squiggles, as my daughter used to do, may be enough for them. Although they begin to realise that written texts are supposed to have meaning, they still have few ideas about how the information is related to the text. Thus several children told me that it didn't matter which letters were used. Others were happy to look on writing as something other people knew about; these children would write letters, but then say that they did not know what they had written.

What struck me most of all about the development of writing in pre-school children was how little development actually occurred. I had been expecting children to make gradual progress in writing throughout the time of the study; but in fact most children remained at the same stage for long periods. Some learned to write phonetically very early; others learned to form letters but did not progress further. Probably they were waiting for instruction.
During the pilot study I carried out, I asked the children who could write their names, or who could produce many letters, who had shown them how to write. I received many answers along the lines of "Nobody" or "I just knew". This seemed to be quite in line with Piaget's theories, and hence with Ferreiro's writings. I, too, was prepared to believe that children could not be taught to write until they had invented the concepts of written language for themselves. But during the longitudinal study I was able to ask at the appearance of any advance (rather than some months later) "Who showed you how to do that?" This time most children named family members who had been teaching them letters, and helping them to write their names. Similarly Clark (1984) noted that the fluent readers in her study had had a lot of support, encouragement and assistance from parents or other adults.

It seems that writing progress is generally the result of active teaching by parents or others - which is not to say that all children are ready to be taught. Obviously some children are a lot more interested in writing than others. Some children would spend all day with pen and paper; while one of the pre-nursery children in the study would not even pick up a pen for several visits.

As well as being more or less interested in writing, children also have personality differences which affect their readiness to learn. Some are happy to try anything, and are not put off by fear of making mistakes. Others are less willing to take risks - such as Jill, who for the first few sessions insisted that I write everything first, and then she would copy it. Neil was quite proficient at writing, but found it incredibly laborious because of his desire to do everything correctly. This tended to make him an unwilling volunteer, and I often cut the sessions short because of his sighs and groans.
We come back to the question of whether children can really be expected to discover the highly complicated structure of written language with, as far as Ferreiro seems to believe, the minimum of formal input. Other authors also suggest that "children discover and invent literacy as they participate actively in a literate society" (Goodman, 1984). According to Smith (1984), children initially see print as a natural phenomenon, and they make discoveries about writing in the same way as they do about other aspects of their environment. As children discover the uses and the power of writing they become keen to learn to use it themselves. Smith sees written language as just one of the many areas in which young children acquire knowledge of the world.

Children certainly manage to learn spoken language without formal teaching. Whether this is due to the existence of something like Chomsky's Language Acquisition Device is debatable; but it seems clear that the relationship between mother and infant has evolved into an ideal situation for language learning. The same however cannot be said of written language. Not only is writing a recent invention in the history of humankind; but different societies use different writing systems. Therefore it is highly unlikely that children are equipped with any mental set which would enable them to tease out something as complicated and as arbitrary as the structure of written language.

I suspect that many authors underestimate the amount of specific instruction which takes place in the homes of many preschool children. Perhaps it begins as a parlour trick ("See Johnnie write his name"); perhaps it comes at the instigation of the child. Some young children are desperate to learn to read and write; others, like my son, begin with a fascination for numbers, and move on to writing letters and words after they have
mastered the number system. Having a preschooler sitting at a table with pencils and paper is after all a clean, quiet and restful occupation, preferable for most young mothers to having the child making mud pies, finger painting, baking, or just spreading toys throughout the house. Of course Smith is right to say that children learn enormous amounts; but I have come to the conclusion that writing cannot be learned unless it is also taught.

Implications: future research and educational practice

At the time research was planned I felt that there was already a large body of research into how children learn to read. Therefore I decided, as much as it is possible to separate the two, to concentrate on writing and how children come to be able to produce written language. However, I now recognise that it might have been revealing to have included more information on their reading - their understanding of the functions and features of written language, their familiarity with concepts in reading such as letter, word, sentence, etc., so that the progress of individual children in both reading and writing could have been compared and contrasted.

At the planning stage, this research project was designed to be strictly non-interventionist. I intended to observe the writing progress of the children in the study, without interfering in their development. (This was often quite difficult, and I did not always resist the temptation to slip a little instruction in to the session.) An obvious direction for future research would be actively to teach writing. Ferreiro suggested that learning to write their name helped children to find out about the writing system, and to falsify early incorrect hypotheses about writing. One could therefore teach three-year-olds to write their name, and then watch to see if this had any effect on their other writing attempts. Or, one could teach writing in general, and compare the
progress of three- and five-year olds. The younger children might be slower to learn than the older; or it is possible that they might be inclined to make different sorts of errors, related to the immaturity of their metalinguistic concepts. The success or otherwise of such a teaching programme might give further information about how children come to understand what writing is all about.

Another task for future researchers is to explore the finding that Edinburgh children did not appear to use a syllabic hypothesis at any time during their development. This conflicts with Ferreiro's claim that most Spanish-speaking children in her studies went through a syllabic stage, even when they were being taught alphabetic writing at school. Three possible reasons were suggested for this discrepancy: that it was due to the language difference; or due to the fact that Scottish children start school earlier than do Mexicans; or that Mexican children used the syllabic hypothesis to justify what they had written after the fact, rather than using it to control writing production. The ideal person to carry out research to test these three possibilities would be bilingual in English and Spanish, and would test children from different cultures: British children who speak English and start school early, North American children who speak English and start school later, and Spanish-speaking children (starting school if possible at different ages).

I have recently discovered that there exists in Edinburgh a small population of children who start school later than is the norm. These are the children who attend the Rudol fin Steiner school. Although children can attend the Steiner kindergarten from age 3 years, they do not receive formal teaching in reading or writing until they move into Class 1 some time after their sixth birthday. (Class 1 normally has 20-30 children each year.) These
children would have made a very interesting contrast to the children in the main study; if I had learnt of their existence in time; although it is also possible that such a middle-class group would not be comparable with a group of children attending a local authority school.

The research described here also has implications for educational practice. Clearly, education in the early stages of writing is likely to be taking place at home as much as at school. The transition between home and school could therefore be eased by increased communication about teaching methods and teaching vocabularies, between parents and teachers.

Schools have been telling parents for some time now to teach children to write their names using lower-case letters. Not all parents appear to have got the message; although it may be that younger children tend to write in capitals because they find capital letters (mainly straight lines) easier to produce than lower-case (with many curves).

Another area in which I found much confusion was in the naming of letters, and the describing of the sounds of each letter. Consonants were difficult enough - I was corrected many times for, for example, saying "nnn" when the child had been taught "nuh", or "en". Vowels were worse, with the added problem that the children did not seem to hear vowels clearly anyway:

Since most parents are going to introduce the idea of the alphabet, and are likely to teach a child at least the letters of his or her own name, there should be more guidance to parents from school and nursery on what to call letters and letter sounds. Unfortunately, before this could happen there would have to be agreement between schools as to how to cope with a system where letters have both a name and at least one, possibly many, sounds; and sometimes two letters are needed to write one sound. At the
moment schools seem to follow a variety of systems; and many get into difficulties because they believe that children cannot cope with more than one sound value for each letter. However, the phonics teaching programme *Letter-links* devised by Reid and Donaldson (1978), which explains the true nature of the writing system from the beginning, is gaining in popularity in Scottish schools.

I believe that nursery schools should be encouraged to take a more active teaching role. Many years ago it was thought that their function was to give children social contacts, and also to allow them experience of physical substances such as water and sand. This was in order that they should be able to understand concepts of number and quantity when they reached school. Parents were discouraged from teaching their children to read; this was seen as a sign of an overly-ambitious middle-class mother who would not allow her child to enjoy childhood.

But now nursery schools are more receptive to the idea that many children will start to read and write before school. Many provide a pencil and paper table, as well as painting easels; and staff are willing to help children who ask for assistance in writing their name, or some other text. But they could go further - they could begin actively to teach children to form letters, and to learn conventional letter-sound correspondences. At the same time, regular games such as 'I Spy' and rhyming games would teach children to listen to the sounds of words, and would help them to learn to write their own texts.

It is my conclusion that young children are being both over-estimated and under-estimated in regard to their ability to learn to write. Although they do form some ideas about the nature of written language, these ideas tend to be vague and unclear, and do not generally control writing production.
However, this very vagueness means that many children are able to benefit from instruction in writing at an early age. Some demand - and receive - such instruction from family members, and learn to write phonetically before they reach school. Others make rapid progress once they reach primary school. But this study clearly suggests that progress is dependent on instruction.

Clay (1975) suggested that learning about writing before school was the result of chance exposure to aspects of the writing system, as much as to factors such as age and intelligence. Clark (1984) noted that early readers had few similarities, apart from the desire and ability to learn. Children who do learn to write before starting school have an enormous advantage over those who have not had much chance to explore the writing system. It seems remarkably casual of a society to leave such a fundamental skill to be learnt by chance.
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APPENDIX

Recognition of writing (Chapter 5) stimulus cards.

Note: All materials reduced by one quarter.

You might say it would never have happened if it hadn't been for the white admiral. But neither would it have happened if it hadn't been for the tortoiseshell twins nor for the tiger moths. Nor for the death's head hawks, and it certainly wouldn't have finished it it hadn't been for the spider and George Collin.

Of course the white admiral is a dear old fuss-pot, which is what you might expect from his white whiskers and the white braid on his wings, but from the way he talks you'd think he'd won the

Indian stick insects are unusual because they have no wings. Most insects have one or two pairs. They also have three pairs of legs and a pair of antennae, or feelers.

All insects have bodies that are divided into three parts. The front part is the head which has eyes and antennae (feelers), the middle is called the thorax (the legs and wings are attached to the thorax), and the rest of the body is called the abdomen. If you are not sure whether something you have caught is an insect, count the legs. If it has more than six legs, then it is not an insect.

A cat sat down

apneumoniakills

i. Handwriting

ii. Typescript

iii. Printed sentence

iv. Letters without spaces
v. random letters

vi. vertical letters

vii. identical letters

viii. numbers
ix. A large letter B

△ ○ □ — ○ △

x. Geometric shapes

xi. Hieroglyphic symbols

xii. Zig-zag
xiii. Stick figures

xiv. Scribble

xv. Car