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ABSTRACT

This paper considers the place of one-to-one teacher/student oral reading interactions in reading instruction. Maintaining that there is an important function for such interactions in learning to read, the paper analyzes one learning process in these interactions--attention to errors--and argues that in oral reading instruction, attention to errors will function along with attention to appropriate reading responses. An analysis of error attention in terms of direct and indirect influences is then presented, with specific emphasis on the timing of attention, a strong determinant of self-behavior and accuracy. The paper concludes with the comment that it not only matters that early and remedial readers have one-to-one interactions, but it also matters how these interactions are conducted. (FL)

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LEARNING IN ONE-TO-ONE ORAL READING INTERACTIONS

: OUTCOMES OF TEACHER ATTENTION TO ERRORS.

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Paper presented at the Ninth N.Z. International Reading Association Conference, Dunedin, August 1978.

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A. The Functions of One-to-one Oral Reading Interactions

Learning to read takes place in two major settings in New Zealand classrooms. These are, small groups composed of readers at similar stages (e.g. currently receiving instruction with the same text) and, oral reading interactions between a teacher and one reader (Kitchen, 1976; Glynn and McNaughton, 1975).

This latter one-to-one setting may have crucial functions in learning to read, especially for remedial instruction. It allows a teacher to monitor the progresss of specific readers and observe the acquisition of appropriate reading strategies. Accurate observation enables the teacher to assess the competencies of the reader and design instruction accordingly.

One-to-one interactions also provide opportunities for learning. Acquiring proficiency in reading can be seen as learning to accurately attend to both graphic and contextual cues, to integrate responding to those cues, to become efficient by using the most informative cues, and finally, to become independent and self instructing, partially through learning to self correct (Clay, 1972; Day, 1975; Doehring, 1976; Goodman, 1976; La Berge and Samuels, 1974; McNaughton, 1978; Wanat, 1976). This conceptualisation of reading implies that readers must have opportunities to use and develop their behavioural strategies in the task of contextually based reading.

During one-to-one interactions where extended text-based oral reading occurs, a reader has the opportunity to practice skills and strategies already learned. The reader can also learn to integrate responding by attending to all cues 'on the run'. Opportunities for becoming more accurate, efficient and automatic in attending to cues are provided and independent self monitored and self corrected reading can develop.

As a result of several studies it now seems obvious that one-to-one interactions with a sensitive teacher could be an optimal setting for learning to put skills together and develop proficiency, especially when the usual classroom instruction has failed (e.g. Glynn and McNaughton, 1975; McNaughton and Delquadri, 1978).

In simple terms of time, reading in these settings probably markedly increases the opportunity for practice relative to the time available for individual responding in small group settings. The effects of practice are well known in psychological research and are an important learning process variable (Hintzman, 1976). With a complex set of skills like contextually-based reading it is probably a very significant variable.

Similarly, in the one-to-one setting the reader can attend to contextual cues for extended periods of time without interruption and so build a context within which to integrate use of specific graphic cues. This is more difficult to maintain in a small group setting. As reading proceeds the teacher can 'match' feedback and instruction with the particular reader's skills. This 'match' between instruction and the peculiar needs of an individual learner is more difficult to achieve in a small group setting.

These comments should not be taken as a condemnation of small group settings for reading instruction. Different settings may be important for learning different skills. Similarly, different settings may become more important at different stages of learning. Thus a small group setting may be the most functional setting for discussing and recalling experiences and concepts which are relevant for reading a text and inducing specific stragies in shared book experience methods. The argument suggested here is that somewhere the reader must have the opportunity to put skills together and actually read, and that the most efficient setting for this to occur with a maximum of practice and learning will often be in one-to-one interactions with a teacher.

Some observations made during the course of a pilot study may illustrate this point. Daily measures were taken of six-year-old low progress readers from a suburban Auckland classroom. The study aimed to examine the usefulness for 'normal' early readers of a reinforcement programme which had been developed for junior special class children (Glynn and McNaughton, 1975). Reading instruction for the early readers took place in an open plan classroom, was typically conducted only in a small group setting, and did not occur every day. This made it difficult to collect the measures of teacher and reader behaviour which were of interest.

In order to gain greater experimental precision readers were removed from the classroom every day and read with the Senior Teacher of Junior Classes in her classroom. These oral reading sessions were conducted every day for about five minutes. Readers read a different text each day. No instructions were given to the teacher other than to interact in her "usual" fashion. It was planned that after repeated measures had been taken for a 'baseline' period the teacher would be instructed in the reinforcement programme and changes in reader behaviour due to the reinforcement programme could be monitored.

Figure 1 about here

The niceties of experimental precision were not achieved. Major changes in readers' behaviour occurred during baselines. The 22 baseline days shown in Figure One are the data from one of the readers.

The low progress reader became highly accurate (above 90% words read initially correctly) and was self correcting at a high level (above 40% errors self corrected after 20 days. Checks on observer reliability were taken on seven days by a second observer. Observer agreement on errors was 84% and was 100% for self corrections[1].

The major change that had occurred for this reader was from a small group reading session to daily one-to-one reading interactions with an experienced teacher. Increased practice and/or matched instruction may have contributed to this change.

From casual observations it would seem that the reader would have had very little opportunity to respond in the small group settings. The change altered this infrequent, short duration responding to five minutes of extended practice per day.

Another interesting observation from this study is that the S.T.J.C. did not praise very often, about three times per session (less than once a minute). However she did pay very careful attention to errors as can be seen in the top graph of Figure one. In the first few sessions she attended to almost every error (close to 100%). The percentages declined as the reader became more independent (self corrected) and then rose again. Although the teacher may have attended to almost every error in the last few sessions, because there were so few errors reading was not often interrupted (about every 20 correct words compared with almost every other word in the first few sessions).

B. Dimensions of Attention to Oral Reading Errors

This last observation introduces the basic concern of this paper. A significant feature of oral reading interactions is teacher attention to errors (e.g. Weinstein, 1976). It was claimed above that one-to-one interactions may provide crucial learning opportunities. It is possible that attention to errors may be one of the operative teaching processes. This process may operate to either facilitate independent proficient reading or inhibit such learning.

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[1] Agreement calculated by formula smaller of the two observer's session totals divided by the larger of the two observer's totals and multiplied by 100.

Most analyses of behavioural interactions over academic skills have emphasised the use and evaluation of reinforcement contingencies (e.g. Lovitt, Eaton, Kirkwood and Pelander, 1971; Staats, Staats, Schutz and Wolf, 1962). Those behavioura programmes that have also used error correction procedures have not usually analysed the usefulness separately (e.g. Berner and Grimm, 1972; Glynn and McNaughton, 1975).

Error attention could function to provide information, that is cue certain reading behaviours to occur. An error can be seen as an instance of inexact or inappropriate reader attention to contextual and/or graphic cues in the text. Teacher attention to that error may have instructional properties which cue the reader in how to be more accurate in attending to appropriate cues. From this perspective error attention provides crucial information enabling a reader to learn what cues to attend to and how to attend to them.

Error attention can also have motivational properties. There are several studie which indicate that under appropriate conditions attention to errors can actually reinforce (i.e. increase) error production (Hasazi and Hasazi, 1972; Sajwaj and Knight, 1971). This could be a very real problem in remedial interactions. It suggests that teachers closely observe the outcomes of their behaviour and that appropriate responding have more reinforcing consequences than inappropriate responding. The question of motivational properties of error attention will not be dealt with further in this paper. It will be assumed in the following discussion that interactions are ideally designed so that attention to errors does not function as a reinforcer for errors. (i.e. increases error production).

The instructional or cueing function of error attention can be analysed in greater detail. When a teacher (or other instructor such as a paraprofessional parent or peer etc.) attends to an error during oral reading the attention has direct and indirect influences on reading behaviours. These influences need to be examined with the question, does the error attention facilitate rapid integrated learning or does it restrict the readers attention forcing a difficult component discrimination which is not able to be integrated with other skills?

Figure 2 about here

In Figure 2 indirect influence is termed the spatio-temporal properties of attention. This term refers to how information is provided.

a. Timing. Attention can occur immediately following an error or it

can be delayed for varying lengths of time.

(A) TEXT : The house had big windows.
READER : The horse had big windows.
(attention)..a .....b

Immediate (a) and Delayed attention (b) are illustrated in example (A). Given the substitution 'horse' for house, attention could be given immediately after 'horse' and before 'had', or could be delayed (for example) until after the sentence has been completed.

This indirect influence will be examined further in a study reported below. Anticipating that study three outcomes of the difference between immediate and delayed attention are obvious. Immediate attention restricts the opportunity for self correction to occur. It also reduces the availability of the post error context. Finally, it restricts the sort of assistance the teacher can provide. A conclusion from the study reported below is that if one delays attending to errors until the end of the sentence, readers will become more proficient than if one attends immediately.

Pauses or no-response errors are somewhat different. With response (substitution) errors both the reader and teacher have overt information to use. However, several different events could be happening when a reader pauses. These include, less overt forms of self-correction, intensive analysis of cues, or, breakdown of integrated and accurate responding. There probably will be a length of time, different for different readers, which would correspond to delaying until the end of a sentence. However, delay after this time and readers will begin to lose preceeding contextual cues and solving the error becomes a difficult discrimination task. This is an illustration of the importance (both to reader and teacher) of the reader actually making a response rather than omitting or not attempting a response. Conditions in interactions should be arranged so that responses are more likely to occur.

b. Frequency. Attention can also vary in terms of how often or which errors attention is given to. Forgetting timing of attention for a moment, should all errors be attended to, and under what conditions should an error not be brought to a reader's attention?[1] One can't accurately answer that question without knowled of particular readers and the texts they are reading.

[1] It is assumed that a self corrected error is not also attended to by the teacher. There are good reasons for considering a self correction to teach a reader more than any subsequent attention a teacher could provide (McNaughton, 1978). Subsequent attention could even interfere with that self-instructed learning.

If attention to errors is intended to facilitate learning then different readers will need to learn different things from error feedback. A major concern, however, is that every instance of error attention will interfere to some extent with ongoing attention to cues and the avilability of preceeding cues (Klein, 1976). Additionally, errors differ in the extent to which meaning is altered (consider example B). Given the goal of reading is to gain meaning then it may be more important to correct some sorts of errors than others.

(B) TEXT : The mouse ran into the house.
READER 1 : The house ran into the house.
READER 2 : The mouse rat into the house.
READER 3 : The mouse ran into the home.

But while some errors minimally alter meaning they also arise from inexact attention to graphophonic cues and if this is not attended to as an error then inaccurate responding may generalise to similar situations. In the long term meaning may be interfered with because incorrect attention has been over-learned.

More proficient readers can become more accurate just given extra reading practice without any error attention (McNaughton and Delquadri, 1978). But even with these readers learning effects of extra practice (no attention to any error) are inconsistent and not as strong as those resulting from error attention. Alternatively several studies of oral reading interactions which have programmed attention to every error have been very successful (McNaughton and Delquadri, 1978).

It would seem that most errors which are not self corrected should be attended to. It is of course important to alter such factors as texts and discussion around texts so that readers do not make many errors anyway. (The data in Figure 1 also say something about the instructional necessity for providing appropriate texts). If too many errors occur the disruption of meaning via the error, and the interference with reader attention to cues via the teacher, produce a situation of inefficient dysfunctional word-by-word decoding.

But if more than one error in ten is occurring it may be important not to always attend to the errors which minimally change meaning. In this way appropriate contextual cues are allowed to build up without interference by error attention. With this build up other errors which do alter meaning will be more easily observed by the reader (a behaviour necessary to self correction) and will be better able to be corrected.

It is interesting to note in Figure 1 that as the reader became more accurate the teacher began not to attend to some errors (a reduction in percent of errors attended to). Other data from a study of learning disabled twelve year olds showed a similar occurrence[1]. As readers became more accurate their teacher attended to fewer of the errors that were made.

To add to these data one researcher has found low progress first year readers received greater amounts of attention to errors than high progress readers. Thus increased error attention was associated with lower progress. The differences between high and low progress readers increased over the five months of observation (Weinstein, 1976). This finding could also illustrate the operation of immediate attention and other dimensions of error attention in addition to frequency alone. Nevertheless it does indicate that there may be inappropriate outcomes of high frequencies of error attention.

Cunningham (1976) has shown that teachers are much more likely to correct black dialect-specific errors that minimally change meaning than non dialect-specific errors which minimally change meaning. This suggests expectation and attitudes of teachers may influence what errors they attend to. Low progress readers receiving greater amounts of error attention may be being restricted in developing independent reading. Enforced instructional dependence may occur when no encouragement/support is given (by not attending) to substitutions which are contextually appropriate and the reader cannot build up usuable contextual cues.

c. Duration. Duration refers to how long an instance of error attention takes.

(c) TEXT : The mouse ran into the house.
READER : The house
(attention) : "No...that's not right, would it be house?... look at the first letter...it couldn't possibly be house because house is the last word... you read it in th last sentence ....."

An inappropriate duration is shown in example (C). If the objective in oral reading interactions is to maintain attention to contextual cues so that meaning is gained, and if error attention is to efficiently instruct a reader to attend more accurately to a cue and integrate that skill with attention to other cues, then the shorter the duration the better.

[1] The study is reported in McNaughton and Delquadri (1978) but the data referred to are unpublished.

There should be just enough information matched with what the reader needs to learn to strengthen the inexact or redirect inappropriate attention to cues.

If the reader does not correct very soon after the attention has been provided then the teacher has probably not provided appropriate usuable information. Continued attention in the form of questions reduces both the likelihood that the error will be corrected easily and the likelihood that the resulting learning will be usefully integrated with other skills. A rule adopted in some studies has been to use no more than three simple prompts (questions or instructions) and if a correction does not occur then provide the correct word and get reading going again (Glynn and McNaughton, 1975).

d. Change sequences. A final indirect form of influence is change in the timing, frequency and duration of error attention. Changes such as those from immediate to delayed timing, from no errors attended to, to most errors attended to; and long to short durations should set the occasion for greater learning. An example in Figure 1 is the change from very high percentages of error attention to lower and more variable percentages.

Direct influence by attention to errors occurs in what information is provided.

e. Amount of information. This dimension is similar to duration. Example (c) above illustrates how attention to an error can provide different amounts of information. At one extreme there are statements like "no" and "that's wrong". Very little learning is possible from the minimal information provided (e.g. Egeland, 1975). The other extreme is shown in Example (c). It is possible to have both too little and too much information. The reader should be provided with the appropriate information to learn to attend more accurately. That information should be in the most economical package possible so that contextually-based reading can continue. Many different sorts of prompts will confuse learning.

f. Type. Two types of Information can be provided. Prompts are questions or instructions for how to respond correctly. The second type, models, give direct information for what the correct response is. Both types are shown in example D.

(D)	TEXT	:	The mouse lived in a hole
	READER	:	The horse lived in a hole
			("Look at the first letter".
	PROMPTS		("What does or say?'
	(attention)		("Would a horse live in a hole?"

MODELS ("The word is mouse"
(attention)

A model rapidly provides a response which can be integrated with an available context. Prompts will place greater demands on reader attention than a model. But a prompt, if matched with a reader's learning needs and emphasising important cues for learning to read, will provide more useable information about how to respond on future occasions with different words.

Models are more appropriate to use (1) when readers do not have the text word in their oral language repertoire, (2) when readers are not able to use contextual or graphophonic cues associated with the text word to solve it, and, (3) when readers are not able to quickly use information from prompts. This can happen for example with interest words, multi-syllabic words and unfamiliar words. Thus, models often may be more appropriate with weaker or younger readers.

Models appear to be a pervasive feature of early reading instruction (Forester 1975) and often have been used in successful remedial programmes (e.g. Knight, Hasazi and McNeil, 1971; La Forge, Free and Hasazi, 1975). In one study of twelve year old learning disabled readers a modelling procedure was compared with a prompting procedure. The prompting procedure was more effective with the more proficient reader and the modelling procedure was more effective with the less proficient reader (McNaughton and Delquadri, 1978).

g. Level of prompt. Level refers to the behaviours which are cued or instructed by the prompt used. A basic distinction can be made between graphic or graphophonic cues and contextual (semantic and syntactic) cues. Prompts can cue attention to either of these cue sources in the textual array.

(E) TEXT : The cat ran into the house
READER : The can ran into the house
PROMPTS I : ("Look at the last letter"
(attention) ("Sound it out"
("Is that n ?"

PROMPTS II : ("Would that make sense?"
(attention) ("Start from the beginning again and see if its can"
("Who was running away?"

These two levels are shown in example (E). Prompts at level I are intended to

instruct attended to and use of graphic cues and those of level II are intended to instruct attention to and use of contextual cues.

Readers learn to use both cue sources accurately and efficiently (Clay, 1972; Doehring, 1976). Early in the acquisition sequence, especially in New Zealand, the reader relies on contextual cues to overcome limitations on automatic processing of complex visual stimuli. Effectiveness is dependent on the match between the readers specific skills which determines what needs to be learned, and the information provided by the prompt. Even given complete description of a readers capabilities what needs to be learned is not obvious. It depends on the general goals of the reading programme (cf. Barr, 1974,) and knowledge of how different sets of reading skills are most usefully and efficiently acquired.

Continued over emphasis on one cue source will lead to problems: Generally prompts for use of contextual cues can also set the occasion for learning about graphic cues. But prompts for graphic cues restrict attention primarily to that cue source (Klein, 1976,, Schvanaveldt, Ackerman and Semlear, 1977, Wittrock, Marks and Doctorow, 1975). However it doesn't make any instructional sense to prompt for context with a contextually appropriate substitution (e.g. "Dad" for "Father"). Thus prompts to attend to specific graphic cues should be used when errors are contextually appropriate if such attention to the error is appropriate. Continued over emphasis on graphic cues will tend to limit attention to contextual cues especially with weaker readers.

h. Change sequences and consistency. In the last paragraph it was claimed that inflexible continued prompting may interfere with acquisition of proficiency. This suggests that as a reader acquires new skills the information provided should shift so that the match between reader's skills and information available is maintained.

Continued modelling, or prompting of already learned skills would reduce progress. Major changes in the amount or level of information, irrespective of changes in reader behaviour would also be problematic. Alternatively, to facilitate learning some consistency in instructions is required. Consistent instructions to attend to a particular cue source keep the reader attending to that source.

i. Consequent sequence. Several programmes for oral reading instruction have adopted a reread procedure after an error has been corrected following a prompt or an imitation of a model has occurred (Fox, 1973; McNaughton and Delquadri, 1978).

In these programmes a reread involves going back to the beginning of the sentence in which the error occurred. Rereads could be useful in building up contextual cues after an error attention episode. This would be especially important if it has taken some time for the error to be corrected. The reread also allows for the repetition of the corrected word within a context. If the emphasis has been on graphic cues then this may be an important instructional strategy for imbedding the discrimination learning in a context (cf. Medin, 1975).

C. Results from a Study of the Timing of Error Attention

A study was designed to test the usefulness of the framework for analysing error attention, and specific predictions about timing (McNaughton, 1978). In that study 6 six year old normal readers had individual oral reading interactions in their classroom. Whenever an error occurred a specially instructed tutor intervened either immediately or after a delay (typically the end of a sentence). Other aspects of the error attention such as the information provided and the duration were kept constant. The tutor used a small amount of nondescript praise to maintain reading. The children read a different book each day being the book that had been introduced to the whole class in the previous day. Every second day the children read a second completely unfamiliar book to the tutor. No error attention occurred on this book.

This second book was used as a transfer test of the continuing effects of immediate or delayed attention to errors. It also provided unambiguous measures of changes in self correction behaviour on accuracy. In the non-tutored texts there were no direct effects due to information provided by error attention. Finally, it provided a more sensitive measure of effects because the texts were completely unfamiliar. Reliability of observations based on interobserver agreement data was acceptable. Immediate and Delayed phases alternated across time so that readers received seven or eight days under one condition and then seven or eight under the othe All readers received two phases of each condition.

Immediate versus delayed attention during tutored reading will necessarily restrict the opportunity to self correct. The tutors intervened before 5 seconds had elapsed or before the next word was read. The results showed that this restriction of opportunity occurred. What is interesting in the data however is that when given the opportunity under the delayed attention all the readers produced more self corrections. They self corrected more than 4 out of 10 errors when attention was delayed compared with less than 2 out of 10 errors under immediate attention.

There was no direct instruction to self correct or extrinsic reinforcement for self correction. This effect is like manipulating a setting condition such as the

familiarity of books to guarantee use of contextual cues (Schvanaveldt, Ackerman and Semlear, 1977). Self-correction appears to be a behaviour which is likely to occur given supportive conditions for attention to context and typically may not depend on direct forms of instruction.

The teacher had chosen texts at an appropriate level and introduced them very effectively. The children read the texts under immediate conditions at 91% words read initially correctly[1]. Under delayed attention conditions 93% of the words were read initially correctly. Thus there was some change in accuracy but readers were already very accurate.

This effect may have been due to the tutors immediate attention to errors reducing the readers attention to contextual cues in two ways. Firstly, contextual cues are reduced by repeated interruption of the post-error context. Reducing self corrections also may have reduced attention to contextual cues by interfering with self monitoring of mismatches at the level of appropriate meaning.

These two influences would tend to interfere with efficient generation of meaning by reducing prediction and self checking. Additionally, self corrections may have an instructional function. Observing mismatches, attending more closely to cues and correcting inexact or inappropriate attention may have a self instruction function (McNaughton, 1978). More accurate and efficient attention could be learned during self correction. If this is correct then greater accuracy would also be expected under delayed conditions. This is a conceptualisation of self correction as a self instructional process.

The non-tutored text data give a very similar picture. For four of the six readers the delayed conditions which applied on the text read several minutes before were associated with greater percentages of self corrected errors (on average one more error in ten being corrected). For one further reader the daily measures show immediate conditions reduced a general trend towards higher rates of self correction. With one subject there was a general increase across time.

In keeping with accuracy during tutored reading, accuracy of non-tutored reading closely followed the self corrections. Five out of the six subjects read the non-tutored texts with greater accuracy when delayed conditions allowed more self corrections and higher accuracy on the tutored texts.

[1] This is a measure of how accurately words are read the first time they are encountere It treats self corrections as errors.

(Average 89% words read initially correctly compared with 83% words read initially correct). The remaining subject showed consistent increases in accuracy associated with the increases in self corrections.

The data generally show that for all but one reader the effects of timing were strong and transferred to a new unfamiliar text. The major implication of this result is that immediate attention to errors during oral reading will reduce self corrections. This effect on self corrections will be associated with decreased accuracy in reading. Both effects will tend to generalise to situations where there is no attention to errors. The effects will be stronger with weaker readers and, if continued over time, would significantly reduce the development of proficient reading.

A question arises concerning the 'naturalistic' occurrence of immediate versus delayed attention in oral reading interactions in school. Fully representative descriptive data are not currently available. Data being processed by a research Project in process[1] suggests that at least some teachers may often attend immediately to errors. Over three months, observations were made of teachers of five problem readers who had been referred to the Project for profound difficulties in reading. The data indicate the teachers attended immediately to around 70% of the 1192 errors which were observed. Teachers ranged from immediately attending on 40% of the occasions to 90%. Thus this may be a pervasive feature of our oral reading interactions with problem readers. An unintended effect of these interactions may be enforced instructional dependence by the problem readers. This relates very clearly to data reported above concerning increasingly greater amounts of error attention being given to low progress readers (Wienstein, 1976).

The paper began by considering the place of one-to-one oral reading settings in reading instruction. It claimed there is a very important function for such interactions in learning to read. It then analysed one learning process in these interactions; attention to errors. In oral reading interactions attention to errors will function with attention to appropriate reading responses. Both are essential components of interactions. An analysis was made of error attention in terms of direct and indirect influences. One indirect dimension, the timing of attention, has recently been shown to be a strong determiner of self behaviour and accuracy. This is one dimension that teachers should be aware of when conducting instruction via oral reading interactions. One final comment is in order. It not only matters that early and remedial readers have one-to-one interactions, it also matters how these are conducted.

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[1] The Mangere Home and School Project. Education Department, University of Auckland.

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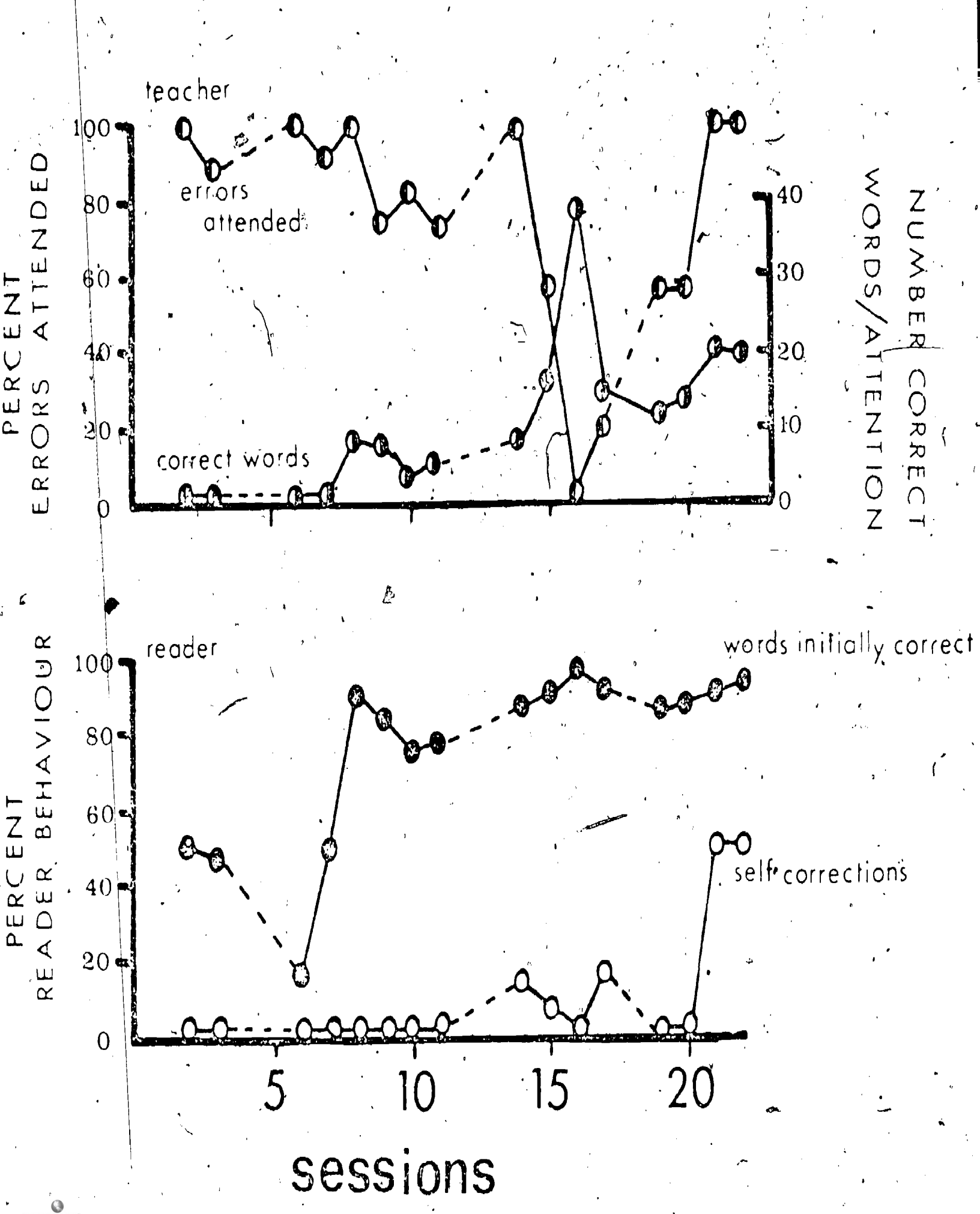
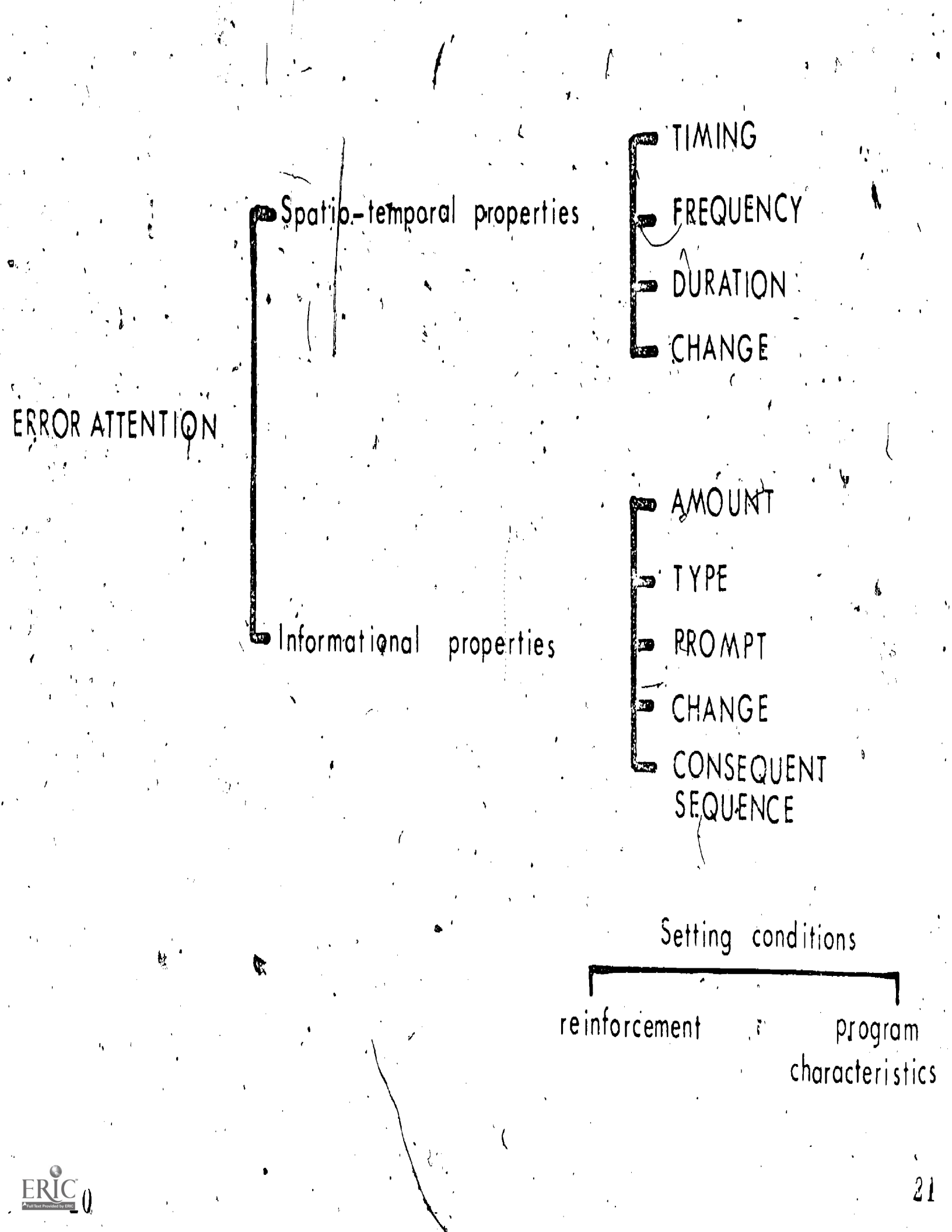
FIGURES


teacher
errors attended
correct words
PERCENT ERRORS ATTENDED
NUMBER CORRECT WORDS/ATTENTION
100
80
60
40
20
0
40
30
20
10
0
reader
words initially correct
self corrections
PERCENT READER BEHAVIOUR
100
80
60
40
20
0
5
10
15
20
sessions


ERROR ATTENTION
Spatio-temporal properties
TIMING
FREQUENCY
DURATION
CHANGE
Informational properties
AMOUNT
TYPE
PROMPT
CHANGE
CONSEQUENT SEQUENCE
Setting conditions
reinforcement
program characteristics