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The Reading Process and Alphablanks

Dale Saul
School for International Training

Linda Driver
School for International Training

THE READING PROCESS

AND

ALPHABLANKS

By

Dale Saul

Linda Driver

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Date Jan. 25, 1977 Principal Advisor Mary M. Clark

Project Advisors:

Mary Clark

Ann Puyana

Alex Silverman

Acknowledgement

To Mary Clark. Thanks a lot, Mary.

Alphablanks was developed as an aid for teaching reading by Rosalie R. Saul. It has been used chiefly in teaching children to read in their native language, especially in the field of learning disabilities. We wanted to expand its use into the ESL classroom. But we also wanted to present a rationale for using Alphablanks, to research the field of reading and how we go about learning to read, in order to find out exactly what areas of reading Alphablanks would help. Thus this paper is divided into two main parts: a summary of current research into reading, interpreting this research with respect to what is happening when we try to read; and a section relating these concepts to the use of Alphablanks. This second section will explain what we think is going on when Alphablanks is being used. At the end of the second part will be a series of activities specifically related to ESL. Many of these activities can be applied in teaching reading as a first language as well, and can also be adapted to use in teaching reading in other languages using the Roman alphabet.

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PERCEPTION AND ITS RELATION TO LANGUAGE

The understanding of language processes has been referred to as "perhaps the biggest current challenge to neurophysiological research."[1] The neurological make-up of the brain prescribes how we think and perceive; Nobel Laureate Gunter Stent makes the observation:

> Our visual perception of the outer world is filtered through a stage in which data are processed in terms of straught parallel lines, thanks to the way in which the input channels coming from the primary light-receptors of the retina are hooked up to the brain. This fact cannot fail to have profound psychological consequences; evidently a geometry based on straight parallel lines, and hence by extension on plane surfaces, is most immediately compatible with our mental equipment. It need not have been this way, since (at least from the neurophysiological point of view) the retinal ganglion cells could just as well have been connected to the higher cells in the visual cortex in a way that their concentric on-center and off-center receptive fields form arcs rather than straight lines. If evolution had given rise to that other circuitry, curved rather than plane surfaces would have been our primary spatial concept.[2]

Thus the brain orders our visual world in terms of straight lines.

Applying these ideas to language, one can look at the development of writing systems and see the emphasis: parallel straight lines in the characters themselves and/or in the order they are set down on the writing surface, vertically or horizontally. A perceptual prowess is displayed when children at a young age become aware of variables in graphic representations; at 27 months the average child can draw a line as distant from a scribble and at 30 months can draw a line as distinct from a circular stroke.[3] The extent of preschoolers' ability to recognize writing, even if it is from a different alphabetic system, as a phenomenon distinct from random markings, numbers and pic-

[1]Wrolstad, "Manifesto for Visible Language", Visible Language X 1 (Winter 1976), 14

[2]Stent (Wrolstad 1976), 14

[3]Gibson, "The Ontogeny of Reading": American Psychologist Vol. 25, 2 (1970), 137

tures is shown in an experiment by Linda Levine at Cornell University (Gibson, 1970). Figure 1 represents samples of material presented on cards to 3 and 4 year olds in seven different kindergartens. Results varied widely. Although few four year olds in a cooperative nursery school could distinguish scribbling from writing, 75% of Ss at the school with the highest socioeconomic standing could, although they could not yet write. In many cases, the children could not name the letters that they could identify as writing. Gibson comments, "This is particularly interesting because it substantiates the idea that there is something categorial in the structure of writing that distinguishes it from random marks on paper and from pictures even when none or only a few individual characters can be identified."[4]

In our own experience, when inquiring of this writer's daughter (4½ years), "Do pictures look different from writing?" we received the answer: "They look another way," accompanied by a look implying that we were indeed dim-wits.

Just as the input channels to the retina structure our visual perception, so does the small size of the retina limit the amount of information which can be taken in by the eye at a fixation. Another factor limiting information being received is the bottleneck of short-term memory, which combined with retinal size is responsible for our inability to process more than four items of visual information every two seconds. This is why in reading, information may be in the form of characteristics of letters, pieces of words, words themselves or even larger groupings of visual information, but however it is broken down by the reader, it is perceived in amounts not larger than four or five units.

[4]Gibson (1970), 137

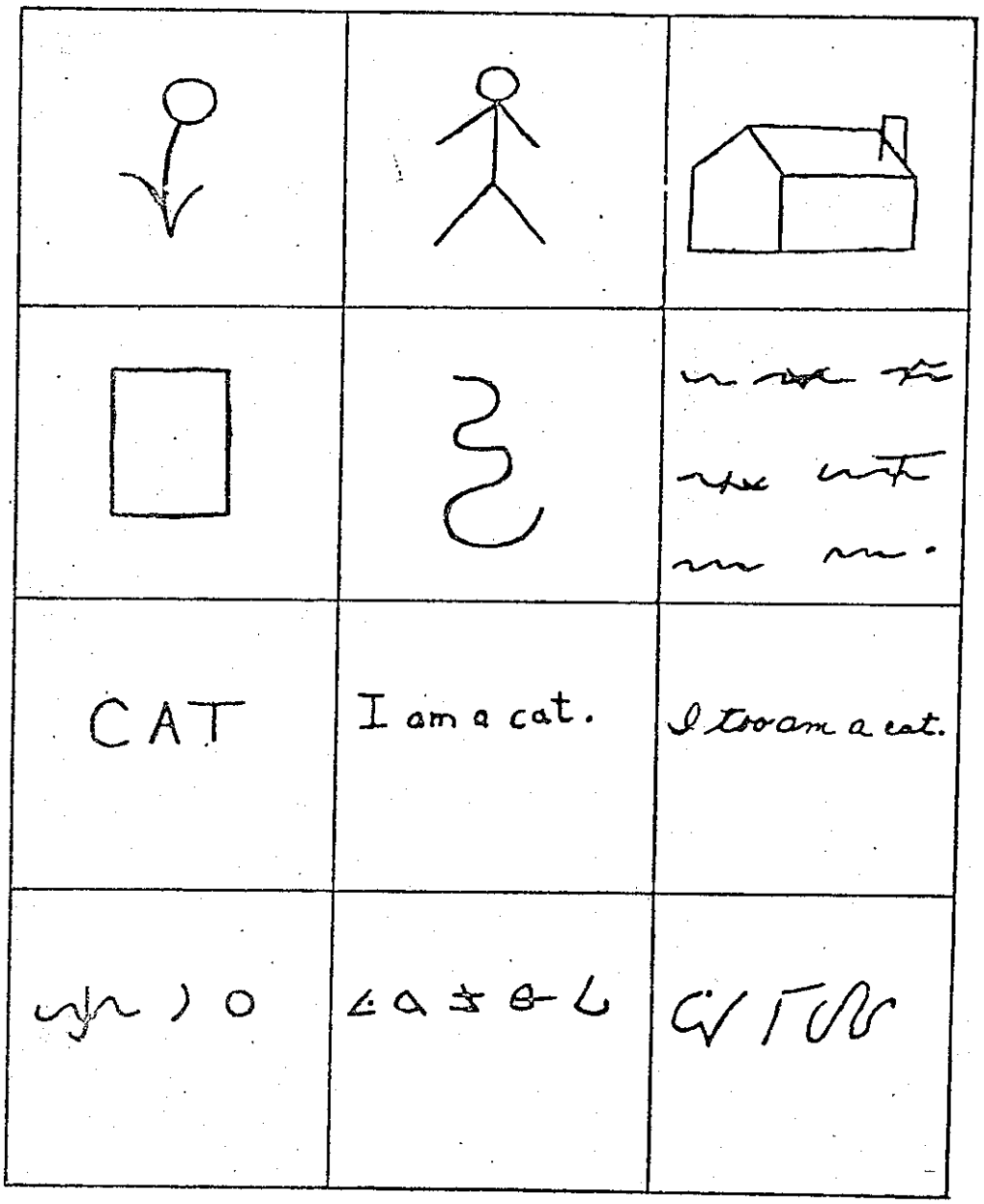


FIG. 1. Redrawn samples of material presented to preschool children for differentiation as "writing." (Gibson, 1970)

Not enough is known on the nature of the detection system used in human perception to state unequivocally what the eye is discriminating and how the brain uses that information. We base our ideas on results of tachistoscopic tests on human subjects and work done on the information detection systems in the visual cortex of several types of animals with highly developed nervous systems, such as the frog, cat and monkey. While the nervous system in the human may differ from those of the animals studied, the differences are not substantial but only more complex. In a series of experiments reported in a paper entitled "What the Frog's Eye Tells the Frog's Brain"[5], the researchers monitored the activities of the eye of numbers of frogs by attaching electrodes to the optic nerves. Among the many specialized detectors, they noted one type which responded to variations of light and shade, one to the edges of objects, another to general dimming of illumination in the laboratory and one to small objects moving in erratic fashion across the field of vision (the "bug detector"). Each of these sends a signal to the frog's brain. (Note to those with special interest in frog behavior: the "moving small object" detector also elicited a reflex movement from the tongue of the frog.)

The frog's eye structures the environment in particular visual terms, leaving out what is not important to frog existence. This is relevant to humans in that we do not see things unless they hold meaning for us. In reading we perceive that which is most efficient in giving us the most information in one fixation of our eye, i.e., that which reduces our uncertainty most quickly.

[5]"What the Frog's Eye Tells the Frog's Brain": J. Y. Lettvin, H. R. Maturana, W. S. McCulloch, W. H. Pitts. Proceedings of the Instit. of Radio Engineers, NY 47 (1959), 1940

FEATURES: UNITS OF PERCEPTION IN READING

Features are distinctive (and therefore significant) when discrimination of them reduces the number of alternatives that a visual stimulus might represent. (Smith, 1971.)

"Features" is a key concept in understanding the reading process, for at a deep level in cognition, they are the smallest blocks the brain picks up as stimuli in perception. The features of the acoustic aspect of language are sound-based (phonemes, stress and intonation patterns). The features of the visual aspect of language are in the physical representation of what is written, be it ink prints on a page, carvings in stone or wax, or plastic forms arranged on a board. Whatever is hypothesized as a feature, the primary problem in identification of the visual stimulus or configuration, be it inkmarks or plastic tiles, is to distinguish the presented configuration from all other configurations: to discover its critical difference.

For the reader, knowing that an "r" is an "r" whenever he/she comes across it holds little meaning until he/she realizes that "r" is different from "n" and "c" and "t". In the context of word identification, the importance of critical difference would be in recognizing that "list" is not equivalent to "lint". In experiments by Havens and Foote, Ss frequently mistook tachistoscopically flashed words, simple but not common, for words of high frequency usage which resembled them structurally in terms of ascenders, descenders and flat letters. A word like "lint" occurs only twice per million words read on the average, and may be reported as its similar-looking counterpart instead of correctly read. Low frequency words -- for example, "drab" -- which do not have high frequency look-alikes, were read correctly. (Of course, mistakes

like this substitution would probably be made by a fluent reader only when the two words were equally probably in terms of context -- e.g., "He took the lint out of his pocket." It is difficult to conceive of a fluent reader making the error, in a short story in "Red Book" magazine, in which a woman is preparing to go shopping: "She wrote ham and eggs on her lint". A second language learner would be more prone to this kind of error because of his/her lack of awareness of context clues.)

Goodman's article in Smith (1973) outlines such substitutions and other errors in reading. These errors he calls "miscues" because the word "error" implies wrongness. He goes on to say that it is rare that these miscues will not occur in oral reading and "that silent reading is almost never miscue-free. In fact, it appears likely that a reader who requires perfection in his reading will be a rather inefficient reader."[6] This is because the reader who attempts to get every letter perfect will have been concentrating too hard on only the letters and will be unable to grasp meaning sufficiently.

As important as the ability to perceive features as distinctive, is being able to see them in relationships; for example, as spelling units or common vowel-consonant combinations. Cognitive psychology emphasizes the relationship of features to one another rather than the importance of features themselves. The significance of such relativity is evidenced by observing that "in most natural (i.e., non-synthetic) languages, ideas emerge not out of language symbols or words per se.."[7]; cognition is the process of deriving deep structure, or meaning, from complex surface patterns. In contrast, artificial lan-

[6]Kenneth Goodman, "Analysis of Oral Reading Miscues: Applied Psycholinguistics" (Frank Smith, 1973), 164

[7]Jagjit Singh (Wrolstad 1976)

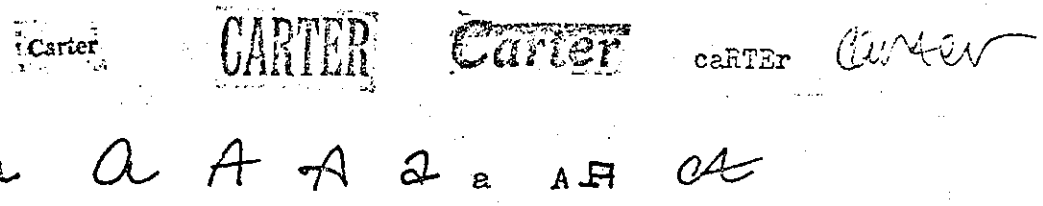
guage, such as that used by computers, embodies meaning in its surface representation. This concept accounts for the difficulty second language learners may have when, having read a passage in which they are able to identify the individual words, they are confused as to the meaning of the whole. In reading, the mind is always having to go beyond identification of stimuli to perceive meaning in language patterns.

How features are distinguished from one another and the process results in reading comprehension is debated among a number of theories, each of which puts forth strong points which the more general view of Frank Smith, the feature-analytic approach, accounts for and adds to. Briefly, we shall summarize two popular competing views, then continue with a modified feature-analytic approach of our own.

TWO COMPETING READING THEORIES

One premise for how words are processed and comprehension results is the template-matching model, sometimes called the whole-word ("sight") theory, which asserts that words are identified as wholes rather than the sum of their parts. According to this view, the brain acts as a warehouse of filing card-type accumulators of information. Every time a stimulus comes before the eye, the mind with lightening-like speed goes down the lists of "cards" until it finds one that has a name on it similar enough to the stimulus presented to assure the reader that it is a word that he/she knows. And then on to the next word. Problems with this theory are 1) it neglects to explain how the wholes (words) are first identified; 2) it assumes that there are many thousands of "photographs" which must be sorted through in order to match the correct pic-

ture to the correct word. This would require that the 50,000 words which the average reader is able to recognize on sight be in storage in the brain. By what system does the brain eliminate alternatives in such a system? How does this theory account for our ability to identify HAT, hat and hat as apparel for people's heads? How does the brain make spontaneous adjustments such as those which determine that the above three examples or the different ways of writing "Carter" or "a" are equivalent?



How is a new letter or word shape processed?

On the other hand, the whole-word theory does have substance in that experiments show repeatedly that a word can be identified as fast as a letter, suggesting that a word is as much a unit as a letter. Smith shows that a group of four or five words also can be identified as fast as a letter or word in isolation, which will be accounted for in further explanation of the feature-analytic view.

The phonics approach is a second theory of reading which has a lot of support. It views reading as a process of decoding writing to sound. According to proponents of this theory, determining the spoken form of a word is a necessary step between the written form, and the meaning. At its most extreme this theory asserts that each letter must be identified and sounded out in order to identify the word. First a letter, then clusters of letters are sounded out in order to identify a word.

A major base supporting the phonics method is evidence that nonsense words which contain pronounceable units are read with much greater accuracy than those which cannot be pronounced: "BIM" is more easily identified than "IBM"; "GLURCK" more than "CKURGL".

However, E. Gibson, realizing that strings of letters generated by rules are most easily perceived, experimented with deaf students to see how the grapheme-phoneme relationship, or "pronounceability" facilitated their reading. The deaf Ss made as much use of the pronounceable units as the hearing Ss did. She concluded that spelling patterns are generated by rules of orthography which structure language "without regard to the speech they decode to"[8] (Gibson, 1970). This is in direct opposition to a traditional phonics approach. For Gibson, a unit is a common spelling pattern.

The letter-by-letter theory assumes that reading proceeds sequentially by letters. It has been shown in recent experiments by Newman and Kolers that this is unfeasible[9]. When familiar words were flashed letter by letter on one spot on a screen, six-letter words were read with only 20 percent accuracy; with longer tachistoscopic exposure, the accuracy was better, but the rate of perception was over two seconds for short, easy words. In contrast, when a word of six or more letters or meaningful sequences of four to five words were flashed as units on a screen, recognition proceeded much more quickly -- demonstrating that information can be "chunked" or grouped into larger units than single letters.

[8]Gibson, Shurcliff and Yonas, (1970) in press.
[9]Gibson (1970)

> Short-term memory may contain only four or five elements at any one time, but each of these elements may be a single letter or a single word or possibly a meaning extracted from several words. Since sentence meaning cannot be determined on a sequential word-by-word basis, it is obvious that information from several printed words has to be held in short-term memory at any one time. The load on short-term memory can be reduced by "chunking" information in larger units (for example, by storing words rather than letters) but this involves making use of syntactic and semantic information that must already by stored in long-term memory.[10]

There are other reasons why reading could not be a letter by letter decoding of written information to sound. First, it does not take into account the aspect of "blending": bi- and trigrams changing the direct correspondence of letter to sound. But most importantly, this process would have limited use. We often are frustrated in attempts to correlate letters of an unknown word to its sound, if we have heard but not seen the word. For the beginning reader or second language learner, a great deal of knowledge is required in order to make good guesses at sound-letter correspondence, which the first language speaker has already acquired. Kenneth Goodman says:

> Even in an alphabetic system, the interrelationships between the oral and written forms of the language are not simple phoneme-grapheme correspondences, but are relationships between patterns of sounds and spelling patterns. The concept of regularity .. should be seen in relation to constrained sequences. S is a regular representation of /s/ in "sure" and "sugar", just as t is a regular representation of /s/ in "action". The correspondence is consistent, though it operates in limited circumstances (Venezky, 1967).[11]

Another point in opposition to the letter-by-letter view is that context and letter-combination redundancy make it unnecessary to read and sound out every letter in a word. Certain features reduce the possibilities of other

[10]Frank Smith, Psycholinguistics and Reading (New York: Holt, Rinehart and Winston, 1973)

[11]Kenneth Goodman, "Analysis of Oral Reading Miscues: Applied Psycholinguistics" (Frank Smith, 1973), 164

features occurring: for instance, in very few words in English does any letter but "u" follow "q". Context, word order and semantic information make information obtained from identification of letters old news; this is how it is possible to read words which are partially obscured. Furthermore, as Goodman writes, "Oral language is no less a code than written language." (Smith, 1973) Where is the advantage in translating from one code to another? If a reader pauses over a word in his/her reading, the sound of the word may immediately come to mind. It may seem to him that he is hearing the sounds of the words as he reads and especially as he writes. However, this is not the same as translating from written language to spoken, or vice versa; nor is it a necessary step between the two processes. Does the reader, when reading a complicated number like $3,525,010 in connected discourse, mentally say the number as he/she reads? Does he/she pause to sound out a foreign word when coming across it in a paragraph in English? There are many symbols used in writing which may not have immediate phonetic correspondances: "*", " ", "?", and " ... " are symbols which usually need no translation to sound in silent reading. In reading Chinese -- or Japanese or Korean written in Chinese characters -- it is not necessary to pronounce the characters. In fact, when trying to read Chinese aloud there is often a problem deciding which pronunciation among several alternatives to use. There are few clues to pronunciation within the character itself: pronunciation is determined from context.[12]

[12]Samuel E. Martin, "Nonalphabetic Writing Systems: Some Observations": Language by Ear and by Eye, James F. Kavanagh and Ignatius G. Mattingly (eds.), Cambridge, Mass.: MIT Press, 1972.

FEATURE ANALYTIC VIEW

The feature-analytic approach of Frank Smith looks at the question of how reading takes place in a different way than the whole word and letter-by-letter theories, but uses elements of them both. Smith believes that actual identification of a word is a process whereby features which look familiar are allocated by the brain by a series of "feature tests" to their respective feature lists, mental categories in the reader's memory of phenomena come across in previous reading and remembered/recognized.

The features that a reader differentiates between may be restricted by his/her level of reading proficiency: features may at one time be letters, at a later time spelling units, phrases, or words until a higher degree of proficiency is attained.

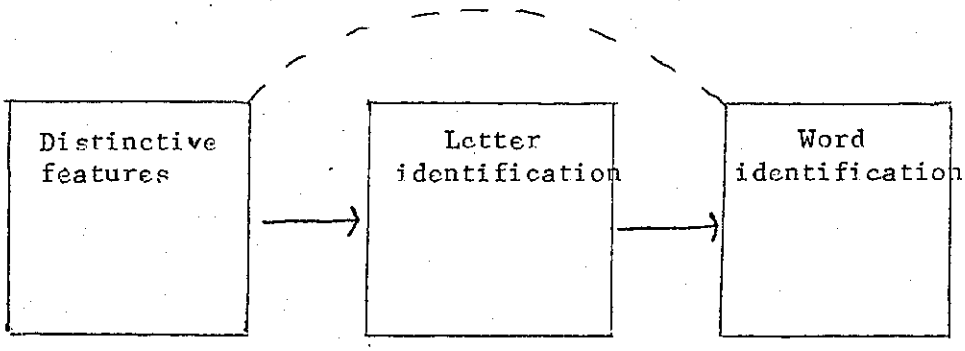
Smith is exceedingly cautious about the nature of features in reading, and qualifies his ideas on them with many "It would seem.." prefaces to whatever he is saying. However, figure 2 on the following page is a hypothetical theoretical feature list against which configurations might be checked for identification.

There are two types of word identification where identification means that the reader now knows the name of the word, whether or not he/she understands the meaning. For the accomplished reader, there is immediate word identification; for the beginner, mediated word identification. Immediate word identification is essentially the same process one goes through when encountering a 25-foot green, bristled, cone-shaped object in a cold, northern setting and thinking "tree". The reader examines a visual stimulus and allocates it to a class of things he/she already knows. The two methods can be shown,

Features	A	B	C	E	K	L	N	U	X	Z
Straight segment										
Horizontal	+			+		+				+
Vertical		+		+	+	+	+			
Oblique /	+				+				+	+
Oblique \	+				+		+		+	
Curve										
Closed		+								
Open vertically								+		
Open horizontally			+							
Intersection	+	+		+	+				+	
Redundancy										
Cyclic change		+		+						
Symmetry	+	+	+	+	+			+	+	
Discontinuity										
Vertical	+				+				+	
Horizontal				+		+	+			+

Fig. 2. Example of a hypothetical possible feature list. (Gibson 1965)

simplified, as follows:



------- Immediate word identification
_____ Mediated word identification[13]

Since the beginner knows only a limited number of words, a major part of his/her work is establishing new word categories and their alternates which are functional equivalents, e.g., HORSE and horse and horSE. In order to first identify a word, whether or not the verbal form of the visual configuration is familiar to him/her, the beginning reader has to either ask someone or apply spelling/phonic rules which may or may not be helpful. In order to eliminate alternatives as to what a word might be, the reader can choose from four potential sources of information:

1. visual (features)
2. orthographic (spelling regularities)
3. syntactic (position in phrase/sentence)
4. semantic (meaning in context).

The reader analyzes a configuration for all four possibilities according to what he/she knows most about in each case, and analyzes all parts of the configuration-beginning, medial and end positions. The feature-analytic approach

[13]Frank Smith, Understanding Reading: A Psycholinguistic Analysis of Reading and Learning to Read (New York: Hold, Rinehart and Winston, 1971), 7

does not make a statement on the sequence of the analysis; that is, whether the eye proceeds to discriminate features in groups (parallel processing) or one at a time (serial processing).

The expectation held by a reader as to what he/she will read depends upon a variety of factors, one of which is context, where word order and redundancy are important. Certainly evidence shows that knowledge of the structure of the language takes precedence over analysis of visual features when the configuration is unclear. In a case where context is not clearly helpful, such as with a very beginning reader or second language learner, other elements become more important. Consider this example: a driver sees a distant sign on a highway at night. Quite some distance before he/she is able to discriminate individual letters, he/she will probably have guessed the word. It is internal awareness of what visual language looks like and how its elements work together in a unique way which help the distant words to be identified, even if they are new words which have never been seen before.

An experiment by Frank Smith and Deborah Lott underlined this ability in readers. Simple three letter words which they were normally able to identify were shown to groups of first grade children. The subjects were able to identify more letters when they were present in words shown on a screen at low intensities, than they were individual letters shown at higher intensities.

One of the strongest factors enabling the reader to build up expectations about what letters will follow one another, and what words will fall in what order is the redundancy in all language. Redundancy occurs wherever information is duplicated by more than one source, reducing the reader's uncertainty about alternatives. For instance, the distributional redundancy of letters in English shows that "e", "t", "a", "o", "i", "n" and "s" occur far more fre-

quently than the least frequent, "z". If a letter occurs in a position that requires a vowel, the choices are cut down from 26 possible choices to 5. There is also duplication in the orthographic and featural information that the eyes perceive; when these overlap, redundancy occurs and the reader can make identification on less featural information because he/she makes use of the sequential constraints of the language. Combinations like st-, th-, br- as well as almost any consonant and vowel pair are more likely to occur than combinations like tf-, sr-, bm-, ae- and uo-. If the first letter in a word is "t", the next letter will almost certainly be "h", "r", "w", or a vowel. The actual uncertainty of letters -- the number of possibilities that a letter might be -- decreases in English by 50% as each additional letter in the word is identified. If the first letter of a word is "t" and the second is "h", you don't require nearly as much information to figure out the second letter as you did to identify the first letter, due to the restrictions of the language. There is a high probability in English that the second letter will be "h", and the number of possible alternatives is not 26 letters, but far less than that. The amount of information needed to figure out the rest of the word decreases rapidly.

EXPERIMENTAL RESEARCH ON FEATURES

We will now cite a variety of articles indicating more precisely the nature of the information which the eye picks up as significant.

We assume that letters, words and perhaps frequently used phrases are compiled of features and at times, may themselves be features. Configurations represent a series of units; unity is conferred upon them by the reader. The

reader's expectations of what he/she is going to read in the sentence colors what he/she does in fact read. We define a distinctive feature as a discriminable element common to more than one and less than all of a set of configurations. As the blanks surrounding the set of configurations are components of the set themselves, they may also be considered distinctive features. Franz Messmer suggested as possible features "the gridiron effect due to the accumulation of vertical strokes and the lively effect of a sequence of curved letters"[15]. Zeitler at the Univ. of Leipsic in 1900 developed a "dominant letter" theory (Woodworth, 1938). He noted that certain characteristics of capitals and some lower case letters seemed to dominate the total shape of configurations, and that their positioning at the ends of words may increase the span of distinctly seen letters reported in tachistoscopic experiments. For example, where letters such as "b", "p", "f", "g" and capitals extended above or below the general line of other letters in groups, they seemed to dominate the word just as prefixes and suffixes catch the attention of the eye in rapid visual fixations, whereas the vowels and low profile consonants are the most frequently misread and substituted among themselves, filled out with "inner mental contributions."[16] He experimented by presenting words tachistoscopally under low illumination. The following are examples of subjects' reporting in Zeitler's experiment before they were able to identify the entire configuration:

[15] R. S. Woodworth, Experimental Psychology (New York: Holt, Rinehart and Winston, 1938)

[16] E. B. Huey, The Psychology and Pedagogy of Reading (New York, 1908)

Word flashed by tachistoscope:	Ss reports:
Gold	G ld
Haut	H t
Fliege	F lg
Woche	W ch (ck)
Streit	St t
Minute	M t (Huey, 1908.)

The tendancy to generalize from what is identified easily on the page and to fill in what most likely lies in between those identified segments was explored in a pioneering study by Pillsbury in 1897. Typed words which had errors in them were flashed on a screen. Their errors consisted of letters omitted, substituted or blurred over by an "x" typed over them. Generally, the errors were not recognized by the Ss for what they really were. An absent letter was detected in only 40% of the cases, substituted letters in 22%, the blurred letters 14%. In those cases where the errors were detected, they occurred most times in the beginning of a word, often to the left of what Pillsbury determined was the fixation point. Pillsbury concluded that the Ss were not reading letter-by-letter, but were attending to the general word shape to grasp the essence of the configuration.

> "Usually the word as a whole is given as read definitely and distinctly as a whole, then several letters are given as most definite, or as clearly seen, while others are not so clear, or the subject may be in doubt whether they were seen at all. In many cases it was noticed that the letters which were most certain and of whose presence the subject is most confident were not on the slide, but were added subjectively..."[17]

Following are examples of the experiment's results:[18]

[17] Pillsbury (Huey, 1908)
[18] Ibid.

Letters exposed:	Word Read:	Subject's Comments:
kommonly	commonly	"But I can't make out the first letter."
fashxon	fashion	"Didn't see the i."
duplably	culpably	"The c was not clear."
uvermore	evermore	"Seems to be an m before it."

A more recent experiment, by W. E. Foote and L. L. Havens[19], suggests that words beginning and ending with descenders and ascenders were recognized earlier than those with flat-lettered beginnings and ends. They questioned the assumption that was current in 1965 that familiarity of words is a determinant of their recognition ease. They theorized that if the stimulus material were kept constant and the manner of obtaining a response was changed, the variable which affected perception should show up despite alterations in the subject's responding. Twelve 5-letter words were selected, one half of which had a high frequency of usage, one half having a low frequency of usage. There were three types of configurations: words beginning and ending with descenders such as "y", "g", "p", and "j" (example: young); words beginning and ending with ascenders -- "h", "l", "t" (example: break), and words beginning and ending with flat letters -- "a", "e", "r" (example: ocean).

Despensing with the procedure used in the experiment, a hierarchy in the results was noted. Words in the descender group were recognized earlier than words beginning with ascenders. Words in the ascender group were identified more quickly than words in the flat-letter group. Their conclusion:

[19]W. E. Foote and L. L. Havens, "Stimulus Frequency: Determinant of Perception or Response?" Psychonomic Science, 2 (1964), 153-154

> "Configuration.. is a significant variable... suggesting that the overall structure of words... as defined by the shape of their composite letters affects perception. This finding serves to emphasize the importance of structural features in word recognition." (W. E. Foote and L. L. Havens, 1965)

Gibson, Gibson, Pick and Osser[20] experimented with artificial letter-like figures illustrating types of transformations in the structure of letters. The experiment provides a basis for determining what differentiates letters from one another and what they have in common. Figures 3, 4 and 5 offer examples of what the experimenters developed as representative of transformation that occurs in the alphabet. They represent line-to-curve transformation (example of which is the change from "v" to "c"), rotation or reversal (example: "c" to "u"), and perspective (example: "o" to "c"). Results of this experiment suggest that at least some of the critical differences between the letters are topological (break versus curve), line versus curve; rotation transformations of right-left reversal, up-down reversal, and perspective transformations of left-slant and backward tilt. Overall error scores among the various age groups (subjects were four to eight years old) decreased as subject age increased, but the difficulty in discrimination was different for the various transformations. Errors were most frequent in differentiating between perspective transformations, and the least difficult task was discriminating among the topological transformations. Changes of rotation and reversal fell in between. Within these groups of differentiation factors are areas of perceptual confusion for readers to whom the alphabet is new, or for whom the letters are familiar but the sounds of a new language are different. An experi-

[20]Gibson, Gibson, Pick and Osser. Journal of Comparative and Physiological Psychology. 55, No. 6, 897-906

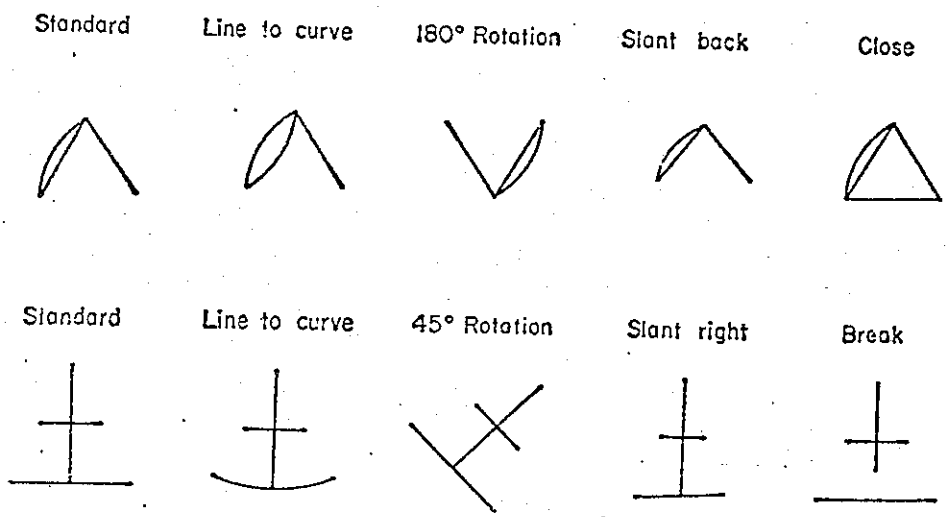


Fig. 3. Examples of letter-like figures illustrating different types of transformation. (Gibson, 1965)

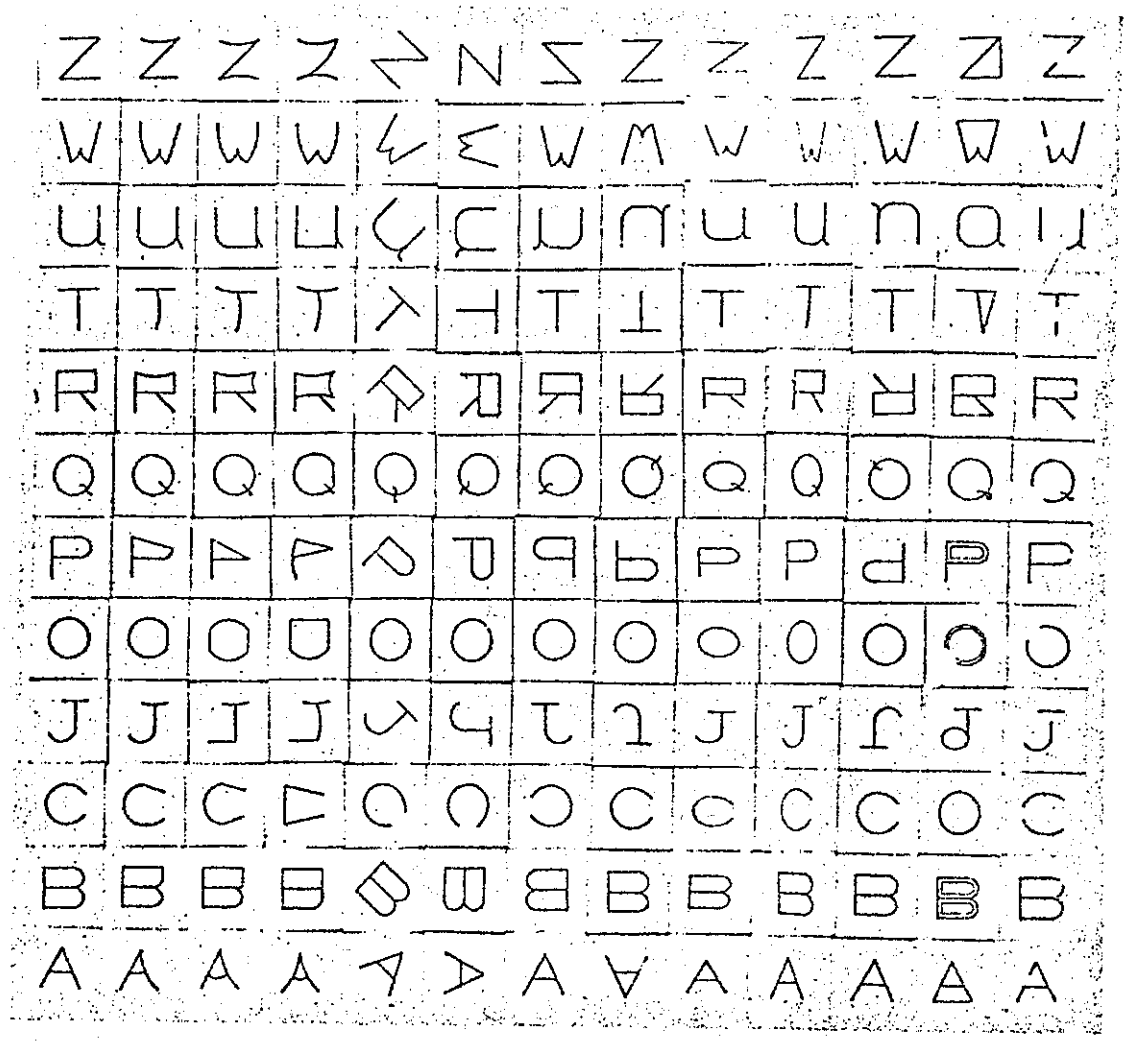


FIG. 5. Real letter standards and their transformations.
(Gibson, Gibson, Pick & Osser, 1962)

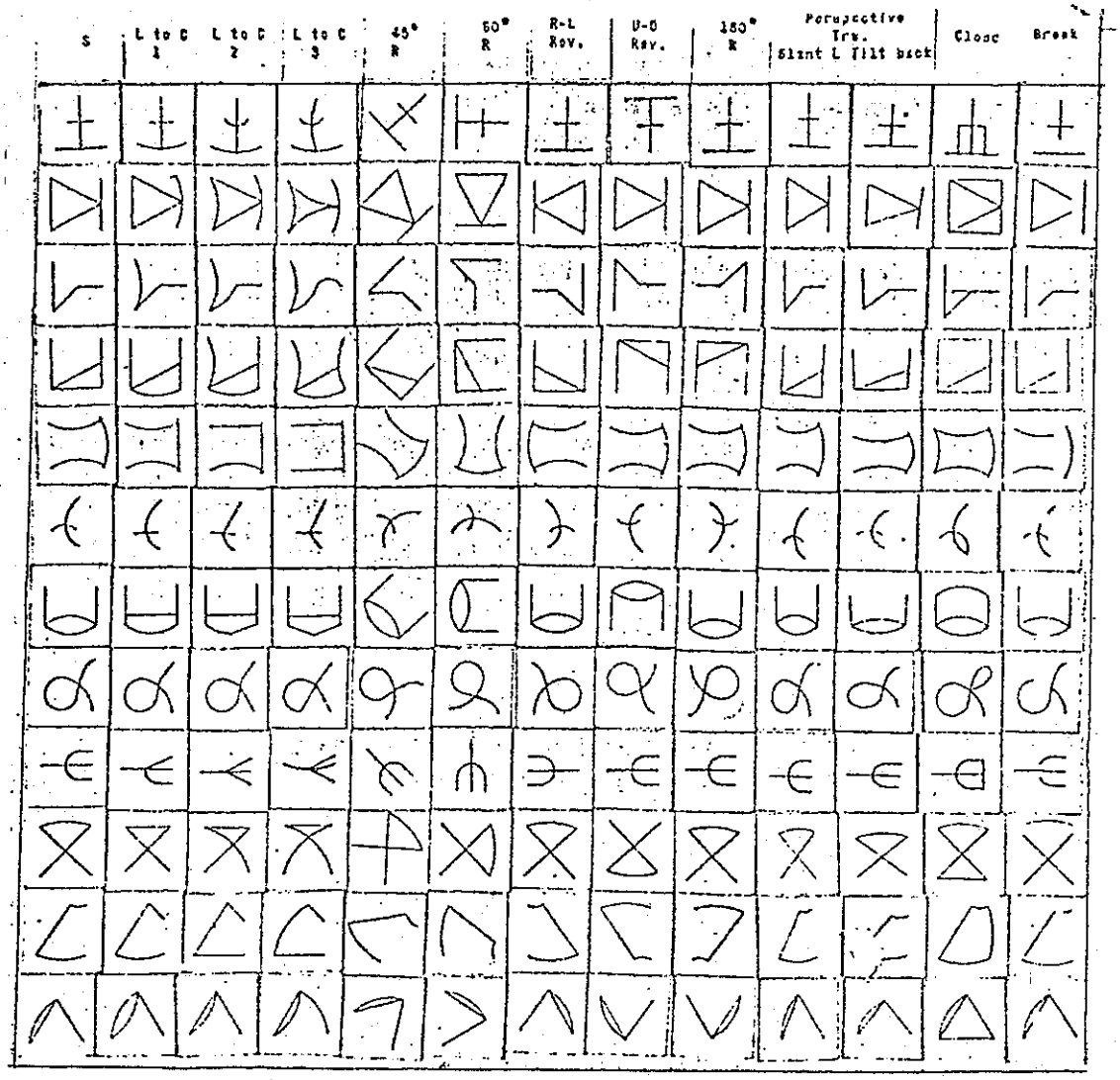


FIG. 4. The standard forms and their transformations.
(Gibson, Gibson, Pick & Osser, 1962)

ment by Peter Dunn-Rankin[21] provides insightful information on lower-case letters similar in enough ways to create uncertainty for the new reader and cause frequent error. In his study, he used a relative discrimination task rather than an absolute discrimination task (in the latter, one of the letters in the set would be the same as the stimulus, or target letter). By analyzing the cumulative choices made over all possible pairings, he was able to assign linear scale values to the letters in regard to their similarity to all the other letters in the alphabet. The letters he did not test for similarity were those that are used infrequently: q, v, x, z. His subjects were 315 second and third graders in Hawaii who responded to two pages each of English alphabet letter-pairs. Each of the 21 letters tested was thereby used fifteen times as a target against all 210 pairs for a total of 66,150 discriminations for the 21 most commonly used letters of the alphabet. The task was arranged as follows in the sample below:

(target letter)	(pairs)	
e	a	b
	y	c
	w	d
	u	e
	t	f

Each subject was directed to circle the letter of each pair that looked the most like the target letter.

[21] P. Dunn-Rankin, "The Similarity of Lower-case Letters of the English Alphabet," Journal of Verbal Learning and Verbal Behavior, 7 (1968)

The factor groups derived from the correlations between the letter scales which account for 90.7% of the variances between the letters are as follows:

1) short, all-curved	e,a,s,c,o
in contrast with	
tall, central line dominated	f,l,t,k,i,h
2) closed, ascender/descender	p,d,b o,g,h partially)
	in contrast with
	w
3) partially curved, short	n,u,m
	w although not curved, w is similar to m
	h
4)	r
5)	y

The experiment suggests that the factor groups appear to be based on size of letters, formal similarity, axial rotation, line-to-curve transformation; that not many errors occur between letters of different orthogonal groups (p is not mistaken for i,f,l,t,k); that within factor groups, particular features of individual letters become more essential for correct discrimination.

II

Alphablanks is composed of a set of notched plastic pieces which fit into the holes of a wooden peg board. These pieces are either red or yellow and are one of two sizes: approximately 1 cm. square, or about 1 cm. by 2 cm. They represent the lower case letters of the alphabet - yellow being vowels (including y) and red, consonants. The two sizes represent three types of letters: small letters (called flat or body letters) which include all the vowels (except y) and the consonants c, m, n, r, s, v, w, x, and z; tall letters which ascend above the middle range: b, d, f, h, k, l, and t; and tail letters which descend below the base line: g, j, p, and y. Words and sentences are spelled out in Alphablanks which represent the letters of English. Alphablanks reduces information about letter shapes to just those features which were shown in the preceeding section to be the most important. At first the system may seem difficult to comprehend, but with a minute of practice the puzzle evolves into an exciting way to approach our writing system. It points out relations between vowels and consonants that we rarely notice, demonstrates how much of a factor word-shape plays in recognition, and underlines the importance of context clues. It has a leveling effect, putting everyone including the teacher, in the role of a novice learning the alphabet because only the person who has written something in Alphablanks knows immediately what a word or phrase means.

What we are concerned with in this paper is Alphablanks and its use in teaching English, or any foreign language with the Roman alphabet, by analogous application of the following techniques.

HOW ALPHABLANKS TEACHES THE STUDENTS TO MAKE USE OF REDUNDANCY

Alphablanks is like any other writing system in that it links the

structural form of what we say and the thought that motivates the act of speech. But it is different in that it eliminates a great deal of redundant information. Featural information on the level of letters and words has been reduced to five pieces: vowel, consonant, and three sizes. Because of the reduction in number of features, context clues and syntactic information must be utilized if the words are to be read. The student comes to realize that it is not necessary to identify all the information that the alphabet supplies; it is more efficient to read for meaning and not for letters or sound. Alphablanks is a way to train the reader to use this semantic-syntactic or phonological redundancy to be a more efficient reader.

The features which Alphablanks uses are not the only features we utilize in reading. There are occasions when several words may fit one Alphablanks pattern and it becomes necessary to distinguish features on the level of letters: a from e, r from n. But it is not always necessary to use the letter shape itself. As several of the above experiments showed, in words where letters are substituted, omitted, blurred or obliterated, the readers were still able to identify these words, often not noticing that anything was wrong or not being able to pinpoint exactly where the error was. It was also explained that what enabled the reader to read these words was information coming from the overall word shape and context. Letters can be obscured in a word with no loss in recognition - Alphablanks carries that one step further.

Frank Smith (1973) says: "Only a small part of the information necessary for reading comes from the printed page." By this he means that the information we have stored in our minds about language makes redundant the infor-

mation we can get from letters and letter shapes. It is our mind which values and interprets information to form meaning. According to Smith:

> The skilled reader needs no more visual information to identify a string of words than the beginner needs to identify a couple of letters because all the additional information that the skilled reader requires is contributed by his prior knowledge of the language. To return to the earlier definition of information as the reduction of uncertainty, the reason a skilled reader does not require as much information as a beginner is that he already knows so much more, therefore his uncertainty is much less to begin with.[1]

He goes on to say that "Comprehension must preceed the identification of individual words." (Smith, 1973) In other words, if words are going to be assimilated they must be understood, or given a meaning. Each of these statements supports the use of Alphablanks. In order for the reader to identify the Alphablanks words he must already have a good deal of information about the nature of the language he is reading in. But even before that he must have had some kind of comprehension of the overall meaning of the phrase in order to have assigned even some kind of visual - acoustic form to these words.

HOW ALPHABLANKS HELPS STUDENTS TO USE THEIR OWN PROBLEM-SOLVING ABILITIES

An essential aspect of Alphablanks is its dual aspect of ambiguity and potential for development of problem-solving skills. Although Alphablanks gives clues as to how words are spelled and where the divisions between words exist, it is less specific than the alphabet. In order to understand a message a certain amount of reasoning must be used. Alphablanks gives the reader clues to understanding but not enough that uncertainty is wholly eliminated - and so he must think things out for himself. This is an important feature of Alphablanks. Gibson (1970) mentions an

[1] Smith, 1971, p. 102

experiment she did dividing a group of children into three groups, one of which was told exactly what to look for, a second told nothing, and the third told hints as to what to expect. On the first and second days of tests the first group performed better than the second and third, although on the second day the gap between the performance of the third group and the first group was narrowing. Tests on the third day showed that the first group had not retained the information that they had received and their performance declined. At the same time, the children given a small amount of helpful information but not the exact specifications of what to look for performed much better than either the children given all the necessary information or the children given none. She interpreted these results to mean that if students are helped with finding information but not given this information outright, they will retain the information longer and make better use of it. And there is another aspect to this - if we give rules and information to the students that we think are helpful instead of giving a little guidance and letting them figure out the rest for themselves we may not only be depriving them of the chance to figure it out on their own, but we may be giving them the wrong information. Smith says:

> In one sense, of course the teacher does "know" what (the) critical rules of featural and orthographic and semantic redundancy are; otherwise, he could not be a fluent reader himself. But this special information about redundancy is not accessible to our awareness, we acquire and use it quite unconsciously, with the unfortunate result that not only can we not pass it on verbally, but we often fail to realize how important it is.[2]

As was said earlier with respect to letter identification, it doesn't help to be told that n and N and ɲ are the same. A child cannot know the properties of n unless he compares it to h or r and discovers its distinctive features with respect to other letters.

[2]Smith, 1971, p. 225

The learner must be allowed to make errors, to feel free to guess and take chances in order to determine correctness. Alphablanks is a strategy allowing both for mistakes and differences in reading and the opportunity to figure out on one's own the linguistic structure. A pattern like ■□■□* can be read in several ways provided there is no context surrounding it or there is a context which will permit equal meaningfulness. The teacher should accept all answers which are appropriate as having "solved" the puzzle. If there is a mistake, for example, if the student says "take" instead of correct responses like "rice" or "mine", he should be corrected not by being given the answer, but by the teacher pointing to the small red blanks and asking if that is the way t or k look. In this way the teacher is allowing the child an additional chance to use his own knowledge.

One important aspect of Alphablanks which has not been mentioned yet is the way in which Alphablanks changes the visual field that the learner is working with. This is especially important in the case of the learner who has already had some trouble with learning to read the alphabet or the learner who has a different language orientation to the alphabet in English. Instead of the letters which he may have been having trouble with he has colors and word shapes - and more than that he can touch these shapes and move them around, put them in and out of the holes, fixing - tactually - his ideas in his environment. They get him involved manually as well as mentally. And the colors bring out new relationships in letters and words. Changing the image of his problem may enable him to get around it. The colors of Alphablanks and the necessity of thinking out what the colors and shapes represent should make it easier to remember spelling.

*Darkened squares represent red blanks and clear squares, yellow.

Renée Fuller, in explaining a reading system she developed and uses with learning disabled children, said, "Because letters or sounds by themselves make no sense, many children are stymied by rote memorization and the mechanics of learning to read."[3] She feels that children benefit from manipulating and creating forms of their own. Both child and adult language learners need to try out and generalize from experience rules which they need to make sense out of what they are learning. Alphablanks makes this kind of analysis into a kind of game and gives the learner an experimental testing ground in which to practice.

The most obvious yet simple reason for using Alphablanks as an aid to learning the alphabet and as a means of learning how to read more efficiently is that Alphablanks allows the learner to work creatively and have fun while doing so.

HOW ALPHABLANKS RELATES TO DIFFERENT KINDS OF LEARNERS

Alphablanks helps the teacher to diagnose the students' needs, abilities and disabilities; to look for strengths and teach to weaknesses. Many common problems can be caught quickly with Alphablanks. Some of these are of more concern to the teacher of students with learning disabilities, but many are of importance to the teacher of students who come from the background of a different writing system. Typical problems will be students who place blanks from right to left, who mix up ascending and descending letters, or who do not distinguish consistently between consonants and vowels. Other problems to look for may be how quickly the student can copy a pattern or write one in Alphablanks - does he/she have a lot of trouble?

[3]Fuller, Renée, "Breaking Down the IQ Walls: Severely Retarded People Can Learn to Read", Psychology Today, Vol. 8 no. 5 (October 1974) p. 97.

Each student will have different abilities and must be treated differently. The teacher should be on the watch for problems that students have when writing with Alphablanks - these are also problems which will appear in his writing the alphabet.

There are five types of learners we must be prepared to work with when developing strategies for Alphablanks for use in the language classroom. Each group has different experiences when using the alphabet and will have different kinds of problems.

A. Students with no present writing system. In teaching English as a second language this is the most uncommon. But this is of course the category that nearly all children entering primary school belong in. The learners in this group have to learn everything from the beginning, although in a sense this is an advantage as they have no prior assumptions. The relationships of letters to blanks will have to be taught more thoroughly to this kind of student.

B. The second group would include students who use an ideographic system of writing. These students have some knowledge of what is going on when we write, but just have nothing resembling the system in English. They may have problems separating vowels from consonants and could probably be expected to see words on more of a whole-word basis rather than searching for letter clues within words. These students also may have more trouble transferring speech to Alphablanks in a one-to-one relationship of blanks to sound.

C. In the third group are students who have a syllabic system of writing, for example, Japanese. These students would have some analogies

to the alphabet in their writing but may have certain problems relating to the alphabet. For example they may not necessarily think of the spaces between all syllables. Also there may be trouble seeing vowels as such. All three of the preceeding groups may have trouble placing the alphabet or blanks on the middle or base line in writing.

D. Students with a prior knowledge of an alphabetic system other than our own. In this category fall many students with very varied alphabetic experiences, ranging from speakers of Russian or Greek whose alphabets do not differ very much from the Roman, to those students whose backgrounds are Thai, Korean or Farsi and are very dissimilar. These students may often reverse letters, as may students in the previous three groups, forget vowels, and so on.

E. The final group is composed of students whose alphabet is the same or nearly the same as our own. Native speakers who have not learned the alphabet well and students of English who come from French, Spanish, or German language backgrounds, among others, belong in this group. Most of these latter, assuming they have learned their own alphabets, will have little trouble with the English alphabet, although they may have a good number of misconceptions and assumptions which do not apply in English. For example, a Spanish-or Italian-speaking student may assume that our alphabet represents the sounds of English more closely than it really does. Native speakers of English who have a poor knowledge of their alphabet will have some of the above problems, and may also share some of the confusions of a learner coming from an alphabetic system like Russian or Greek.

These last four groups share some similarities in that they have had experience setting thought into print. Their orientations to the alphabet vastly differ and the teacher using Alphablanks must be aware of these differences. He should try to draw from the varied strengths of the learners' language and writing backgrounds.

CLASSROOM ACTIVITIES USING ALPHABLANKS

Teachers must remember that we, who know how to read, do not remember what it is like to not know how to read. Different processes are involved in learning to read and in reading fluently. Whereas the fluent reader reads just for meaning, the learner has to cognitively realize the importance of redundancy and learn how to use it. What he most needs is practice - practice in order to find the relationships between writing and meaning, and practice to use these relationships to build up the speed which is necessary to reduce the load on short term memory.

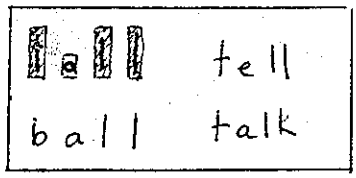
Teaching the Alphabet Using Alphablanks

There are many ways to go about doing this. One way suggested in the teacher's manual by Rosalie R. Saul and Susan Martin is to write the letters of the alphabet in lower case letters on the blackboard, using red chalk for consonants and yellow for vowels. This technique would be good for the most elementary classes and learners in category A above. Certain steps can be left out or modified with other types of classes. Ask the students to identify consonants and vowels if they can and to explain the differences between them. Ask them to spell their names and to give you other words. Spell these words in red and yellow letters on the blackboard and help them realize that all words have vowels. Point out the ascending letters and descending letters in the same way. Give each student Alphablanks and ask them to copy your alphabet on their boards. The manual says "the vowels become spatial targets. A child who has already been threatened by the whole alphabet can now go from a to e, master that much, them go on from e to i."[4]

[4]Rosalie R. Saul and Susan Martin, Alphablanks Teacher's Manual (Stamford, Conn. 1972) p. 5

At this point an activity comparing similar words can be done. Starting with a word spelled in blanks like at: ▯▯, add a letter to the beginning, for example, b: ▯▯▯ . Keep relating the blanks to spelled words on the blackboard. Substitute a letter for one in the Alphablanks word: c - ▯▯▯. Moving slowly, go through a whole spectrum of words that can be spelled with alphablanks, and show - or let the students show you - that several different words can be spelled with the same Alphablanks configuration.

To emphasize the transition between Alphablanks and letters if the class is having trouble, make up a felt board with pieces of felt resembling Alphablanks pieces. These pieces should be large enough to cover other felt or painted letters. Put down a word in letters, then have someone cover it up with Alphablanks. Or put down a word in Alphablanks and have people cover it up with letters and then move those letters to the side and let someone else cover it up with different letters. Doing this kind of intermediary operation makes the distinctions between letter sounds and letter shapes more obvious.



Students who are having difficulty at this stage should practice copying from letters to Alphablanks and finding words which go with Alphablanks words shapes. Additional practice can be done at a more advanced level with copying words and sentences from speech. Mistakes should not be corrected by giving the answer outright but by encouraging the student to compare the letters and Alphablanks he used. It is important to remember that as much information as possible should come from the

student himself.

An activity which will further help a student with problems in writing is to "spell" a sentence in Alphablanks and then read this sentence, asking the student to write down the sentence. Alphablanks will help him to find the letters which go with the sounds and to see spaces in between the words by himself.

Teaching Certain Spelling-to-sound Relationships

This must be done carefully. Not all phonics rules are regular and confusion may result. Also it is not a good idea to teach too many rules until the students have already some grasp of these relationships. Rules tend to make students afraid, especially in the case of English phonics where these rules are easily broken. In general it is best to let the students find their own rules. The teacher can help them do this by guiding them in making generalizations.

One rule or generalization that is not too hard to teach or too confusing and is especially easy to see in Alphablanks, is the rule concerning a silent e at the end of a one-syllable word, making the vowel long. It can be demonstrated that configurations like:

▨□▨	rip		▨□▨□	ripe
▨□▨	cub, mat, rod	become	▨□▨□	cube, mate, rode
▨□▨	man, can		▨□▨□	mane, cane

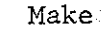
To help students recognize spelling patterns, the teacher should put down a letter on the blackboard and ask the students what letters can go before it or after it to either begin or end a word. For example, in a consonant cluster which begins a syllable the second consonant is typically

r or l unless the first is s, in which case the second consonant may be c, k, n, t, or w. Look at the shapes which are formed by these clusters in Alphablanks and ask the students to name words with these shapes in them. The teacher can have prepared a board beforehand with words or sentences spelled out on it. Then he can ask the students to find these combinations of letters in the word shapes and tell him what words the shapes represent.

This exercise can also be used in teacher training or a high school or college level linguistics course to help people concerned with the spelling configurations in English which are phonetically possible but just do not occur. Fries (1962,3) mentions that there are at least 100 consonent clusters which appear only at the ends of words, at least 40 which are found only at the beginnings, and only 3 which can appear in both places. Many pronounceable clusters appear only internally within a word at a syllabic break: recognize; and others not at all: /žl/.

Using Word Structure to Read

Write a word in Alphablanks which has many alternatives in spelling, for example, ▣□▣□ (mine, rice). Ask the students to give you some suggestions as to what this word may be. Write their suggestions on the blackboard. Now transform the word shape somehow - make it plural or singular by adding or subtracting its inflectional ending (or telling the students that the ending is the same for the plural: deer - deer), or change it to a third person verb form. If it is an adjective, you can make it into an adverb by adding -ly. Let the students tell you which of their word-suggestions are possible for which transformation. If you use the shape above, mine, rice, nice, and come, among many other words, can fit the

form. Make this shape into an adverb:  and ask them which word can fit this pattern. Make it past (in the case of come, tell them the form remains the same in the past). Ask them to name the new words which are now appropriate.

A related exercise helps students see typical word endings in Alphablanks. Certain word endings are linked to syntactic forms, for example, the -ly ending marking an adverb, or the noun endings -tion or -ness. Make a list in Alphablanks of these words which fit this pattern, ask students to figure out the words, and then practice recognizing them in sentences which the students can make up.

Using Context to Read

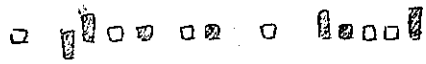
Ask students to write sentences in Alphablanks and the other students try to guess the sentences. In this exercise the teacher should play a mediating role, checking to make sure that the Alphablanks spelling is right and suggesting clues to aid the students in guessing. In an exercise like this common words which have rare configurations will be very helpful, as will the fact that y is the only long yellow blank. A combination like is always the and thus signals that a noun will follow, and the same is true of  which is two and signals a plural noun.  can be a or I.* Another clue is  in a position which is possible for a verb - it will most likely be is. The teacher and students become sensitive to configurations like this with practice.

So far there is no way to mark apostrophes or punctuation in Alphablanks. One possible substitution for the teacher to use is a small piece of paper inserted between blanks. Others include markers like pipecleaners, cardboard, or even - if the teacher is not too horrified - a piece of gum (in the case of squeamish teachers, a wad of clay) to be put in a hole in

*Remember that I is in the lower case.

place of a blank. It is a good idea to put parts of the sentence as it is guessed on the board with lines representing blank words: "The _____ is _____ a _____." sometimes helps students grasp the contxt more quickly. Use word ending clues and pronounceable letter-cluster information in addition to context to fill in the rest.

This activity can be combined with one of the previous ones and played as a game. A student writes a word in Alphablanks and other students must ask him questions about it to determine what this word is. (He must have a specific word in mind.) These questions can be about transformations: "What does this word look like if it is a verb?" or about context: "Write a sentence using this word." If the students cannot guess the word, he can make up an additional sentence in Alphablanks:

 (A plum is a fruit.)

 (A plum is purple.)

or he can give a definition orally.

Another activity using context is one where the teacher writes a paragraph on the board leaving blanks every five or so words. First let the students try to guess the words which go in the spaces through context. Then spell the difficult or ambiguous one in Alphablanks and let the students use spelling clues to guess the words.

When the teacher _____ to class this morning she saw that one _____ was absent. "_____ is Mary?" she asked. Mary came ____ 45 minutes late. Mary said, "I was _____ for the street-car this _____ and a large elephant came and _____ me up and carried ____ away. We walked _____the park and down _____ streets. Finally we came ____ school and he put me _____. I shook his trunk _____ he went away." The _____ liked Mary's story very _____ but nobody believed her.

came
student, where
in
waiting
morning
picked, me
through, some (the)
to, down
and, class (teacher)
much

A paragraph which is more difficult both in vocabulary and context can be used for more advanced classes.

Using Alphablanks to Illustrate a Grammar Point

This example practices using the words "maybe", "probably" and "may be". Make a list of four or five famous people (Muhammed Ali, Elizabeth Taylor, Jimmy Carter). Ask the students to make up three sentences for each person, one sentence using each word you want to practice. Afterwards the students must try to guess what these sentences are. A discussion can follow, if enough opinions seem different. In addition to what we have been saying all along that Alphablanks helps students do, this game helps introduce jargon specific to each of the fields these people are famous in; tells the opinions, cultural or personal that the students may have about these people ("Queen Elizabeth II is beautiful." in Japan); and practices the grammar point you had in mind.

Most of these activities can be used with different levels of English learners, depending on the difficulty of the words or sentences used. Here are some brief ideas on how to use Alphablanks to enrich other activities:

1) When teaching a dialog, write it in Alphablanks instead of letters. The process the student must go through when he reads the dialog in Alphablanks will help him learn it faster and retain it longer.

2) When a student asks how to spell a word, don't tell him, write it in Alphablanks.

3) After a dictation, put the correct form of misspelled words up in Alphablanks and have the students who misspelled them correct themselves. Or better yet, ask for volunteers in the class to spell these words in Alphablanks.

4) A similar activity can be done after an oral reading assignment where new words have been introduced. Put new words on the board in Alpha-blanks and ask the students what these words are. Have someone come to the board and try to spell them.

All of these ideas stem from the concept that it is better for the student to have to do the thinking for himself. Ideally you never want to give him more information than he really needs. Alphablanks is particularly suited to do just this, because it allows the teacher to hint at something without giving the answer himself.

GAMES TO PLAY WITH ALPHABLANKS

1. Use a picture and a word written in Alphablanks which the picture represents. Let the students try to guess the word.

_____ (dog)

_____ (canine) - for more advanced students

2. One student puts down a blank representing the first letter of a word he knows. The second student puts down another blank which combines with the first and together represent the first two letters of a word he knows. The third student again adds a blank representing the beginning of a word, and so on. Each student may be, and probably is, thinking of different words (or none at all --he may be faking it). If at any point a player thinks there is no word that can be spelled this way he can challenge - and if the previous player had no word in mind or if it is spelled wrong he loses a point; if there is a word then he gains a point. When all players agree that the word is finished the round ends.

3. Place a vowel on the board, in the middle of a line. Students add one letter to either side to make a word each time After four or five letters have been placed they can subtract letters to make different words. This can be done adding morphemes or syllables on to make more words. After a word has several syllables letters or syllables can be subtracted in the same way to make new words.

1) □ (a, e, i, o, u)

2) □□ (at, it, of)

3) □□□ (hat, hit)

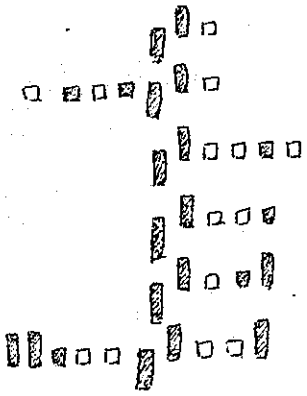
4) □□□□ (hate, take)

5) □□□□ (state, stake, shake)

From a base like □□□□ you can add syllables to make 2) □□□□□□□□ (statement). 3) □□□□□□□□□□ (restatement).

4. A student thinks of a word and shows a certain number of places to correspond with the number of letters in the word. Other students ask questions like "Is there a high red blank?", "Is there a middle yellow blank?" and so on. The student has a choice of where he wants fill in the the blanks according to their questions. For example, if his word is "train" he marks five spaces on the board _ _ _ _ _. One student asks if there is a small red blank. He says yes, and has the choice of putting a blank in one of two places. A third student asks if there is a tail red blank and the leader says no and marks a point against the group. After a few more questions the word is filled in with blanks: □□□□. If someone can guess the word he gets a point, but if by the time that all the blanks are filled in a student guesses a word that fits the blanks but is not the word the leader wanted, he gets a point but the search continues.

5. The teacher or a student writes a consonent cluster and a vowel on the Alphablanks board. Students in turn write words before, after, or around this basic pattern:



(ple, glo, gho)

(example)

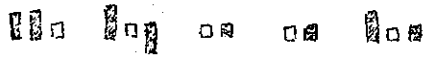
(please)

(gloom)

(ghost)

(throughout)

6. One student puts down a word in Alphablanks. The second student puts down a second word which he thinks can go with the first word. Each student adds another word. This is like the second game above in that each student has a different set of words in mind. A student who thinks that the configuration cannot be a sentence or that the sentence is finished can challenge or ask to stop. If he challenges and the blanks do not make a sentence or part of one, the previous student loses a point. If he asks to stop, all of the students must agree that it is the end. If another student can add a word or group of words to finish the sentence, he gets a point.



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