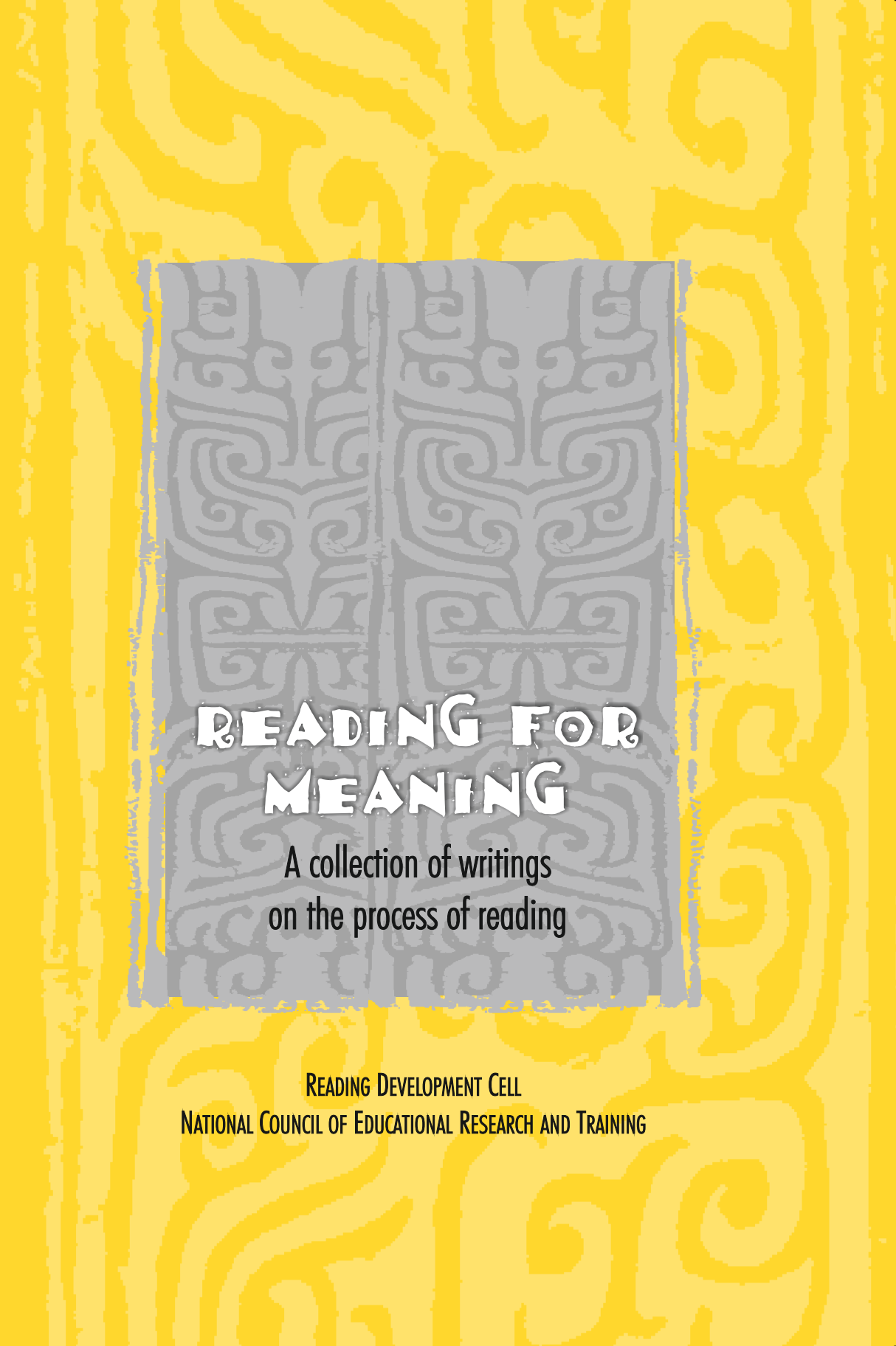
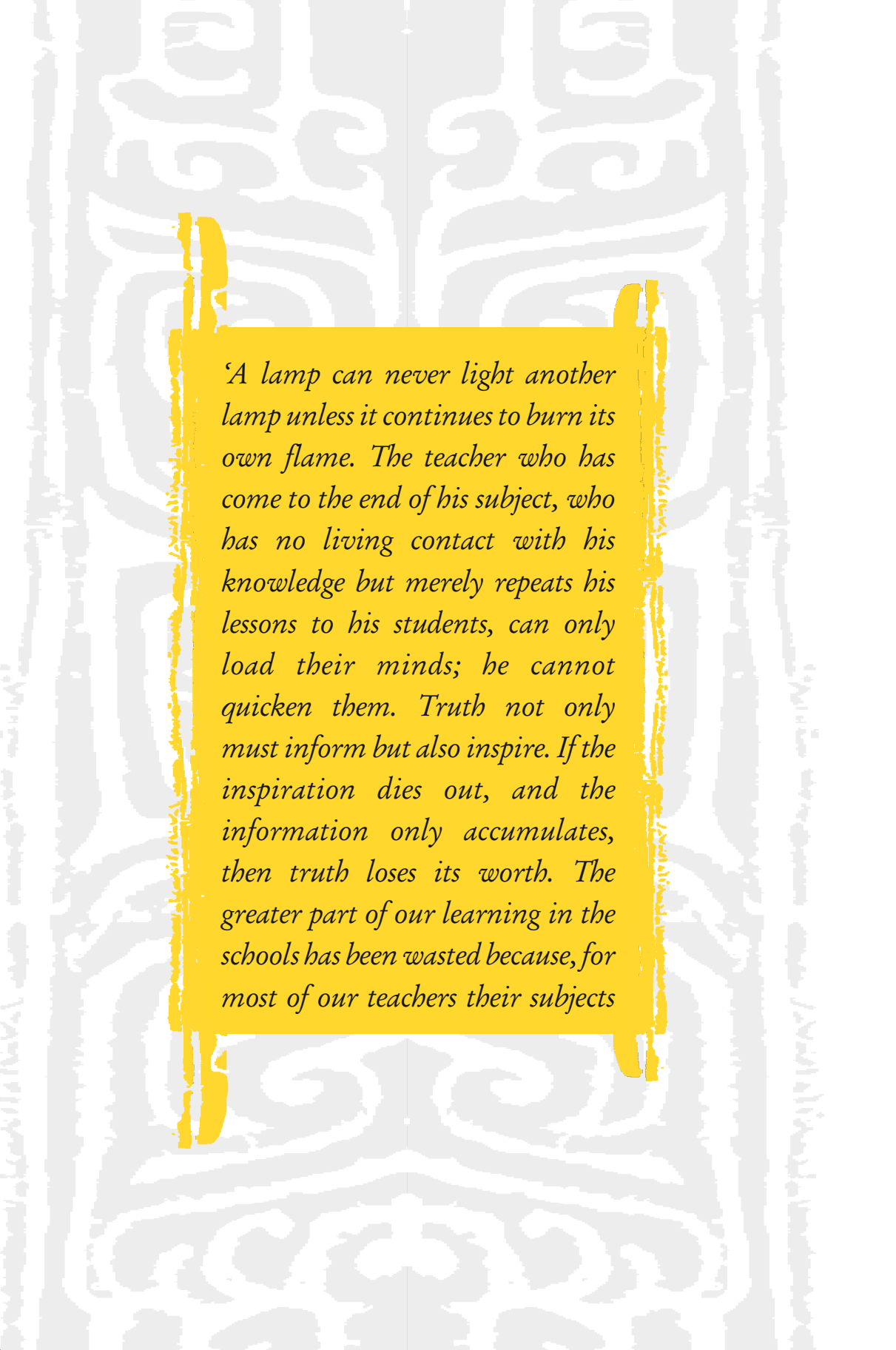




READING FOR MEANING

A collection of writings
on the process of reading

READING DEVELOPMENT CELL
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING



'A lamp can never light another lamp unless it continues to burn its own flame. The teacher who has come to the end of his subject, who has no living contact with his knowledge but merely repeats his lessons to his students, can only load their minds; he cannot quicken them. Truth not only must inform but also inspire. If the inspiration dies out, and the information only accumulates, then truth loses its worth. The greater part of our learning in the schools has been wasted because, for most of our teachers their subjects

READING FOR MEANING

A COLLECTION OF WRITINGS ON THE PROCESS OF READING

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी
NCERT

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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PREFACE TO THE REVISED EDITION

“*Reading for Meaning*” has been in print for nearly a decade now. The last ten years have been significant and witness to a lot of changes in the area of reading in India. The most significant change is the acknowledgement of the fact that issues related to reading especially reading in schools, need to be addressed urgently.

With the recognition of the fact, the spotlight immediately shifts to the teachers and teacher educators. Undoubtedly, teachers and teacher educators have a crucial role to play in the context of addressing learning to read in schools.

Lakhs of teachers face the challenge of teaching reading to children in schools with a few material resources and hardly any understanding about the process of reading.

The Early Literacy Programme (the erstwhile Reading Development Cell) has been making efforts to share an informed understanding about the reading process with teacher educators, teachers and SSA personnel across the country. Besides developing capacity through workshops an important channel for sharing a nuanced understanding with teachers and teachers educators is through our publications. *Padhne Ki Samajh*, *Padhe ki Dehleez Par*, *Padhna Sikhane ki Shuruwat* are the other publications on reading. Reading for Meaning has been translated into Hindi to make it accessible to a wider readership. In addition to the publications on reading, we have published a title on writing in the early years- *Likhne ki Shuruwat: Ek Samvad*. The Early Literacy Programme has also developed booklets and brochures on Reading Corner, Print-rich environment in the classroom, Barkha series and the Early Literacy Programme. Which provide useful information in brief. In addition to the material for teachers and teacher educators, there are several beautifully illustrated posters which can be displayed in the classroom. The series for the early readers, the Barkha Series, has been translated from Hindi into Punjabi (Gurmukhi), Konkani, Marathi, Urdu and Sanskrit. *Firkee-Bachchon Ki*, a bilingual magazine for young children specially for Grade I and II, published by the NCERT is soon going to see the text issue in print. Most of the resource material is available on the NCERT website for free access. Most of the titles mentioned here are being made available in both English and Hindi.

We would like to thank Dr. Hrushikesh Senapaty, *Director*, NCERT for guiding the publication of the revised edition of *Reading for Meaning*. We would also like to acknowledge the support received from Ms. Deepti Chawla in examining the first edition of the book.

We would also like to specially thank Dr. Sonika Kaushik, *Senior Consultant*, Early Literacy Programme, NCERT for the editing of the first and revised edition of ‘*Reading for Meaning*’. This book will be of great help to the teachers and teacher educators as they will be benefitted by

Dr. Sonika Kaushik's research based nuance and deep understanding related to 'reading' and various other important issues.

Sh. Girish Goyal, Sh. Jeetendra Kumar, and Shri. Anshul Gupta *DTP Operators* provided the technical support to ensure a print ready copy of the book. Ms. Nishu Jaiswal and Ms. Varsha Singhal followed up the different tasks involved in bringing out the revised edition. We gratefully acknowledge their support.

USHA SHARMA
Professor and Coordinator
Early Literacy Programme

PREFACE TO THE FIRST EDITION

Reading is integral to academic studies, professional success and personal development. In pedagogic literature reading is recognised as a distinct developmental area during the formative years of schooling.

So far, reading for pleasure has remained more of a theoretical concept than an actual educational goal. Millions of children learn reading every year but a large number of them fail to achieve lasting reading skills. Reading for pleasure has remained passive and perfunctory in the school curriculum.

The National Curriculum Framework- 2005 emphasises the need to focus on reading skills during the primary school years and on creating a print-rich environment in order to encourage reading as a lifelong habit. The Reading Development Cell (RDC) at the NCERT was set up in 2007 under the auspices of the *Sarva Shiksha Abhiyan*, a flagship programme of the Ministry of Human Resource Development. The creation of the Cell marks the beginning of a significant attempt, to direct the attention of policy makers and curriculum designers, from all over the country, towards the pedagogy of reading in the early years.

The Cell has undertaken several activities. It carried out a baseline survey to assess the reading abilities of class III children as a part of its pilot project in Mathura district. As a part of the project the Cell is training teachers in Mathura and is equipping them with progressive pedagogy of reading. Classes I and II of schools included in the pilot project have been provided with two sets of select children's literature in Hindi. This literature has become a part of the reading corners being developed in classes I and II of the project schools. A similar list of select children's literature is being created in English. A colour coded and graded reading series, *Barkha*, has also been developed for classes I and II to make them independent and motivated readers. To support teacher training programmes, a Teacher's Manual on reading and a Training Manual have been developed. The developed material and experiences gained from the field are being shared with the states to help them start a reading cell in their state. Very soon, in order to facilitate this development, the RDC has been publishing a magazine called '*Firki Bachchon ki*' for young children.

This document presents a selection of writings on reading, which radically approaches reading from different angles but converge at the central point, which is comprehension. This selection of writings also includes classics, which revolutionised the thinking and understanding of reading in their respective times. The Council is grateful to Kenneth Goodman, P. David Pearson, Shobha Sinha, Judith Newman, Peter Russell, Elfrieda H. Hiebert, Ian A.G. Wilkinson, Frank Smith, Judith Scott, G. Brian Thompson for granting permission to publish their articles and papers in this dossier.

We would like to thank Dr. Hrushikesh Senapaty, Director, NCERT for guiding the publication of this dossier through different stages.

The exercise of bringing out the dossier was coordinated by Sandhya Pednekar, Senior Consultant at the Reading Development Cell. The Council also acknowledges the support given by Meenakshi Khar, Associate Professor, Department of Languages.

The cooperation received from Kanchan Sethi, Devi Dayal Gautam and Aribam Abem Devi, Junior Project Fellows for proof corrections; Neelam Choudhary and Anshul Gupta, DTP Operators and Mansi Sinha for graphic designs is also acknowledged.

We are grateful for the help received from Shri Gobind Ram, Consultant, Technical Section, Publication Department for careful reading.

This collection is meant for parents, teachers, teacher educators and anyone interested in understanding the depths and intricacies of the process of reading.

MANJULA MATHUR
Professor and Head
Reading Development Cell

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READING: A PSYCHOLINGUISTIC GUESSING GAME

—KENNETH S. GOODMAN

As scientific understanding develops in any field of study, pre-existing, naive, common sense notions must give way. Such outmoded beliefs clutter the literature dealing with the process of reading. They interfere with the application of modern concepts of language and thought to research in reading. They confuse the attempts at application of such concepts to solution of problems involved in the teaching and learning of reading. The very fact that such naive beliefs are based on common sense explains their persistent and recurrent nature. To the casual and unsophisticated observer they appear to explain, even predict, a set of phenomena in reading. This paper will deal with one such key misconception and offer a more viable scientific alternative.

Simply stated, the common sense notion I seek here to refute is this:

“Reading is a precise process. It involves exact, detailed, sequential perception and identification of letters, words, spelling patterns and large language units”.

In phonic centred approaches to reading, the pre-occupation is with precise letter identification. In word centred approaches, the focus is on word identifications. Known words are sight words, precisely named in any setting.

This is not to say that those who have worked diligently in the field of reading are not aware that reading is more than precise, sequential identification. But, the common sense notion, though not adequate, continues to permeate thinking about reading.

Spache (1964) presents a word version of this common sense view: “Thus, in its simplest form, reading may be considered a series of word perceptions”.

The teachers manual of the Lippincott ‘Basic Reading’ (McCracken and Walcutt, 1963) incorporates a letter by letter variant in the justification of its reading approach: “In short, following this programme the child learns from the beginning to see words exactly as the most skillful readers see them... as whole images of complete words with all their letters.”

In place of this misconception, I offer this: "Reading is a selective process. It involves partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation. As this partial information is processed, tentative decisions are made to be confirmed, rejected, or refined as reading progresses".

More simply stated, reading is a psycholinguistic guessing game. It involves an interaction between thought and language. Efficient reading does not result from precise perception and identification of all elements, but from skill in selecting the fewest, most productive cues necessary to produce guesses which are right the first time. The ability to anticipate that which has not been seen, of course, is vital in reading, just as the ability to anticipate what has not yet been heard is vital in listening.

Consider this actual sample of a relatively proficient child reading orally. The reader is a fourth grade child reading the opening paragraphs of a story from a sixth grade basal reader (Hayes, 1963):

"If it bothers you to think of it as baby sitting", my father said, "then don't think of it as baby sitting. Think of it as homework. Part of your education. You just happen to do your studying in the room where the baby brother is sleeping, that's all". He helped my mother with her coat, and then they were gone.

He has not seen the story before. It is, by intention, slightly difficult for him. The insights into his reading process come primarily from his errors, which I choose to call miscues in order to avoid value implications. His expected responses mask the

hoped © a

So education it was! I ~~opened~~ dictionary and picked out a
 word that sounded ^s good. ^{PH} 'Phil/oso/phi/call!' ^{He} + I yelled. Might

what it means 1. Phizo 2. Phiso/

soophical

as well study ~~word meanings first.~~ "Philosophical: showing calmness

his 1. fort 2. future 3. futshion

and courage in ~~the~~ face of ill fortune". I mean I really yelled it. I

guess a fellow has to work off steam once in a while.

Fig. 1

process of their attainment, but his unexpected responses have been achieved through the same process, albeit less successfully applied. The ways that they deviate from the expected reveal this process.

In the common sense view that I am rejecting, all deviations must be treated as errors. Furthermore, it must be assumed in this view that an error either indicates that the reader does not know something or that he has been “careless” in the application of his knowledge.

For example, his substitution of ‘the’ for ‘your’ in the first paragraph of the sample must mean that he was careless, since he has already read ‘your’ and ‘the’ correctly in the very same sentence. The implication is that we must teach him to be more careful, that is, to be more precise in identifying each word or letter.

But now let’s take the view that I have suggested. What sort of information could have led to tentatively deciding on ‘the’ in this situation and not rejecting or refining this decision? There obviously is no graphic relationship between ‘your’ and ‘the’. It may be, of course, that he picked up ‘the’ in the periphery of his visual field. But, there is an important non-graphic relationship between ‘the’ and ‘your’. They both have the same grammatical function: they are, in my terminology, noun markers. Either the reader anticipated a noun marker and supplied one paying no attention to graphic information or he used ‘your’ as a grammatical signal ignoring its graphic shape. Since the tentative choice ‘the’ disturbs neither the meaning nor the grammar of the passage, there is no reason to reject and correct it. This explanation appears to be confirmed by two similar miscues in the next paragraph. ‘A’ and ‘his’ are both substituted for ‘the’. Neither are corrected. Though the substitution of ‘his’ changes the meaning, the peculiar idiom used in this dictionary definition, “in the face of ill fortune”, apparently has little meaning to this reader anyway.

The conclusion this time is that he is using noun markers for grammatical, as well as graphic, information in reaching his tentative conclusions. Altogether in reading this ten page story, he made twenty noun marker substitutions, six omissions and two insertions. He corrected four of his substitutions and one omission. Similar miscues involved other function words (auxiliary verbs and prepositions, for example). These miscues appear to

have little effect on the meaning of what he is reading. In spite of their frequency, their elimination would not substantially improve the child's reading. Insistence on more precise identification of each word might cause this reader to stop seeking grammatical information and use only graphic information.

The substitution of 'hoped' for 'opened' could again be regarded as careless or imprecise identification of letters. But, If we dig beyond this common sense explanation, we find that both are verbs, and both have 'key' graphic similarities. Further, there may be evidence of the reader's bilingual French-Canadian background here, as there is in subsequent miscues ('harms' for 'arms', 'shuckled' for 'chuckled', 'shoose' for 'choose', 'shair' for 'chair'). The correction of this miscue may involve an immediate rejection of the tentative choice made on the basis of a review of the graphic stimulus, or it may result from recognising that it cannot lead to the rest of the sentence. 'I hoped a dictionary...' does not make sense. (It isn't decodable.) In any case, the reader has demonstrated the process by which he constantly tests his guesses, or tentative choices, if you prefer.

'Sounds' is substituted for sounded, but the two differ in ending only. Common sense might lead to the conclusion that the child does not pay attention to word endings, slurs the ends or is otherwise careless. But, there is no consistent similar occurrence in other word endings. Actually, the child has substituted one inflectional ending for another. In doing so he has revealed: 1. his ability to separate base and inflectional suffix, and 2. his use of inflectional endings as grammatical signals or markers. Again, he has not corrected a miscue that is both grammatically and semantically acceptable.

'He' for 'I' is a pronoun for pronoun substitution that results in a meaning change, though the antecedent is a bit vague, and the inconsistency of meaning is not easily apparent.

When we examine what the reader did with the sentence "Might as well study word meanings first", we see how poorly the model of precise sequential identification fits the reading process. Essentially this reader has decoded graphic input for meaning and then encoded meaning in oral output with transformed grammar and changed vocabulary, but with the basic meaning retained. Perhaps as he encoded his output, he was already working at the list word which followed, but the tentative choice was good enough and was not corrected.

There are two examples, in this sample, of the reader working at unknown words. He reveals a fair picture of his strategies and abilities in these miscues, though in neither is he successful. In his several attempts at philosophical, his first attempt comes closest. Incidentally, he reveals here that he can use a phonic letter-sound strategy when he wants to. In subsequent attempts he moves away from this sounding out, trying other possibilities, as if trying to find something which at least will sound familiar. Interestingly, here he has a definition of sorts, but no context to work with. 'Philosophical' occurs as a list word a number of times in the story. In subsequent attempts, the child tried 'physica', 'physicacol', 'physical', 'philosovigul', 'phizzlesovigul', 'phizzo sorigul', 'philazophgul'. He appears to move in concentric circles around the phonic information he has, trying deviations and variations. His three unsuccessful attempts at 'fortune' illustrate this same process. Both words are apparently unknown to the reader. He can never really identify a word he has not heard. In such cases, unless the context or contexts sufficiently delimit the word's meaning, the reader is not able to get meaning from the words. In some instances, of course, the reader may form a fairly accurate definition of the word, even if he never recognises it (that is matches it with a known oral equivalent) or pronounces it correctly. This reader achieved that with the word 'typical' which occurred many times in the story. Throughout his reading he said 'topical'. When he finished reading, a check of his comprehension indicated that he knew quite well the meaning of the word. This phenomenon is familiar to any adult reader. Each of us has many well-defined words in our reading vocabulary which we either mispronounce or do not use orally.

I've used the example of this youngster's oral reading not because what he's done is typical of all readers or even of readers his age, but because his miscues suggest how he carries out the psycholinguistic guessing game in reading. The miscues of other readers show similarities and differences, but all point to a selective, tentative, anticipatory process quite unlike the process of precise, sequential identification commonly assumed.

Let's take a closer look now at the components the reader manipulates in this psycholinguistic guessing game.

At any point in time; of course, the reader has available to him and brings to his reading the sum total of his experience and his language and thought development. This self-evident fact needs to

be stated because what appears to be intuitive in any guessing is actually the result of knowledge so well learned that the process of its application requires little conscious effort. Most language use has reached this automatic, intuitive level. Most of us are quite unable to describe the use we make of grammar in encoding and decoding speech, yet all language users demonstrate a high degree of skill and mastery over the syntax of language even in our humblest and most informal uses of speech.

Chomsky (1965) has suggested this model of sentence production by speakers of a language:

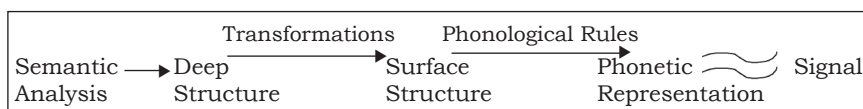


Fig. 2

A model structure of the listener's sentence interpretation, according to Chomsky, is:

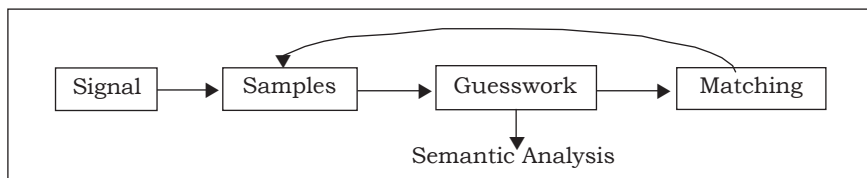


Fig. 3

Thus, in Chomsky's view encoding of speech reaches a more or less precise level and the signal which results is fully formed. But in decoding, a sampling process aims at approximating the message and any matching or coded signal which results is a kind of by-product.

In oral reading, the reader must perform two tasks at the same time. He must produce an oral language equivalent of the graphic input which is the 'signal' in reading, and he must also reconstruct the meaning of what he is reading. The matching in Chomsky's interpretation model is *largely* what I prefer to call a re-coding operation. The reader recodes the coded graphic input as phonological or oral output. Meaning is not normally involved to any extent. This recoding can even be learned by someone who doesn't speak the language at all, for example, the bar-mitzvah boy may learn to re-code Hebrew script as chanted oral Hebrew with no ability to understand what he is chanting; but when the

reader engages in semantic analysis to reconstruct the meaning of the writer, only then is he decoding.

In oral reading there are three logical possible arrangements of these two operations. The reader may recode graphic input as oral language and then decode it. He may recode and decode simultaneously. Or, he may decode first and then encode the meaning as oral output.

On the basis of my research to date, it appears that readers who have achieved some degree of proficiency decode directly from the graphic stimulus in a process similar to Chomsky's sampling model and then encode from the deep structure, as illustrated in Chomsky's model of sentence production. Their oral output is not directly related to the graphic stimulus and may involve transformation in vocabulary and syntax, even if meaning is retained. If their comprehension is inaccurate, they will encode this changed or incomplete meaning as oral output.

The common misconception is that graphic input is precisely and sequentially recoded as phonological input and then decoded bit by bit. Meaning is cumulative, built up a piece at a time in this view. This view appears to be supported by studies of visual perception which indicate that only a very narrow span of print on either side of the point of fixation is in sharp focus at any time. We might dub this the 'end of the nose' view, since it assumes that input in reading is that which lies in sharp focus in a straight line from the end of the nose. Speed and efficiency are assumed to come from widening the span taken in on either side of the nose, moving the nose more rapidly or avoiding backward movements of the eyes and nose, which, of course, must cut down on efficiency.

This view cannot possibly explain the speed with which the average adult reads, or a myriad of other constantly occurring phenomena in reading. How can it explain, for example, a highly proficient adult reader reading and rereading a paper he's written and always missing the same misprints. Or how can it explain our fourth grader seeing, 'Study word meanings first,' and saying, 'Study what it means?'

No, the 'end of the nose' view of reading will not work. The reader is not confined to information he receives from a half inch of print in clear focus. Studies, in fact, indicate that children with severe visual handicaps are able to learn to read as well as normal children. Readers utilise not one, but three kinds of

information simultaneously. Certainly without graphic input there would be no reading. But, the reader uses syntactic and semantic information as well. He predicts and anticipates on the basis of this information, sampling from the print just enough to confirm his guess of what's coming, to cue more semantic and syntactic information. Redundancy and sequential constraints in language, which the reader reacts to, make this prediction possible. Even the blurred and shadowy images he picks up in the peripheral area of his visual field may help to trigger or confirm guesses.

Skill in reading involves not greater precision, but more accurate first guesses based on better sampling techniques, greater control over language structure, broadened experiences and increased conceptual development. As the child develops reading skill and speed, he uses increasingly fewer graphic cues. Silent reading can then become a more rapid and efficient process than oral reading, for two reasons: (1) The reader's attention is not divided between decoding and recoding or encoding as oral output, and (2) His speed is not restricted to the speed of speech production. Reading becomes a more efficient and rapid process than listening, in fact, since listening is normally limited to the speed of the speaker.

Recent studies with speeded up electronic recordings where distortion of pitch is avoided have demonstrated that listening can be made more rapid without impairing comprehension too.

Though the beginning reader obviously needs more graphic information in decoding and, therefore, needs to be more precise than skilled readers, evidence from a study of first graders by Goodman (1967) indicates that they begin to sample and draw on syntactic and semantic information almost from the beginning, if they are reading material which is fully formed language.

In Figure 4 are excerpts from two primer stories (Betts, 1963 and Betts and Welch, 1963) as they were read by a first grade child at the same session. Ostensibly (and by the intent of the authors) the first, from a second pre-primer, should be much easier than the second, from a third pre-primer. Yet she encountered problems to the point of total confusion with the first and was able to handle exactly the same elements in the second.

Note, for example, the confusion of 'come' and 'here' in 'Ride In'. This represents a habitual association in evidence in early

reading of this child. Both 'come' and 'here' as graphic shapes are likely to be identified as 'come' or 'here'. In "Stop and Go", the difficulty does not occur when the words are sequential. She also substitutes 'can' for 'and' in the first story, but encounters no problem with either later. 'Stop' stops her completely in "Ride In", a difficulty that she doesn't seem to know she has when she reads "Stop and Go" a few minutes later. Similarly, she calls (ride) 'run' in the first story, but gets it right in the latter one.

Though there are miscues in the second story, there is a very important difference. In the first story she seems to be playing a game of name the word. She is recoding graphic shapes as phonological ones. Each word is apparently a separate problem. But in "Stop and Go" what she says, including her miscues, in almost all instances makes sense and is grammatically acceptable. Notice that as 'Sue' becomes better known she becomes 'Suzie' to our now confident reader.

RIDE IN

Run

Ride ~~in~~, Sue.

Run

Ride in here.

Come here at ~~train~~

Here-I Come, Jimmy.

Can Come

And here I (stop).

at ~~toy~~

STOP AND GO

Jimmy said, "Come here, Sue,

too

Look at my ~~toy~~ (train)

See it go.

toy

Look at my lit/tle ~~train~~ go".

toy

Sue said, "Stop the ~~train~~.

Come

Stop it ~~here~~, Jimmy".

toy

Jimmy said, "I can stop the ~~train~~.

toy

See the ~~train~~ stop".

too

Sue said, "Look at my ~~toy~~.

toy

It is in the ~~train~~".

too

See my little red ~~toy~~, Jimmy.

toy
 It can ride in the ~~train~~".
 toy
 Jimmy said, "See the ~~train~~ go.
 Look at it go Suzie".
 too
 Sue said, "Look at my little red ~~toy~~.
 toy
 See it go for a ~~train~~ ride."
 Suzie too
 Sue said, "My little red ~~toy~~!
 too
 Jimmy said, my © ~~toy~~ is not here.
 too
 It is not in the ~~train~~.
 toy
 Stop the ~~train~~, Jimmy.
 too
 Stop it and look for my ~~toy~~".

Fig. 4

A semantic association exists between 'train' and 'toy'. Though the child makes the same substitution many times, nothing causes her to reject her guess. It works well each time. Having called (train) 'toy', she calls (toy) 'too' (actually it's an airplane in the pictures), not once, but consistently throughout the story. That doesn't seem to make sense. That's what the researcher thought too, until the child spoke of a 'little red "too"' later in retelling the story. What's a 'little red "too"' asked the researcher. 'An airplane', she replied calmly. So a train is 'toy' and a **plane** is a 'too'. Why not? But, notice that when 'toy' occurred preceding 'train' she could attempt nothing for 'train'. There appears to be a problem for many first graders when nouns are used as adjectives.

Common sense says go back and drill her on 'come', 'here', 'can', 'stop', 'ride', 'and'; don't let her go to the next book which she is obviously not ready to read.

But the more advanced story, with its stronger syntax, more fully formed language and increased load of meaning makes it possible for the child to use her graphic cues more effectively and supplement them with semantic and syntactic information.

Teaching for more precise perception with lists and phonics charts may actually impede this child's reading development. Please notice, before we leave the passage, the effect of immediate experience on anticipation. Every one of the paragraphs in the sample starts with 'Jimmy said' or 'Sue said'. When the reader comes to a line starting 'Jimmy', she assumes that it will be followed by 'said' and it is not until her expectation is contradicted by subsequent input that she regresses and corrects her miscue.

Since they must learn to play the psycholinguistic guessing game as they develop reading ability, effective methods and materials used by teachers who understand the rules of the game, must help them to select the most productive cues, to use their knowledge of language structure, to draw on their experiences and concepts. They must be helped to discriminate between more and less useful available information. Fortunately, this parallels the processes they have used in developing the ability to comprehend spoken language. George Miller (1965) has suggested '... psycholinguists should try to formulate performance models that will incorporate,... hypothetical information storage and information processing components that can simulate the actual behaviour of language users.'

I'd like to present now my model of this psycholinguistic guessing game we call reading English. Please understand that the steps do not necessarily take place in the sequential or stretched out form they are shown here.

1. The reader scans along a line of print from left to right and down the page, line by line.
2. He fixes at a point to permit eye focus. Some print will be central and in focus, some will be peripheral; perhaps his perceptual field is a flattened circle.
3. Now begins the selection process. He picks up graphic cues, guided by constraints set up through prior choices, his language knowledge, his cognitive styles, and strategies he has learned.
4. He forms a perceptual image using these cues and his anticipated cues. This image then is partly what he sees and partly what he expected to see.
5. Now he searches his memory for related syntactic, semantic and phonological cues. This may lead to selection of more graphic cues and to re-forming the perceptual image.

6. At this point, he makes a guess or tentative choice consistent with graphic cues. Semantic analysis leads to partial decoding as far as possible. This meaning is stored in short-term memory as he proceeds.
7. If no guess is possible, he checks the recalled perceptual input and tries again. If a guess is still not possible, he takes another look at the text to gather more graphic cues.
8. If he can make a decodable choice, he tests it for semantic and grammatical acceptability in the context developed by prior choices and decoding.
9. If the tentative choice is not acceptable semantically or syntactically, then he regresses, scanning from right to left along the line and up the page to locate a point of semantic or syntactic inconsistency. When such a point is found, he starts over at that point. If no inconsistency can be identified, he reads on seeking some cue, which will make it possible to reconcile the anomalous situation.
10. If the choice is acceptable, decoding is extended, meaning is assimilated with prior meaning, and prior meaning is accommodated, if necessary. Expectations are formed about input and meaning that lie ahead.
11. Then the cycle continues.

Throughout the process there is constant use of long and short term memory.

I offer no apologies for the complexity of this model. Its faults lie, not in its complexity, but in the fact that it is not yet complex enough to fully account for the complex phenomena in the actual behaviour of readers. But such is man's destiny in his quest for knowledge. Simplistic folklore must give way to complexity as we come to know.

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A PRIMER FOR SCHEMA THEORY

—P. DAVID PEARSON

One psychological experiment requires a reader to think out loud about what a written text means after each segment of the text is presented. Following is a hypothetical transcript from such an experiment with the text in italics.⁺

Business had been slow since the oil crisis.

Subject: “Oil crisis, hmm, must be some business related to oil. Let’s see – service stations? (no, they boom in crisis), cars? (could be cars), could be anything affected by inflation! I’ll wait and see.”

Nobody seemed to want anything elegant anymore.

S: “Aha! Expensive cars!. . . or recreational vehicles . . . probably Cadillacs, though.”

Suddenly the door flew open and a well-dressed man burst onto the showroom floor.

S: “This must be a salesman? But, it could be the potential buyer? . . . I’ll wait and see.”

John Stevens looked up from the want-ad section of the morning paper, adjusted his now loose-fitting coat to hide the frayed sleeves of his shirt and rose to meet the man . . .

S: “Now this is the salesman, right? Times are hard; therefore the want-ads, frayed shirt, and weight loss. So the other guy must be the customer, the well-dressed one, I mean.”

...whose hand-painted tie and rhinestone stickpin seemed incongruous amidst the array of steel-gray and black...

S: “That guy is the customer. And he’s one of those got-rich-quick kind of guys. And I bet he’s going to buy either a Mercedes or a Rolls-Royce, probably a Mercedes. He’ll probably pay cash too.”

. . . Mercedes sedans. “I’ll take it, cash on the line”, the man asserted, pointing to the most expensive model on the floor.

S: “I knew it. He is nouveau-riche.”

⁺ This example is based largely on the work of D.E. Rumelhart (1980).

Later, as he completed the paperwork, John muttered to himself, "I'm glad I didn't blow that one". Then he added, "What does he know about elegance, anyway? What does anyone know about elegance anymore?" With that, he smiled and returned to his newfound pastime.

S: "Aha! We have an existential cynic. He probably remembers better times and, definitely, better customers. He seems resigned to his new fate in life, though."

While each reader's protocol for this text would be different from this hypothetical subject's certain similarities in form would have appeared across readers. For example, another reader may not have hypothesised after the first segment that the business was cars, but may have chosen some other plausible candidate for the type of business. But after the second segment (and definitely after the third), it is most likely that a reader would think of expensive cars. Like "s", most readers will sometimes jump to a conclusion and sometimes decide to wait and see, letting the text dictate. Sometimes, a reader will make correct predictions; sometimes they will be wrong.

This journey through a hypothetical reader's mind illustrates, at an intuitive level, a number of the processes and hypothesised mental structures that cognitive psychologists and reading researchers (e.g., Collins and Quillian, 1969; Collins, Brown, and Larkin, 1980; Lindsay and Norman, 1972; Rumelhart, 1980; Rumelhart and Ortony, 1977; Anderson, 1977; Pearson and Spiro, 1980) have claimed to explain how people process, store, and retrieve information during the act of reading. While several of the different theories that have arisen, such as Schank's scripts (1972), Minsky's frames (1975) and Rumelhart's schemata (1980; Rumelhart and Ortony, 1977), share the goal of describing how information is stored in human memory, they do not claim to be theories of reading. Reading researchers (e.g., Anderson, Reynolds, Schallert, and Goetz, 1977; Pearson, Hansen and Gordon, 1978; Pearson and Spiro, 1980), however, have adopted these theories of cognition to explain how people read.

By analysing several of the subject's reactions to the "Oil Crisis" text, it can be shown how each illustrates a facet of schema theory. First, the subject could never have understood the text without prior knowledge about business, oil crisis, automobiles, sales transactions, hard times, and resigned cynicism. In the language of schema theory, the subject had

to select a number of already existing *schemata* (knowledge frameworks) as repositories for the information contained in this specific text. *Schema selection*, then, is a critical step in comprehension. Two questions about selection must be answered: (a) What is the nature of schemata that readers select? and (b) How do readers select them?

What is the Nature of Schemata?

A basic premise of schema theory is that human memory is organised semantically (as opposed, say, to phonologically or alphabetically). In other words, memory is organised like a thesaurus rather than a dictionary. Presumably, one can possess schemata for all manner of things, ranging from simple objects (chair, boat), to abstract entities (love, hope, fear), to actions (buy, dive, run), to complex events (attending a conference or a football game), to very complex entities (story, novel, world affairs).

A schema for *chair* might be organised as in Figure 1. This schema, referred to as a semantic network (Collins and Quillian, 1969), gives a picture of the semantic interrelationships among different schemata; that is, chair is a schema, but it also belongs to other classes (e.g., *functional furniture*) that are themselves schemata and members of other classes of schemata (e.g., *furniture*). Chairs also have certain other attributes (or slots) that , must be present (or filled) in order to be recognised as chairs. That is, a chair must have some sort of seat, will likely have a back, and will probably have a set of legs of some sort. In addition to the upward organisation (*chair to functional furniture*), the system also has a downward organisation that requires examples (*dining room chair, easy chair*). Schemata are *abstract* by definition and hence correspond not to any particular chair but to some idealised chair that may not even exist (Shoben, 1980).

Schemata for objects and for abstract entities such as *love*, *hate*, or *fear* appear to be very much like concepts. But schemata for actions and events have a dimension that is not typically associated with concepts - an episodic or sequential dimension. Figure 2 depicts a schema that is more like a play (see Rumelhart, 1980, for a more elaborate treatment of this analogy) than a concept. *Slots*, or *variable slots*, since they can be filled by a variety of specific elements, are akin to the roles in a play. The particular characters who are selected to fill these slots are akin

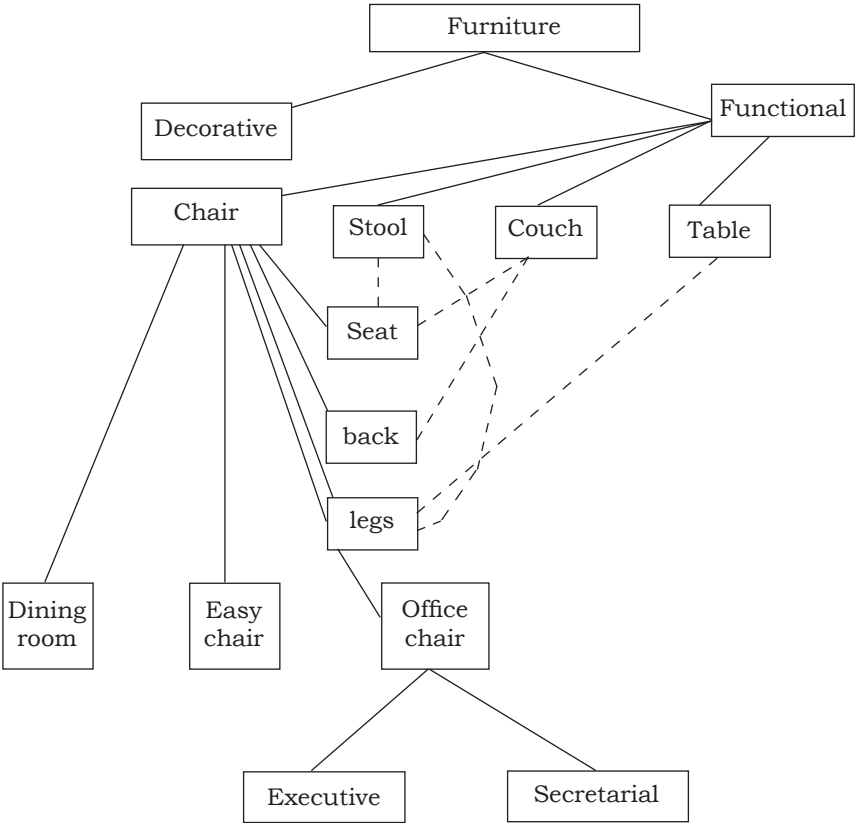


Fig. 1: Partial Semantic Network for “Chair”

to the actors one might call on to play the roles. The particular entity that fills a variable slot is called a *value*. In addition to the cast of characters, the *buy* schema has a set of episodes (more slots) that typically take place when a buying activity occurs, as represented in the dotted box in Figure 2. They correspond to the scenes in a play. In addition to hierarchical organisation, there is a great deal of cross-referencing among schemata (Pearson and Spiro, 1980). For example, if a *buy* schema is selected and the buyer is a criminal, then the separate schema for *criminal* is called up and added to the *buy* schema. The values (actors) that fill variable slots (roles) in one schema are themselves schemata in other parts of a person’s semantically organised memory.

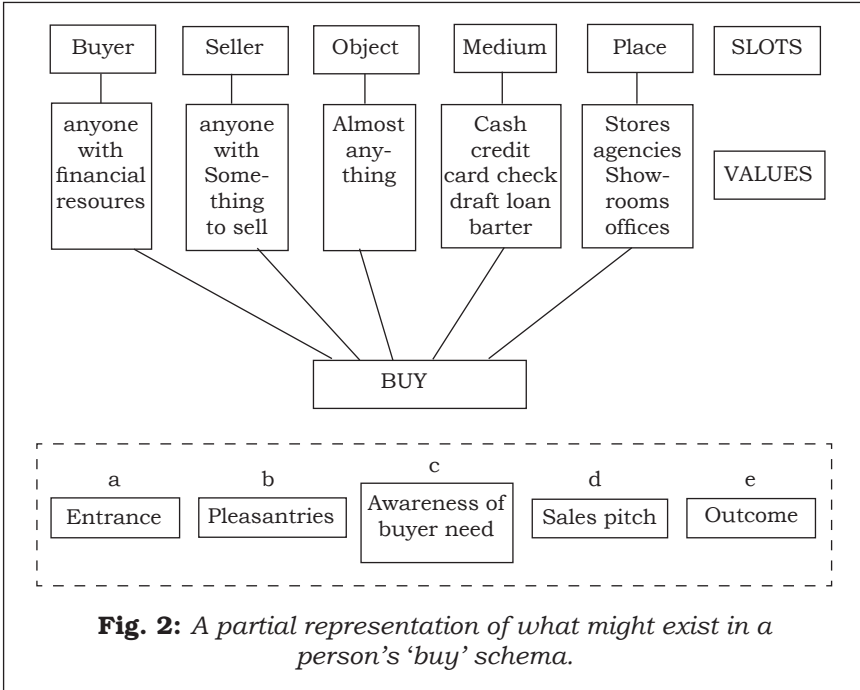


Fig. 2: A partial representation of what might exist in a person's 'buy' schema.

How are Schemata Selected?

How does a reader decide what schema (or schemata) to select in order to comprehend and remember a particular text? The author may be informative, as in: "This is a story about a man who wanted to buy a car." Usually, however, a reader has to rely on more subtle clues and form hypotheses.

One of the common ways for a reader to select a schema is to recognise a specific value (e.g., a character) as the kind that usually fills a particular variable slot in a schema. He or she then guesses that schema is appropriate. In other words, inferential leaps on the part of the reader are often necessary just to decide what the text is about.

How do Slots get Filled?

The process of filling slots is usually called *instantiation*, from the word *instance*, (i.e., a specific instance is bound to a variable slot). Once a schema is selected, filling slots is usually simple. Having decided that the story was about buying, it was fairly easy for the subject in the opening example to decide who or what

should fill the *buyer*, *seller*, *object*, *medium*, and *place* slots. But again, slots are sometimes filled before schemata are selected; in fact, slot-filling can lead to schema selection.

Slots can also be filled (at least temporarily) before a reader actually finds a likely candidate (i.e., value) to fill a slot. In the example, the subject suspected that the buyer would pay cash before she came across the information in the text; she also thought that Cadillacs were a likely object early on in her interpretation of the story.

Much slot-filling takes place through inference. In fact, readers are constantly filling slots for which authors specify no values. The reader's "best guess" or "most likely candidate" to fill a slot not specified by the author is termed a *default value*.

Inferences are also necessary even where the text provides a likely candidate to fill in a variable slot. When the subject said, "This must be the customer", there was nothing in the text that compelled her to this conclusion. Indeed, inferences are very often necessary just to decide who or what fills what slots in a working schema. This stems from the fact that authors do not provide direct information when readers can easily infer values for themselves.

A Word about Inference

Schema theory has shown that reading is only incidentally literal. *Product* measures can tap recognition or recall of explicitly stated information; however, in the *process* of working one's way through a text, tens or hundreds of inferences are necessary. Inference is an essential part of schema selection and instantiation (in deciding who or what in the text fills what slot *and* in filling slots with default values).

Inference arises in another way: The value that fills one slot will affect the choice of a default value for a second slot. When the subject of the example predicted that the buyer would pay cash for his Mercedes, she assigned cash as a default value for the medium slot because the buyer slot had been filled by a *nouveau-riche* character. In fact, a bank loan would have been her default value for almost any other type of character. Similarly, in the story of a woman who takes 18 friends to dinner and picks up the tab, the default value for *medium* would be credit card, not cash or cheque. Slot-filling is an interactive process: How one slot gets filled influences how other slots can get filled.

How do People Change their Schemata?

Unfortunately, schema theory has been more helpful in explaining comprehension than it has in explaining learning (for a fuller treatment, see Rumelhart, 1980; or Pearson and Spiro, 1980). However, schema theory does include mechanisms for learning (Rumelhart, 1980). The most common kind of learning within schema theory is what Rumelhart calls *accretion*. The notion of accretion is similar to Piaget's (1952) notion of assimilation and Smith's (1975) notion of comprehension. Accretion occurs each time an individual experiences an example of a schema and records in long-term memory its particular instantiation. Accretion is what allows a person to recall the specific circumstances involved, for example, in a particular trip to a restaurant. Unlike other forms of learning, accretion does not alter the structure of the schema.

A second kind of learning is *fine tuning*. While fine tuning has no exact counterparts in Piaget's or Smith's views of information processing, it would be included in what Piaget calls *accommodation* and what Smith calls *learning*. Through fine tuning, the components of schemata are modified in important ways. New variable slots are added, variable slots are changed, or default values are altered. For example, a person who has encountered male automobile sales persons only might have a variable constraint that such sales persons must be male. When a female salesperson is encountered, this variable slot must be modified to include females.

The third kind of learning, *restructuring*, occurs when old schemata must be discarded in favour of new schemata necessary to accommodate existing and incoming data. Old theories or paradigms are replaced by new ones. The Copernican revolution, the advent of Newtonian physics, and Einstein's notions of relativity are extreme examples of restructuring (see Kuhn, 1962). Restructuring occurs continually at a more modest level in daily life: a 4-year-old child learns that not all four-legged creatures are cats and is forced to develop specialised schemata for horses, cats, cows, and goats; a teacher learns that different teaching routines are suited to children of differing abilities; or a student discovers that the laws of commutativity generalise from addition to multiplication but not to subtraction or division.

There are two aspects of restructuring. Schema *specialisation* occurs when several new schemata are needed to replace a single

one: 4 sub-categories of dogs where one sufficed before. Schema *generalisation* occurs when several sub-schemata are seen to share some common variable slots, and the learner realises that they can be seen as variations on the same theme: for example, fables and myths are both stories.

How are Schemata Controlled during Reading?

Sometimes readers engage in what has been variously called “top-down” processing, schema-based processing, “inside-out” processing, reader-based processing, or conceptually driven processing. This is a very active mode of processing in which the reader generates hypotheses, using his or her store of schemata, about the text to be read. These hypotheses guide the processing of the upcoming text and hypotheses are either confirmed or negated, in which case they need to be modified. The subject in the example revealed several instances in which she engaged in this sort of processing.

Other times, readers are more passive. They engage in what has been variously called “bottom-up” processing, outside in processing, text-based processing, or data-driven processing. In this particular mode, the reader decides to suspend judgement, waiting instead for more information from the text before drawing any conclusions. This kind of processing often occurs when a reader initially encounters a text, when a hypothesis has been negated, or when the reader simply cannot understand the sequence of events. The subject gave several such examples.

An interesting way to think about these two control modes is that in top down processing, a reader is operating within his or her own schema, while in bottom-up processing, he or she is trying to operate within the author’s schema. And, of course, any competent reader will shift back and forth constantly between the modes in the process of negotiating an interpretation of the text with the author.

Of what Conceivable Benefit is Schema Theory?

The critical question is: How can teachers and clinicians use schema theory to help them make better diagnostic and instructional decisions about students? An article by Pearson and Spiro (1980) found that five kinds of problems that students exhibit can be explained in a schema theory framework, with some implications for diagnosis and instruction. These can be

thought of as five reasons for student's failure to comprehend what they read. A summary of these instructional decision-making framework follows.

Schema Availability: Put simply, if students do not have well-developed schemata for a topic, they will not understand selections about that topic. This phenomenon has been amply demonstrated (e.g., Anderson, Spiro, and Anderson, 1978; Pearson, Hansen, and Gordon, 1978). Indeed, Johnston and Pearson (1982) and Johnston (1981) have found that prior knowledge goes more to explain variance in comprehension than does measured reading ability.

Regarding assessment of prior knowledge, Langer (1980) and Pearson & Johnston (1978) have found that simple free-association techniques (with key concepts in a passage) provide a quick diagnostic picture of where a student stands with respect to these concepts. For remediation, Hagen (1979) and Thoms (1982) have found that approaches that follow Pearson and Johnston's (1978) semantic mapping paradigm are most beneficial to students with meager backgrounds.

Schema Selection: Some students have the prior knowledge but neglect to call it into focus at the appropriate time. These students quite often rely too much on bottom-up processing, failing to realise which of their schemata can be used to comprehend and interpret the text at hand. In this case, remediation is relatively straightforward: Any prereading teaching strategy that brings appropriate schemata into focus will help. Specifically, the experimental work of Hansen (1981) and Hansen & Pearson (1982) as well as the advice of people like Stauffer (1969), Pearson and Johnston (1978), Herber (1970), or Hanf (1971) all contain techniques that will help such students become more active processors of text.

Schema Maintenance: Just because a reader has a scheme available for comprehending a passage does not mean that he or she will maintain that schema throughout the reading. Many students can forget what they are reading about. This is a schema maintenance problem. One reason for this problem is that readers may rely too heavily on bottom-up processing, directing all their attention to processing low-level text units (letters, syllables, words), thus leaving no cognitive capacity for the integrative thinking that is necessary to discern a text's overall meaning. Another reason is what Anderson, Armbruster, and Kantor

(1980) call inconsiderate text - text that does not make clear how different ideas in the text should be tied together. Marshall & Glock (1978-79) and Irwin (1980) have all found this to be more of a problem for poor than good readers, who seem more able to create ties where none are offered by the author.

None of the instructional advice about this problem has been tested. However, clinical experience and a few experimental studies (e.g., Gordon, 1980; Singer and Donlan, 1982; Bartlett, 1978) suggest the importance of helping students develop schemata for the ways in which stories and expository texts are organised. This can be accomplished either through systematic questioning techniques or the use of visual representations of the way texts are organised.

Overreliance on Bottom-up Processing: Over reliance on bottom-up processing is a case of failing to see the forest for the trees. Such readers will make oral reading errors because of attention to graphic features rather than to semantic concerns. In addition, they give verbatim answers from the text when inferences to prior knowledge are called for.

Helping students who have acquired this habit is not easy. Basically, they need to learn two things: that reading should make as much sense as listening, and that comprehension sometimes requires going beyond the text. To help them learn the first principle, there has been some success with anomaly detection techniques. Students are given texts that contain anomalous words, phrases, or sentences, and asked to delete things that do not fit the passages. Obviously, they cannot do this task unless they have a good idea of what the text is about, that is, unless they operate top-down. For the second principle, the students are given questions followed by several answers; then they are asked to determine which came from the text and which did not. Finally, they are asked to judge which answers are appropriate, in an attempt to demonstrate that sometimes non-textual answers are as good as textual answers.

Over reliance on Top-Down Processing: It is possible for students to rely too much on schema-based (or top-down) processing. Such students make semantically appropriate oral reading errors. Their answers to questions, while sensible, often reveal a cursory or careless reading, or no reading of the text. While getting the "gist" may serve a student well in most situations, it is a serious disadvantage when careful reading

is required (e.g., experiments, following directions, poetry, evaluative reading). Sometimes it is essential to work within the author's schema!

Several approaches are used to counter these tendencies. To help with question-answering behaviour, students are engaged in precisely the same task as bottom-up over-reliers (finding good answers from and not from the text), but the goal is different. These students need to understand that it is all right to give answers from the text. For the careful reading problem, students are given complex directions and fill-in-the-blank exercises in which all answers *denote* a semantically appropriate response (e.g., *walked, skipped, trudged*), but only one carries the appropriate connotation (e.g., *Susan felt so happy that she _____ through the park*).

In conclusion, schema theory can be a useful tool in approaching students reading problems. By providing a framework for how students understand or fail to understand a text, a teacher can develop strategies like those explored above to remedy reading problems.

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THE IDENTIFICATION OF MEANING

—FRANK SMITH

Word identification does not require the prior identification of letters, at least not the immediate word identification that readers accomplish when a word they are concerned with is familiar to them, a part of their “sight vocabulary”. It is only when words cannot be identified immediately that the prior identification of letters may become relevant at all, and then only to a limited extent depending on the amount of contextual and other information that the reader might have available. The alternatives are summed up in Figure 1.

Now I want to show that comprehension, which in this chapter will be referred to as the *identification* (or apprehension) of meaning, does not require the prior identification of words. The same feature-analytic process that underlies the identification of letters and words is also available for the immediate apprehension of meaning from visual information. Although mediated meaning identification may sometimes be necessary, because for some reason meaning cannot immediately be assigned to text, attempting to make decisions about possible meaning by the prior identification of individual words is highly inefficient and unlikely to succeed.

In other words, immediate meaning identification is as independent of the identification of individual words as immediate word identification is independent of the identification of individual letters. The alternatives are represented in Figure 2. The argument is presented in three steps:

1. Showing that immediate meaning identification is accomplished; that readers normally can and do identify meaning without or ahead of the identification of individual words.
2. Proposing how immediate meaning identification is accomplished.
3. Discussing how immediate meaning identification is learned.



Fig. 1: Immediate and Mediated Word Identification

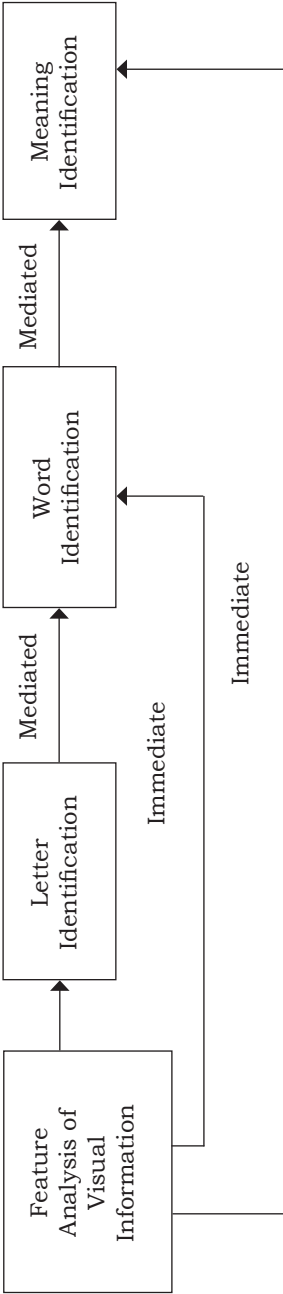


Fig. 2: Immediate and Mediated Word Identification

In a final section, I briefly discuss the mediated identification of meaning, or what a reader do when the direct apprehension of meaning is not possible.

Using Meaning in Reading

One demonstration has already been given that readers employ meaning to assist in the identification of individual words rather than labouring to identify words in order to obtain meaning. I am referring to the experiment showing that from a single glance at a line of print – the equivalent of about one second of reading – a reader can identify four or five words if they are in a meaningful sequence but scarcely half that amount if the words are unrelated to each other. With a meaningful text a reader could recruit non-visual information to reduce alternatives so that the amount of visual information that the brain can handle in a second would go twice as far, to identify four or five words instead of a couple. The non-visual information that the reader already possesses can only be meaning, or prior knowledge of the way in which words go together in language that is not only grammatical but makes sense.

A Constant Concern for Sense: It is important to understand that the reader in the situation just discussed is constantly making use of meaning; meaningfulness facilitates the identification of every word in the line. The reader does not first identify one or two words by a word identification strategy, as if they had nothing to do with the other words in the line, and then make an educated guess about the rest. Indeed, that same experiment shows that if two words had to be identified to give a clue about the others, then there would be no time left for the others to be identified. Two is the limit for words that have no meaningful relationships. Where a sequence of words does make sense, the identification of every word is facilitated, the first as well as the last, just as individual words can be identified in conditions in which none of their component letters would be individually discriminable. It is all a matter of the prior elimination of unlikely (and impossible) alternatives.

The research just discussed is historic; it was first conducted and reported a century ago. But in a sense, the fact that meaning facilitates the identification of individual words is demonstrate every time we read, because reading would be impossible if we laboured along, blindly striving to identify one word after

another with no prior insights into what those words might be. Eye-movement studies may show that in some circumstances the eyes briefly come to rest on all or most words, reading is not achieved saccadically. The eyes may “look at” words one at a time, but the brain deals with words in meaningful clusters. Slow reading is not efficient reading because it tends to create tunnel vision, overload short-term memory, and leave the reader floundering in the ambiguity of language. It’s impossible to read normally text that does not make sense, as you can experience for yourself if you try to read the following passage:

Be might words those of meaning the what into insight prior no with, another after word one identify to striving blindly, along laboured we if impossible be would reading because, read we time every demonstrated is words individual of identification the facilitates meaning that fact the, sense a in but.

The words you have just tried to read are what I hope is a meaningful English sentence – because I used it myself in the previous paragraph – written backward. Any difference between the rate and ease with which you could read the backward and forward versions of that sentence can only be attributed to whether you were able to make sense of it. If you had read the backward passage aloud, incidentally, you probably would have sounded very much like many “problem readers” at school, who struggle to identify words one at a time in a dreary monotone as if each word had nothing to do with any other. Such children seem to believe – and may well have been taught – that meaning should be their last concern; that sense will take care of itself provided they get the words right.

Professional readers, for example, broadcasters know the importance of prior understanding of what they are about to read, that is why they like to scan through a script in advance. Looking ahead also helps the silent reading of novels and technical books – we can get a probable idea of what will transpire and then we can always go back general idea study necessary points. General comprehension comes out of fast reading while the slow reading, that might be necessary for memorisation or for reflection on detail, can only be accomplished if comprehension has already been taken care of. Conversely, meaning can interfere with some reading tasks. Proofreaders tend to overlook misprints if they attend to the sense of what they read; they see the spellings and words that should be on the page rather than those that

actually are there. Sometimes proofreaders will deliberately read backward in order to give all their attention to spelling and individual words, but then of course they will overlook anomalies of meaning. Their dilemma highlights the fact that attention to individual words and attention to meaning are alternative and not concurrent aspects of reading.

The prior use of meaning ensures that when individual words must be identified, for example, in order to read aloud, a minimum of visual information will be used. And as a consequence, mistakes will occasionally occur. If a reader already has a good idea of what a word might be, there is not much point in delaying to make extra certain what the word actually is. As a result it is not unusual for even highly experienced readers to make misreadings that are radically different visually – like reading said when the word is announced or reported – but that makes no significant difference to the meaning. Beginning readers often show exactly the same tendency, demonstrating that children will strive for sense even as they learn to read (provided the material they are expected to learn from has some possibility of making sense to them). The mistakes that are made are sometimes called *miscues* rather than *errors* to avoid the connotation that they are something bad (Goodman, 1969). The miscues shows that these beginning readers are attempting to read in the way fluent readers do, with sense taking priority over individual word identification. Of course, reading with minimal attention to individual words will sometimes result in misreading that do make a difference to meaning, but one of the great advantages of reading for meaning is that one becomes aware of mistakes that make a difference to meaning. An important difference between children who are doing well in reading and those who are not is not that good readers make fewer mistakes, but that they go back and correct the mistakes that make a difference. Children who are not reading for sense have no chance of becoming aware of even important errors.

The Priority of Meaning: A unique illustration of the way in which the meaning takes priority over the identification of individual words was provided by Kolers (1966), who asked bilinguals fluent in English and French to read aloud from passages of text that made sense but where the actual language changed from English to French every two or three words. For example:

His horse, followed de deux bassets, faisait la terre resonner under its even tread. Des gouttes de verglas stuck to his manteau. Dne violente brise was blowing. One side de L'horizon lighted up, and dans la blancheur of the early morning light, il apergut rabbits hopping at the bord de leur terriers.

The subjects in this experiment could read and understand such passages perfectly well, but when they had finished they often could not remember whether particular sentences or words were in English or French. Most significantly, they frequently substituted for a word in one language an appropriate word in the other. They might read *porte* when the word was *door* or *hand* when *main* was given, getting the meaning right but the language wrong. This does not mean that they were not looking at individual words at all – the passage was not completely predictable – but that they were looking at words and finding meanings, just as an English speaker might look at *2000* and understand “two thousand” while a French speaker would look at the same print and understand “deux milles”.

An important and perhaps difficult point to understand from the preceding discussion is that it is possible to make meaningful decisions about words without saying exactly what the words are. In other words, we can see that the written word *door* means door without having to say aloud or to ourselves that the word is “door”. Written words convey meaning directly; they are not intermediaries for spoken language. An obvious example is provided for English by words that have different spellings for the same sound, like *their* and *there*. It is easy to detect the spelling error in *The children left there books behind* because *there* represents the wrong meaning. The difference between *their* and *there*, and *read* and *reed*, and *so*, *sew*, and *sow* is evidently not that the different spellings represent different sounds, because they do not, but that the different appearances of the words indicate different meanings. The visual appearance of each word indicates meaning directly.

The fact that readers can, do, and must read directly for meaning is similarly apparent with a written language like Chinese, which does not correspond to any particular sound system. It would be pointless to argue whether a particular Chinese symbol at represents the Mandarin or the Cantonese word for “house” because it simply represents a *meaning*. The fact that some written languages are based on letters that are

more or less related to the sound system of a spoken language is quite coincidental as far as readers are concerned. There is no evidence that fluent readers need to identify letters in order to identify familiar words, and English spelling is an inadequate guide to the identification of words that are unfamiliar.

My final example that written language indicates meaning directly comes from studies of brain-injured patients. People unable to find the exact word have been reported, for example, as reading the isolated word *ill* as “sick”, *city* as “town”, and *ancient* as “historic” (Marshall and Newcombe, 1966) or *injure* as “hurt”, *quiet* as “listen”, and *fly* as “air” (Shallice and Warrington, 1975).

Comprehension and the Reduction of Uncertainty

I have tried to show that meaning can take priority over the identification of individual words in two ways, both for experienced readers and for beginners. In the first case, the meaning of a sequence of words facilitates the identification of individual words with relatively less visual information. In the second case, written words can be understood without being identified precisely. Usually both aspects of meaning identification occur simultaneously; we comprehend text using far less visual information than would be required to identify the individual words and without the necessity of identifying individual words. Both aspects of meaning of identification are, in fact, reflections of the same underlying procedure—the use of minimal visual information to make decisions specific to implicit questions (or predictions) about meaning on the part of the reader.

I am using a rather awkward expression “meaning identification” as a synonym for comprehension in this chapter to underline the fact that the way in which a reader makes sense of text is no different from that by which individual letters or words may be identified in the same text. I could also use the rather old-fashioned psychological term *apprehension* to refer to the way meaning must be captured, but that would cloud the similarities between comprehension and letter and word identification. What is different about comprehension is that readers bring to the text implicit questions about meaning rather than about letters or words. The term *meaning identification* also helps to emphasise that comprehension is active. Meaning does not reside in surface structure waiting to be picked up. The meaning that readers comprehend from text is always relative to what they already

know and to what they want to know. Put in another way, comprehension involves the reduction of a reader's uncertainty, asking questions and getting them answered, which is a point of view already employed in the discussion of letter and word identification. Readers must have *specifications* about meanings, specifications that constantly change as meaning develop.

A passage of text may be perceived in at least three ways: as a sequence of letters from an alphabet, as a sequence of words of a particular language, or as an expression of meaning in a certain domain of knowledge or understanding. But a passage of text is none of these things, or at least it is only these things potentially. Basically, written text is a conglomeration of ink marks on a page or screen, variously characterised as visual information, distinctive features or surface structure. Whatever readers perceive in text – letters, words, or meanings – depends on the prior knowledge (non-visual information) that they happen to bring and the implicit questions they happen to be asking. The actual information that readers find (or at least seek) in the text depends on their original uncertainty.

Consider the sentence that you are reading at this moment. The visual information in the sentence can be used to make decisions about letters, for example, to say that the first letter is c, the second o, the third n, and so forth. Alternatively, exactly the same visual information can be used to decide that the first word is *consider*, the second word *the*, the third word *sentence*, and so forth. The reader employs the same visual information, selects from among the same distinctive features, but this time sees words, not letters. What readers see depends on what they are looking for, on their implicit questions or uncertainty. Finally, exactly the same visual information can be employed to make decisions about meaning in the sentence, in which case neither letters nor words would be seen individually. It is not easy to say precisely what is being identified in the case of meaning, but that is due to the conceptual difficulty of saying what meaning is – using words to describe something beyond words – not because the reader is doing anything intrinsically different or difficult. The reader is using the same source of visual information to reduce uncertainty about meaning rather than about letters or words.

As we have already seen, the amount of visual information required to make a letter or word identification depends on the extent of the reader's prior uncertainty, on the number of

alternatives specified in the reader's mind (and also the degree to which the reader wants to be confident in the decisions to be made). With letters it is easy to say what the maximum number of alternatives is – 26 if we are considering just one particular letter in upper or lowercase typeface in the English alphabet. It is similarly easy to show that the amount of visual information required to identify each letter goes down as the number of alternatives that the letter might be (the reader's uncertainty) is reduced. The fewer the alternatives, the more rapidly or easily a letter is identified, because fewer distinctive features need to be discriminated for a decision to be made. It is not so easy to say what the maximum number of alternatives is for words, because that depends on the range of alternatives that the reader is considering but again it is not difficult to show that the amount of visual information required to identify a word goes down as the reader's uncertainty is reduced. A word can be identified with fewer distinctive features when it comes from a couple of hundred alternatives than from many thousands. Finally, it is quite impossible to say how many alternative meanings there might be for a passage of text, because that depends entirely on what an individual reader is looking for, but it is obvious that reading is easier and faster when the reader finds the material meaningful than when comprehension is a struggle. The less uncertainty readers have about the meaning of a passage, the less visual information is required to find what they are looking for in the passage.

The Use of Non-visual Information: In each of the preceding cases non-visual information can be employed to reduce the reader's uncertainty in advance and to limit the amount of visual information that a reader must attend to. The more prior knowledge a reader can bring to bear about the way letters go together in words, the less visual information is required to identify individual letters. Prediction, based on prior knowledge, eliminates unlikely alternatives in advance. Similarly, the more a reader knows about the way words go together in grammatical and meaningful phrases – because of the reader's prior knowledge of the particular language and of the topic being discussed – the less visual information is required to identify individual words. In the latter case, meaning is being used as part of non-visual information to reduce the amount of visual information required to identify words.

Many people can follow the meaning of a novel or newspaper article at the rate of a thousand words a minute, which is four times faster than their probable speed if they were identifying every word, even with meaning to help them. There is a prevalent misconception that for this kind of fast reading the reader must be identifying only one word in every four and that this gives sufficient information at least for the gist of what is being read. But it is easy to demonstrate that identifying one word in four won't contribute very much towards the intelligibility of a passage. Here is every fourth word from a movie review: Many-----been-----face-----business-----sour-----If-----to----- . . . The passage is even less easy to comprehend if the selected words are in groups, with correspondingly larger gaps between them. It is somewhat easier to comprehend what a passage is about if every fourth *letter* is provided rather than every fourth word, and, of course, my argument is that reading at a thousand words a minute is possible only if the omissions occur at the *featural level*.

It should not be thought that there is a special kind of distinctive feature for meaning in print, different from the distinctive features of letters and words. There is no "semantic feature", for example, that *house* and *residence* physically have in common that we should expect to find in print. What makes visual features distinctive as far as meaning is concerned is precisely what makes them distinctive for individual letters and words – the particular alternatives that already exist in the reader's uncertainty. The same features that can be used to distinguish the letter *m* from the letter *h* will also distinguish the word *mouse* from the word *house* and the meaning of *we went to the mill* from the meaning of *we went to the hill*. It is not possible to say what particular features a reader might employ to distinguish meanings; this would depend upon what the reader is looking for, and, in any case, it is not possible to describe the features of letters or words either. The situation is only additionally complicated by the fact that we cannot say what a meaning is.

Capturing "Meaning": In the chasm between the surface structures and the deep structure of language, meaning lies beyond words. One cannot say what meaning is in general, any more than one can say what the meaning of a particular word or group of words is, except by saying other words that are themselves surface structure. The meaning itself can never be exposed. This inability to pin down meaning is not a

theoretical defect or scientific oversight. We should not expect that researchers will soon make a wondrous discovery that will enable us to say what meanings are. Meaning, to repeat myself, cannot be captured in words.

A reader does not comprehend the written word *table* by saying the spoken word *table* either aloud or silently, any more than the spoken word *table* can itself be understood simply by repeating it to oneself. And neither the written nor the spoken word *table* is understood by saying silently to oneself “a four-legged, flat-topped piece of furniture”, or whatever other definition might come to mind, because the understanding of the definition would itself still have to be accounted for. There can be no understanding and no explanation unless the web of language is escaped. The actual *words*, written or spoken, are always secondary to meaning, to understanding.

We are normally unaware of *not* identifying individual words when we read because we are not thinking about words in any case. Written language (like speech) is transparent – we look through the actual words for the meaning beyond, and unless there are noticeable anomalies of meaning, or unless we have trouble comprehending, we are not aware of the words themselves. (When we deliberately attend to specific words, for example in the subtle matter of reading poetry, this is a consequence of asking a different kind of question in the first place. The sounds that we can give to the words do not so much contribute to a literal interpretation as establish a different- complementary or alternative – kind of mood or meaning).

Reading Aloud and Silently: Of course, word identification is necessary for reading aloud, but as I have tried to show, the identification of words in this way depends on the prior identification of meaning. The voice lags behind the understanding and is always susceptible, to some extent, to diverging from the actual text. The substitution of words and even phrases with appropriate meanings is again not something a reader will be aware of; the reader’s main concern, even in reading aloud, must be with the sense of the passage. Misreadings (miscues) would have to be pointed out by a listener following both the text and the reading. Misreadings of this kind are not normally made if the words to be read are isolated or in arbitrary lists, but then there is no way that meaning could be sought in such words. Besides, in such circumstances readers usually have the leisure

to scrutinise sufficient visual information to identify individual words precisely (giving the words a label rather than a meaning) because nothing is lost by reading slowly.

Sub-vocalisation (or reading silently to oneself) cannot in itself contribute to meaning or understanding any more than reading aloud can. Indeed, like reading aloud, sub-vocalisation can only be accomplished with anything like normal speed and intonation if it is preceded by comprehension. We do not listen to ourselves mumbling parts of words or fragments of phrases and then comprehend. If anything, sub-vocalisation slows readers down and interferes with comprehension. The habit of sub-vocalisation can be broken without loss of comprehension (Hardyck and Petrinovich, 1970). Most people do not sub-vocalise as much as they think. If we “listen” to ascertain whether we are sub-vocalising, sub-vocalisation is bound to occur. We can never hear ourselves not sub-vocalising, but that does not mean that we sub-vocalise all the time. Why do we sub-vocalise at all? The habit may simply be a holdover from our younger days, when we were expected to read aloud. A teacher knows that children are working if their fingers are moving steadily along the lines and their lips are moving in unison. Sub-vocalisation may also have a useful function in providing “rehearsal” to help hold in short-term memory, the words that cannot be immediately understood or otherwise dealt with. But in such cases sub-vocalisation indicates lack of comprehension rather than its occurrence. There is a general tendency to sub-vocalise when reading becomes difficult, when we can predict less.

Prediction and Meaning: We don’t normally read with our minds blank, with no prior purpose and no expectation of what we might find in the text. We don’t look for meaning by considering all possibilities, nor do we make reckless guesses about just one; instead we predict within the most likely range of alternatives. In this way readers can overcome the information processing limitations of the brain and also the inherent ambiguity of language. We can derive meaning directly from text because we bring expectations about meaning to text. The process is normally as natural, continuous and effortless as the way we bring meaning to every other kind of experience in our life. Comprehension is not a matter of putting names to nonsense and struggling to make sense of the result, but of operating in the realm of meaningfulness all the time.

Learning to Identify Meaning

There is no need for a special explanation about how children learn to apprehend meaning from print because no special process is involved. Children will naturally try to bring sense to print, as they try to bring sense to all their encounters with the world around them. For them there is no point in language that is not meaningful, whether spoken or written. They perceive spoken language by looking for meaning, not by focusing on the sounds of words.

The Expectation of Sense

There is a classic illustration of the priority that meaning takes as children learn to talk. Even when children try to “imitate”, it is meaning that they imitate, not meaningless sounds. McNeill (1967) reported an exchange between mother and child which went like this:

Child: Nobody don't like me.

Mother: No, say “Nobody likes me.”

Child: Nobody don't like me.

(eight repetitions of this exchange)

Mother: No, now listen carefully, say “*Nobody likes me*”.

Child: Oh! Nobody don't likes me.

Even when children are asked to perform a language exercise, they expect that it will make sense. Like the child in the previous example, it takes them a long time to understand the task if they are required to attend to surface structure, not to meaning. Children do not need to be told the converse, to look for sense; that is their natural way of learning about language. Indeed, they will not willingly attend to any noise that does not make sense to them.

Just as children do not need to be told to look for meaning in either spoken or written language, so they also do not need to learn special procedures for finding meaning. Prediction is the basis of comprehension and all children who can understand the spoken language of their own environment must be experts at prediction. Besides, the very constraints of reading – the constant possibility of ambiguity, tunnel vision, and memory overload – serve as reminders to learners that the basis of reading must be prediction.

Certainly there is no need for a special explanation of how comprehension should be *taught*. Comprehension is not a new kind of skill that has to be learned for reading but is the basis of all learning. However, it may happen that children at school are taught the *reverse* of comprehension, being instructed instead to take care to “decode” correctly and not “guess” if they are *uncertain*. They may even be expected to learn to read with materials and exercises specifically designed to discourage or prevent the use of non-visual information.

Of course, there are differences between the comprehension of written language and the comprehension of speech or of other kinds of events in the world, but these are not differences of process. The differences are simply that the reader must use the distinctive features of print to test predictions and reduce uncertainty. Children need to become familiar with these distinctive features of print and with how they are related to meaning. This familiarity and understanding cannot be taught, any more than rules of spoken language can be taught, but formal instruction is similarly unnecessary and in fact impossible. The experience that children require to find meaning in print can only be acquired through meaningful reading, just as children develop their speech competence through using and hearing meaningful speech. And until children are able to do meaningful reading on their own account, they are clearly dependent on being read to, or at least on being assisted to read. Let me summarise everything I have just said: children learn to read by reading.

The Right to Ignore: A Final point. It is not necessary for any readers, and especially not for beginners, to understand the meaning of *everything* that they attempt to read. Whether adults are reading novels, menus or advertisements, they always have the liberty to skip passages and to ignore many small details, either because they are not comprehensible or because they are not relevant to their interest or needs. Children, when they are learning spoken language, seem able and willing to follow adult conversations and television program without comprehending every word. A grasp of the theme, a general interest, and the ability to make sense on the basis of a few comprehensible parts can be more than sufficient to hold a child’s attention. Such partially understood material is indeed the basis for learning; no one will pay attention to any aspect of language, spoken or written, unless it contains something that is new. For children,

a good deal that is not comprehensible will be tolerated for the opportunity to explore something that is new and interesting. But children are rarely given credit for their ability to ignore what they cannot understand and to attend only to that from which they will learn.

Unfortunately, the right of children to ignore what they cannot understand may be the first of their freedoms to be taken away when they enter school. Instead, attention may be focused on what each child finds incomprehensible in order to “challenge” them to further learning. Anything a child understands may be set aside as “too easy”. Paradoxically, many reading materials are made intentionally meaningless. In such cases there is no way in which children will be able to develop and profit from their ability to seek and identify meaning in text.

Mediated Meaning Identification

Reading usually involves bringing meaning *immediately* or directly to printed text without awareness of individual words or their possible alternative meanings. There are occasions, however, when the meaning of the text or of particular words cannot be immediately comprehended. On these occasions, mediated meaning identification may be attempted, involving the identification of individual words before comprehension of a meaningful sequence of words as a whole. There are two cases to be considered, the first concerned with the mediated meaning identification of entire sequences of words, such as phrases and sentences, and the second concerned with the mediated identification of the meaning of occasional individual words.

I have already argued that the first is rarely possible. The meaning of a sentence as a whole is not understood by putting together the meanings of individual words. Individual words have so much ambiguity – and usually alternative grammatical functions as well – that without some prior expectation about meaning there is little chance for comprehension even to begin. In addition, constraints of visual information processing and memory are difficult to overcome if the reader attempts to identify and understand every word as if it had nothing to do with its neighbours and came from many thousands of alternatives. So although some theories of reading and methods of reading instruction would appear to be based on the assumption that comprehension of written text is achieved one word at a time,

the present analysis leaves little on this topic to be discussed. To attempt to build up comprehension in such a way must be regarded as highly inefficient and unlikely to succeed.

But the second sense of mediated meaning identification—where the passage as a whole is comprehensible and perhaps just one word is unfamiliar and not understood—is a more general characteristic of reading. In this case, the question is not one of trying to use the meanings of individual words to construct the meaning of the whole, but rather of using the meaning of the whole to provide a possible meaning for an individual word. And not only is this possible, it is the basis of much of the language learning that we do. The bulk of the vocabulary of most literate adults must come from reading (Nagy, Herman, and Anderson, 1985). It is not necessary to understand thousands upon thousands of words to begin to learn to read—basically all that is required is a general familiarity with the words and constructions in the written material from which one is expected to learn, and then not all of those. And it seems highly unlikely that our understanding of many of the words that we have learned as a result of reading should be attributed to thousands of trips to the dictionary or to asking someone else what the word might be. We learn the meaning from the text itself.

Informal evidence that we quite coincidentally learn new words while reading comes from those words whose meaning or reference we know “well” but which we are not sure of pronouncing correctly, so there is no way we could have learned about them from speech. I am referring to words like *Penelope* (Penny-loap?), *Hermione* (Hermi-own?), *misled* (mizzled? myzeled?) and *gist* (like guest or jest?), and perhaps *slough* and *orgy*, not to mention innumerable foreign words, names, and places. There is what I like to call the *facky-tious* phenomenon (*tious* to rhyme with *pious*) after the occasion when the mother of a friend commented that one did not often hear the word *facky-tious* these days. My friend confessed that he could not remember the last time he heard the word and asked what it meant. “A little sarcastic or supercilious”, he was told. Something clicked. “You mean *facetious*”, he said. “No”, replied his mother thoughtfully, “though the two words do have a similar meaning. Come to think of it”, she added, “I don’t think I’ve ever seen the word *facetious* in print”.

The question, of course, is where she got the correct meaning of *facky-tious*, which she had never heard in speech and had

obviously never asked anyone about. And the answer must be that she learned it the way most of us learn the meaning of most of the words that we know – by making sense of words from their context, using what is known to comprehend and learn the unfamiliar. Mediated meaning identification from context is something that experienced readers probably do frequently, without awareness, and is the basis not just of comprehension but of learning.

Learning new words without interference with the general comprehension of text is another example of the way that children – and all readers – continually learn to read by reading. The vocabulary that develops as a consequence of reading provides a permanent source of knowledge for determining the probable meaning and pronunciation of new words. If you know both the meaning and the pronunciation of *auditor* and *visual*, you will have little difficulty in comprehending and saying a new word like *audiovisual*. The larger your capital, the faster you can add to it – whether with words or material wealth. The best way to acquire a large and useful sight vocabulary for reading is by meaningful reading. If the text makes sense, the mediation and the learning take care of themselves.

Issues

A persisting issue is whether individual words have to be specifically identified, one at a time, before the meaning of a phrase, sentence or passage can be comprehended. Such issues are difficult to resolve experimentally – evidence of where the eyes are focused does not necessarily indicate what the reader is thinking about. Meaning as a concept is difficult enough to contemplate in any case. To try to pinpoint meaning by studying where the eyes fixate can be like trying to study digestion by analysing knife and fork movements. As we shall continue to see, driving many of the controversies about the nature of reading are deep-rooted beliefs about how children should be taught.

Summary

Comprehension, the basic objective of reading, also facilitates the process of reading in two ways. Immediate meaning identification makes unnecessary the prior identification of individual words, and comprehension of a passage as a whole facilitates the **comprehension** and, if necessary, the identification of individual words. **Mediated meaning identification** increases

the probability of tunnel vision, memory overload, and ambiguity caused by over – dependence on visual information.

Notes

Effects of Meaningful Context

Meaningfulness clearly has a substantial role in facilitating the identification of words in reading, reducing their uncertainty at least 12 bits (the equivalent of 4,096 from equiprobable alternatives) for words in isolation to fewer than 8 bits (256 alternatives) for words in context. It is really irrelevant to talk of letters at this stage – letters are not normally a concern when meaningful text is read. But as a yardstick, the uncertainty of letters falls from 4.7 bits to scarcely 1 bit when context is meaningful, enabling perception of four times as much of a line of print. Not only can twice as many words be identified in a single glance when they are in a *meaningful* context, thus overcoming bottlenecks of information processing and memory, but problems of ambiguity and the gulf between surface structure and meaning are removed by the prior elimination from consideration of unlikely alternatives. Context has its effect because it contributes information that reduces the uncertainty of individual words through sequential redundancy; it places constraints on what each individual word might be.¹ Sequential redundancy is usable only if reflected in the prior knowledge, or non-visual information, that the reader can bring to bear. That is why I stress that the context must be *meaningful*, with all the relative connotations of that word. If a particular context is not comprehensible to a reader, or if for one reason or another the reader is reluctant to take advantage of it, then the context might just as well be nonsense, a random arrangement of marks on the page.

Meaningful context as I have been using the term exercises its constraints on word occurrence in two ways, syntactic and semantic. These are two types of restriction on the particular

¹ The present concern is with *language* context, the body of words in a text. But words can also be considered by more general *situational* contexts; for example, there is a very small and highly predictable set of alternative words likely to occur on a toothpaste tube. There is also an important context in the receiver's expectations. As Olson (1970) points out, words are selected and get meaning from what the listener or reader needs to know.

words an author can select—or a reader predict—at any time (There are other constraints on authors, such as the limited set of words a reader might be expected to understand). Choice of words is always limited by what we want to say (semantics) and how we want to say it (syntax). I have not tried to separate the effects of syntax and semantics in this discussion for the simple reason that I have not found a good way to do so. The theoretical analysis argued that the two are inseparable—that without meaning it is pointless to talk about grammar.

There is no shortage of research demonstrating the powerful facilitatory effect of meaningful context on word identification. Indeed, there is no evidence to the contrary. But I must reiterate that *reading does not usually involve or rely upon word identification*. Meaningful context makes reading for meaning possible and word identification unnecessary. The fact that meaningful context makes individual words easier to identify is basically as irrelevant as the fact that individual letters are easier to identify in words; the research evidence is merely a demonstration of the effect of meaningful context. Even when reading aloud is involved, so that the accurate identification of words is required, the prior apprehension of meaning is an important pre-requisite. Reading aloud is difficult if prior comprehension is limited, and if word identification is given priority there will be interference with comprehension (Howe & Singer, 1975). Sharkey and Mitchell (1985) showed that word recognition in meaningful contexts is frequently minimal and not very predictable, especially when the context itself is a predictable “script” – when it is a familiar narrative, in other words.

Levy (1978) reported that changing the wording but not the sense of written language did not affect a short-term memory task—meanings, not specific words, are retained whenever possible, even for brief periods. Sometimes context leads us astray, evidence again for the potency of meaning and prediction. Carpenter and Daneman (1981) give several examples of “garden path” texts where context misleads rather than facilitates, such as “Cinderella could not go to the ball. There were tears in her dress”. Crowder and Wagner (1991) show that readers use meaning from other words to help identify specific words in text.

Experienced readers read familiar text at the highest possible level of comprehension, phrases if possible, then words—this applies to Chinese and Japanese Logo graphic readers as well

as to English Language alphabetic readers (Tao & Healy, 2002). Experienced readers of both systems make more small unit errors (like letters in English text) in familiar than unfamiliar larger units. We all attend to the broader picture rather than the unimportant detail. Masonheimer, Drum and Ehril (1984) observed that children may identify labels correctly even. When a letter has been changed (like “Xepsi” for “Pepsi”). They reported with some concern, because unlike the children, they were looking for mastery of letters, not of entire words or sense.

For examples of how context facilitates word identification, see Morton (1969, 1982), Klein and Klein (1973), and Smith and Spoehr (1974). For a summary of the arguments of the present chapter and preceding three chapters, see Smith and Holmes (1971). In related studies demonstrating the effect of meaningfulness, Rothkopf and Coatney (1974) show that reading rate is determined by the reader’s expectations of information in text, and Rothkopf and Billington (1974) that comprehension is improved when answers to specific questions are sought and found. Smith and Kleiman (1979) summarise many experiments showing that a preceding context “somehow activates the meaning of the possible next word”. Carpenter and Just (1975, 1977) examines how reading normally involves the integration of new contextual information with what is already known (again demonstrating that learning and comprehension are inseparable). Crowder and Wagner (1991) show that readers use meaning from other words to help identify specific words in text; see also Goldsmith Philips (1989).

Cohen (1970) and Neisser and Beller (1965) provide experimental demonstrations that meaning can be sought without the identification of words. In tasks involving a search through word lists, it took no longer to find an example of a category (such as “any flower”) than to find a specific word in that category (such as *daisy*). Search tasks of this kind basically require rejecting irrelevant items on the list (much as we quickly dispose of names we are *not* looking for in a telephone directory) and show that it is not necessary to identify a word specifically to decide that it does not fall into a particular category (set of alternatives) in which we are interested. Spragins, Lefton and Fisher (1976) have demonstrated that meaning is so prepotent that it will interfere with a search in which meaning is actually irrelevant. Neisser (1967) has an extensive discussion of such

search tasks and the light they throw on visual decision-making; for a review see Martin (1979). In a study entitled "Meaning in Visual Search" that is *not* about reading, Potter (1975) reports that viewers recognise pictures as accurately and almost as fast when all they know in advance is the "meaning" (given by a name or title, such as "a boat") as when they have already seen the picture itself. McNeill and Lindig (1973) show that context effects exist with spoken language just as with written (see also Miller, Heise and Lichten, 1951).

Context and Prediction

Some theorists have argued that *context* and *prediction* play a smaller role in reading than proposed in this book. But they tend to use the terms more narrowly than I do. For example, Stanovich (1992) concluded from eye-movement studies that "context effects" are minimal because visual information rapidly blurs outside the foveal area in the centre of the field of view. Earlier, Stanovich (1986) asserted that poor readers depend more on prediction than fluent readers. But I see context in terms of a reader's *understanding* at any given point in the text of what it is about, enhanced by what has already been seen behind and sometimes ahead of where the eyes happen to fall. Such advance knowledge, primarily non-visual rather than visual, facilitates reading by reducing the reader's uncertainty. There is a tendency to equate prediction with "guessing", a term I would never use to describe what fluent readers do. My definition of prediction – the prior elimination of unlikely alternatives – is precisely what makes experienced readers so effective when reading texts whose language and subject matter are familiar to them. Once again everything hinges on the purposes of the reader and on the reader's freedom to be flexible and selective.

Various studies have demonstrated the readiness of children to make use of context in early reading (if they are so permitted), for example, Klein, Klein and Bertino (1974), Golinkoff (1975/1976), Doehring (1976) and McFarland and Rhodes (1978). Rosinski, Golinkoff and Kukish (1975) concluded that meaning is irresistible to children; it can interfere with performance on a task because they cannot ignore it. Such studies also tend to show that use of context and reading ability increase together. This correlation is often attributed to the fact that better readers can make more use of context; less often the possibility is

considered that use of context makes better readers. Studies of children's misreadings tend to highlight the important fact that many of the errors, especially those made by better readers, preserve the meaning of the context and also that errors that make a difference to meaning are often subsequently corrected by children who are reading for meaning (and therefore are not errors that need be a great cause for concern). Children who read more literally, perhaps because of an emphasis on "accuracy" during instruction, may, however make non-sensical errors without being aware of them.

The paradigm example of a child learning to read by meaning alone, without any possibility of decoding to sound, must be that of Helen Keller. Henderson (1976) reported the case of a deaf child who learned to recognise 4,400 printed words in nine months at the age of 6 by relating them to manual signs in a meaningful context, basically in response to the child's own spontaneous inquiries. Ewoldt (1981) demonstrates that deaf children read in the same way as hearing children.

Dual Process

The most popular assumption about comprehension in experimentally-based research on reading is centred on the notion that there is an "internal lexicon" in the head – a kind of mental dictionary – where the meaning of words are stored. Comprehension is achieved when definitions of the words that we read are "looked up" in the internal lexicon. The concept is a metaphor, not an explanation. It fails to explain how the internal definitions are understood and does not allow for selectivity, prediction and all the other things that readers normally do. The idea actually precludes certain explanations – for example, that comprehension might on occasion be a pictorial or sensory image or a physical response, that comprehension is a state rather than a process, or that meaning is brought to language. It papers over the profundity of understanding. Yet the notion that such a lexicon actually exists is often taken for granted and it is simply assumed that words are understood by being identified and "routed" to the internal lexicon. This is a great theoretical convenience as it permits discussion of hypothetical "routes" between eye and understanding without any consideration of the nature of the terminus. Understanding can be ignored simply as "lexical access". Among many discussions of the internal lexicon see Reiben and

Perfetti (1991). Miller and Fellbaum (1991) discussed the enormous problems of constructing an actual lexicon of English – their database of 46,000 entries includes 26 different hierarchical relationships for nouns, up to 10 levels deep with at least three different categories of distinguishing features – parts, attributes, and functions. Nevertheless such semantic decomposition is popular (see also Miller and Johnson-Laird, 1975). A notorious, e.g., is McCawleys (1968) “kill=cause become not alive” ridiculed together with all theories of innate grammar by Robinson (1975), who decried what he calls “linguistic atomism”. Fodor (1981) said most words are not decomposable. If people know 50,000 word meanings, there must be close to 50,000 “primitive concepts”.

Dual Process theorists see two ways of getting from visual information to the internal lexicon – direct (which means an unmediated loop between word and meaning, similar to the general point of view of the present book but not necessarily in the same direction) and by phonological recoding. The idea is that the lexicon contains not only meanings but also spellings and pronunciations, information about syntactic functions, and possibly featural descriptions of various kinds. All these are alternative ways in which the lexicon can be entered, both for recognition and for production (writing and spelling).

Most researchers say both routes are possible but put different emphasis on each. Some theorists, like Gough (e.g., Gough & Walsh, 1991), argue that only a phonological route to the lexicon exists; that reading is a process of decoding the “cipher” of English spelling. Ehri (1992) claimed that access is through the spelling patterns of words, without necessarily recoding into phonological form (which nonetheless usually becomes available with recognition of meaning). Ehri called this the *visual-phonological route*, which is used even for “direct access”. She cited evidence that children “learning to read by sight” find ‘msk’ easier to learn and remember as the word “mask” than an arbitrary spelling like *uhe*, though non-readers don’t. Some orthographic utilisation in word identification is obvious, for example, in distinguishing homophones like *their* from *there*. The term orthographic structure (literally, visual structure) is usually taken to refer specifically to spelling, although it can also refer to the shape or featural detail of words as a whole and to arrangements of letters, individually or in clusters, seen as visual configurations, not as guides to pronunciation.

Walters, Komoda and Arbuckle (1985) offered experimental evidence that phonological recoding plays a very small part in skilled reading and that it is unnecessary unless there are detailed memory demands. It is often assumed that decoding (or recoding) written language into speech automatically provide meaning for written words. But spoken words must themselves be interpreted and they can be even more ambiguous than written words. Including a phonological loop in reading constitutes an additional step, not a shortcut, for understanding.

Van Orden, Johnson and Hale (1988) entitle their publication unequivocally "Word identification in Reading Proceeds From Spelling to Sound to Meaning". Barker, Torgesen, Wagner (1992) studied 87 thirds graders on five tests-untimed and timed word identification, oral and silent reading of 100-word passages and accuracy for reading non-words-and found orthographic skills implicated in all five, from 5 per cent for reading non-words to 20 per cent for oral reading of text. They also found "phonological processing skill" a more significant factor but did not note whether this was related to the instruction the children had been receiving. Seidenberg and McClelland (1989) argue that the apparent utilisation of phonological information in word identification does not necessarily involve explicit use of grapheme-phoneme correspondences but is a result of statistical regularities in the covariance of the orthographic and phonological representation of words.

Perfetti (1985) does not accept the speech recoding model of Gough, which he feels is possible but not necessary. Perfetti calls his own approach a verbal efficiency theory – "verbal efficiency" meaning skill in allocating attention and memory resources to language-related aspects of reading and language in this context meaning speech. Perfetti breaks reading down into multiplicity of separate "processes" – like word recognition, lexical access, schema access, comprehension processes and prepositional encoding and the activation of semantic and phonetic codes, with an underlying need to learn the "coding system". He relies particularly on research by Carpenter and Just (1981) that in experimental reading situations, most words are fixated upon-long words more than short, unfamiliar words more than familiar, and the last word in a sentence more than the others.

Rayner and Pollatsek (1989) argue for direct grapheme-phoneme access, not through a syllabary or whole words. Their

position is rejected in a long, technical and polemical article by Van Orden, Pennington and Stone (1991) with a massive bibliography of the various points of view. Van Orden, Pennington and Stone claim that flaws in dual-process theories, for example in the reading of “exception words”, favour direct access models. They want to substitute a “subsymbolic psycholinguistic” alternative based on complex connectionism and “covariant learning” involving the weighting of connections. The paper is concerned solely with “initial stimulus encoding”, yet among other claims its title not atypically asserts that the subject matter is “reading”. Walters, Komoda and Arbuckle (1985) offer experimental evidence that phonological recording plays a very small part in skilled reading and that it is unnecessary unless there are detailed memory demands. For earlier, less technical reviews of dual process theories, see Henderson (1984) and Baron Strawson (1976).

It is often assumed that decoding (or recoding) written language into speech will automatically provide meaning for written words. But spoken words must themselves be interpreted and they can be even more ambiguous than written words, is including a phonological loop in reading constitutes an additional step, not a shortcut, for understanding.

Physiological Evidence

Evidence for a direct route for understanding in reading is beginning to come in from advanced brain studies.² Petersen et al. (1989) used Positron Emission Tomographic (PET) images of blood flow change to identify brain areas involved in lexical processing of spoken and written words in adults. Their results indicated a direct route from words presented visually to semantic and

² I should note here that all such studies should be interpreted very cautiously. I would not be persuaded by studies indicating that “auditory areas” of the brain, or indeed the entire brain were invariably activated during reading, either as side effects or as part of a total response. Some profound theoretical issues about the nature of thinking and the way the brain functions need be resolved before extrapolating from physiological to psychological phenomena. In a review of a book with a marked neuropsychological emphasis on the “psychology of reading”, Underwood (1992) asks how outlines of the structure of the ganglionic structure of the eye and the function of the amygdala and hippocampus in the brain help an understanding of reading and thinks they may in fact be a distracting irrelevance because important questions are lost.

articulatory areas, without necessarily a phonological recording. Raichle (1990) describes in detail but non-technical language procedures to come to a similar conclusion. Subjects are asked to think about written or spoken words while the metabolic activity of their brains is recorded three-dimensionally by PET scanning of the distribution of radioactive substances.

Posner and Carr (1992) also review current brain imaging methods and their utility for studying cognitive activities like attention and reading, looking particularly at word recognition and lexical access. They report that PET imaging shows that some parts of the brain (usually the left occipital cortex) are activated when real words and “orthographically well-structured pseudowords” are read but not random letters and other complex visual patterns. Semantic judgement tasks involve the lower left prefrontal cortex. Tasks requiring phonological or articulatory processing involves a variety of temporal areas. Not surprisingly, all these studies are very complex to perform, interpret and relate. They tend roughly to support modular theories that different properties of words are “computed” by complex sets of distinct, isolable brain systems. In reporting earlier work, Warrington and Shallice (1979) argue from neuropsychological premises that “word form” has direct access to a “semantic system”, assumed to be the source of meaningfulness.

Willows, Kruk and Corcos (1993) present a comprehensive edited review of research into visual aspects of reading and the complex neurological bases of visual perception. They complain that although reading is obviously a visual activity, very little focused attention is paid to this aspect of it compared with the emphasis on such topics as phonological awareness. This is an accurate observation, although the editors might themselves be charged with concentrating on one end of the reading process with insufficient recognition of the importance of intention, prior knowledge, and the social nature of meaning and learning. Most of the hundreds of studies cited involved tasks primarily if not exclusively focused on what the eyes do, certainly much more difficult, demanding and possibly unnatural than reading when purpose and linguistic constraints are involved. Coltheart (1987) provides a number of useful “tutorials” in a 700-page summary of experimental approaches to reading – including word recognition, sentence comprehension, and eye movements.

Eye Movements

The particular order and location of fixations is not a reliable guide to how readers comprehend text, especially as reading rate increases. (In the same way, the intermittent manner in which our gaze wanders around a room is not particularly suggestive of the stable perception of the room that the brain constructs.) Nevertheless, Just and Carpenter (1980) claim to present a new theory of reading based on points of fixation. For other discussions of fixations and comprehension see Kolars (1976), Kieras and Just (1984), Just and Carpenter (1984), Rayner (1983), and Groner, McConkie, and Menz (1985). Rayner and Morris (1992) claim that experiments demonstrate that “semantic preprocessing” does not control eye movements in reading. The evidence could also be taken to indicate that experiments on eye movements say nothing about reading.

Sub-vocalisation

Edfeldt (1960) concluded that good readers engage less in “silent speech” than poor readers and that an easy text results in less subvocalisation than a difficult one (which to me reflects the same underlying factor – all texts are difficult for poor readers). Kleiman (1975) in a carefully controlled study showed that recoding to speech was not necessary for the understanding of individual words (lexical access) but might be useful while “semantic integration” takes place, in other words when there might be a heavier demand on short-term memory. Baddeley, Eldridge, and Lewis (1981) argue that although memory is helped by sub-vocalisation, inappropriate articulation requirements in experiments can disrupt short-term memory. Swanson (1984) has also shown that the need for sub-vocalisation (which he calls phonological recoding) increases as load on memory increases, for example in the face of “comprehension questions”. The need is also greater for younger readers or when reading is difficult. In any case, comprehension has to occur prior to phonological recoding; words cannot be sub-vocalised meaningfully in any other way. Pugh (1978) discusses both speed reading and the elimination of sub-vocalisation and concludes that neither interferes with comprehension.

ACQUIRING LITERACY IN SCHOOLS

—SHOBHA SINHA

Widespread literacy has been a desirable goal in India since pre-Independence days. However, there is a wide gap between goals and reality. Even though the percentage in terms of literacy has increased, the absolute number of illiterates in the population has not decreased. In fact, it is larger than ever. Most people who are considered literate (due to the liberal census criteria) are incapable of comprehending what they read. Studies dealing with this situation usually highlight home-based factors, but we equally need to focus on school factors for a better understanding of the dismal performance in literacy learning (Kumar, 1992).

In our country, the primary responsibility of facilitating literacy acquisition falls on schools, the only learning site for most children. However, even while discussing language education little attention is paid to literacy learning. The *National Curriculum for Elementary and Secondary Education: A Framework* (NCERT, 1988), a pre-cursor to the currently in news, *The National Curriculum Framework for School Education* (NCERT, 2000), has devoted little space to literacy learning. It merely states, 'In the first two years of primary stage... the child should be helped to acquire the basic skills in reading and writing in his/her mother tongue/regional language' (p. 22). It refers only briefly to comprehension along with pronunciation, voice modulation, good handwriting, and spelling. Literacy learning should not be treated in such a casual manner because failure to acquire literacy will affect learning across the educational spectrum.

It is important to look at the quality of materials and literacy instruction in Indian primary schools. Textbooks form the core of teaching in schools. Consequently, an examination of textbooks will reveal the type of literacy instruction that children receive in the school context. This paper focuses on the textbooks used in the early grades, that is, Hindi primers.

Primers, specifically prepared for the purpose of teaching reading in early grades, are used to impart literacy in most Indian classrooms. They play an important role in teaching reading in the absence of other types of reading material, such as children's

literature. They form the basis of literacy curriculum and dictate how it should be taught. Thus, children from non-literate backgrounds are likely to be exposed only to these type of texts and form conclusions about literacy and acquire literacy skills from them. In a country with a high dropout rate in early years of schooling and low literacy rates, the role of these texts becomes even more important. Therefore, they need to be assessed with care. In this paper I analyse current Hindi primers, assess the quality of reading they offer, and discuss if indeed they support literacy acquisition in young children.

Traditionally, reading was narrowly conceptualised as a decoding process, that is, finding oral equivalents of written language. In terms of literacy acquisition the dominant perspective (reading readiness) considered learning to read as learning to decode. Clearly, then, the instructional implication was to master decoding. This was accomplished by mastery of sub skills in a sequence. Additionally, there was a tendency to focus on formal and not functional aspects of language while learning to read (Teale and Sulzby, 1986).

In terms of material, it meant that the texts were structured around letter-sounds and children were expected to master the letter-sound correspondence and learn about blending to decode words. The assumption behind constructing materials was a 'bottom-up' approach to reading, where the whole consisted of parts and by learning parts one could learn the whole.

This view of reading has been challenged in recent years. An alternative perspective, emergent literacy, based on a different and broader conceptualisation of reading and development has gained prominence. Literacy is not viewed merely as decoding but rather the whole act of reading, including comprehension (Mason and Sinha, 1993). Emergent literacy perspective advocates literacy learning by interacting with meaningful texts for genuine purposes including enjoyment. This perspective focuses on all aspects of language (semantic, syntactic, and grapho-phonetic), and not merely on phonics.

The instructional implications are that children are not to engage in sequential mastery of phonics as in the earlier perspective but are to engage in literacy in a meaningful manner. Authentic tasks are recommended to promote literacy acquisition. According to Hiebert (1994), authentic tasks 'involve children in immediate use of literacy for enjoyment and communication. They

are not the tasks that have typified school literacy instruction, in which pieces of literacy... have been practiced for some undefined future use' (p. 391). Additionally, literacy learning is considered easier if it is sensible, interesting, and relevant (Goodman, 1986). In terms of texts the recommendation is to use predictable but interesting texts with natural language patterns, not the earlier artificial language patterns.

Ten current publications of Hindi primers were analysed from an emergent literacy perspective. The first level of analysis identifies text structures and the underlying assumptions about literacy acquisition. The second level of analysis assesses the quality of content, style, and interest level of these texts.

Structure of the texts: The analysis of the structure reveals an over-reliance on a traditional phonics approach. In all the primers chapters are constructed around specific letters (specifically on vowels). Generally, they follow the order of Hindi alphabets. Only rarely do they change the order.

The chapters in all primers begin with a list of words (sometimes with illustrations). The words are selected on the basis of similarity of sounds and are in no way connected to each other thematically. For example: (a) *car, bhat, sagar, sarcar, dama, sham, talwar, sal, and kala* (car, rice, sea, government, asthma, evening, sword, year, black) are listed in the same lesson because they have common 'a' (rhyming with car) sound (*Shiksha Bharati*, p.12). (b) *mithas, sitar, barish, palish, takia, bilav, dahina, lifafa, khatia, tikia, nariyal, shanivar, ravivar, cycle* (sweetness, sitar, rain, polish, pillow, cat, right, envelope, bed, tablet, coconut, Saturday, Sunday, cycle) are used in a lesson based on 'i' (vowel in hit) (*Gyan Ganga Praveshika*, p. 37).

Children are supposed to practice reading (sounding out) these words and then given some sentences to read. The list is generally quite lengthy (as many as 84 in one primer). The words are selected on the logic of sound, not meaning. The words have no thematic unity and are disconnected to each other in terms of meaning. Therefore, the only purpose of reading is to practice the sounds mechanically. If one tried reading those words, very tedious reading will result.

The chapters have some sentences following the list of words. The sentences are constructed using the letters and vowel sounds learnt to that point. An effort is made to use almost all

or maximum amount of words with that particular sound. For example: *Sarla idhar aa. Bazar ja kar gazar ka halwa la. Mata ka kahna maan. Namak mat kha. Rama apna samay kharab mat kar. Bazaar ja kar badam la.* (*Shiksha Bharati Pravesika*, p. 13). (Sarla come here. Go to the market and get some carrot halwa. Obey your mother. Don't eat salt. Rama don't waste your time. Go to the market and get some almond). These sentences have at least one word with vowel sound 'a' (rhyming with car). The other words are learnt in the previous chapters. Vowel sounds such as 'i' or 'o' are not utilised because they appear later. Again the primary consideration is to practice the sounds and learn to decode. What the text means is not a major concern. Most often the sentences are not connected (the details will be discussed later). Theme is considered along with letter-sound in few texts, e.g., *Bal Bharti* series.

Since language production is not dictated by specific sounds, the resulting texts are highly unsatisfactory. On analysis of content, style, and interest, there are three major problems with these types of texts: meaninglessness, unnatural language, and uninteresting/irrelevant content.

Content – meaningless texts: Due to the compulsion of using specific sounds, the overall meaning of texts is ignored, leading frequently to absurd texts. The sentences given in each chapter are also constructed on the same logic. The list of words and sometimes sentences have no thematic unity. The only logic of their selection is that of sounds, not meaning. The text structure shows blatant disregard of meaning. As long as the sentences fit into the scheme of correct sound there is no concern whether they make sense or not.

Absurd sentences: There are several examples of absurd sentences in the primers. Due to the restriction of sounds and total disregard for meaning, bizarre sentences are constructed. For example:

- (a) The primers begin with lesson based on 'a' (vowel in but). They are referred to as words without vowels (*matra*) and include vowel sounds if they are not blended with consonant sounds.

Kah. Ish kah. Ose kah (*Bal Manjri*, p. 13). (Say. Say God. Say dew.)

Aam par chadh. (*Deepu Hindi Reader*, p. 17). (Climb on a mango.)

Ek aurat aai. Woh chat par gayi. Khatmal pakad kar utar ayee (Bhasha Sagar Praveshika, p. 20). (A woman came. She went to the roof. She caught a bug and came down.)

- (b) Lesson based on 'i' (vowel in hit): *Gilas sir par mat rakh* (Indradhanush Swar Mala, p. 19). (Don't keep the glass on your head.)
- (c) Lesson based on 'o' (as in coat): *Mote ghore se daro. Chhote ghore se darna uchit nahin* (Bhasha Bodh, p. 38). (Be afraid of fat horse. It is not proper to be afraid of a small horse.)
- (d) Lesson based on 'r' (as in harp): *Sarp mat ban* (Bhasha Sagar Praveshika, p. 14). (Don't become a snake.)

Disconnected texts: Texts without any thematic unity also contribute to meaninglessness. Again the logic of construction is sound, not meaning. Since the sentences are totally independent of each other, the reader doesn't get any help from the context in reading. However, even if the reader can read the sentence the texts hardly encourage meaning construction, as is clear from the examples listed:

- (a) lesson based on 'a' (vowel in but): *Ose par chal. Path par mat thak.*
Jal thal nabh par mat thak. Ab chal yagya kar (Saras Shabda Bodh, p. 8). (Walk on dew. Don't be tired in the road. Don't be tired at water, land, sky. Now perform yagya (a religious ceremony).)
- (b) lesson based on 'i' (vowel in feet): *Vir ban. Tir chala. Geet ga.*
Larki nadi gayi. Woh machhli layegi.
Jalpari ki kahani kah. Larai mat kar.
Bakri bhagi. Hathi aya. Larki giri.

Chil udi. Nani ki chari nikal pari (Hindi Reader. p. 13). (Be brave. Sing a song. The girl went to the river. She will bring fish. Tell a story about mermaid. Don't fight. The goat ran. Elephant came. The girl fell. Grandma's stick came out.)

The texts usually have more disconnected sentences in the early chapters because of the restrictions in terms of the vowel sounds.

Incomplete stories: Sometimes a few sentences are connected but the authors do not feel compelled to maintain the link or build the story. For example:

Lesson on 'u' (vowel in put): Ek kachhua tha. Woh yamuna nadi par gaya. Kachhua pul par chadh gaya. Woh bahut dheemee chal chala. Bulbul aa. Phur phur karti udti ja (Shiksha Bharati, p. 19). (There was a tortoise. He went to the river yamuna. He climbed on the bridge. He moved very slowly. Nightingale come. Fly away).

In this passage the story is abandoned halfway. The last two sentences have nothing to do with the preceding text. Unfortunately, these types of text are not rare. The disregard for meaning displayed by these texts is a matter of serious concern. These texts can only misteach what reading is all about. They are bound to be difficult to read because reading is a sense making activity and these texts do not permit one to make sense.

Style – unnatural language: (a) The sole consideration of phonics results in a highly unnatural language pattern. The sentences are often choppy and lack flow. This happens more so in the beginning lessons as the constraints (in terms of letter) are more. The sentences have to be composed using limited sounds (learned till the point) so that they appear choppy. The following excerpt from a lesson *aao, khana khao* (come, eat food) demonstrates the point:

Aao, Kamla aao. Aao, madan aao. Khana ban gaya. Meera ko saath lao. Aao, khana khao. Sab milkar khana khao. Aao, Meera ko saath lao. Aao, khana khao. Mataji, dal-chawal do. Lo meera, dal-chawal lo. Saag lo, chutney lo. Madan, roti lo, raita lo. Khana chaba-chaba kar khao (Bal Bharati, Part I, pp. 36–37). (Come, Kamla come. Come, Madan come. The food is ready. Bring Meera along. Some, eat food. Eat food together. Come, Meera come. Come, eat the food. Mother, give me rice and daal. Take Meera take rice and dal, Take spinach, take chutney. Madan, take bread, take raita. Chew the food while eating.)

(b) There are constant shifts in the text. For example, the text changes from a series of commands to that of narration and back to command. This is a common occurrence in the texts. It results in a bizarre reading experience. For example, the lesson based on 'u' (vowel in put):

Pul par ja. Gumsum na rah. Gungun mat kar. Chhup kar bat mat sun. kuli saman laya. Darwaja khula tha. Munmun awaz sun kar ayi. Saman dukan ka tha. Uska bhai guria laya tha. Who bahut khush huyi. Burhiya kahani sunati thee. Gulab chun. Hapur ka sabun la. Munmun pul par batua na rakh. Muni ki kutiya ja.

Burhiya rui lai. Kapra bun. (Indradhanush Swar Mala, p. 27).
 (Go to the bridge. Don't be quiet. Don't hum. Don't eavesdrop.
 The porter brought Luggage. The door was open. Munmun heard him. It was from a shop. Her brother brought a doll. She was very happy. The old woman was telling stories. Pick roses. Bring soap from Hapur. Munmun don't keep the wallet on the bridge. Go to the hermit's cottage. The old woman got some cotton. Weave cloth.)

In this case the text begins with a series of commands, shifts to narration and then back to command.

- (c) There are some sounds that are not frequently used in Hindi, for example, 'ri'. However, since it is listed in the alphabet, lessons are devoted to it. In these cases the language changes to very sanskritised Hindi. Since it is not easy in terms of vocabulary one wonders what sense children make of the text. For example:

Kisise ghrina mat karo. trin mrig ka bhojan hain. Mrig vriksha par nahi chadh sakta. prithvi ke jeev-jantu par kripa karo. kise par vayarihat dosh mat lagao (Gyan Ganga Pravesika, p. 66).
 (Don't hate anyone. Grass is deer's food. A deer can't climb the tree. Be kind to the animals of this earth. Don't accuse anyone unnecessarily.)

This lesson is concerned with the sound ri. Due to the compulsion to use this sound several highly sanskritised words are used, e.g., *trin*, *mrig*, *vriksha*, *vritha*. Simpler substitutes are available for all these words in Hindi which are more familiar to children but the need to use these words arises because of the sound 'ri' which appears at the end. The familiarity or difficulty level of the words is disregarded to accommodate this sound.

It is evident that the authors are not concerned with creating readable texts in terms of style. The constraints they work with is bound to make their writing contrived. The effect of such texts will be to hinder literacy development, as natural language patterns help children use their prior knowledge of language to read. Dealing with a language pattern which is totally unfamiliar and lacks any flow can well-alienate children from the literate medium. Emerging readers will deal with unfamiliar medium of literacy with unfamiliar and difficult language.

Irrelevant/boring texts: Very rarely was any attempt made to make the texts relevant or interesting for children. As stated earlier, there is little attempt made to create meaningful texts

so the texts are bound to be irrelevant and boring. Even when there is an attempt to stick to a particular theme, it is rarely interesting because little attention is paid to the style of writing and the story element.

- (a) The texts often contain a series of commands. For example, this excerpt, based on 'o' (vowel in *coat*), illustrates the point; *Dhol bajao. Chor bhagao. Shor na machao. Paathshala chalo. Kitab kholo. Bolkar padho. Dekhkar likho. Tote ko ram-ram ratne do. Coat pahno. Topi pahno. Motor lao* (*Hindi Reader*, p. 19). (Beat drum. Scare the thief. Don't make noise. Go to school. Open the book. Read aloud. See and write. Let the parrot say Ram-Ram. Wear coat. Wear hat. Bring car.)

In almost all primers, the texts use this style of writing. This shows the condescending attitude towards children, who are at the receiving end of these commands. It is unlikely that children would find such texts exciting or worth reading.

- (b) Sometimes they have a very philosophical and moralistic tone. It is highly unlikely that children would enjoy these type of texts. For example: *Nirdhan me ishwar ke darshan kar. barf ki tarah nirmal ban. Nirbhay rah. Sharmanak marg se bach. Jurm mat kar. Baat ka marm samajh* (*Bhasha Sagar Praveshika*, p. 14). (See God in poor. Be pure like snow. Be fearless. Avoid shameful path. Understand the meaning of utterance.)
- (c) Even when the texts are thematically coherent, they often tend to be insipid and dull. They lack the story element and are not concerned with making the text interesting. These texts fare poorly when compared to children's literature. It is unlikely that children will feel motivated to read texts that does not include their point of view or offers anything of interest.

These texts reveal a unidimensional commitment to phonics to the exclusion of other aspects of language. The underlying assumption about reading and literacy acquisition process is more akin to earlier views of reading (reading readiness) than to the more recent perspective of emergent literacy. It can be argued that these texts, instead of promoting literacy learning, might indeed hinder it. The message conveyed to children is that reading is a meaningless, boring activity, without any relevance to their lives, or resemblance to the language they already know. This is

a specially dangerous message for children who have minimal literacy encounters outside school and are solely dependent on schools for literacy learning.

From the cognitive point of view as well, these texts are problematic. Learning of sub-skills and then waiting to add it all together to read meaningful texts is hardly a sensible model of learning how to read. A key function of reading (in this case enjoyment) is totally ignored. These texts certainly ask children to learn to read and then wait to use the skills in some indefinite future.

Though literacy is a major concern, it is surprising that the processes that contribute to effective literacy have been ignored so drastically. It is not that advances in theory building and research in literacy learning and even the major shifts of perspective are recent occurrences. So why have these shifts gone by unnoticed in a country where literacy is such a major issue? Why have these perspectives not influenced the Indian instructional environment?

It is, therefore, imperative to make substantial changes based on recent emergent literacy perspective; to discuss the nature of literacy acquisition and to decide the logical starting point in school. There is also a need to redefine the meaning of an easy text. A text is not easy if it aims to teach one sound at a time. Indeed, the examples in this paper demonstrate that this method makes the text less accessible to children.

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WHAT ABOUT READING?

—JUDITH M. NEWMAN

For quite some time teachers have been concerned about their students 'reading fluency'. It's clear there's a need for continually planned instruction in reading throughout a student's school career since many students seem unable to handle the range of materials we'd like them to read. However, improving students reading fluency doesn't rest only with the teaching of English or Language Arts. Instead, it's important that reading instruction be provided throughout the curriculum. We need to consider how we can adapt instruction across the curriculum to foster reading development. We need to examine ways of integrating instruction in reading with subject instruction as well as explore ways of helping students develop, adequate background knowledge so they can read what we want them to read.

Let's start by looking at the reading process. Many people believe reading begins with the print. But consider the example in Figure 1. At first glance it's unintelligible. Why is that? Our eyes are receiving information from the page; but something is clearly missing. What's missing is the interpretive information we must supply. If I tell you the example is a word, some of you will be able to see it. If I add that the word has been written in white against a black background more of you will find it. I might even need to tell you the word in the example is "ART" before you will be able to see it.

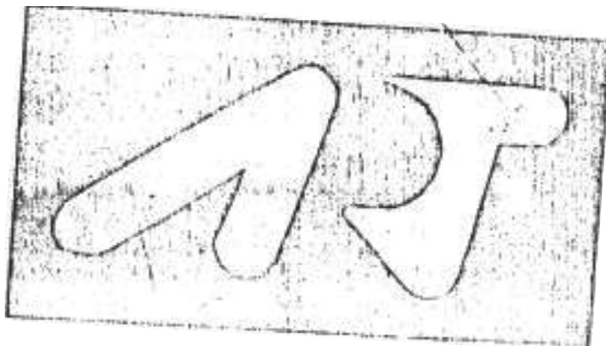


Fig. 1

This example illustrates a fundamental point about seeing, that is seeing is not primarily a visual process (Kolers, 1969). Neither is reading. We gain some information directly from the print through our eyes. Frank Smith (1971) called this “visual information”. But this isn’t the only source of information we use. We also have considerable information stored in our heads, in memory. Which we need to use when we’re reading. Since this information is available, as Smith (1971) says, from behind the eyes, it can be called “non-visual information”. We don’t need to identify every print element in order to understand what we’re reading. Our non-visual information (that is, our knowledge of the world together with what we know about language and how it works) affects the actual perception of print and contributes substantially to our understanding.

Let me illustrate this, with the following print symbol:

B

How it’s perceived depends on the context in which it occurs. When it appears in:

BLACK

we see it as a letter. When it occurs in:

413-7609

We identify it as two numerals. The visual information is the same. What makes the difference is the non-visual information we’ve supplied.

The skill that’s developed in becoming a fluent reader is learning how to use relevant prior knowledge to select the fewest, but most productive, print cues. The amount of attention we need to give the print will vary from moment to moment. If we have a great deal of non-visual information we need to pay relatively little attention to the print. If, on the other hand, we have little prior knowledge to supply, we have to attend more carefully to what’s on the page. The more we know in advance, the easier it is to read; the less we know before-hand, the more difficult it is to understand.

The conceptual information we supply is crucial for understanding written language. Many students, both younger and older, have difficulty reading school materials, not because they don't know how to read, but because they lack sufficient non-visual information. Having insufficient non-visual information is a common experience for everyone. Consider the following passage.

In this example the modulation to E is a passing modulation. The suspension in the inside voice is helpful in avoiding the cadential effect at each final chord of the pattern. The first transposition moves down a major third and the second down a minor third, it being impossible to divide the interval of a perfect fifth (from the initial key, G-sharp, to the desired destination, C-sharp) into two equal parts [Piston, 1962.]

Just as with the "ART" logo and the print symbol that could be either the number 13 or the letter B. The information we need to understand this passage is not on the page. In order to make sense of the paragraph we need to have some knowledge about harmony before we read. Although we have some clues that we're reading about music, if we lack any knowledge of the terms used in the study of harmony we find the meaning of the text is still largely a mystery.

The point being made is this: whether we are fluent readers or not depends largely on the background knowledge we have available to bring to the print. A fluent reader can have difficulty reading when they have little or no prior knowledge to supply. The opposite is also true; less fluent readers can read more easily if the material they are reading is about something with which they are already familiar.

What does this distinction between visual and non-visual information mean for instruction?

Because we know reading is easier when we can bring some prior knowledge to the text, we can simplify reading by making sure our students have adequate background knowledge before asking them to read. Since understanding depends on our being able to relate new information to what we already know, we must help students develop the conceptual background necessary for reading.

How can we help students develop background knowledge? There are a variety of ways we can do that. The instructional choices we have available depend on what the students know already. In some situations students general knowledge is

adequate for understanding. What is required is that their attention be drawn to what they already know. One useful way of doing that is having students brainstorm the topic before they read to make them aware of what information they possess. This enables them to read actively; their reading is guided by the information they have considered in the brainstorming discussion. The questions raised during brainstorming lead them to read for answers.

Most teaching, however, is concerned with helping students develop new knowledge. There are many situations in which it's helpful to provide practical experiences. Students will find a text on animal classification easier to read if they have had an opportunity to observe and sort specimens first. Math books make more sense when students have explored concretely the concepts about which they are reading. History is also easier to understand if a novel or a film about a particular period has preceded a difficult chapter from a textbook or if appropriate artifacts are examined and discussed.

Another way of building background knowledge is through reading itself. The information from one selection on a topic can serve to support reading of another selection; what we learn from the first becomes the foundation for subsequent transactions with text. Sometimes reading a brief selection, simply written, can serve to support students' reading of a more complex passage. Where the ideas are complex, and perhaps difficult to grasp, information from several sources can be used to help students build a general understanding of the topic under discussion. The supporting selections can come from books other than the ones we want the students to be able to read and understand, or they can, if necessity, be written by the teacher.

Developing students reading fluency requires more than attention to word identification or word analysis. We can affect our students reading more directly by helping them develop the knowledge they need for understanding and interpreting a text before we ask them to read it. We need to keep in mind it's the amount of non-visual information readers have that makes reading, difficult or easy. If we expect our students to read without first ensuring that they have some background knowledge, then we're making reading difficult, if on the other hand, we draw their attention to what they already know, if we discuss previously learned concepts and anticipate where they

might lead, if we take the time to provide concrete experiences, as well as a range of reading selections on the same topic, we'll be making reading easier.

We've been discussing non-visual information, prior knowledge, in general terms. We need, however, to consider its precise nature. Specifically, we need to examine the language cue systems which contribute to understanding. Let's begin with a sentence:

Jimmy lived in a small

Suppose we'd encountered this part of the sentence at the bottom of a page. Even before turning the page we've some information about the next word. We know, for example, that it is likely to be a noun or an adjective because other types of words such as verbs, adverbs, prepositions, conjunctions, or articles don't usually follow an adjective. We wouldn't expect to find:

Jimmy lived in a small eat

Or

Jimmy lived in a small of

We'd expect, instead, the name of a place or a type of dwelling to occur next, although another descriptive word would be possible:

Jimmy lived in a small white

Knowing the next word is a noun or an adjective is part of our knowledge about language. Our ability to anticipate a particular part of speech is based on our syntactic knowledge – what we know intuitively about the grammatical rules which govern how language is used.

We also know the next word won't be *elephant* or *telephone*, and it probably won't be *submarine* because although these words are nouns their meaning is inappropriate; they don't refer to small places in which people usually live. Our semantic knowledge, what we know about meaning, restricts our choice of words.

If I added a bit more to the example:

Jimmy lived in a small c.

We could make some guesses about what the word might actually be. We know the next letter won't be, *b*, *f*, or *g* because these letters don't follow *c* in common English words; after *c* we

expect to find either s or n, h, l or r. Our intuitive knowledge of spelling patterns used in English orthographic knowledge, is acquired through experience with reading and writing and helps us anticipate what specific words would occur next.

<i>Jimmy lived in a small</i>	<i>cabin</i>
	<i>church</i>
	<i>clearing</i>
	<i>craft</i>

In other words, we bring to reading our knowledge of language structure – syntactic knowledge, knowledge of the meaning of words and of how certain meanings fit together, semantic knowledge, and knowledge of spelling patterns commonly found in the language – orthographic knowledge. Syntactic information, by indicating the relationships among words, limits the grammatical choices possible; the semantic cues help us predict appropriate meanings within the syntactic constraints. The orthographic cues help us predict specific word choices.

These sources of information – the language cue systems – are used interactively with visual information. The more syntactic, semantic, and orthographic knowledge we can supply, the less we have to rely on the print because we already have some sense of what we expect to see. As we read we use the language cue systems to anticipate what is coming next, to confirm our expectations, and to integrate new information into what we already know.

It was still dark but there was a faint suggestion of a grey luminosity in the east as we felt our way through the bordering poplar bluffs to the slough.

Through the blurred screen of leafless trees, I behold the living silver of the slough, miraculously conjured out of the dark mists. The shimmering surface was rippled by the slow, waking movements of the green-winged teal.

As the dawn approached, the red glare of the morning sun fell on the immaculate mirror of the slough; and then the ducks came to the pond with a great whoosh. They came in such numbers that it seemed the slough would be too small to hold them all.

There is a word in this passage – slough – which many of us haven't seen before. Using our syntactic knowledge we can tell it's a noun because it's preceded each time by *the*, used to identify a

noun. We also can say something about what the word means. We're able to tell it's a place surrounded by trees which for the moment are leafless perhaps because it's winter or early spring. Its surface is being rippled by the movement of the ducks. From the semantic cues we understand the place must be some kind of a pond or small lake.

Many of us won't have ever heard the word used, but we do have some idea now it might be said. It could be like *cough* or *though* or *rough* or *plough*, or *though*. However, being unsure of its pronunciation doesn't prevent our knowing what the word means, pronunciation isn't necessary for understanding the meaning, which we've been able to construct by using syntactic and semantic cues.

What the examples illustrate I think is that an emphasis on pronouncing words detracts from the more important business of understanding them. While it was possible to establish a tentative pronunciation for the word, our semantic and syntactic input contributed substantially more to our understanding.

Yet, instruction is often based on the premise that if we can say a word we'll understand it. That may be true if the word is one we've heard before and we recognise it. However, we meet many words we've never heard used, and being able to say them won't help with understanding. What we will be using are the syntactic and semantic cues to formulate a tentative meaning. Which we'll revise as we gather further information from reading. How can we make use of this information about the language cue systems for reading instruction?

I want to emphasise that I'm not advocating we teach our students about the language cue systems in any formal way, because I'm not sure that making this knowledge explicit would be of much use to them. Being able to talk about the language cue systems is not necessary for fluent reading any more than being able to analyse and describe what we do when we talk makes us better talkers. It is important, however, for teachers to understand what's involved in reading so we can create instructional situations in which students are encouraged to risk using the range of knowledge they have available to them.

In fact, without our realising it, many of our students have become rather adept at using the syntactic cue system. We've often assumed they've understood the concepts we've wanted them to learn when they've been able to answer our questions.

By using word order, function words, inflectional endings, and punctuation, they can often supply “answers” and still lack understanding.

For example:

In scrangle, wizzets were crailing because most furples were glinking a targ of pranialism. This targ of pranialism was the result of many pranial fwumps wanting their own persts.

Why were wizzets in Scrangle crailing?

Because most furples were glinking a targ of pranialism.

Why was there a targ of pranialism?

Because many pranial fwumps wanted their own persats.

Is the following situation, in which students are asked to read and answer questions about the text, very different?

In Europe, tensions were rising because most countries were experiencing a surge of nationalism. This surge of nationalism was the result of many national groups wanting their own governments (Tait and Mould, 1973. p. 307).

Why were tensions in Europe rising?

Because most countries were experiencing a surge of nationalism.

Why was there a surge of nationalism?

Because many national groups wanted their own governments. These “answers” may be demonstrating an ability to manipulate syntactic structure and not an understanding of the concepts.

If we shouldn’t formally teach students about the language cue systems, how, then, can we help them become more adept readers? We can begin by emphasising that the goal in all reading situations is understanding. We can help them realise that they don’t need to identify every word in order to develop a sense of the passage. We need to help students become aware of how they make use of the language cue systems, how they make decisions for handling what doesn’t make sense.

Knowledge about the kinds of decisions readers can make. Another aspect of non-visual information, is largely intuitive. That is, we don’t actually say to ourselves, “What do I do now?” when we encounter something unfamiliar. But as we read, we’re engaged in deciding when to go back and try again and when and how to keep on going. Such decisions are called reading strategies (Goodman and Burke, 1980).

There are three basic types of reading strategies. We predict what is coming next. We confirm our predictions and correct when

our expectations are not verified. We integrate new information into existing knowledge.

Predicting strategies consist of generating expectations on the basis of information from any or all of the available cue systems. Confirming strategies are the result of asking ourselves if what we're reading makes sense. Integrating strategies are involved in the complex process of incorporating the meaning we're constructing into the knowledge we bring to the reading situation. We integrate meanings for unfamiliar words; we integrate complex ideas and relationships as well. We predict, confirm, and integrate on the basis of information from all the cue systems. Try the following passage:

People usually shudder when we mention.....	...(snakes, spiders, slugs murder, war, inflation)
This is unfortunate because most...are harmless and interesting creatures.	(Cross out murder, war, inflation – they're not creatures.)
The mother...cares for her baby just as carefully as a human.	(May be snakes do; slugs spiders lay eggs and leave.)
The...carries her baby with her for the first two weeks of life.	(I don't think snakes carry their young around.)
Like all mammals, she provides it with milk by nursing it.	(Snakes aren't mammals, anyway)
By the time it is two weeks old, its wings are ready for flight.	(Mammals, wings: bats?)
A wing is unusual. It really is a thin skin that stretches from the arm – like front limb, along the body, to the hind leg.	(Bat's) (I didn't know that.)
The flying habits of..... are amazing. Although they	

fly only at night when it
is dark, they never strike
an object.....can not
see in the dark, but they
have a special sense that
warns them before they
fly into an object.

The passage demonstrates how we use predicting, confirming, and integrating strategies. Reading such a passage helps us realise that meaning is constructed from the text as a whole. Through a sampling of the print, readers confirm predictions and predict subsequent meaning; tentative meanings are confirmed or disconfirmed depending on information met later in the passage. Having tried a number of different possibilities – snakes, slugs, war, inflation – most of us have realised we are reading about bats with the reference to wings. Knowing bats are the only mammal which can fly allows us to establish a meaning for the missing word. The remainder of the passage provides confirmation, at the same time offering what may also be some new confirming, and integrating – operate both continuously and in concert.

How can we help students develop more fluent reading strategies? One major objective should be to help them overcome the obstacle of unknown words. Because many non-fluent readers think reading is an exact process, involving the accurate identification of every word, they usually stop when they come to something they don't know. Many of them try at that point to "sound it out" usually with little success. In the meantime they have forgotten what they have been reading about. We need to help students understand that the meaning of the whole doesn't depend on being able to identify every word. We can help them realise there are a variety of decisions they can make when encountering something unfamiliar. They can do what fluent readers do:

- They can try reading on to see if what comes later in the passage offers more information.
- They can try substituting a "placeholder" – something which makes sense until some new information makes it necessary to try something else.
- They can choose to reread, to see if they've missed something which would help specify the meaning.

- They could decide to make no decision for the moment, to read on and later return to what's unfamiliar if it seems crucial.

In other words, we want to encourage students to predict, confirm, and integrate.

An activity which is particularly useful for helping students make meaningful substitutions when they encounter something unfamiliar is *Synonym Substitution* (Goodman and Burke, 1980). In this activity, readers are encouraged to substitute something which makes sense for anything in the text they don't know. The emphasis is upon creating meaning from a context. The students are forced to integrate actively both semantic and syntactic information in order to supply a reasonable "placeholder". The activity demonstrates, to students that they possess non-visual information which can be used for interpreting text. It also encourages the processing of large chunks of language. Students are helped to focus on meaning rather than to rely on the print.

The lesson is used most effectively with small groups. First, each student is asked to read the passage silently. Then each group reads the text together, trying to supply a minimum of two substitutions for each underlined word. The substitutions are written down and discussed later. The most important aspect of the activity is the discussion about meaning which takes place as students try to create an interpretation of the text. This discussion allows them to recognise that there may be a variety of ways of conveying meaning.

For students having considerable difficulty reading, it is useful to begin with an excerpt from a familiar story or fairy tale. With more proficient readers an excerpt from a textbook is appropriate. Let's try a passage ourselves:

*The sea is our ecosystem of last resort. Destroy or seriously **impair** the oceans and we obliterate not only the diverse and bountiful life harboured there, but **ultimately**, ourselves as well. A dead ocean portends a dead earth. Most marine experts are **profoundly** disturbed about this possibility.*

For millennia, man believed that the sea was a bottomless pit into which his offal could be dumped endlessly because the oceans recycled the products of life on earth with ease. However, everytime we put something in or take something

out, it has **an impact**. Despite its vast self-healing ability, scientists are learning how **vulnerable** the sea really is. (adapted from fisher, 1977).

Now, let's try substituting the words.

*The sea is our ecosystem of last resort. Destroy or seriously **impair** (spoil, damage, injure) the oceans and we **obliterate** (wipe out, exterminate, destroy) not only the diverse and bountiful life **harboured** (which lives, which is sheltered or protected) there but **ultimately** (finally, in the end, eventually), ourselves as well. A dead ocean portends (means, threatens, foreshadows) a dead earth. Most marine experts are profoundly disturbed about this possibility.*

*For millennia, man believed that the sea was a bottomless pit into which his **offal** (garbage, waste, rubbish) could be dumped endlessly because the oceans recycled the products of life on earth with ease. However, everytime we put something in or take something out, it has an **impact** (an ability), scientists are learning few **vulnerable** (fragile, defenseless, open to damage) the sea really is.*

Notice that the substitutions need not be single words; sometimes we need to substitute whole phrases and rearrange sentences if we try to understand what we're reading. The activity legitimises the substituting of something meaningful for something unfamiliar in the text. It helps students overcome their fear of unknown words.

Another activity which has the same kind of objective – that is, helping students deal effectively with something (words, sentences, paragraphs, even whole texts) unfamiliar – is *Reader Selected Miscues* developed by Dorothy Watson at the University of Missouri. This activity helps students become aware of the range of options available to them as readers when they encounter something unfamiliar. The students receive a copy of selection and read it silently, marking either with pencils or highlighting pens anything they don't understand or about which they have questions. When they have finished reading and marking the reading material, they take turns discussing what they have marked. They are encouraged to consider which of the items they marked were significant and which were not; which affected their understanding and which didn't. During the discussion the

students are encouraged to return to the material for clarification. Either factual or fictional material can be used for the activity.

Again what the activity demonstrates is that reading involves making sense. Through social interaction students are helped to see that not everyone creates the same interpretation from reading: that one's interpretation is determined by what one knows. What the discussion allows is the development of a consensus and a collective working out of what wasn't understood. The activity demonstrates that it isn't necessary to identify every word on a page in order to understand. It also shows students that the meaning of something unfamiliar can be created from understanding the whole. *Reader selected Miscues* makes "not understanding" legitimate. It helps develop a willingness to use what is understood for clarifying what is unfamiliar.

Not only are we concerned with helping students overcome the obstacle of unfamiliar words, we also want to help them integrate the complex ideas and relationships they are reading about. *Say something*, developed by Jerome Harste of Indian University, helps students explore the relationships between what they know and what is offered in a particular reading selection. In this activity, students choose partners. Each student takes a copy of the reading selection. Before reading, students decide how they will read (orally – in turns or in unison or silently) and how much they will read before stopping and reacting. Students then read and stop at the pre-determined points to "say something". The "something" can be questions they might have which they can discuss: it can be a reaction to what they've read; it might be information they have from other sources which confirms or contradicts what is said in the current selection. After the students have completed reading and discussing the selection they can share their insights and interpretations with other pairs of students.

Say something allows students to read the information in a selection and relate it to what they know. The opportunity to discuss what they are understanding as they read permits students to see how others make sense of written language. The sharing of knowledge facilitates the development of understanding.

Another activity which serves the same purposes was developed by Carol Gillis, a teacher in Columbia, Missouri: *Estimate/Read/Respond/Question*. In this activity, students

begin by glancing through the selection and estimating how far they think they will be able to read with some understanding. The reason for this is to let students see they are often able to understand more than they thought they could. Next they read the selection, they can choose to read independently, in pairs, orally, or silently, stopping for discussion or reading straight, through. Now they respond/retell by discussing what they think they've learned from reading and their reactions to what they've read. At this point, the students write general questions concerning some aspect of the selection that interested them or where they found the meaning unclear. They exchange questions with a partner and answer the questions either orally or in writing. Once again, the activity helps students see the relationship between what they already know and what they are learning from a particular reading.

What all of these activities I've described have in common is a focus on understanding. It is important, at this point, to raise a question which concerns many teachers. Shouldn't students be able to read accurately? By that, most teachers mean shouldn't students be able to replicate what's on the page. The answer is, however, that an interpretation which approaches what an author has intended comes not from closer attention to the print but from being able to supply appropriate non-visual information to the transaction with written language. What each of the foregoing activities emphasise is that reading is an interpretative process. As students become fluent readers they learn to take risks, to ask an essential question: "Is this making sense to me?" They become less and less concerned with getting the words right and more and more concerned with creating meaning. They learn not to depend on the print as their only source of information. Rather, they sample the text on the basis of what they know about language and about the world. They construct meaning which is confirmed or disconfirmed depending on subsequent information. They do a great deal of interpreting and filling in. The social interaction, an integral aspect of each activity, provide the means by which interpretations can be compared and related back to the text itself. The need to understand the author's intent develops from exchanging and comparing interpretations.

As teachers, we must keep in mind that it is the students themselves who must construct meaning. No two individuals reading the same passage will arrive at exactly the same

interpretation. Our interpretations are influenced by our prior knowledge, which is different for everyone. Our role is not to impose our interpretations on our students, but to help them construct understandings of their own, if we want to help students become more fluent readers, we need to encourage them to deal with unfamiliar words and concepts in a variety of ways. We need to help them become more aware of the contextual cues (both syntactic and semantic can be used to construct a tentative meaning). We need to direct students to construct a general understanding of what they are reading before we ask them to consider the details. If we emphasise only the detail, we are likely to force them to become overly concerned with identifying words. We have to create activities in which students are willing to ask being wrong.

The following language story illustrates, I think, the sort of understanding about reading we must help students, develop. I was reading with a fifth grader who was having some difficulty in school. I handed him a passage to read from which several words had been deleted. He took the passage, looked at it, and said, "I can't read this; some words are left out". I suggested he try anyway. He looked at me as though I were foolish; then he began reading. When he'd finished, I asked him to tell me about what he'd done. With a look of astonishment on his face he said, "The words just came out of my head!"

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THE TEACHING OF READING

—G. BRIAN THOMPSON

Teaching has two principal aspects – the motivational and informational. The motivational aspect is concerned, for example, with promoting the learner's security and commitment to learning. The informational aspect is concerned with fostering the learner's knowledge and skill. This review of the teaching of reading considers the second aspect and offers historical and international perspectives on selected current research. The emphasis is on teaching normal progress of children during the initial years of primary schooling, as also are children's reading difficulties.

Early Developments

The Alphabetic Method was the standard method of teaching reading for alphabetic orthographies for at least 3,000 years until the nineteenth century. In this method, the names of the individual letters of the alphabet were first taught to the child, then two-letter syllables such as *ab, eb, ib, ob, ub; ba, be, bi, bo, bu; ac,...* These were spelt orally by naming the component letters and then pronouncing the syllable. The child later graduated to a similar procedure for short words, followed by brief texts which were selected for their significance to the educational aims of the times, for example, the Lord's prayer or the Creed. If children did not know a word, they spelt it orally before attempting to pronounce it (Davies, 1973).

By the second half of the nineteenth century the Alphabetic Method was losing its dominance (Smith, 1965). In the last decade of that century, in New Zealand, a country remote from the main centres of literate population, a book on teaching method was published (Farnie, 1895) which set out three alternatives to the Alphabetic Method. The first was a Phonic Method in which children were taught the most common sound for each letter, for example, */buh/* for *b*. When they did not know a print word they were taught to pronounce the sound for each letter sequentially and then, by approximation, to blend these sounds into a recognisable word. The second alternative was the Look and Say Method. The children were taught to look at the word

as a whole and respond to it without making any response to the individual letters. The third alternative, which Farnie recommended to teachers, was a combination of the 'best points' of the three Methods. In this alternative the alphabet was taught first, then the Look and Say Method, followed by teaching of the sounds of letters (Phonic Method) when this was considered necessary (Farnie, 1895).

Since the nineteenth century, there have been shifts to and fro between the more analytic Phonic Methods and the more global Look and Say. A Phonic Method had been advocated in the sixteenth century by Ickelsamer as more natural than the Alphabetic Method for learning to read German, and by Hart for reading English. However, Phonic Methods were not widely adopted until the nineteenth century. This was also the case with Look and Say which had been advocated in Germany by Lubinus early in the seventeenth century and later carried out by Comenius (Davis, 1973; Hladczuk and Eller, 1992 Chapter 24).

Late in the nineteenth century, the Sentence Method, which was more global than Look and Say was advocated in the United States. The rationale of this method was that language is recognised in whole units that express thought. Hence, the teaching of reading commenced with the meaningful reading of these whole units that are sentence rather than letters or words (Smith, 1965).

Major Contributions and Working

The integrity of literacy activities

From the turn of the century until the 1920s, the Story Method was a quite popular, more global successor to the Sentence Method in the United States. The child commenced reading instruction by listening to complete stories, often from authentic literature, and did not attempt to read the print until familiar with the oral form (Smilth, 1965). Subsequently, in 1960s and 1970s the Language Experience Approach to teaching reading had some influence in several English-speaking countries. In this approach, reading was considered an extension of the language skills which a child had already acquired and the emphasis in teaching was on the purpose of reading as meaningful communication.

The current Whole Language Approach has evolved, in part, from Language Experience. Whole Language, however, has a

stronger emphasis on wholeness and integrity of the literacy activities in which children engage, as well as on meaningful communication. Authentic literature for learners, including beginner readers, is advocated (Goodman, 1989). In fact, the emphasis on literature is such that 'Whole Literature' would seem a better label for the approach. Versions of the approach are currently influential in the United Kingdom, the United States, Canada, and New Zealand (Hladczuk and Eller, 1992). In Russia an experimental reading programme has been developed which aims to educate readers in literature as art (Hladczuk and Eller, 1992, Chapter, 20). From the United States perspective, Harris (1993) has reviewed issues that arise within the literature-based approaches to reading instruction.

Stahl and Miller (1989) have analysed numerous United States studies that compare the reading achievement outcomes of Language Experience and Whole Language programmes with 'basal reader' programmes which ostensibly use less authentic, graded texts and more analytic teaching methods, such as lessons on phonics or on isolated words. An interesting finding was that the more rigorously conducted studies showed no trend favouring either type of teaching programme. However, these outcome comparisons did not include such matters as the readers' evaluations of the texts and response to literature as an art form.

A major issue here is whether in the years of primary schooling children are able to apply criteria to a reading experience in order to form an evaluation that justifies their personal reaction to a literary work. Do they have the ability to objectify their reading experience, and the ability to take multiple perspectives on their experience? Pinsent has reviewed the research literature on children's thinking about their reading experience, from the perspectives of the text, the author, and other readers. The evidence indicates that from 10 years of age children can begin engaging in the task of literary evaluation. From this age they would benefit from teaching which explicitly supports the development of their critical response to literature as an art form.

Word Identification

In the twentieth century, there has been continuing debate about the relative merits of the analytic and global methods for teaching

children to identify print words. This has been an issue for alphabetic orthographies as diverse as the highly regular Serbo-Croatian and Hangul (of South Korea), the fairly regular German (Hladczuk and Eller, 1992) and Russian orthographies (Downing, 1988), and English orthography which has some highly complex letter-phoneme relationships. It has also been an issue in teaching the reading of Chinese; whether to use an analytic method in which characters are grouped by similar visual structures and/or pronunciations, or a more global method in which characters are taught only in a meaningful language context such as a story text (Hladczuk and Eller, 1992, Chapter-4).

Alternative phonic methods have been introduced to provide ways for children to learn how to identify unfamiliar print words. By the 1920s in the United States letter-sound correspondence were sometimes taught by demonstrating common letter – sound components of words. For example, the words *sun*, *saw*, *sat* were presented in print and each pronounced by the teacher with prolongation of the initial sound that is common to the words. Spelling patterns larger than single phonemes were also used, the teacher presenting phonograms such as – at and showing how, by adding other letters, words such as *sat*, *bat*, *fat* are produced. This type of Analytical Phonics was examined in studies by Gates (1928).

The effects on rate of learning of teaching programmes which include an emphasis on Phonics Methods continue to be compared with programmes such as Whole Language that have little or no such emphasis (e.g., Foorman, Francis, Novy and Liberman, 1991). Unfortunately such studies fail to take account of a complete set of potentially confounding variables, such as different vocabularies of print words in programmes and their rate of introduction, teacher effects, teaching time, and learner levels on entry to instruction.

Recently, however, some studies have moved from consideration of outcome levels of achievement to examine whether the processes, or ways of learning, vary in the different teaching approaches when learners have reached the same level of reading achievement (Johnston, Thompson, Fletcher-Flinn and Holligan, 1995; Thompson, Tunmer and Nicholson, 1993). For instance, Connelly, Johnston and Thompson found that when 5 and 6-year-old children taught with a mix of the Phonic Method and reading of story texts were compared with children

in a Whole Language programme, the former were superior in reading totally unfamiliar items (regular pseudowords, e.g., *blum*) but poorer at reading ordinary words with irregular letter-sound correspondences (e.g., *sword*). The children taught phonics showed a small advantage in reading comprehension, probably due to their greater attention to word detail, as indicated by their much slower reading rate.

For identification of words, proponents of the Whole Language Approach usually advocate that the teacher encourage the child to give priority to predictions from the meaning provided by the context of the reading passage. Contrary to this, there is much research evidence showing that the context is little used by readers for identification of familiar words (Perfetti, 1995). For attempting unfamiliar words, context may provide some useful information, particularly for the beginning reader (Nicholson, 1991), but usually only in combination with the reader's use of information from letter-to-sound correspondences. There is evidence that this is the case in New Zealand for children taught by the Whole Language Approach (Tunmer and Chapman, 1997). Recommendations about the teaching of reading can now benefit from the accumulating evidence (Ehri, 1994) about the processes by which children learn to identify words as they develop reading skill.

The Alphabetic Principle

For beginning reading, Ickelsamer in Germany in the sixteenth century urged teachers to take account of how humans first learnt to read and to teach the child how spoken words can be mentally divided into constituent phonemes before teaching the letters (Davies, 1973). In the middle of last century Ushinsky in Russia advocated the Historic Method which was based on how the alphabetic writing system was supposedly invented (Downing, 1988, see also the review by Burnbay, the volumer). As this invention depended on discovery of the set of abstract sound segments which comprise the spoken words of a language, learning about this aspect of spoken words is the first step in teaching the child to read. For example, the child is taught to identify phonemes by selecting several spoken words which contain a particular initial sound, e.g., /k/; and to identify the first phoneme and the last phoneme of a presented spoken word.

This Historic Method was not satisfactorily put into practice, although somewhat similar new methods of beginning reading instruction studied by Elkonin were developed in Russia in the 1960s and 1970s (Downing, 1973, Downing, 1988 Chapter-22).

Knowledge of the alphabetic principle, that letters of words systematically map onto sounds in words, is more than knowledge of sound labels for letters. Children may learn, for example, that /buh/ is an appropriate sound label for the letter b. However, if they cannot identify the phoneme common in spoken words, e.g., /job/ and /crab/, they have not acquired the alphabetic principle. If for normal progress, implicit knowledge of this principle is necessary early in learning to read, then the teacher would need to ensure that knowledge of phoneme identities is acquired early in teaching. Does such knowledge have to await implicit spontaneous induction by the child or can it be fostered by explicit teaching?

Byrne and Fielding – Barnsley (1995) in Australia show that knowledge of phoneme identities can be taught to 4-year-olds over 12 weeks and prior to commencement of their school reading instruction. However, follow up testing after two and three years of schooling, with some teaching of letter-sound correspondences, showed that these children then performed no better than a control group in reading individual words (although they did better on regularly spelt nonsense words). In contrast, Ball and Blachman (1991) show that seven weeks of teaching of phoneme identity, along with sound labels for letters, resulted in an advantage for 5-year-olds in their reading of simple regularly spelt words (constructed from the taught letter-sound labels). The children in this study were in a United States kindergarten programme which did not include systematic reading instruction. It is perhaps surprising that this reading advantage was achieved without also teaching the child how to apply knowledge of the alphabetic principle when attempting unfamiliar words. Teaching such strategies of application may well have facilitated a greater advantage. Tunmer and Chapman describe a Metacognitive Approach which considers the child's strategic knowledge for identification of unfamiliar words.

Reading Comprehension

Much of the child's skill which is often classified as reading comprehension is more properly considered language

comprehension, which is not specific to reading (Thompson, Tunmer and Nicholson, 1993). The principal issue here, however, is whether the development of the skill of understanding printed texts can benefit from explicit teaching. This has been an issue in several countries. For example, in Japan some approaches to teaching reading comprehension have been more explicit and analytical, and others more global (Downing, 1973). In the United States since the 1980s there has been much interest in a model of teaching reading comprehension in which the child is taught several strategies and when and why each should be used (Dole, Duffy, Toehler and Pearson, 1991; Pearson and Fielding, 1991). A number of researchers in the United States have attempted to determine whether such strategies can in fact be taught and whether the learner can apply them successfully to previously unseen texts in the same content area. There are, however, only a few research studies which come close to rigorous standards of methodology (Pressley et al., 1989). Rapnael and Wonnacott (1985) found that 9-year-old students could be taught to recognise that the information for comprehension questions may be either explicit in the text, that it may be inferred by relating information from different locations in the text, or that it may have to be supplied from the reader's background knowledge. Dewitz, Carr and Patberg (1987) found that 10-year-old students could be taught to integrate their knowledge with the text information and (to a lesser extent) consider the structural organisation of the text information.

There are objections to this approach to teaching reading comprehension. One is that teaching the strategies is unnecessary if students are motivated to read and are not attempting texts which exceed their level of understanding (Carver, 1987). Another objection is that the explanations about when and how to use the strategies will become more demanding for the reader than the comprehension activity itself (Pearson and Fielding, 1991). Yet another objection is that strategy instruction in the classroom has been too unidirectional, from teacher to students, and has not provided for teacher responsiveness to students or transactional teaching. Pressley et al., (1992) have reported on teaching which is intended to confront this particular objection and, rather than be limited to a concern with the extraction of ideas, also takes account of the readers' varied interpretations and emotional and aesthetic responses to the text.

Future Directions

There is now emerging a realisation that the beginning reader can acquire and use the alphabetic principle in several different ways. The child may use sounds for letters as simple taught instances of the principle in order to 'sound out' unfamiliar print words. In another way, the beginning reader can acquire untaught instances of the alphabetic principle by self-teaching, or induction, of knowledge of patterns of letter-sound relations inherent in their accumulating reading vocabulary (e.g., the print words *sit*, *cat*, *not* have a common final letter and sound; *ball*, *fall*, *wall* have common letters and sounds). Such self-taught knowledge of letter-sound patterns can be used in the child's attempts to identify unfamiliar words (Thompson, Cottrell and Fletcher-Flinn, 1996; Thompson and Nicholson). There is yet a third way for using the alphabetic principle. The child may use an analogy word, for example, *jump*, as a prompt in attempting to identify an unfamiliar word, for example, *hump*. There has been recent research on the child's use of analogy prompts, which has led to the advocacy of teaching by analogies for beginning readers. Unfortunately, advocates have ignored long standing evidence that teaching by analogies is less effective for initial learning than teaching by sounds of letters (Sullivan, Okada and Niedermeyer, 1971). To make effective spontaneous use of analogies for word identification requires the child to find an analogue word from an existing reading vocabulary. Unless this reading vocabulary is extensive enough, effective use of analogy will be very limited.

Phonics teaching provides the child with a limited number of taught instances of the alphabetic principle. It is not yet clear how much of such teaching is advantageous for the child's self-teaching of untaught instances of the principle. In a complex orthography such as English, explicit attention to each of the very large number of patterns of letter-sound relations would be overwhelming for both teacher and child. Some non-conscious self-teaching of knowledge of these patterns takes place. Future theories to provide the teacher with grace of monitoring when to provide explicit analytic teaching and when not, and how to determine how much is enough for particular students. Moreover, it should show how to effectively teach the child to apply the results of any such analytic teaching in literacy activities.

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READING

—C. PETER RUSSELL

*How do we learn to read?
What do we see when we read?
Why read left to right?
How can reading be speeded up?
And without losing comprehension?
What is the best method of study?*

Before 1950 most people were taught to read English by what is called the Alphabet Method. In this system children first learn the twenty-six letters of the alphabet. They then learn particular sounds for each of the letters of the alphabet, having to remember that the same letter can sometimes take different sounds, such as the *c* in *civil* and in *cavil*, and that different letters can sometimes indicate the same sound, such as *g* and *j* in *gib* and *jib*. The children then learn to put the sounds together to make syllables and simple words.

Up to this point the process has been done “out loud” so that the teacher can check on the sounds the children are making. The next step is to teach them to read silently. The children begin by saying the words to themselves, then they are taught to read “silently”, and finally to read without moving their lips. They are probably still pointing to the words they read, and so the last stage in this method is to persuade the children to stop pointing at the words and to read with their eyes alone.

Further progress is made by giving the child progressively more complex books, expanding his vocabulary and knowledge of grammar, so that by the time he leaves junior high school he can hopefully read most of the material he encounters.

Unfortunately this method has several disadvantages. A major handicap is the complex relationship of the letters and the sounds they represent, which slow down a child’s rate of learning. As one reading teacher put it, “*ay*” is for ‘apple’, “*bee*” is for ‘book’, “*sea*” is for “confusion”.

Since the 1950s a wide variety of techniques have evolved that have attempted to overcome the failing of the Alphabet Method.

One of the most common of these is the “Look-Say Method”. The child is given pictures of a familiar object, such as a cup, and underneath it in large letters is written its name, *cup*. Initially the child is not taught the alphabet but simple words and their associated sounds and meanings. Other techniques have concentrated on adding extra symbols to the normal alphabet so that there is a more direct relationship between the letters and their sounds. In the “Initial Teaching Alphabet”, or i.t.a., the twenty-six letters of the English alphabet are augmented by eighteen additional signs so as to cover most of the phonetic range of speech. And in the Diacritical Marking System the normal alphabet is used with additional signs to indicate how letters should be pronounced. In another system, the Colour System, the normal twenty-six-letter alphabet is used and each letter is printed in one of forty-eight different colours, each colour indicating a specific sound. The current trend is towards combining the best elements of each system, making full use of imagery, colour, association, and other factors that help learning.

All these systems undoubtedly have their own advantages, but they are concerned only with teaching basic recognition of letters and words. They do not of themselves help children to increase their “silent reading” speed, to read more effectively, nor to remember what they read.

Children are normally considered to have learnt to read once they are reading silently without moving their lips and without tracing the words with their fingers. But in terms of the fantastic amount of visual information that the brain can take in and retain, they are all very poor readers.

Most of us, even as adults, “hear” the words we are reading. We may not go so far as to sub-vocalise the words – that is, “say” them to ourselves – but the sound of the word is still there. Most people cannot “hear” more than around two hundred to three hundred words per minute, and this rate becomes a limit to our normal reading speed. We have simply not been taught how to read visually. This would speed up our reading to several thousand words per minute. Nor have we been taught how to maximise both our comprehension and our retention of what is read. Learning to read is seen as learning to recognise the letters and put them into words. Yet these are really only the first stages in the reading process.

The word *reading* comes from the Anglo-Saxon *raedan*, “to advise oneself”. It does not mean just the ability to interpret the symbols on a page and know the words they form; it is also the ability to advise oneself of the meaning and significance of what is being seen. Buzan, who advocates a similar broader interpretation of reading, defines it as a seven-stage process:

1. Assimilation of the visual data by the eye
2. Recognition of the letters and words
3. Understanding; relating the words being read to the meaning of the passage as a whole
4. Comprehension; relating the information to one’s whole body of knowledge
5. Storing the information in memory efficiently and effectively
6. Recalling the information where and when it is needed
7. Making effective use of the information and communicating it successfully to others; and also communicating it to oneself, that is, thinking clearly.¹

By this definition we can see that most standard approaches to reading deal mainly with the first two stages. Comprehension tests may measure the third and fourth to some extent, but children are given little help on *how* to comprehend and integrate the material properly, nor on how to ensure it is remembered.

The Eye and its Movements

In order to understand how we read and how reading may be improved, we must first look a little at how the eye works.

Light entering the eye is focused by the lens onto the retina, which lines the inside of the eye. The retina itself consists of hundreds of millions of tiny cells responsive to light- equivalent to the population of the U.S.A. squeezed onto a postage stamp. Some cells, the cones, respond to specific colours; others, the rods, to the overall light intensity. These cells are connected to a web of nerves extending over the retina, and these nerves relay information directly back to the brain. In fact, the retina is not really separate from the brain, it should be properly thought of as an extension of the cortex.

The centre of the retina, called the fovea, is a small area in which the cells are much more tightly packed. These two thousand cones are packed into an area less than one tenth of a millimeter square. The perception of images falling on the fovea

is much sharper and finer than elsewhere on the retina. When we are looking directly at something, the light from that object is falling on the fovea. The fovea sees less than one forty-thousandth of the total visual field. If you are looking at a line of print from a distance of two feet, only about three letters are in this central field of vision, and only those few letters are seen perfectly at any one time. The further images are from the fovea, the less clear the vision becomes, until at the periphery of the visual field you receive only very faint visual impressions.

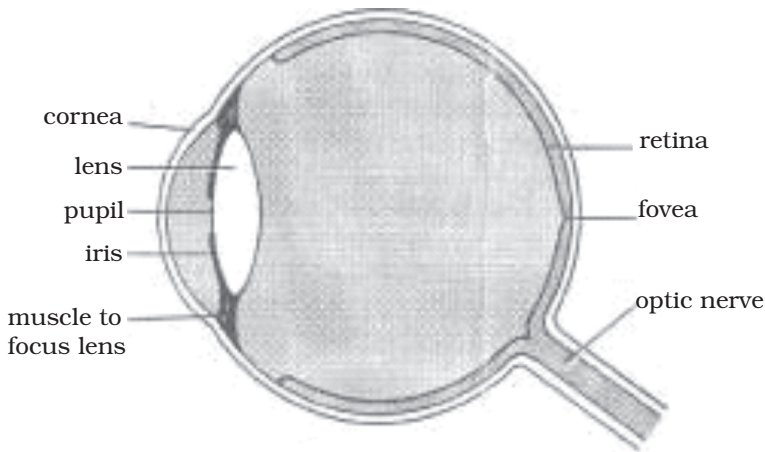


Fig. 1

Figure 1 Simplified diagram of the human eye. The retina contains several hundred million light-sensitive cells. They are most closely packed at the fovea, the centre of the visual field where vision is most acute (a quarter of a million cells per square millimeter).

The fact that we see most clearly that which we are looking at directly has two important implications for reading:

1. The eye must move along the text so that different parts of the line are brought into focus at the fovea.
2. To see anything clearly, the eye actually has to stop moving for a fraction of a second in order that a still image can rest on the fovea and be transmitted back to the brain.

Thus, the eye takes short gulps of information. In between it is not actually seeing anything; it is moving from one point to another. We do not notice these jumps because the information

is held over in the brain and integrated from one fixation to the next so that we can perceive a smooth flow.

The first person to discover that the eye did not move smoothly was Professor Javal, at the University of Paris, in 1879. Javal called these movements *saccades*, French for “jerks”, and since then psychologists have talked of these movements as “saccadic eye movements”. The eye is rarely still for more than half a second.

Even when you feel the eye is completely still (as when you look steadily at the period at the end of this sentence), it will in fact be making a number of small movements around the dot. In fact, if the eye were not continually shifting in this way, the image would rapidly fade and disappear.

Eye Movements in Reading

The first attempts to carry out a detailed study on the speed of the eye movements, the duration of the stopovers, and the number of fixations per line were by Edmund Huey, who published his pioneering work, *The Psychology and Pedagogy of Reading*, in 1908.² To this day it remains one of the most comprehensive and accessible studies on reading.

Huey found that the eye takes about a quarter of a second to move from one point of fixation to the next. Thus, it is limited to about four fixations per second. Each fixation of an average reader will take in two or three words, so that to read a line of this book probably takes between three and six fixations. The duration of the stops and the length of the jumps will vary considerably, according to both the material being read and the individual's skill. The more skilled the reader, the more will be taken in by a single fixation.

You can see for yourself the way the eye moves during reading by asking a friend to read from a book, holding it up in the manner shown in Figure 2 so that you can watch the eyes as they move along the line.

The visual information is picked up by the eye in a few hundredths of a second, and is quickly sent on its way to the brain. The brain itself takes between a quarter and a half of a second to process and recognise the visual data. While this is taking place, the eye is already moving on to the next point of fixation, and often on to further fixation points. Thus, the eye will usually be a phrase or two ahead of what one is conscious of reading.

Although the sharpest perception occurs at the fovea, images that are off-centre are still seen but less clearly. This off-centre vision is called peripheral vision. We often talk of it as “seeing out of the corner of the eye”.

Peripheral vision performs a most valuable function during reading. Words that lie ahead of the current point of fixation will be partially received by the eye and transmitted to the brain. On the basis of this slightly blurred view of what is coming, the brain will tell the eye where to move to next. Thus, the eye does not move along the line in a regular series of jumps but skips redundant words and concentrates on the most useful and distinguishing parts of the text.

Most readers do not continue to read along the line in a steady sequence. Much of the time their eyes are jumping back to check on words already “read”, and even on words in the preceding line. This back-skipping is called regression. Generally, the more skilled the reader, the less regression there is. In a study of five thousand readers it was found that 25 per cent of the eye movements made by children were regressive, as were 15 per cent of those made by adults.³ Many of these regressive movements are unnecessary. They are not based on lack of comprehension so much as apprehension and fear that one may have missed something.

Huey found that the fixation points tend to be concentrated toward the middle of a line of print. When the eye goes to a new line, it does not usually start at the beginning; instead it starts a word or two in from the edge. The brain has a good idea of what is to come from the sense of the previous lines and only needs to check with peripheral vision that the first few words are as anticipated. Similarly, the eye usually makes its last fixation a word or two short of the end of a line, again making use of peripheral vision to check that the last few words are as expected.

Why Read Left to Right?

What we see to our left (the left visual field) falls on the right retina of each eye and is transmitted to the right side of the brain. Conversely, the right visual field of each eye is transmitted to the left side of the brain. Since the left hemisphere is better at verbal tasks, whatever lies in the right visual field will have its verbal content processed more quickly than that which lies in the left. Experiments have shown that when words are briefly flashed

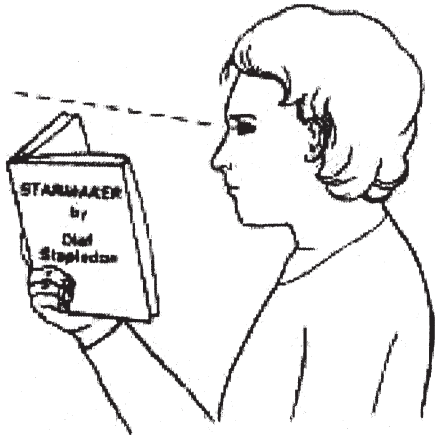


Fig. 2: Watch someone reading and observe his eye movements.

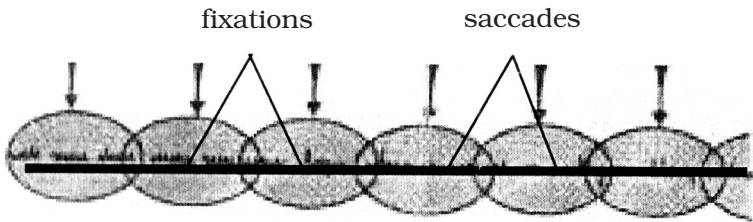


Fig. 3: The eye moves along a line of print in steps, taking in the section of the line which is at the centre of vision at each fixations.

to either the left or right visual fields, the words flashed to the right are recognised more quickly than those flashed to the left.⁴ If a person is reading from left to right, the material that has not yet been read, but which is nevertheless being processed peripherally, is being received by the left side of the brain, more specialised at verbal processing. Reading right to left, on the other hand, results in the material yet to be read being processed by the right hemisphere, which is not as good at verbal tasks, with the result that the brain would have a poorer idea of what is to come. This implies that it is intrinsically easier to read languages written from left to right. Studies of different systems have shown that not only is left-right reading more efficient, it is also better for the brain itself. The two halves of the brain of the left-to-right readers become more adept at working together and better able to integrate verbal and spatial tasks. The two halves of the right-to-left readers' brains did not work together so well.⁵



Fig. 4: Typical eye movements down a page of print, concentrated more toward centre of page.

Recognition

Once the visual information has been received by the brain, it has to be recognised and given meaning. As soon as the data arrive at the visual cortex at the back of the brain, they undergo feature analysis. The data are broken up into their basic constituents of lines, curves and angles, the whole process taking only a few hundredths of a second.

To some extent, letters are recognised on this basis. Experiments have shown that when letters are briefly flashed onto a screen and a person is asked to call out what the letter was, any wrong letters called out tend to be letters with similar features; a *P*, for example, may be confused with a *B*, or an *F*.⁶ Further evidence for feature recognition comes from the finding that when a person is required to search for a particular letter among a series of letters, he takes much longer when the other letters contain similar features to the letter searched for.⁷

Feature analysis cannot, however, explain how ‘A’ written in different styles are all easily recongnised as the letter A. Here the features involved vary considerably from one typeface to the next. It appears that letters are also recongnised holistically, that is, as informational wholes in their own right.

Not only are individual letters recognised holistically, but common words are often recongnised and treated as single units. As far back as 1886 it was discovered that people were better at recognising a series of letters flashed briefly before them if the letters formed meaningful words.⁸ It has also been found that

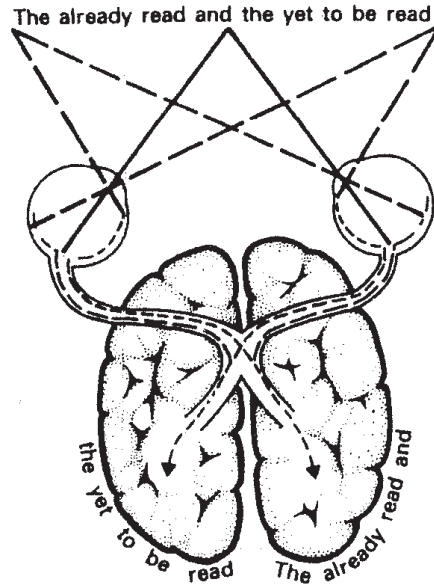


Fig 5: Schematic diagram of the visual processing of a line of text.

When reading left to right, the material yet to be read is taken in with peripheral vision and analysed for content by the linguistic left hemisphere. This helps the brain decide the best next point of fixation and increases the efficiency of reading.

a person who is a little too far away from a word to be able to recognise the individual letters can still recognise the word as a whole.⁹ Words can also be recognised when they are in peripheral vision and the individual letters are too blurred to be recognised.¹⁰ As with letters, words that have their own characteristic shape are more easily recognised than words with shapes similar to others.

Earlier it was shown that immediate memory span depends on the number of “chunks” rather than the information content. The same is true of reading. When we read, we can take in about five chunks at a time. A chunk may be a single letter, a syllable, a word or even a small phrase. The more meaningful the material, the easier it is to understand, and the larger will be the chunks. Strings of random letters such as *krplztgf* are read very slowly, letter by letter. Nonsense words such as *bidnolleck* that approximate English words in structure will probably be read syllable by syllable. A phrase such as *the differentiated effects of temporal neocortical resections on overtrained and non-overtrained*

visual habits in monkeys (sic) that is difficult to understand will be read word by word. But an easy passage will be “chunked” into groups of words and phrases.

Redundancy

There is a large amount of redundancy in printed English, and much of the material can often be omitted without any loss in meaning. Much of each letter’s structure is redundant and phrases can still be read even though parts of each letter may be missing. The brain knows that only certain arrangements of lines and curves are going to occur and fits in the letters according to the general gist of the whole thing. It is this redundancy that allows a pharmacist to read a doctor’s prescription. The reason many people find doctor’s prescriptions illegible is that they are searching for the correct word out of millions of possibilities. The pharmacist making up the prescription has only to pick the right word from a few hundred possibilities. This means that the writing need contain less information and that more of it is redundant. Not only can parts of the letters be omitted, but whole letters can be dropped. Sntncs wtht vwls cn b rd, and so can th.se wi.h eve.y fif.h let.er mi.sing. Similarly, every fifth word... be omitted from a... without losing the meaning. The general meaning and grammatical structure of a sentence, help the reader anticipate what is to follow. A sentence that begins “We write more words than necessary for...” is unlikely to be followed by words such as *cats, visitors, plastic, philodendron*. It is much more likely to be followed by such words as *comprehension, recognition or understanding*. The reader has to determine merely whether the word is one out of ten rather than one out of millions. Only a little information is needed, and this information can usually be gained from peripheral vision, without having to fixate upon the word itself.

By helping us anticipate what is to come, redundancy speeds up the reading process. We read what we expect to read, and faster, more expert reader will probably have corrected the errors in this sentence without realising it.

Skilled Reading

Reading speed can be increased considerably by—

Eliminating regression;

A very simple and convenient way of examining the normal reading process is to read material upside down. This slows down the process sufficiently for you to begin to become aware of the operations involved. At first it seems very strange. You may start by reading syllable by syllable, much as a child does at first, then after a few lines you begin to take in complete words more easily, and later simple phrases become readable. As you continue, you will find your reading speeding up and will probably notice that you do not read the whole of a word – probably the first letter or two and the last letter or two are sufficient and your guess at the rest, only coming back to it if in the light of the rest of the sentence you realise your guess was wrong. And where you come across phrases that are very common, you will find yourself reading them quite rapidly. You may also begin to notice how the eye fixates on the most distinguishing features of a word or phrase. By slowing down the reading process in this manner you become directly aware of the importance of context. If you continue to practice like this for ten minutes or more, you will find reading steadily speeding up as you get more proficient at reading larger chunks at a time.

Expanding the focus of fixation;
 Making greater use of peripheral vision;
 Making greater use of redundancy;
 Increasing motivation;
 Previewing the material; and
 Using the right side of the brain as much as the left.

Early speed-reading techniques were based on tachistoscope training. A tachistoscope is an instrument for presenting very brief flashes of a picture. In speed-reading techniques the tachistoscope gives a brief glimpse of a few words from a line and then moves on to show the next few words. Regression becomes impossible, and since more words are included in each flash, the subject is forced to take in progressively larger units with each fixation. Using such techniques it is possible to increase a person's reading speed from 250 or so words per minute to 500 or 600 words per minute.

Doubling your reading speed may sound a considerable achievement, but it is not, in fact, that large an increase. With modern techniques of skilled reading it is possible to increase your rate to 2,000 or more words per minute. Two limiting factors

in the tachistoscopic approach are that it does not develop peripheral vision, nor does it make use of many of the findings about how we assimilate and recognise written material.¹¹

Visual Guides

A visual guide is a pointer, such as the blunt end of a pencil or a fingertip, moved along underneath a line of print. To many people it might seem a backward step to start using a visual guide again. Were we not taught very early on at school that pointing to the words as we read only slows us down? How then is it being claimed to speed up reading?

Try moving your finger backward and forward as fast as possible. You will probably find you can do so at least five times a second, which is ten times faster than the eyes normally move along a line of print. So following the finger cannot in itself slow down reading. The reason children are discouraged from pointing to the words as they read them is that stopping to point *at each individual word* can indeed slow up the process. But if instead of pointing at each word the finger is moved along smoothly underneath the line of text, it can actually speed up reading.

A visual guide improves reading in three ways:

1. If the eye is trained to follow the visual guide, then most unnecessary back-skipping is eliminated.
2. Deliberately speeding up the visual guide will help the eye to move along faster.
3. The number of fixations is limited to about four or five per second. As the eye moves faster, it is encouraged to take in more words with each fixation. This increases the meaningful content of the material so that comprehension actually improves.

A visual guide used in this way in practical situations has been found to increase reading speeds by an average of 50 per cent.¹² In one study it was shown that a visual guide halved regression (from 1.37 back-skips per ten words to 0.77) and increased the span of fixation by 60 per cent (from 2.15 words to 3.50 words). Together these two improvements led to an increase in speed from 274 words per minute to 465 words per minute.¹³ This is already approaching the level normally attained by several weeks of tachistoscopic training!

Expanded Focus

Since written English is highly redundant, a large proportion of the information in a text can be absorbed through peripheral vision. Words that are highly likely to occur in a given context do not have to be checked by looking directly at them – peripheral vision can check that they are what is expected even while the eye is fixating elsewhere. Thus, many skilled readers do not read along each line but read from side to side of the centre of the page, taking in most of a line in one glance.

The central area of clear vision extends not only in a horizontal direction but also vertically. Although we may not realise it, when we look at a word in a line, we are also getting a fairly clear impression of the words a line or two above and below. Very fast readers make use of this and can take in two or more lines with one fixation.

Visual guides are again very useful for developing peripheral vision. Instead of moving the guide along individual lines, move it down the middle of the page, following it with the eye. The high redundancy in written language often allows you to use the incomplete peripheral information and still gain as much understanding as you would by fixating on each word or phrase.

Making a fuller use of peripheral vision, the skilled reader is able to get a better idea of the general sense of what is to follow, and this also helps to speed up reading. Furthermore, with this broader overview it is easier to understand and integrate the material. This is why many people find that as soon as they start speed reading, their comprehension actually increases. They have a broader perspective of what they are reading, and since they are reading faster, the short-term memory for what has just been read goes back several sentences further and those words being read are understood within a larger immediate context.

The importance of context in aiding both understanding and speed becomes apparent if you try reading the following passage as it stands:

With hocked gems financing him, our hero bravely defied all scornful laughter that tried to prevent his scheme. “Your eyes deceive”, he said. “It is like an egg, not a table”. Now three sturdy sisters sought proof. Forging along, sometimes through calm vastness, yet more often over turbulent peaks and valleys,

days became weeks as many doubters spread fearful rumours about the edge. At last, from nowhere welcomed winged creatures appeared, signifying momentous success.

Each sentence is simple enough; the grammar is straightforward, and the words are common. The reason you probably found yourself reading it slowly was because you simply had very little idea of what it was about. And if you did manage to make sense of it, it was probably only after much time spent reading it several times through (or of looking down here first). But once you know that it is about Christopher Columbus discovering America, you can read it much more easily, much faster, and remember it better.

In addition to the redundancy in letters and words mentioned earlier, whole phrases, and even sentences, are sometimes redundant. Often sentences are only elaborating on other sentences or putting them in different words; they can be omitted without loss of meaning. The efficient reader will recognise this from various clues in the text and skip ahead, checking with just a glance or two that no new information is being added. Since the main theme of a paragraph is often stated at the start, many skilled readers read only the first sentence of a paragraph, doing so with one or two fixations, merely checking the rest of the text with peripheral vision.

Obviously the degree to which skimming is possible depends largely on the type of text being read. In very condensed concise passages it may well be necessary to read every sentence. Conversely, with highly redundant material it may not even be necessary to check each paragraph. The important thing is to be flexible. Go slowly when you need to and fast whenever you want to and the material allows you to.

High-speed Training

In high-speed training the reader is forced to scan pages of print at speeds many times faster than normal reading. The reader starts by moving the visual guide as fast as physically possible along each line, not worrying if very little is absorbed. Then he begins moving the guide down the page, increasing the pace every few minutes until he is spending only one second on each page. At this speed very little, if anything will be absorbed. After about five minutes of high-speed training, the person goes back to reading at what he takes to be a normal speed. He will probably

find, however, that he is reading at double his usual speed and yet with the same or even greater comprehension.

This training breaks the habit of reading at a set pace. It is rather like driving down a highway at eighty miles an hour for a long period, and then being asked to slow down to thirty miles an hour. If you try to do this without looking at the speedometer, you will probably think you are at thirty when in fact you are still doing fifty.

High-speed training has two other advantages: It encourages you to see the key words in the text, and it brings the right side of the brain into the reading process.

When you first start high-speed training, spending only a second on each page of the book, everything seems to be a blur and nothing is absorbed. But after a few minutes an interesting phenomenon may occur. You may find that a few of the words are in fact being seen. This by itself is not remarkable. What is significant is that the words that are being picked out are generally the nouns and verbs in the text. Moreover they are often the nouns and verbs. The fact that these words are being picked out implies that, although the page of print is not being consciously read in detail, most of the page is nevertheless being processed by the brain. And being processed in only a second! The high-speed training develops this ability to extract the relevant words from a page.

A person learning to read finds it easy to stop saying the words aloud and not difficult to stop sub-vocalising (moving the throat); but many people find it difficult to stop hearing the words they are reading, and this limits their speed to 250 or so words per minute. High-speed training breaks the habit. At a page a second you cannot hear many of the words, but you can still take in the page visually, for visual processing is many times faster. This shift in processing corresponds to a shift from the left hemisphere to the right. When you slow down again to "normal" speeds, the right hemisphere stays enlivened, words continue to be taken in visually, and reading is correspondingly faster. It is only when the shift is made from auditory to visual reading that high speeds become possible. Indeed, it could be said that until you have made this shift, you have not fully learned to read.

Florence Schale, at Northwest University, has integrated many of these different approaches to skilled reading and taught them to large numbers of people. She found that most people

were capable of reading at what would normally be considered very high speeds: two thousand or more words per minute. In a study of fifteen hundred people she also found fifteen people who, after suitable training, were capable of reading at even higher rates of twenty thousand words per minute – and still with a comprehension rate of 70 per cent or more! (Seventy per cent is good: People reading at “normal” speeds of two hundred or three hundred words per minute seldom score better than this). The most advanced subjects were able to take in two columns of print simultaneously by scanning down the centre of the page. The readers themselves did not claim to have “photographic” memory, but they reported that the key words in the passages stood out and that they read enough key words to complete the thoughts of the passage meaningfully. One subject, a fifteen-year-old girl, could even scan material at the rate of eighty thousand words per minute, with 100 per cent comprehension!¹⁴

Application to Study

It is of little value to be able to read at two thousand or even twenty thousand words per minute if half an hour later 90 per cent of the information has been forgotten. Reading, as was defined by Buzan includes not only the assimilation and recognition of the written material but also understanding, comprehension, retention, recall and communication.

The principal reason many people find themselves forgetting what they have read is that as children they were rarely given guidance on memory and study. The most common approach to study of a new text is a linear one, typified as the “start and slog” approach. The reader opens the book at page 1 and reads the book through to the end—if, that is, he does not give up out of boredom or fatigue halfway through. This might seem the obvious approach, since most books do appear to start inside the front cover and end just before the back cover. But a linear approach is, in fact an inefficient use of both the reader’s time and knowledge and has a number of serious disadvantages:

- Time is wasted going over material that is already familiar.
- Time is wasted covering material that is irrelevant to the study in question.
- Time may be wasted wading through large chunks of text only to find that the author has conveniently summed up the essence of a chapter in a short summary at the end.

- The reader has no overall perspective until he *finishes* the text, and possibly not even then.
- Association and organisation are poor, and this leads to poor recall of the information.
- Any information that is retained is usually disorganised; it is seldom well integrated with the rest of the book nor with the reader's whole body of knowledge.
- Motivation is low and the reader tends to become bored, dull and tired. The more tired he becomes, the less efficiently he reads, the less he remembers, and the less motivated he will be to read again.

Numerous books have been written on the subject of study, and nearly all agree that a book should be approached as a whole. The reader should start with some sort of plan and overview in order to get a general feel of the ground, setting definite goals and aims, selecting relevant portions, and rejecting irrelevant ones. A linear approach to study is like going shopping by systematically walking along each street, going into every store, and walking through every floor of each store picking up here and there any items required. Holistic study, on the other hand, parallels the normal activity of shopping. One prepares a list of what is required, goes down only the relevant streets, window-shopping as one goes to get a preview of what is available, selecting the few stores that contain all that one needs. In approaching any sort of study, the following practices will all be valuable:

1. *Plan the Session* – Do not just rush into the text, but set aside a definite time and definite areas to be covered.
2. *Review your current knowledge of the subject* – This increases expectancy of what is to come, bringing to the fore the relevant mental hooks, which improves the retention of what is being read. The best way to do this is to make a quick mind map of your current knowledge.
3. *Establish objectives* – This sets the right mental hooks in advance. In addition it helps you select the relevant and reject the irrelevant.
4. *Overview the material* – This clarifies the aims and goals and gives you an overall perspective of the subject covered. It also makes use of the “warm-up” effect. During overview you should not be reading any of the text itself. Look at:

Title and sub-title – They are not trivial. Their implications may affect your approach to the book.

Author – If he is known to you already, you have a good idea of the level at which the book will be pitched. You may not need a popularisation, for example.

Date of publication – This will indicate whether the material is up to date, where that is pertinent.

Table of contents – Study them carefully. You will begin to have a general feel for the layout of the book and which parts are going to be of greatest interest and relevance.

Index – Indexes are not only valuable for finding passages. Quickly running through the index at this stage will give you a fuller idea of the topics covered and how much attention is paid to each.

Diagram, pictures, graphs and other visuals – Visual information is better absorbed and remembered than verbal information and often summarises large portions of text.

Dust-jacket flaps/back cover – These provide a good overview.

Preface – Nearly always written last, it will, if short, often provide an excellent summary, and usually a statement of purpose for the book and/or a note on the author's perspective on the subject.

All the foregoing will probably take a minute or two yet will save you many times this. You will begin to know how much of the book is going to be valuable and will not be wasting time on irrelevancies, repetitions, and that which you already know. If, for example, you practice hang-gliding as a regular hobby and pick up a book entitled *A guide to Hang-Gliding*, You may well find after a minute's overview that there is nothing in the book new to you.

You will have effectively read the book in a minute and need spend no more time with it.

5. *Preview* – Get a close feel for the book as a whole by flipping through, looking at:

Beginnings and ends of chapters.

Sub-section headings.

Summaries the author may have provided.

Anything else which catches the eye-bold print, italicised Sections, etc.

6. *Practice high-speed training* – It is good to precede in-depth study with five minutes of high-speed reading. This not only increases “normal” reading speed but encourages the use of the right side of the brain. During the high-speed training you will be unconsciously absorbing a considerable amount of the text. An extra five minutes here can save an hour or more later.
7. *Study in-depth* – This is the stage for filling in details not provided by the overview and preview. Again treat the book as a whole. It will often be more effective to go through the book quickly ten times, gradually building up knowledge, than to slog through from the beginning. Psychologists call this the lag effect. It has been found that when the same information is repeated during the same learning session, the material is better remembered the more separated are the repeated presentations.¹⁵ In addition, difficult passages may often become clear in the light of later sections. In other instances the mind may be working sub-consciously on the argument and spontaneously come up with an understanding of it later on. Flexibility is of utmost importance here; different types of books will require different approaches.
8. *Mark and underline* – Despite most people’s inhibitions, marking books can be very valuable. Mark the text in preparation for note taking. If the book is not yours, use a *soft* lead pencil and remove the marks later with a soft eraser; it would take a forensic expert to discover you. It is your own book, do not be afraid to use different coloured pens; it helps memory and distinguishes different themes and topics.

Underlining key words, or otherwise making them more outstanding, has been found to greatly enhance students’ performances, resulting in better short-term and long-term comprehension than does straight reading,¹⁶ and also that students who regularly use underlining during reading score significantly higher on recall than those who do not.¹⁷

9. *Be prepared to reject* – Omit sections that are
Irrelevant;
Already familiar;
Padding;
Repetition;

Outdated; or
Excess examples.

Also reject false arguments. Robert Thouless, in *Straight and Crooked Thinking*,¹⁸ lists thirty-eight dishonest tricks to watch out for. Some of the principal ones are:

using emotive words to bias the reader;
quoting well-known names to “prove” a point;
denigration of opponents rather than their arguments;
generalisation from the particular;
false premises;
undefined sources;
proving by analogy;
misuse of statistics.

10. *Take regular breaks* – Taking a five-minute break every thirty or forty minutes increases retention of the material. Break regularly even when the study is going excellently. *Understanding well is not necessarily remembering well.* After each break take a minute to review the previous work. This consolidates the retention. Rest during the break. Especially rest the eyes by cupping them in your palms. The hand should not touch the eye but simply form a little dome over it. This practice soothes the eyes and gives them complete rest.¹⁹
11. *Make mind maps* – Mind maps increase comprehension and integration of knowledge; they are easier and quicker to make than conventional notes, are better remembered, and are more fun. After you finish a book, take a five-minute break; then go through the book making detailed pattern notes, relating points to previous knowledge wherever possible. Remember to use colour, imagination, outstanding features, shape, outlining, absurdities, etc., as much as possible.
12. *Review* – Regular review consolidates memory. Making detailed mind maps serves as the first immediate review and makes maximum use of the reminiscence effect. It helps integrate the material and gives an overall perspective. Review again, after one day, one week, one month, and six months, by running through your pattern in your head. This ensures that you will remember virtually everything.

The best way to review is again to use mind maps. At the end of a study session, if you're not already working with a mind map, it is good to prepare comprehensive notes in map form.

The preparation of the mind map can count as the first review, and once that is completed, many of the details will already be firmly implanted in your memory. At the subsequent reviews it is enough to go over the pattern mentally, checking that you can still recall all the details, referring back to the pattern whenever you are vague.

A good way to organise all the reviews is to keep a file of all your mind maps. Each map should be marked with the date of its next review, and they should all be ordered by date. Each day look at the top of the file to see if there are any for review. Once you have reviewed them, put a new date on them and reinsert in the corresponding place in the file. In this way the patterns will automatically arrive at the top as they are needed.

Or, if the patterns are filed by subject, go through all the files regularly to see whether any patterns are due for review.

The Best Conditions for Study

Heat – Most central heating systems keep the temperature between 68 and 70 degrees Fahrenheit. This may be comfortable as far as the body is concerned, allowing a person to work with only a shirt or cotton dress, but it is a little too warm for the brain. The brain works best when the surroundings are at a temperature of 65 degrees Fahrenheit (18 degrees Celsius). You may need to put some more clothes on if you have been used to working in warmer conditions, but it will be worth it in terms of increased mental clarity.

Light – The human eye is capable of a remarkable range of adaptation, being able to accommodate variations in intensity of several million fold. Once the eye has adjusted, it can read under the brightest sunlight or by a dim candle flame. In order not to put too heavy a strain on the eyes, however, something in between is more advisable – shade on a bright day, or a well-lit room at night.

Natural daylight is better than artificial illumination. It contains the full range of the visible spectrum and much more restful as a result. Artificial light tends to give an unbalanced spectrum, and some forms of fluorescent lighting may be limited to a very narrow

band of wavelengths. This puts an undue strain on certain cells in the retina and leads to more rapid fatiguing of the eye. Daylight also has the advantage of providing a diffused illumination. If you are working out of the direct rays of the sun, the light is coming from many different directions and does not cast harsh shadows across the page. If possible, windows should be to your left (for right-handed people) so that a shadow of your writing hand will not fall across the page. It is best not to work directly in front of a window, for every time you glance up out of the window, the eyes are forced to make a rapid accommodation to the change in light intensity, and this can result in eye strain. Similarly, with artificial light, it is best to work in as diffuse a light as possible, one reflected from the ceiling and the wall rather than directed straight onto the paper. This gives a greater evenness of light and avoids tiresome reflections from any shiny objects there may be on the desk. If spotlights are used, they should be used in conjunction with a good general illumination. A single spotlight may help to concentrate the attention on the page, but it is not good for the eyes. It creates a very uneven brightness over the table itself, which means that every time you glance away, the eyes again have to accommodate to a rapid change in intensity, this time to darkness rather than brightness.

Posture – The fatigue felt after a period of study is partly mental fatigue, partly eye fatigue and partly a result of muscular effort and tension. The least tiring study position is an upright one with the back very slightly bent forward. Sitting with an absolutely straight back can, if you are not used to it, add tension to the back muscles.

Chairs should be high enough that the thigh is horizontal and the lower leg at a right angle to it with the feet resting comfortably on the floor. If the seat is too high the chair edge exerts pressure on the leg obstructing blood circulation. If too low, the thighs are tilted up and the weight of body pressing down on the top of the thigh again causes tiring pressure.

This does not mean you have to have chairs made especially for you. A little adjustment with cushions or foot rests will usually be sufficient.

Table height should also be attended to. Too low and you will begin to slouch, with tension and fatigue in the back. Too high and your arms will be pushing up into your shoulders.

Thus, reading in its broadest sense is far more than recognising

letters and putting them together to form sentences. Reading also needs to be efficient. We need to be able to go faster where we need to, comprehend better, remember what we have read, and apply it usefully in long term. Moreover, as much attention needs to be paid to how and where we study as to the art of reading itself if the best use is to be made of the time spent reading.

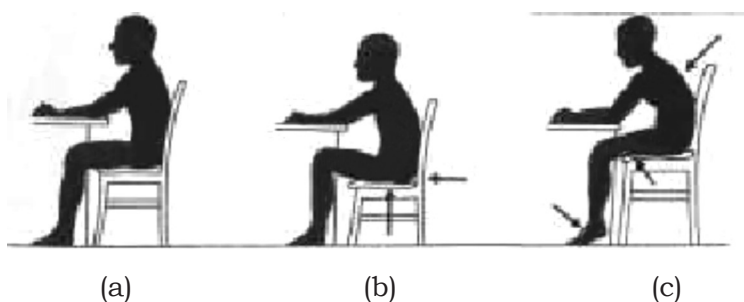


Fig. 6: Sitting positions (a) good; (b), (c) bad (arrows show tension points).

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WHAT IS READING?

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Substantial advances in understanding the process of reading have been made in the last decade. The majority of scholars in the field now agree on the nature of reading: Reading is the process of constructing meaning from written texts. It is a complex skill requiring the coordination of a number of interrelated sources of information.

Reading can be compared to the performance of a symphony orchestra. This analogy illustrates three points. First, like the performance of a symphony, reading is a holistic act. In other words, while reading can be analysed into sub-skills such as discriminating letters and identifying words, performing the sub-skills one at a time does not constitute reading. Reading can be said to take place only when the parts are put together in a smooth integrated performance. Second, success in Reading comes from Practice over long periods of time, like skill in playing musical instruments. Indeed, it is a lifelong endeavour. Third, as with a musical score, there may be more than one interpretation of a text. The interpretation depends upon the background of the reader, the purpose for reading, and the context in which reading occurs. How does the process of reading occur? A common view is that reading is a process in which the pronunciation of words gives access to their meanings; the meanings of the words together to form the meaning of clauses and sentences; and the meanings of sentences combine to produce the meanings of paragraphs. In this conception, readers are viewed as always 'starting at the bottom' – identifying letters – and then working up through words and sentences to higher levels until they finally understand the meaning of the text.

However, research establishes that the foregoing view of reading is only partly correct. In addition to obtaining information from the letters and words in a text, reading involves selecting and using knowledge about people places, and things, and

knowledge about texts and their organisation. A text is not so much a vessel containing meaning as it is a source of partial information that enables the reader to use already-possessed knowledge to determine the intended meaning.

Reading is a process in which information from the text and the knowledge possessed by the reader act, together to produce meaning. Some aspects of this interaction can be illustrated with the following passage:

When Mary arrived at the restaurant, the woman at the door greeted her and checked for her name. A few minutes later, Mary was escorted to her chair and was shown the day's menu. The attendant was helpful but brusque, almost to the point of being rude. Later, she paid the woman at the door and left.¹

The first phrase will lead readers to expect that their existing knowledge of restaurants will be relevant. That is to say, the word "restaurant" brings to mind past associations and experiences with restaurants and the interrelations among these ideas. From there, reading is easy because of the expectations that come from this knowledge. The woman at the door is taken to be the hostess. Mary must sit at a chair at a dining table before she can eat. The "attendant" is probably the waiter or waitress, and the person referred to as leaving in the last sentence is probably Mary. These are all inferences that make use of both the information presented in the text and the knowledge the reader already has about restaurants.

Good readers skillfully integrate information in the text with what they already know. However, immature readers may depend too much on either letter by letter and word by word analysis or too much on the knowledge they already have about the topic.²

Some children labouriously work their way through texts word by word, or even letter by letter (e.g. m-m-M-a-r-y). They are so intent on saying the words right that they miss aspects of the meaning. In oral reading, these children tend to make nonsensical errors that look or sound like the words they are trying to read with results such as, "The woman at the door *grated* her and *locked* for her name".³ These children sometimes fail to use the knowledge they may have about the topic to think about what they are trying to read.

Other immature readers show an overreliance on the knowledge they already have about the topic. Such children may

use pictures, titles, their imagination, and only a small amount of information in the text to produce a believable story.⁴ For example, "...and when Mary got to the ...ah...pizza place. She went in the door and greeted her friend. Then she sat down in her chair and had a pizza." These children often do not have enough skill at word identification to make use of all of the information in the written message.

Five generalisations in flow from research of the past decade on the nature of reading:

The first generalisation is that *reading is a constructive process*. No text is completely self-explanatory. In interpreting a text, readers draw on their store of knowledge about the topic of the text. Readers use this prior knowledge to fill in gaps in the message and to integrate the different pieces of information in the message. That is to say, readers "construct" the meaning. In the restaurant example, the reader is able to infer that Mary sat at a table, selected her meal from the menu, and was probably served by the attendant. Yet none of this information is expressly mentioned in the text. These details are constructed from the reader's other knowledge of restaurants.

The meaning constructed from the same text can vary greatly among people because of differences in the knowledge they possess.⁵ Sometimes people do not have enough knowledge to understand a text, or they may have knowledge that they do not use fully. Variations in interpretation often arise because people have different conceptions about the topic than the author supposed.

Some children may completely lack knowledge on a particular topic, others may know something, while still others may a lot. Research shows that such differences in knowledge influence children's understanding. For example, in one study, second-grade children equivalent in overall reading ability were given a test of knowledge about spiders prior to reading a selection about spiders.⁶ Then they were asked questions about the selection. Children who were more familiar with spiders were significantly better at answering the questions, particularly questions that required reasoning.

Research reveals that children are not good at drawing on their prior knowledge, especially in school settings.⁷ They may know something relevant, but yet not use it when trying to understand a passage. These failures are more likely to happen

when understanding the passage requires children to extend their knowledge to a somewhat different situation. Even a subtle difference between a child's interpretation and the "right" adult interpretation can give rise to the impression that the child doesn't understand the material.

The second principle is that reading must be fluent. The foundation of fluency is the ability to identify individual words. Since English is an alphabetic language, there is a fairly regular connection between the spelling of a word and its pronunciation. Every would be reader must "break the code" that relates spelling to sound and meaning. Research suggest that, no matter which strategies are used to introduce them to reading, the children who earn the best scores on reading comprehension tests in the second grade are the ones who made the most progress in fast and accurate word identification in the first grade.⁸

"Decoding" a word – that is, identifying its pronunciation and meaning – involves more than letter by letter analysis. It has been known since late in the 19th century that short, familiar words can be read as fast as single letters and that, under some conditions, words can be identified when the separate letters cannot be.⁹ These facts would be impossible if the first step in word identification were always identification of the constituent letters and their sounds. More recently, it has been shown that a meaningful context speeds word identification.¹⁰ For instance, nurse is more readily identified if it is preceded by doctor. Again, this is a fact that is impossible to square with the common theory that word identification consists of letter by letter decoding.

All of the known facts are understandable within the generally-accepted current model of word identification.¹¹ According to this model, a possible interpretation of a word usually begins forming in the mind as soon as even partial information has been gleaned about the letters in the word. The possible interpretation reinforces the analysis of the remaining information contained in the letters. When enough evidence from the letters and the context becomes available, the possible interpretation becomes a positive identification. This all happens very quickly, within 250 milliseconds on the average, when the reader is skilled.¹²

Readers must be able to decode words quickly and accurately so that this process can coordinate fluidly with the process of constructing the meaning of the text. One piece of evidence that this is so is that good readers are consistently much faster than

poor readers at pronouncing pseudowords that have regular English spellings, such as *tob* and *jate*.¹³ People with more than fourth-grade reading ability make almost no mistakes with regular pseudowords. What distinguishes good and poor readers in this case is speed, not accuracy. What this fact means is that typically poor readers have barely mastered spelling-to-sound patterns, whereas good readers have a command that goes beyond simple mastery to automaticity.

Interestingly, it does not appear that skilled readers identify unfamiliar words by rapidly applying “rules” governing the relationships between letters and sounds. Instead, research suggests that they work by analogy with known words.¹⁴ Thus, for example, the pronunciation of *tob* may be worked out from knowledge of the pronunciation of *job* plus a notion of the initial sound of words beginning with it. One piece of evidence in support of the decoding-by-analogy strategy is the fact that pseudowords such as *mave*, which have conflicting possible analogies, such as *have* and *wave*, are pronounced more slowly than other pseudowords, and are sometimes pronounced with a short *a* like *have* and are sometimes pronounced with a long *a* like *wave*. Notice that for the process to work the reader need not have any specific knowledge of the difference between long and short *a*’s, only an adequate vocabulary of actual words and a command of the analogy strategy.

Decoding skill must develop to the point where it is automatic and requires little conscious attention. The reader’s attention must be available to interpret the text, rather than to figure out the words. Immature readers are sometimes unable to focus on meaning during reading because they have such a low level of decoding skill. They are directing most of their attention to sounding out words letter by letter or syllable by syllable.¹⁵ Even skilled readers show much less understanding of what they read when forced to attend to the surface features of written material.¹⁶ Consider, for example, the way a young child might read the first sentence of the restaurant passage:

When Mary arrived at the r, ruh, ruh, ruh-es-tah,
oh! restaurant! When Mary arrived at the...rest...
restaurant..

Restaurant is a difficult word for this child, and he or she requires several attempts to decode it. By this time, the child’s memory for the earlier part of the phrase has faded and he or she

has to re-read the words to try and create a coherent meaning.

Available figures suggest that an average third grader can read an unfamiliar story aloud at the rate of about 100 words per minute.¹⁷ The corresponding rate for poor readers at this level is 50 to 70 words per minute. According to one group of scholars, this rate is “so slow as to interfere with comprehension even of easy material, and is certainly unlikely to leave much...capacity free for developing new comprehension abilities”.¹⁸

The third principle is that *reading must be strategic*. Skilled readers are flexible. How they read depends upon the complexity of the text, their familiarity with the topic, and their purpose for reading. Studies show that immature readers lack two strategies used by skilled readers: Assessing their own knowledge relative to the demands of the task, and monitoring their comprehension and implementing fix-up strategies when comprehension fails.¹⁹

Skilled readers are aware that there are different purposes for reading and that they must change the way they read in response to these purposes. For instance, they know that reading for enjoyment does not require detailed understanding, while reading for a test may. In one study, third and sixth graders were asked to read two stories, one for fun and the other in preparation for a test.²⁰ The skilled readers adjusted their reading strategies for the two stories; the immature readers didn't. As a result, the immature readers did not remember any more of the story they were supposed to study than the one they were supposed to read for fun.

Perhaps because they frequently do not see the point of reading, poor readers often do not adequately control the way they read. One aspect of such control is being able to monitor one's own reading and notice when failures occur. To investigate this, researchers have placed inconsistent information in passages to see whether readers can detect it. Here are examples of consistent and inconsistent passages:

All the people who work on this ship get along very well.
The people who make a lot of money and the people who don't make much are still friends. The officers treat me as an equal. We often eat our meals together. I guess we are just one big happy family.

All the people who work on this ship get along very well.

The people who make a lot of money and the people who don't make much are still friends. The officers treat me like dirt. We often eat our meals together. I guess we are just one big happy family.²¹

Skilled readers readily detect the inconsistency in the second passage. Younger or less able readers are not as likely to notice the problem and usually say that the passage makes sense.²²

Another aspect of control during reading is being able to take corrective action once a failure in understanding has been detected. Skilled readers know what to do if they have difficulty. There are a number of options available: Keeping the problem "on hold" in the hope that it will be clarified later in the text; re-reading parts of the text; looking ahead; or seeking help from outside sources. In one study, researchers asked second and sixth graders questions about their strategies for coping with failures to understand.²³ Older and better readers said that, for instance, if they did not know the meaning of a word they would ask someone else or go to a dictionary. Poorer readers were unable to say what they would do. These reports have been confirmed by actually observing children. In another study, fourth graders were asked to read and remember a story containing some difficult words.²⁴ They were given paper, a pencil, and a dictionary and told that they could ask questions. As expected, the good readers asked questions, took notes, and used the dictionary. The poor readers used these aids infrequently.

Throughout this report, the idea that skilled reading needs to be strategic will be emphasised. This means that the reader monitors progress in understanding, and resolves problems that prevents understanding.

The fourth principle is that *reading requires motivation*. As every teacher knows, motivation is one of the keys to learning to read. It will take most children several years to learn to read well. Somehow, their attention must be sustained during this period and they must not lose the hope that eventually they will become successful readers.

Reading itself is fun. At least, it is for many children who are skilled readers for their age and for some children with average and below average skill. These children are, as the saying goes, "hooked on books". Increasing the proportion of children who read widely and with evident satisfaction ought to be as much a goal of

reading instruction as increasing the number who are competent readers. As will be detailed in the chapter on Extending Literacy, an essential step in reaching that goal is providing children ready access to books that are interesting to them.

Reading instruction can be boring. Aspects of the standard reading lesson are monotonous. Many of the tasks assigned to children in the name of reading are drudgery. Thus, it is not surprising that in one study, for instance, interviews with a sample of poor, black children reading a year above grade level indicated that most liked to read, but few liked the activities called “reading” in school.²⁵

Teachers who maintain high levels of motivation conduct fast-paced and varied lessons. Tasks are introduced with enthusiasm and with explanations of why doing them will help one become a better reader. Teachers whose classes are motivated are described as business-like but supportive and friendly. Children taught by teachers rated as having these traits make larger-than-average gains on reading achievement tests.²⁶

Failure is not fun. Predictably, poor readers have unfavourable attitudes toward reading. What is not so predictable is whether lack of proficiency in reading stems from unfavourable attitudes or whether it is the other way around. Probably the truth can lie in either direction.

Poor readers frequently are listless and inattentive and sometimes are disruptive. They do not complete work. They give up quickly when faced with a task that is difficult for them. They become anxious when they must read aloud or take a test. A good memory description is that they act as though they were helpless to do better. Etiology of this sense of helplessness is not completely understood,²⁷ but it is known that it is affected in sometimes subtle ways by teachers’ behaviour. It might be thought an act of kindness to express pity when students flub a test, but the hidden message may be that they lack the ability to do any better, that they are not in control of their own fate. An expression of dissatisfaction, on the other hand, may convey the message that the students could do better if they tried harder. People can control effort; people in control, even ones doing poorly, are not helpless.²⁸

Effective reading teachers convey by word and deed that everyone can learn to read, if they pay attention and apply themselves. In their classrooms, effort pays off. Research

establishes that these teachers assign reading material on which children experience a high rate of success.²⁹ However, effective teachers do not offer praise indiscriminately. Praise is given in recognition of noteworthy success at a task that is difficult for *this* student. The statement of praise specifies what the student did well, attributes the success to ability and effort, and implies that similar successes are attainable in the future.³⁰

Though sustained motivation is essential for learning to read, it should be cautioned that poor motivation is not the only problem, or even the most important problem, faced by poor readers. Experience indicates that even under the best of conditions some percentage of children will have difficulties in learning to read. A detailed discussion of what may be the root cause of these difficulties is beyond the scope of this report. It can be asserted with some confidence, nonetheless, that the approaches to reading outlined in this report can help to ameliorate the difficulties faced by very poor readers.

The fifth principle is that reading is a continuously developing skill. Reading, like playing a musical instrument, is not something that is mastered once and for all at a certain age. Rather, it is a skill that improves through practice. The process begins with a person's earliest exposure to text and a literature culture and continues throughout life.³¹

A good rule of thumb is that the most useful form of practice is doing the whole skill of reading – that is, reading meaningful text for the purpose of understanding the message it contains. This fact poses a problem for the beginner. How can a child practice reading without already being able to read?

One or more of several strategies are used to get a beginner start reading. A natural strategy is to use familiar stories that are readily understandable to the child, or may be even partly known by heart. A common strategy is to severely restrict the vocabulary of the first selections a beginner will read. Another useful strategy is to teach the beginner something about the relationships between letters and sounds.

Like instruction in other complex skills, reading instruction most often takes the form of explanation, advice, coaching, and practice on what are judged to be the essential aspects or parts of the process. The test of the value of this instruction is whether the child's reading as a whole improves. Thus, in a well-designed reading programme, mastering the parts does not become an end

in itself, but a means to an end, and there is a proper balance between practice of the parts and practice of the whole.

In Summary

- **Skilled reading is constructive:** Becoming a skilled reader requires learning to reason about written material using knowledge from everyday life and from disciplined fields of study.
- **Skilled reading is fluent:** Becoming a skilled reader depends upon mastering basic processes to the point where they are automatic, so that attention is freed for the analysis of meaning.
- **Skilled reading is strategic:** Becoming a skilled reader requires learning to control one's reading in relation to one's purpose, the nature of the material, and whether one is comprehending.
- **Skilled reading is motivated:** Becoming a skilled reader requires learning to sustain attention and learning that written material can be interesting and informative.
- **Skilled reading is a lifelong pursuit:** Becoming a skilled reader is a matter of continuous practice, development, and refinement.

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READING: AN ORCHESTRATION OF CUES

—SONIKA KAUSHIK

Reading is perhaps one of the most important skills taught in schools. Its use is not confined to the curricular area under which it is taught, namely language(s), but it is used right across the school curriculum. Consequently, the success in reading has serious implications for other subjects as well. Despite the obvious significance of reading, it continues to be an area of concern especially in the primary grades. Largely, children are taught reading skills which are often not lasting, and do not result in meaningful reading. Contemporary research in reading conceptualises it as essentially a meaning-making process. Several strands of research from various disciplines converge to highlight the significance of meaning (Teale and Sulzby, 1986). However, the pedagogy of language practised in schools often neglects the meaning-making aspect, and considers the mechanics of language more important. According to Kumar (2009), “Children breaking down words into letters and sentences into words are common sight in Indian primary schools” (p. 79). Sinha (2000) observes that the conceptualisation of reading as an exercise in finding the oral equivalent of written language is an obstacle in making sense, and hampers comprehension.

This paper examines the reading of a good and a poor reader of Grade III. It analyses the noticeably different ways in which they process the text, and how they negotiate the challenges they encounter while reading.

The Language Cueing System

Goodman (1996) emphasises on the importance of the harmonious functioning of the four language cueing systems—semantics, syntax, graphophonics and pragmatics. Successful or meaningful reading happens when all four systems function in tandem with each other. Semantics refers to the meaning aspect of a language system; syntax refers to the sentence structure or word-order in a particular language. For instance, in Hindi, the verb always follows the object, unlike English where the verb precedes the object. Graphophonics refers to the specific symbol-sound association in a language. For example, the sound /k/ in Hindi

can be associated with only one symbol or letter. Pragmatics is about the use of language in specific ways in certain contexts. An over-reliance on just one or two cueing systems or a complete neglect of one or more systems by the reader can seriously affect reading and the meaning. The centrality of meaning in reading cannot be denied or compromised.

Miscue analysis, a technique for analysing reading, allows one to ‘peep’ into the ways in which a reader uses the four cueing systems. This technique was developed by Kenneth Goodman (Rhodes and Shanklin, 1993). Goodman (1996) coined the term *miscue* to refer to what are commonly perceived as errors while reading. This was to avoid the negative connotations of the word *error*. The technique looks at the ‘errors’ made by children during reading very favourably, and examines why and how the reader has ‘deviated’ from the text. Interestingly, this analytical process reveals that all kinds of readers make miscues while reading.

The analysis in the following section will reveal the complex ways in which the four systems function simultaneously to generate meaning. This multiple cueing system of language has been used as the framework for examining the reading of two children. ‘Good’ and ‘Poor’ readers are terms routinely used in research literature. However, the intention is not to ‘label’ children but only to highlight the sharp qualitative differences in their reading.

Miscues: Nature of Reading

Two grade III children—one a struggling reader and the other a good reader—were given an unfamiliar story, *Dehati ki gaay* (Shankar, 1999), to read aloud. Their reading was recorded, and later analysed to study the nature of miscues, or deviations they were making from the original text. The analysis revealed the qualitative differences in their miscues and consequently reading. A section of the text read by the children will be discussed here.

Consider Text A- the reading sample of the poor reader. The reader makes three miscues in the first sentence (S1). The first miscue is the splitting of the word *gaon* (village) into *ga* and *v*; the nasal sound is ignored completely. He does not bother to blend the parts of the split word and moves ahead. Soon, in the same sentence (S1), he misreads the word *gaay* (cow) as *gaya* (went/ the name of a place) and *thi* (auxiliary verb ‘was’, in this context referring to a female) as *tha* (changing the referent to male).

Locally, *tha* seems in consonance with *gaya*. *Gaya* and *tha* are words in Hindi, and may look visually similar to the words they have replaced. So, at the level of individual words, one may choose to overlook these ‘slips’. But on examining the syntax of the whole sentence as read by the child, the resulting meaning does not seem very satisfactory. The second sentence (S2) is riddled with miscues but they are of a self-correcting nature. The reader skips the second word, *pratidin* (everyday), splits the word *paanch* (five) into *paan* and *ch* and blends it to sound out *paanch*, this time not missing the nasal sound—the *anusvar*. A similar splitting and blending takes place with the word *kilo*. After reading *doodh* (milk), the reader reads *diya* (gave) in place of *deti* (gives), corrects it, and reads *hai* (is) in place of *thi* (was). Considering the deletion of the word *pratidin* and the substitution with the word *hai*, the resulting sentence makes complete meaning even though the tense of the second sentence (S2) has been changed and is not in keeping with the first one. It is difficult to explain this miscue *hai* because visually, the text does not lead to it. In the third sentence (S3), *baich* (to sell) is read as *pahun* and *cha* which, if blended together, would make *pahuncha* (to bring it, here). This makes sense until one reaches the word *use* (that) which is read as *usse*, and the sentence structure begins to crumble at the word *paise* (money). Again at the end of the sentence (S3), the use of the plural form of the word *rehna* (to live) as *rehete thay* (changes the referent from singular to plural) brings incongruence between the singular subject, the *dehati* (the villager), and the substituted word *usse*. In the fourth sentence (S4), the word *gaon* is repeated, and the child reads it differently from the way he read it in the first sentence. This time, the *anusvar* stays and the long vowel / a / is ignored. He progresses, and when he encounters the word *vivah* (wedding), his reading starts to falter. He makes two attempts at reading the word, the first time by splitting it, and then by blending it or trying to read the whole word. In both cases, he creates non-words. Again, he changes the tense when he reads *hai* in place of *ho*, and makes unsuccessful attempts at sounding out and blending the word *raha*, and finally ends with *th* for *tha*. In the fifth sentence (S5), he reads in a similar manner. Interestingly, he stumbles over words he had earlier read with ease in the first few sentences. *Dehati* and *doodh* are two such words. In S5 of Text A he makes three attempts at reading the word *vivah*, but does not meet with success.

An analysis of his reading shows clearly that the most commonly used reading strategy displayed in his reading is that of sounding out the constituent sounds in a word, and then trying to blend them together. More often than not, the use of this strategy does not lead him to the word in the text. Undeterred, he either leaves it at the non-word that has been created, or reads a form of the word which is acceptable in Hindi but syntactically inappropriate, and moves on. *Sakeg* and *uhe* in S5 and *veeh* in S4 of Text A are a few examples of such non-words. The child knows the letters and *matras* and he is using this knowledge in isolation to read. It seems strange that he is able to use this knowledge effectively in some places, and in other places he does not seem to be able to use it. One can speculate that the sole use of graphophonics cannot go a long way in supporting reading. In this case, the child is not actively bringing his knowledge of the sentence structure in Hindi to support his knowledge of the Hindi alphabet. More importantly, he does not seem to know that one reads for meaning, and so makes no attempt to preserve the global meaning of the text. Evidently, he is creating pockets of coherent phrases in some places, and in other places is completely abandoning the meaning and indiscriminately sounding out words. He is not worried about carrying forward or building on the meaning that has been created in the preceding sentences. Moreover, narratives tend to be in the past tense, and active use of the knowledge of this often used genre could have guided him to not switch tense from one sentence to the other.

The reading of the same section of the text by the good reader resulted in three miscues. In the second sentence (S2) of Text B- the reading sample of the good reader, the child inserts the word *ek* after *doodh*, but goes back and repeats the stretch from *doodh*, this time without the earlier inserted word, *ek*. Like the poor reader, he also stumbles over the word *vivah* in the fourth sentence (S4), perhaps because it is not used as commonly as its synonym, *shaadi*. He makes two attempts, the first one being *vaan* which does not occur in the word at all, and then *viha* which gives him a clue about the word, and finally he reads it correctly. Lastly, there seems to be tentativeness in reading the word *sakega* in the fifth sentence (S5). This child is evidently monitoring his reading, and is alert to a changed and inappropriate syntax when he makes the insertion with *ek* and instantly goes back and rectifies it. He

is simultaneously attentive to the sentence structure of the story and the meaning that is being created, and makes selective use of the strategy of focusing on the letters in a word.

The word *vivah* proves to be interesting in analysing the reading of the two children. The poor reader makes more attempts to read it, and is phonologically closer to the word in his attempts. He comes as close as *vivh* but does not use his knowledge of the world and steadfastly focuses only on the splitting and blending of the word. The reading of the preceding sentences does not support him because a coherent meaning does not emerge out of his reading. Therefore, his reading increasingly collapses. The other child consistently monitors his reading for meaning, and makes deviations or miscues which keep the meaning intact.

Conclusion

Miscue analysis urges us to listen to what children are telling us about their reading capabilities and the kind of help they need. Conceptualisation of reading as an exercise in decoding or simply sounding out words, limits our ability as teachers to support children's reading. More often than not, a child struggling with reading is asked to learn his letters and *matras* well (Kaushik, 2004). Such a suggestion overlooks the real complexity of the reading process. It also fails to communicate to the child that she has to actively integrate all the knowledge she has about the language—its sentence structure, the meaning of words, the letter-sound associations—towards one central objective of reading to construct meaning. The role that we have chosen for ourselves, one of correcting children and eliminating errors while reading needs to be redefined (Owocki and Y. Goodman, 2002).

Original Text – Dehati ki gaay

1. एक गाँव वाले के पास एक गाय थी।
2. वह प्रतिदिन पाँच किलो दूध देती थी।
3. देहाती दूध बेचकर उस पैसे से मजे से रहता था।
4. गाँव के पास ही वहीं विवाह हो रहा था।
5. लोग उस देहाती के पास यह पता लगाने आये कि वह विवाह के समय उन्हें कितना दूध दे सकेगा।

Text A – Reading Sample of the Poor Reader

1. एक गाँव वाले के पास एक गया था।
2. वह पाँच-पाँच कि लो दूध दया देती है।
3. देहाती दूध पहुँचा कर उसे पैसे से मजे मजेसे रहते हैं।
4. गंव गंव के पास ही कहीं वही रह रहा था।

Text B–Reading Sample of the Good Reader

1. एक गाँव वाले के पास एक गाय थी।
2. वह प्रतिदिन पाँच किलो दूध एक दूध देती थी।
3. देहाती दूध बेचकर उस पैसे से मजे से रहता था।
4. गाँव के पास ही वहीं कहीं विवाह हो रहा था।
5. लोग उस देहाती के पास यह पता लगाने आये कि वह विवाह के समय उन्हें कितना दूध दे सकेगा।

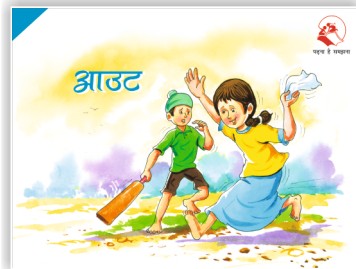
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Note

Barkha

Barkha is a Graded Reading Series being brought out by NCERT's Reading Development Cell. It is a collection of forty stories graded into four levels and woven around five themes. The series will enable every child to become self reliant in reading. *Barkha* stands for text-enhancing illustrations, simple language and age appropriate storylines.





पढ़ना है समझना

While reading is readily accepted as a focus area for language education, school syllabi are burdened with information-absorbing and memorising tasks, so much so that the pleasure of reading for its own sake is missed out. Opportunities for individualised reading need to be built at all stages in order to promote a culture of reading, and teachers must set the example of being members of such a culture. This requires the nurturing of school and community libraries. The perception that the reading of fiction is a waste of time acts as a major means of discouraging reading. The development and supply of a range of supplementary reading material relevant to all school subjects and across the grades

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