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ABSTRACT

        A case study of a New Zealand educator's 14-year
efforts to apply reading theory to reading instruction is described
in this paper. The project was begun in 1962 to find out if teachers
could observe the process of learning to read going awry within a few
months of the child's entry into school, and to seek ways of
correcting that trend if observed. The data were collected in a
longitudinal study design from six New Zealand schools. The data
indicated that students developed self-limiting and self-improving
reading behaviors, complex sets of hierarchically organized behaviors
acquired over three to four years of graduated practice. The
applications of ideas gained from this research took the form of
inservice workshops to make teachers more sensitive observers of
student reading behaviors, helping the teachers to observe, analyze,
and correct the students' reading strategies before self-limiting
strategies would inhibit reading progress and lead to reading
failure. (Discussion following presentation of the paper is
included.) (RL)

THEORETICAL RESEARCH AND INSTRUCTIONAL CHANGE:

A CASE STUDY.

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Beginning Reading Instruction.

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I - INTRODUCTION

1. OVERVIEW

What happens when the results of a research program in beginning reading are translated through the processes of publication, in-service training, and workshop or study group activities into classroom practice. The research questions were posed in 1962 and several projects were reported in academic journals by 1971. In 1972 texts were published (and purchased) and an intensive program of talks, workshops and reporting for teachers was undertaken. This exercise in communication ends with the release of an innovative in-service program in 1976 purporting to bring some of the research insights to classroom teachers.

What influence have the research findings had on instruction? This paper will treat separately the evolving theory and field communication aspects.

The research program did not set out to devise a new instruction strategy. It looked for ways to increase success within the available program so any implications for instructional change would suggest adaptations rather than reformulation.

The aspects of theory which have proved viable in the sense that we have evidence that teachers use them had behavioral signals that could be captured by teachers using simple observation procedures. Little published evidence was found to show that teachers understood any more about the reading process as a result of this work.

Academically, we are only part of the way to our original research goal. Assuming that different programs stress different aspects of the reading process at different times we are still working towards a full developmental

description of psychological process that develops under the particular method adopted in New Zealand schools. In communicating the available insights to teachers it appears from the analysis in this paper that we have a great deal more work to do.

I do not know what relevance readers will find in this case study. New Zealand is a small country with 3½ million people, with demanding indigenous and immigrant ethnic problems, a centralised source of educational authority, funding and ideas, and a relatively high standard of living and education. Teachers are educated in Teachers Colleges with the effect that the University is somewhat removed as a sphere of influence. Ideas and reading texts are usually imported, not home-grown. Publishers participate little in the educational exercise. Initial instruction is by a language experience approach, teaching is more structured than in the British informal infant school but prescriptive teaching would be resented by teachers.

2. ORIGINS OF THE RESEARCH QUESTIONS

From my teaching and clinical experience and an academic training in Developmental Psychology I posed this question: Can we see the process of learning to read going wrong within a few months of school entry? I selected a longitudinal approach, in a field context, (the classroom). Every child who entered each of 6 schools in Term 1, 1963 was included in the descriptive study. In New Zealand children enter school on their fifth birthday, which may be and is any day of the school year.

There was little New Zealand research on reading at any level and none on the first year. A review of overseas literature suggested three approaches to reducing reading failure:

1) predict reading failure from certain characteristics of children prior to or at school entry.

ii) continually revise the instruction in beginning reading.

iii) use a diagnostic-remedial approach to the child who has been allowed
to 'progress at his own rate' for more than 2 years before remedial
help is offered.

From the literature I concluded that predictions of success or failure
prior to entry to programs were only moderately successful, with correlations
of the order of 0.4 to 0.5, and the success rates of children in remedial
programs were also low.

Perhaps most unsettling of all, was my personal experience. I had
taught two remedial pupils, who, after some months of instruction made sudden
and spectacular gains in reading amounting to three years of reading age in
a few months of instruction. I felt that my theories of reading processes
did not explain these successes. It was these positive instances that sent
me searching for a better model than the Schonell-Gates-Monroe-Durrell type
of theory of reading difficulties that I had studied. It was probably this
search for explanation in these particular cases that drew me towards an
information-processing framework because I knew my own instructional behaviors
in my remedial program; I could record, count, and interpret the changed
behaviors, but there were some unknowns between these. What precisely had
the child done with the instruction that wrought such effective changes in
his behavior?

A pilot study answered my major question. It was possible to objectively
record the behavior of children in the first year of instruction who were
establishing a success or failure pattern. Rather more exciting, however,
was the recording of self-correction, an unlooked-for explanatory variable
of how the child could teach himself, irrespective of the program he was in.
This is a crucial theoretical variable which will be followed up later. My

understanding of error behavior also changed in that year, because my high

progress readers made the most errors.

7.   As the pilot study seemed to be probing new territory, I began to

tighten up the research design. I planned

i)   to start at school entry on the child's fifth birthday.

ii)   to make weekly observations, an intensive longitudinal method.

iii) to use in addition a test battery within two weeks of the child's

      reaching 5:0, 5:6, and 6:0, providing a tight control over age

      variability.

iv)   to record observable behaviors in an individual reading situation and

      attempt to obtain a total record.

v)   to adopt deliberately and obstinately, an a-theoretical, no hypotheses,

      stance to data collection.

      Somewhere in these design decisions lay the seeds of productivity for

any instructional changes I would be able to recommend.

1. A detailed description of what happened to Auckland children in their

   first year of instruction could lead directly to ideas for classroom

   improvements.

2. The year-long study would allow for the child to adjust to school, for

   variability in the child's performance to be recorded, and for experimentation

   with program by the teacher. There would be time for the instruction to

   show effects and for trends to become apparent. Implications from this

   longitudinal approach could differ markedly from those which emerge from

   one-point-of-time cross-sectional studies or before-and-after educational

   treatment studies.

3. The search would be directed towards behaviors that would detect early
   failure rather than to methods of stimulating high progress readers.
   All children entering school would be used and the failures would be
   seen against the backdrop of the succeeding children. High and low
   progress readers would be compared to locate discriminating variables.
   While this could lead to suggestions that would raise the mean level
   of progress by narrowing the distribution of the lower 50% of readers,
   it was unlikely to address more general problems of instructional
   approach.

4. Some theoretical integration of the findings with reviewed theory and
   research might be possible as the data base would be sound. The theory-
   building would have internal validity only for urban New Zealand. The
   research would have no external validity for other programs or other
   cultures.

Between the end of the pilot study and the beginning of the main study
in 1963 a major curriculum revision occurred. With the free distribution of
a new series of reading books the centralised Department of Education ousted
the word-learning method of the past ten years and placed New Zealand reading
outside the bounds of promulgated methods in the reading literature. A group
of teachers in several years of meetings had produced a grass-roots revision
of methods and materials. New Zealand teachers had officially discarded
letter-sound approaches as central to reading in 1950. Now they were rejecting
a sight vocabulary approach. In the new program children would read many
interesting short books in a new graded series. Teachers would introduce
new concepts, language and plot of the short story to a reading group, and
within one or two weeks children would have completed the book. The approach
has been called a book experience approach. It is analogous to language
experience methods but the stories are introduced to the children rather

than elicited from them. Comprehension would have the highest value.
Teaching points would arise as the child read and prior teaching of sounds,
or of words lists would seldom occur. Not all the vocabulary of the early
books need be learned: only the high frequency words. (Clay, 1975).

This major shift in t aching method may have produced sufficient
uncertainty at the classroom level to create a receptiveness to new ideas
in the 1970's.

Muttering to myself about the grim effects of practising errors, and
with blind trust that my carefully designed procedures from the pilot study
program would be equally effective in the new program, I began my recording
in the first week of the new style of instruction. It was not so difficult
to adopt an a-theoretical position in this situation.

The timing was fortuitous: the Department of Education had not replied
to my inquiry about the timing of the introduction of the new program. The
schools I selected were those where I was personally welcome although the
socio-economic range was similar to that of the city. I approached schools
with great respect for their sensitivity, aware that the intrusion of my
research needs called for their co-operation, and more alert than the staff
themselves to the exposure of poor teaching that could result from my record
keeping. I became a friend of the schools and of the children but I felt the
cold suspicion of the Department in the background. That is where the program
began in 1963.

II   THEORY

3. FIRST YEAR PROGRESS

By 1966 there was a report plotting the progress from their 5th to 6th
birthdays of 100 urban white children moving into an instructional program.

What the children did, what progress occurred, the grouping and re-grouping, the confusions and retardations were recorded.

The use of syntax

An analysis of 8,000 substitution errors in the records of 100 children showed a high incidence of syntactic equivalence (72%) between error substitutions and the textual stimulus (Clay, 1968). The child's first guesses at the points of uncertainty in his reading tended to be dominated by his control over the syntax of his language. In several parts of the world researchers were arriving at the same insights at the same time. The oral language habits of the linguistically average child provided a source of relatively stable responses which gave some success in predicting what words were likely to occur in a text and in detecting when he made an error

The use of visual cues

The error analysis showed that the use of visual perception cues for encoding and verifying was slow to emerge and was for a long time unreliable and unstable. In this program of instruction, cues from situation or story and from spoken language were supplemented slowly by cues from letter knowledge, word knowledge, letter-sound associations and syllabic awareness. Visual perception must proceed toward a fine knowledge of letters-within-words but some children maximize the importance of oral language and fail to attend to the visual cues. Seen in persepctive the child's oral language skills made an excellent starting point since they provided a set of well established stable responses. Adequate learning must proceed in the direction of more receptiveness to visual perception cues which must eventually dominate the process. They did not do so in the first year as the average six year old could only identify half the letter symbols of the upper and lower case alphabets although within the local definition, they were reading.

Self-correction

In the error analysis, account was taken of the spontaneous correction
of errors. This presumably stems from the awareness, however vague, that
not all the relationships between the spoken and printed words are a neat fit.
A reader may become conscious of the difference between what he has said and
one of the several messages of the text.

a) The response may not make sense - in the sentence, in the story,
or with the pictures. This creates cognitive dissonance.

A child may read "Dad, let me paint you," and exclaim "Hey!
you can't paint YOU!"

b) The response may make sense but something in the print may be
incongruous with the response given. This creates perceptual
dissonance.

The child may read, "Mother said" for "Mother asked" and
then protest, "it hasn't got the same letters as said" (visual
cues) or "but it starts with an a!" (letter-sound awareness)

c) Berlyne (1960) suggests that a dissonant relation can also exist
between cognitive elements and an overt action that the subject
has already executed or is contemplating. This type of dissonance
might be expected in early reading behavior. Movement across a
line, and the finger pointing that supports it, are action sequences
involved in the beginning reading process. Another action sequence
consists of the speech impulses emitted as the child invents or
reads a text. Somehow the word unit must be isolated from the flow
of speech and matched to a word pattern located in the text in a
sequential co-ordination of visual locating and of speech impulses.

Dissonance may arise from action sequences, from spatial cues, from semantic,
syntactic, or morphophonemic cues, or from visual perception cues. The child,
aware that "something is wrong", may search for a response which resolves
the dissonance. This relationship between reading progress and self-correction
behavior was reported in a British journal (Clay, 1969).

An information-processing view

From these and other analyses the interpretation was made that efficient
information-processing strategies are developed by children who make good
progress in learning to read. That such strategies could be developed by
young children at a stage of intuitive rather than logical thinking may be

explained in terms of Neisser's concept of multiple processing which he considers appropriate for dealing with novel, irregular stimuli (Clay, 1969). The first steps towards such multiple-processing strategies are taken very early in the reading program as children begin to choose between alternative responses. Gradually their choices become more and more constrained by the visual and linguistic features of the texts.

These arguments were included in Goodacre's Methods - a reading list and glossary of terms (1971) under the heading Children's Reading - Miscues - applications of linguistics, together with Weber (1968, 1970), Goodman, K.S. (1969), Goddman, Y. (1970) and Kurss (1969). In 1972 Goodacre drew extensively from my article in her publication Hearing Children Read (1972) comparing the results with those of Biemiller (1970), Burke and Goodman (1970) and Christenson (1969). The theory that was emerging in our research was convergent with other reported research.

4. THE THIRD YEAR OF INSTRUCTION

Children in their third year of instruction were also studied (Williams and Clay, 1969) the average age of children was 7:10. A record was made of all observable behavior as the children read 5 graded passages: words correct and words incorrect, pausing, omitting or inserting or substituting words, ignoring punctuation, self-correction and repetition, attacking words, whispering, lip movement, finger pointing, appeals for help and refusals. The techniques derived in the study of beginning readers, proved equally appropriate for the older children. This, in itself, was interesting.

Word-Solving

From the error analyses it was possible to concude that the children used their knowledge of the English language as a guide to the choice of what types of words could occur. They used meaning cues and they used

letter-sound relationships in association with other cues without audible
analysis of words. Most errors had a high degree of agreement with the
syntax, meaning and visual cues of the text word.

In the first year of learning to read it had been fr··· ·h·· visual
cues played less of a role than syntactic and semantic   n ·ne errors
which the children made. At the third year level visual cues played a role
for children at all levels of progress, high, average or low. Visual cues
contributed to 85 - 91% of the errors at this level, despite the slow progress
in this area during the first year. Reversal of letter order was rare.

Children did not use analytic strategies overtly.

The audible analysis of words into sounds, (si - a - sh - d) or syllables
(sur - faced) was found for only 5½% of successful attack although teachers
had been stressing analysis in word study lessons for two years. A further
6% of responses involved a delay which might have been private solving, making
11% of successful solving. On the other hand almost half of the word-solving
was achieved by self-correction. An error was made but the child solved the
problem at a second or third attempt without prompting or help or audible
analysis. If the error sentence was sensible and acceptable English, there
was less likelihood of the error being corrected. The importance of this
kind of word-solving is emphasised by the high rates at which it occurred.

Confirming checks

The easy flow of reading is interrupted when a child repeats a word
which he has already read correctly. This kind of non-fluency occurred
almost as often as self-correction in nearly 40% of all successful attacks.
Why? One can only guess. Perhaps the child was unsure of the word or its
relation to other words. He may have expected something different. It may
have sounded wrong. It may have looked wrong. Each assumption implies

that the child who read correctly and repeated the same word was checking
something. There must be a cognitive component in this. The child seeks
to understand what has been read. It is not enough merely to emit the
right response.

A self-improving system

From this error-detecting, correctigg, and confirming behavior the
child learns how to search, how to use cues and how to check on his responses,
(given that no counter-productive teacher behavior occurs). Self-correction
emerges in the beginning reading stage, has some continuing advantage in the
third year of instruction, has been reported for fluent readers in their
fifth year of instruction, and can be observed in adults who are asked to
read aloud from a difficult text.

When a correct reading response is found it fits all the sources of
cues like the last piece in a jigsaw puzzle. This can be positively
reinforcing. Successful decoding creates its own positive feedback. It
readily produces positive feedback from the teacher or listener in the 1 to
1 oral reading setting. A capacity to convert a difficulty into an opportunity
to master some new features of print or some new operation, independently,
should make the system self-improving.

Reading instruction regularly produces its failures. We blame the
programs, the educational system, the material resources, or the children
but almost never do we attribute the result to the sequence of instruction
itself creating in the particular child a set of behaviours that are self-
limiting rather than self-extending. I have been interested in this problem.

The units or chunks

Juncture, pitch and stress were studied in this third year. The behavi-
of the best readers suggested the hypothesis that they were processing cu

at the intersentence, sentence, phrase and word level whereas the poor

readers worked at best on the two- or three-word phrase and more usually

at the word, syllable, and letter level. It seems likely that these

suprasegmental variables indicate something about the organization of the

response repertoire of the reader (Clay and Imlach, 1971).

At points of difficulty poor readers depended too much on the letters

of the word. One could guess that, not having several sources of cues to

converge on a correct response, they do not have an adequate signal to

tell them when they are right or wrong and so their reading behavior does

not become self-improving. In spite of its lack of success this unprofitable

behavior did not disappear. What adjustments are normally made for slow

reading groups in school? Remedial programs tend to focus children on

exercises which draw attention to the elements of words, word attack and

sounding out. It is assumed that this is the means by which people do read,

the way children learn to read, and the way failing children need to relearn

to read. None of those assumptions is necessarily true. Could we be directing

the poor reader's attention away from the behaviors that would bring about the

most rapid improvement in their reading? Identification of letters and words

is important but not sufficient.

A challenge is emerging here. Reading materials that are controlled

and purport to offer the child one new difficulty at a time are based on

one kind of learning theory. Perhaps materials that are rich in language

cues allow for dissonance and permit the cross-checking, and self-correction

strategies which construct and support a self-improving system.

There is a study which spans the first three years of instruction

(Clay, 1970a).

It was an experiment repeated annually on the same children recording
their responses to words written in normal, in reversed and in inverted form.
Beginning readers seemed to be less disturbed over reading word cards
upside-down than older readers. Did poorer readers read letters and words
without apparent heed to the position that they occupy in space? The children
who were followed for the first year of their schooling were retested at 6,
7 and 8 years. The word lists used the 48 most frequently-used words in the
first year reading books, allocated systematically to 3 lists. Statistical
tests supported the assumption that the three lists could be considered of
equivalent difficulty, and treatments could be rotated across the 3 lists
to minimise any effects that changed orientation might have on the difficulty
level of the lists. The words printed on 4" by 1" cards were presented
singly in decreasing order of frequency and without timing. The treatment
order was fixed as normal orientation, then reversed orientation and lastly
inverted orientation. The children were encouraged to try but no prompting
or verbal reinforcement was given after the practice item. This was a word
recognition task, and the child had to search a store of very familiar and
frequently used words. In un-timed conditions the differences were in favour
of normal orientation for good progress readers. Behavioral evidence showed
that children who were normally competent readers stumbled, paused for long
periods, offered no response as if nonplussed, squinted at the words, backed
away from print, and tried to apply some strategy for unravelling the words
which were easily read in normal orientation. The cues that good readers
commonly used to identify words and discriminate one response from another
appeared to be seriously disrupted by changed orientation, particularly in
the reversed condition. In contrast, and perhaps remarkably, very little
of this concern was shown by poor readers.

The trends were related to successful reading progress and active
processing of information rather than to mere exposure to print. Directional

cues were obviously involved. Reversed orientation was at first the most
difficult but inverted orientation became the most difficult as reading
improved which suggests a two stage learning sequence of the visual scanning.
The first stage, having a left-to-right, horizontal, directional component
with a set to start at the left end would be in conflict with reversed
presentaiton of word stimuli. At a second stage,, with a sub-schema to scan
and categorise individual letters, inverted presentation cou.. interfere
with performance. If the lower case alphabet is written in reversed
orientation, only five letters change their identity, i.e., can be
categorised as another known letter (b, d, p, q, g), but if the alphabet
is written in inverted presentation fifteen letters could readily be identified
as other letters (b, d, f, g, h, k, m, n, p, q, r, t, u, v, w), give or take
some variations which allow h and k to approximate y when inverted.

Attentional expectations, perceptual scanning or search and check
strategies have some explanatory relation to the results. It is reasonable
to suggest that strategies change throughout the five to eight year period.
Indeed some hierarchical ordering of skills seems to be implied. In the
organisation of early reading behavior, directional behavior and the perceptual
analysis of symbols are important, but the preceding argument would imply an
earlier attention to directional behavior and a later attention to letter
identity. One cannot assume that the low progress children were following
the same track as the high progress groups one or two years later. It is
likely that qualitative differences exist between children who interweave
perceptual, cognitive and motor learning into coherent functioning within
a year and children who learn these responses more slowly with much error
and confusion.

This study comes close to the metatheoretical issues of my initial
question. Does behavior become organised in different ways? If so, can

different types of organization be characterised as self-improving and self-limiting?

5. OTHER RESEARCH

Other studies that have rounded out our understanding have reported on the linguistic structures of the texts, motor behaviors (McQueen, 1975), predicting reading progress from behavior observation data (rather than test data), error analysis of thirteen year olds' reading (Watson & Clay, 1975), early writing behavior, and sentence repetition skills (Clay, 1971, Clay et al, 1976). In a special class for retarded children reading behaviors (such as self-correction) were reinforced in a behavior modification program with spectacular gains recorded (Glynn and McNaughton, 1975). This was a challenging use of two seemingly incompatible theories - information-processing and behavior modification.

A research follow-up to my first project was funded by the Maori Education Foundation in 1968 to record the progress of Samoan and Maori urban children in their first two years at school. In 1970 I was able to report on this to the International Reading Association World Congress in Sydney. Another report of this study was recently published in the Reading Teacher (Clay, 1976). As most Auckland schools are multiracial any classroom application of my ideas would need research evidence from ethnic groups. The results did not modify the basic theoretical scheme: the ethnic differences found could be explained within the general theory.

6. IMPLICATIONS OF THEORY AND RESEARCH FOR INSTRUCTIONAL CHANGE

I have been watching children succeed and fail in a quality teaching program for 14 years. I have been searching for ways in which the learning needs of individual children can be detected and understood by busy teachers of class groups. An outcome of the research program is that the reading process

can be described as a complex set of hierarchically-organized behaviors
acquired over three to four years of graduated practice. The challenge for
the young immature learner is how to acquire the functional system of inter-
related behaviors and how to elaborate them as more difficult and more varied
written English language styles are encountered. The learner must achieve
this without knowing what lies ahead of him. The teacher must teach for this
without knowing the characteristics of a particular learner's system of
behaviors. The reading behaviors may be seen as the observable outcomes of
the ways in which the learner is processing the information he selectively
attends to. Teachers can observe the behaviors but their naive or tutored
theories of reading account for the way they plan to develop these behaviors
in their program.

After the first descriptive research the need for change in theory and
in practice was apparent in some areas.

1. Early confusions

The first study underlined the importance of the first year of
instruction and vivid illustrations were provided of children becoming confused,
establishing faulty habits, failing to make successful progressions.

2. Matters of organization

It also showed up matters related to school organisation such as teachers
with large classes and no time for observation, children with 5 teachers in
their first year, failure to transmit appropriate information from teacher to
teacher after a change of class, of school or after the long vacation.

3. Techniques for observing

It provided techniques for the monitoring of day-to-day progress on
classroom tasks and current reading books (rather than tests) the results of

which were reliably and validly related to test results (Clay 1972b). These
are referred to as running records and resemble the Goodman Miscue Analysis
techniques.

4. A Diagnostic Net

It produced a set of survey checks which might be applied at the end
of the first year of instruction to catch, in a diagnostic net, those children
who were seriously confused or very slow starters. (For example checks are
made on the child's control of appropriate directional behavior and on his
concepts about print.) This was a check on reading items known, and reading
strategies employed. It was not an attempt to predict reading progress from
non-reading behaviors. It should lead easily into program changes (Clay 1972b).

5. Interrelating of cues

Records which traced the child's transformation of his preschool behaviors
into early reading behaviors showed that directional behavior, language cues
(from syntax and meaning), and visual cues especially from first letters were
early aids to correct responding but the high progress child readily co-ordinated
all three sources of cues using efficient cross-checking or confirming
strategies. It is this interrelating of cues that low progress children find
difficult. (See Section 3 on self-correction.)

6. A self-improving system

Self-correction and confirming checks were a signal that the child was
cross-relating cues from more than one source, that he was attempting to
achieve a match. It was a good sign if present, even if laboured and frequent,
because it directed the child's attention to the printed message providing him
with an opportunity to learn at the point where he had made an error. The
children who did not self-correct were depending on less adequate strategies
of memory, fragmented cues decoding and external reinforcement.

7. A behavior system

In the first two years of instruction the child learns how to teach himself to read. He learns

the aspects of print to which he must attend   e.g.   letters ordered within words.

the aspects of oral language that can be related to print   e.g.   sound segments within words.

the kinds of strategies that maintain fluency,   e.g.   anticipation of what could follow.

the kinds of strategies that explore detail   e.g.   discrimination between words, that differ by one letter.

the kinds of strategies that increase understanding   e.g.   phrasing, and using intersentence relationships.

the kinds of strategies that detect and correct error   e.g.   cross-relating language and visual cues.

(The examples provided are an illustrative and not an exhaustive list.)

He also learns how to relate new information to what he has already learned.

In the process of learning how to learn he masters a reading vocabulary of familiar words, the set of letters used to record language; and the sound equivalents of common spelling patterns and of single letters. The first two years of instruction appear to be critical for learning to read because this is the formation stage of an efficient or inefficient behavior system (Clay 1972a).

8. When the child fails

At this time we begin the production of our reading failures by allowing some children to build inefficient systems of functioning, which keep them crippled in this process throughout their school careers. As older readers they are difficult to help because they are habituated in their inefficiency. In the terms of the computer age, they have been poorly programmed.

Some children-who fail at reading have developed inefficient behavior
responses for finding, using, checking information as they read. (Clay, 1972 a,b.).

III   INSTRUCTION 1965 - 1976

7. TOWARDS INSTRUCTIONAL CHANGE

Have any of these ideas influenced instructional change in New Zealand
during the 1962-1976 period? The research program began with the suspicion
of the central Department of Education who did not reply to my initial approach
although permission to work in schools was granted locally. Important factors
operating through this period would be a) that there has been no financial
support for instructional change research b) that the traditional change
processes lie in grass-roots consultations between teachers and curriculum
development officers of the Department of Education, c) that publishers
play a minimal role as free publications come from the Department d) that
the quality of teaching is good due to effective transmission of skills in
the field by experienced teachers rather than to explicit preparation at
Teachers College or by study of the literature on reading e) the operation
is small scale and f) the centralised authority promulgates guidelines and
their school inspectors in the field expect, encourage and promote teacher
innovation. During this peric' the International Reading Association has
grown rapidly in New Zealand but would not have been an effective force until
the 1970's.

I could report to people at several levels. A communication hierarchy
would be

      I   International seminars with researchers

      II   Academics and research people

     III   Trainers and advisers of teachers

      IV   Organizers of classroom teachers

      V   Classroom teache. .

      VI   Parents

If I reported only to international researchers there would be several steps
In the chain of report and the ideas might never reach the classroom. Conversely
reports for teachers are unlikely to draw the critical appraisal from research.
people that was needed for theory construction. One could communicate with
each of the above groups directly in a program of talks or remotely by writing
or indirectly by working with the next higher level and hoping for transmission
downwards.

Contacts at Level I with international researchers have been minimal:
three IRA conferences (1968, 1970, 1975) and personal consultations with some
reading researchers. Some articles on theoretical aspects of the work were
published in psychological journals which reading people do not see.

For instructional change in New Zealand I was interested in Levels
III, IV, and V, teachers College lecturers, reading advisers, administrators
and class teachers. Acceptance or rejection of the ideas by these people
would be on the basis of their practical value. Local ideas are commonly
displaced by new ideas from abroad.

8. FIRST CONTACTS AND ORGANISATION.CHANGES

During 1965-67 I spoke to three groups of organizers in Auckland -
the (elementary) Principals' Association (Clay, 1967) and two groups of those
in charge of junior classes. I stressed the need to organize so that teachers
could set time aside for sensitive observation of what children were doing
and to map the progressions over time that occurred in their own schools.
This is essential in any informal, non-prescriptive, or individualised program.
I think this approach helped to remove any threat of criticism at this point
and an anticipation of usable results was created. Some new modes of
organization have been tried and small new entrant classes are considered
necessary.

9. PUBLICATION

I had a clear division in my publication program: research reports would be submitted to recognised journals, and communication would go out to teachers through their own periodicals and through books. The ideas in each of these lines of communication were the same: it was only the manner of communicating the information that was different. When the editors of journals place strict constraints on authors as to the manner in which reports should be made these enable the academic specialist to quickly review the research reported and make a decision that it is worth attending to or not. These formal reports would be difficult for teachers to read if they ever discovered them and, in particular, they would find it difficult to derive implications and program suggestions from them.

The first report of the study was published in the educators' journal (Clay, 1966) reaching Levels II and III. In 1970 an article in the simplest language appeared in a freely distributed good quality publication by the Department of Education, but it was edited first by a senior official, an indication of continuing Departmental suspicion. My ideas do not occur in Departmental reports or publications until after my books became available in 1972. A teachers' guide to reading published by the Department of Education in 1971 has little evidence of the influence of my work. There is a ten year lag here from the research pilot study to extensive influence in the school system.

I was approached by a New Zealand publisher to write a book. This presented me with some problems. I had been trying to find out what children were doing, how they read, what were the strengths and weaknesses of their behaviors given the program they were being taught under. It was not my desire to propound on how reading should be taught or to write a method book

for teachers as to what they should do in reading although my research

certainly had implications for instructional change. The request was that

I should write a book for pre-service training for teachers, (which is not

a university concern) because teachers in New Zealand were reported to do

very little professional reading. I tried to write a text aimed at changing

some traditional ideas about the reading process in the first year of learning

to read. For example:

> Reading behavior concerns all the things teachers have always
> thought it did - word knowledge, meaning, story sense, word study
> skills. It also includes directional behavior, letter identities,
> pronounceable clusters, grammatical sense, fluent processing of cues,
> and error correction. Reading involves the use of items of knowledge
>
> - to anticipate what can occur in meaning and in language
>
> - to search for cues
>
> - to self-correct
>
> - for form intuitive rules that take the child beyond what he already
>   knows.
>
> The good reader manipulates a network of language, spatial, and
> visual perception cues, and categorises these efficiently, searching
> for dissonant relations and best-fit solutions. Familiar responses
> which become habitual, require less and less processing and allow
> attention to reach out towards new information that was not previously
> noticed.
>
> (Clay, 1972a, 148)

Possibly the text would help teachers to be sensitive observers of the

children in their classes. It would document in an explicit account for

new and inexperienced teachers what sensitive experienced teachers already

know. Above all it must be written in a way that would communicate to

teachers (Levels IV and V) and this meant that it could not be an academic

book. The sales to _teachers_ rather than students have surprised the

publisher; only one of seven Teachers' Colleges had adopted the books as

a text but all use class sets in in-service training (Education 4, 1976).

A separate and linked publication described the techniques that had

been devised for observation of reading behavior. Weighing the time demands

on teachers, the adjustments children must make to school, and the evidence

of early failure I recommended that each child's progress should be checked
on his sixth birthday. With staggered entry to school this was a feasible
proposition. The diagnostic survey was written for teachers who were not
psychometricians. It gave some guidance as to which children the teacher
should select for assessment, how she should measure the accuracy with which
they read their texts, noting self-correction, directional movement, error
types, letter identification confusions, concepts about print and writing
vocabulary skills. These materials became available in 1972.

Comments from reviewers point up the problems of communicating to
Levels II - V with these books. (Freyberg, 1973; Doake, 1973; Beardsley,
1973) as each values different aspects of the publications, depending on
their level of interest.

10. WORKSHOPS ON OBSERVATION

My contacts 1965 - 70 were mostly through teacher-created groups, as
the Department of Education remained mistrustful until about 1970. By working
directly with teachers who were eager for information I avoided the Departmental
defences and the translation-process. I was in direct communication with the
practitioners which undoubtedly influenced my messages.

By 1973 my books had been reviewed without the usual rejection of the
academic but with the patronising assurance that Dr. Clay had been a teacher.
I began to travel throughout the country conducting workshops in the
technology of observation for International Reading Association groups.

In a two hour workshop, which was usually the limit of my availability
I adopted two deliberate strategies to break through preconceptions about
reading and particularly about testing. Classroom experience and years working
with children does not imply anything about accurate observational skills. In

fact it probably implies a naive theory which <u>prevents</u> accurate observation.
I asked for volunteers to read aloud to the group - but gave the readers a
smudgy carbon, a badly-printed stencil, a Churchill speech in i.t.a., some
specialised scientific prose, and a newspaper text upside-down. The
participants could observe, under these conditions the same strategies in
the reading process of their peers that children show - self-correction,
sound analysis, back-tracking, syllabic attack, context guessing and so on.
When they accepted that anyone's reading behavior at times involves these
strategies they were ready to observe them in children. Teachers who assume
that they know what children are doing are not always sensitive listeners.
Step 2 in the workshop made the participants listen for "reading behaviors"
in child readers without the support of text. Guided thus, they were ready
to move into taking observation records of children's reading following a
text as they listened and recorded. I was training sensitive observers to
use techniques which began as research procedures for data collection. This
emphasis is different from Goodman's training of analyses of miscues, I believe.

The most productive application of my research has been these procedures
for observing children, This is an a-theoretical contribution because it
provides a technology which does not serve to test hypotheses. These tebhniques
can be used outside the young age range. In a pilot study of four different
programs in Scotland in 1972-3 it was found that they translate outside of
the New Zealand culture and the New Zealand reading program. In the new
Early Reading Inservice program to be mentioned later, this recording skill
is represented as a necessity if every teacher is to become a sensitive
observer, and two of my articles, originally writteh for a teachers' journal
are issued to the teachers who are being trained in the recording skills
(Clay 1970b, 1970c).

II   A ONE-YEAR STUDY GROUP

During 1973 I met monthly with a special group of interested professionals.
The District Psychologist assigned each of his 6 internees to 6 interested
schools. The senior teacher of junior classes ran a program of early detection
based on my books assisted with interpretation by the trainee psychologist.
We met monthly with the reading advisers as a group under the chairmanship of
a teacher, and I was consulted to amplify or clarify my writing. From the
minutes of the meetings the following points can be made to illustrate how
the teachers' questions changed during the year.

1. Orienting to the new approach.

Nov. 1972 - "Most queries were concerned with administration and the
                  need to conform to the i' .tructions. is flexibility to
                  be allowed and if so to what extent?"

This presents the conflict between the accepted standardised test procedures
and the concept of sensitive observation.

2. Clarifying administration details, and interpretation points.

Mar   1973 - "Several forms for recording the different tests were
                  discussed ...   A working party on record forms was set up."

Group members were now concerned with efficiency in administration and reporting
back.to class teachers.
                  "Guidelines: Points of clarification noted so far should
                  be recorded."

These referred to conceptual points in my books which were not understood by
the group. It may have been a matter of poor communication: it may have
been the inevitable process of shifting one's concepts to take in a new way
of looking at things. The application of the techniques was sending the
teachers to the text for explanations of the behaviors observed.

3. Extension of insights within and beyond the trial schools

August 1973 - "Topics discussed were a) assessment before six years of
                  age and b) assessment of writing behavior."

Group members were confident with the reading techniques as recommended.
They were exploring extensions of these insights, and advising teachers in
other schools.

4. Monitoring leads to understanding

October 1973 - "The importance of class teachers (rather than supervisors)
                  doing their own monitoring was stressed."

The group seemed to consider that the techniques were valuable for understanding
something but what was to be understood was not verbalised.

5. <u>Back to techniques</u> - <u>Final Report</u>

The group wrote some <u>Supplementary Notes for Administering Dr. Clay's</u>
<u>Diagnos 'ic Survey</u> and stated that the objective of the meetings was
(merely) "to develop practical knowledge of the techniques and survey
procedures." (Early Reading Evaluation Project, 1973).

Perhaps the teachers who talked about procedures and materials were
shifting their understanding (see 4. above) without articulating the theoretical
assumptions upon which they based their new kinds of judgements. That would be
an optimisitc interpretation of what occurred.

These teachers became a resource group for introducing the research ideas
to others. The ease with which they generated creative ideas which differed
markedly from mine and did not check with the theory was disconcerting.

12. <u>AN IN-SERVICE TRAINING PROPOSAL</u> .

At the end of 1972 an action research program in an Auckland school was
set up

'to co-ordinate current knowledge about early reading, early detection
and the prevention of failure in relation to different ethnic,
cultural and social groups.'

A new interest in research by the Department of Education probably stemmed
from the social issue of ethnic educational problems.

A proposal was made to plan a prototype multi-media inservice resource
to re-educate most, if not all, infant teachers in an area in say, 12 months.
A team consisting of an inspector, a reading adviser and a Teachers' College
lecturer was formed to develop an in-service training program ambitiously
directed to massive retraining of teachers of first and second year children.
The initial proposal stated

"Continuous monitoring of early behavior of individual children
in the earliest stages of reading, combined with sensitive, rapid
feedback to classroom programs is perhaps the most important single
innovation required. We now possess the instruments to set up such
a monitoring system.'

(Holdaway and Penton, 1973).

The program was released in 1976 and 250 teachers began the course.

In the evening newspaper the education reporter said

Project ERIC was set up in 1971 to find the best ways to prevent
failure during the early years of schooling, particularly in multi-
cultural classrooms and among groups of children who had shown themselves
to be at a disadvantage on entering school.

The first step was to document knowledge in this field in Auckland,
where considerable experience had been gained in inner-city schools and
through the research of Marie Clay, now head of education at Auckland
University. Overseas material was also evaluated.

There followed trials of materials, and methods in teaching reading.

About 18 months ago work began on planning and developing an in-
service course to enable the re-education of most infant teachers in the
Auckland district, within one to two years.

The development team of an inspector of schools, a senior lecturer
at Auckland Teachers' College, and a reading adviser have been assisted
by an advisory committee of 18 that includes teachers, psychologists,
and specialist advisers, and 12 resource teachers.

(The Auckland Star, Feb. 1976)

And in the elementary teachers' union journal similar comments appeared.

The audio-visual course is designed to stimulate professional
thinking and development and crucial features of its structure are the
follow-up activities by teachers in their own classrooms between each
unit, and the discussion with other teachers from the same school who
are also currently taking the units.

Eventually the course will be available to all teachers. It will
be re-located term-by-term until all Auckland teachers have had convenient
access to it. Then it will move to rural centres within the Auckland
education district. Arrangements are being made for further copies of the
course to be duplicated and made available throughout New Zealand. The
course offered in Term I will be reviewed in the light of comments from
participating teachers.

(National Education, Feb. 1976)

The independent evaluation of the first intake paid for by the Department

of Education is being conducted by a teacher who is presenting the evaluation

for his Masters thesis of the University of Auckland under a supervisor who

has not been involved in the research program. There has been a move from an attitude of cold suspicion on the part of the Department of Education to co-operation and professional trust.

13. EARLY READING INSERVICE COURSE AND THEORETICAL RESEARCH

I would like to refer back to the implications of theory and research outlined earlier in Section 6. The first four points are covered in some measure by the ERIC program.

1. It calls teachers' attention to areas of confusion for children in their early attempts to read.

2. It provides a first-class, carefully sequenced training in monitoring reading behavior.

3. The last 3 units cover the diagnostic or early detection survey after the first year of instruction, adding recommendations for intensified teaching effort to overcome difficulties.

4. Concerning the interrelating of cues, the points are made in the following way.
    a. Meaning arises from syntax, semantics and intonation.
    b. Directional conventions are arbitrary and must be taught.
    c. Children should be able to predict on the basis of context, sentence structure and letter detail.
    d. As children begin to read they should be encouraged to confirm or correct their own responses by use of meaning, sentence structure and letter detail.

Areas of omission are the last three are s of implications - a self-improving system, an efficient behavior system, and why children develop inefficient behavior systems - there is little application of such concepts in the ERIC program.

Another problem occurs when what is known is used for extrapolation
beyond its known limits. One unit in the ERIC program begins with a tape
of one of my original research children reading a Seuss book and infers
from her five year old skiN what the preschool learning of high progress
children from and about books must be. Most of this is an extrapolation
the validity of which might be contested by a researcher.

14. OUT IN THE CULTURE

We have recently established an adult literacy service and it is
necessary to use the newspapers to call for volunteer tutors. An April
call drew the following headlines –

"Schools Too Late with Remedial Work"

"City Illiterates Total Thousands".

I was delighted to see the quiet tone of the second sub-editorial in the
same edition.

> There is cause for continuing concern in the reminder given by the
> Workers' Educational Association that thousands of young Aucklanders
> have left school without the ability to read and write well enough
> to serve them in their adult life.
>
> The situation is not new. Yet although much more is known about
> causes and remedies than in earlier years, the problem persists.
>
> It makes sense to concentrate what special resources and
> assistance are available in the early years of schooling, so that
> children do not lag further and further behind as they are socially
> promoted up the school.   (Auckland Star, April 1976)

If I did not know how ephemeral the newspaper's views on education were I
might dare to hope that they had become informed about the importance of
the early years of schooling. What this probably shows is that the reporters
are in communication with the advisers in the field who are adopting this focus.
That network is a satisfactory communication system.

III - INTERCHANGE

15. APPRAISAL

Attention is now directed to the early years of instruction. Book sales, the newspaper report, the Early Reading inservice program support this.

Organizational shifts are relatively easy to recommend and achieve. They can be very necessary to establish the framework and support system within which instructional change can occur.

Communication is the researcher's problem. He can write his ideas and have the concepts translated down through the hierarchy of experts, losing integrity at each translation point. Or, he can communicate directly at each level and still be met with selective attention on the part of the practitioner to what he considers to be relevant evidence.

All participants in reading instruction have assumptions about what the reading process is. I have been able to stand outside the in-service course and look with interest at which ideas have been built into it. There are areas where I do not have information. These are the areas where the New Zealand teachers make intuitive judgements on the basis of their experience in the field and from these they generate program ideas. I think the researcher has to look at such generated ideas very carefully. On the one hand they can be inspirational if they stem from careful observation and are sometimes the jumping-off points for new questions in research. At other times one may feel that they are unwarranted extrapolations which could probably be disproved but one doesn't have the information from research to hand to offer any evidence to the contrary. The 1963 reading program which had been generated from grass roots was very successful and I have great respect for the potential of New Zealand's particular brand

of teacher-consultation for generating valuable new insights, but my best guesses as a theorist do not always coincide with the guesses of those who are active in the field. I am usually not prepared to take the methodological leaps that they take. I wish to evaluate and reject if necessary.

The researcher questions, accepts ideas on the basis of evidence and rejects or reserves judgement where there is none. The practitioner revises programs and procedures, re-uses old resources, and fills the gaps in proven practices with, a) best guesses from accumulated experience. b) new ideas prettily packaged or extensively proclaimed or c) favoured hypotheses untested. Thus the practitioner must bridge the knowledge gaps and act while the researcher thinks of how the ideas could be evaluated.

In a process as complex as reading different professionals (and also parents and reporters) make assumptions which are not verbalised and which are not understood in inter-professional dialogue. These are two potential sources of error in the teacher's assumptions in a non-prescriptive program about the reading process. Firstly she is likely to mentally pool or average a vast amount of evidence in order to arrive at a program decision. Secondly she may do this on the basis of superficial observations.

The teacher is less likely to make gross averaging judgements about children's needs when she works closely with individual children and/or if she uses techniques for sensitive observation. Under these circumstances the teacher is likely to bridge gaps in the exposition of theory or method with more insightful assumptions and fewer naive or superficial ones. The techniques of my research program may lead to field-hypotheses of better quality.

Perhaps we can arrive at a metatheoretical concept of instructional
change. Any theorizing we do about learning to read has to account for the
important fact that well-trained teachers teach at least 70 - 80% of children
to read under a variety of theories, programs or sequences of instruction.
Since the formal aspects of direct instruction can differ markedly I can
only draw two conclusions. Children supplement the program with their own
efforts and teachers adapt to individuality more than any program
descriptions imply. If teachers under any instruction program are sensitive
observers of the children's progress then they are in a position to notice
more and more of the behaviors that confirm a valid theory, and/or they
are able to reject notions that do not fit with their careful observations.
At the same time their questions and their creative solutions will be subjected
to feedback from the continued monitoring. Taking observation records may,
like self-correction in early reading, provide the teacher with a basis for
her self-improving theory of instruction.

A current trend in New Zealand is to move away from prescribed reading
texts towards maximum use of real story books as a basis for program. The
technology of monitoring becomes useful for controlling task difficulty.
Self-correction behavior becomes the key indicator under such a program
that progress is satisfactory, and running records provide the technology
for the teacher to observe progress on any selection of materials. So the
shift from basic texts could become a possibility with a minimum of risk
because monitoring techniques are available. The generic nature of the
technological procedures provides this insurance.

A theme of discussion and consultation recurs in this account of
instructional change. Talks, workshops, consultations with study groups,
dialogue between different types of professionals - these activities seemed
to be as important as the research and publication programs for achieving

instructidnal change. In the evaluation study of the in-service training
by a teacher for a Master of Arts thesis we have the academic objectivity
evaluation function being applied now to the in-service program which arose
in a major sense out of the earlier program of the university. This seems
to be an appropriate role for the university to adopt.

Disjunction may be inherent in the respective roles of researcher and
practitioner. Perhaps a continuing dialogue between experts with diverse
roles, in a rolling revision of both theory and practice, cannot be avoided.
It provides a system of checks and balances on the excesses and perceptual
problems of each specialist. If theory has any over-riding status in this
interchange this ought to stem from its generic nature. Instructional
questions and decisions between equally attractive practical alternatives
may be given direction by some priorities or ordering stated in theory.

There is for me, frustration in the thought that I have not communicated
more of the theoretical concepts. That is a task for the future. If teachers
are to generate individual programs to meet particular needs, and if the
matter of strategies for processing information is critical for some learners
then this must be written down in a way that enables teachers to go easily
from behavior signals, through theoretical constructs to program. By offering
teachers the means to sensitive observation of children's reading behavior I
hope I have not merely opened a Pandora's box of creative teaching gimmicks,
unchecked by reference to theory.

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OPEN DISCUSSION OF CLAY PRESENTATION

SQUIRE: How will whatever findings or insights that come out of research and development with respect to classroom practice be translated into a plan of action. Marie has reported on a fairly small, self-contained country, with a central administrator controlling decisions. That country has inspectors--if I understand Marie's report--who pressure the teachers for innovation. At the same time, researchers have mounted a research study, which the ministry is suspicious of. New Zealand has faced all of the problems that we face but ours are on a much greater scale. What is the difference between communicating to researchers and communicating to teachers? How do we bring about change--through publications, through workshops? I don't have any precise suggestions, but it seems to me that given the terrific problem of trying to impact practice in a small country, we in the United States, who have the same problems as New Zealand, are faced with a much greater challenge.

Marie, I have not had the privilege of working in New Zealand, but I spent a number of weeks in Australia last spring. Perhaps New Zealanders don't read and Australians do, but I have never met so many classroom teachers in this country or the U.K. quite so widely read as in Australia. I suspect this is true in New Zealand as well, whether the teachers are applying the ideas or not.

I found teachers in Australia who were acquainted with much of the research from this country in psychology and reading and also research from the U.K. They were trying to integrate both bodies of research in Australia, and I suspect this is true in New Zealand, too. I do think the teachers there--because of the distance--evaluate and take ideas from American, British, and Canadian publications more readily than we do in our own country. So I would just like to

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question the comment you made about New Zealanders not reading, because I think
they are reading.

But I would just like to emphasize the problem you really put here, when it
is applied to the United States: If you can't see, over a period of time, change
brought about dramatically in a country like New Zealand, how are we going to do
it in a country like the United States?

BARTLETT: In your talk, you said that you relied primarily on print media and
person-to-person contact with the teachers. Did you use any television at all?

CLAY: No.

BARTLETT: Is there any reason?

CLAY: There is no educational television in New Zealand.

BARTLETT: You said you had effective means of teaching teachers to observe
children. What kinds of media did you use for that?

CLAY: That's in the in-service program; they have tapes and slides.

BARTLETT: Tapes? Audiotapes?

CLAY: Audiotapes and slides, and they graded it so beautifully. I thought the
grading was unnecessary, but I have to agree now; it's very good training.

BARTLETT: I would be very interested to see if there is any way to extend the

communication range by the use of television, perhaps audiotapes serve the same
function.

CLAY: Wel.., they are hoping to extend the range in another way.   We have an
evaluation study running on the first 250 teachers going through this training
scheme. Then, because it is very portable, they plan just to move it around the
country as it's needed.

CAMBOURNE: Marie, you said that in one aspect of your work, you diverted from
what Ken Goodman was doing. Could you just be a little more explicit about that?

CLAY: Well, what my teachers do is take running records, which is very similár
to taking a behavior record and analyzing it for miscues. But what I am
interested in is that teachers become very sensitive to children's responses, to
all the things that are operating, even things like motor behavior and
impulsiveness. The goal is sensitive observation, not a miscue analysis,
although that can be part of the product.

JACKSON: What interaction situation is occurring during the sensitive
observation, and what kinds of recordkeeping devices or recording devices have
you developed? How does the teacher conduct this interaction and observe and
record?

CLAY: The teachers are being encouraged to set aside time from teaching every
now and again to sit down with the child, have him read to her the book that she
has prepared him for. The teacher takes a behavioral record of everything the
child says and does, while reading the book. Then she tries to analyze the error

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behavior and to think why the child is responding in this particular way. So she takes a complete record of behavior, as the child reads the book for which he or she has been prepared.

JACKSON: How is that process different from your informal reading inventory process?

CLAY: Well, we are talking about children who are at the very beginning, at what some people would call prereading lev   I would call this the level of early reading behaviors. We are dealing with large elements of motor behavior, which don't come into an informal inventory. The direction in which the child is moving across the print, and what he or she is attending to are important. It is not a questioning session. The teacher must take a record of everything the child says and does. A month or three months later, she takes another record to see how the child's behavior has changed and in what ways it has improved. The teacher can see which children aren't improving, by comparing these two records.

ROSNER: I am sure that you don't mean recording everything the child says and does, because that seems sort of mind boggling. You do give teachers some guidelines for what they are to take into account.

CLAY: It is not just mind boggling; it is impossible to record everything. There is a high priority on all verbal behavior. Secondly, emphasis is placed on directional behavior, any signs of directional responding, and then any comments that the child makes, and anything the teacher can pick up about the child's visual scanning.

ROSNER: If two teachers observed a child, would there be a fair amount of agreement in the two reports?

CLAY: No, the records are very reliable, if we take an audiotape or a videotape, and get several people to score the record. We have also gotten some longitudinal material, which I find quite exciting. It shows that these behavioral records correlate highly with test records, and it looks as if we have sufficient reliability and validity to replace the actual testing procedure with these behavioral records on appropriate occasions.

LIBERMAN: I understood you to say that you don't give these people a theoretical background during your in-service training, that you concentrate, instead, on these techniques. Was I wrong on that?

CLAY: Yes, and no! I thought that we were giving them the understanding of the reading process as we built in the techniques. But I have found, by reviewing written statements, no evidence of theoretical understanding of the reading process.

LIBERMAN: And how do you explain that?

CLAY: The textbook itself is oriented towards getting these ideas across. The textbook has been bought and read and accepted enthusiastically. Still I find no evidence of an understanding of the reading process.

LIBERMAN: What ideas would you have for explaining why this might be the case; what is happening there?

CLAY: Well, first, I think that probably written statements are not a very good place to look for these things. Maybe one has to go out and question teachers. I am not sure that some understanding of theory is not there; all I can say is I have no evidence of it. I know that teachers focus on the techniques and procedures. Maybe they are selectively attending to those aspects and not really feeling a need to understand the process.

LIBERMAN: But how do they know what they are looking for, and why they are looking for it, if they don't have a theoretical framework?

CLAY: Let me use as an example one type of behavior that puzzles me, self-correction behavior. I thought I was going to have difficulty in explaining this to teachers, but I had no difficulty at all. As soon as I began talking about it, the teachers would say, "Yes, I observed that in children; I know what you are talking about." But they don't seem to go beyond that and ask the question: What does it mean when a child self-corrects? What is he doing? What is going on inside his head? They don't seem to bother about that kind of understanding.

RESNICK: Are you saying that there is not even an intuitive understanding on the part of teachers--perhaps different from your own--that's guiding them, or that you can find out about?

CLAY: No. I think I am interested now to go back and to try to find out if there is intuitive understanding. It may come out in a questioning kind of interview; it is not likely to appear in a written statement.

JACKSON: I am interested in your workshops and in-service training, which, I assume, are simulation activities. Has there been any follow-up of the teachers in the classroom, to note whether when teachers have learned new instructional behaviors through simulations, does that behavior change persist when they move into the regular classroom situation? In other words, does simulated learnings in a new temporary environment become a part of the teacher's permanent behavior pattern when she returns to the old environment?

CLAY: Well, the techniques are for observation, and certainly they are being used all through the country. They are being encouraged and supported by the reading advisors.

JACKSON: No, I meant that in terms of your research. Was your research extended past the simulation activity, into the actual classroom, to note whether when teachers have a learned behavior chain, that behavior chain actually occurs when they move into the classroom situation?

CLAY: No. We haven't done anything on teacher behavior. We have been looking at the children's behavior.

WHITE: You mentioned that in the middle of your work, New Zealand shifted from the word approach to the book approach. You didn't tell us what the implications of that were, if any, for the work you did.

CLAY: Fortunately, the behavior observation techniques, which had been worked out in the pilot study, transferred to the new system without any problem at all. As the task was simply to observe exactly what the child said and did, it turned

out it didn't matter that they shifted the program. I could still observe exactly what the student did.

WHITE: Did that change the nature of the problems that you started to see; did it change the way in which the teachers were behaving; make them more open to suggestion, because they had to change their methods?

CLAY: In my paper, there is a small paragraph, which I didn't read. It suggested that maybe making the shift would make teachers more open to discussion. But I don't know the answer to that; it was only a question.

CAZDEN: I was struck by your terms self-improving system versus a self-limiting system. They are really beautiful.

If you were now going to design a research project to look at teacher behavior, what are some of the things you think would be most important to look at? What things are likely to help children develop a self-improving system rather than a self-limiting one?

CLAY: An obvious thing to look at in a self-improving system is what the teacher does with self-correction.

It can be very difficult to make self-correction occur. In self-correction, a child who makes an error spends a long time going back trying to work out what it is, and finally solve it. In the typical classroom, the child doesn't get time to do that. Before he has done it, somebody has prompted him or helped him in some way, or asked a question, and he hasn't been allowed to solve the problem for himself. One thing we have brought out in the workshops is that if

self-correction is important in those early years, you have got to be patient with it; how you handle it is very important. Regarding the self-limiting system, I think from the juncture, pitch, and stress study, we look very hard at children who were specializing in attention to letters and words and not using cues from bigger expanses of language, because this is what we found our poorer readers were doing. We would get two stresses per word from them, while we would get one per large phrase from the better readers. I find that it is very difficult to study teacher behavior, because it is so sequential. Every move the teacher makes depends on what the child has just done. There are assumptions of what that means for the child. It is a very elusive thing to study in detail.

RESNICK: Are there stages during which, in your study, it would appear that heavy attention to the word structure is facilitative rather than self-limiting?

CLAY: Yes. When the average school children are perhaps five-and-a-half, they move into books. The high progress children move sooner, and the low progress children take longer. At this stage, as the children are trying to achieve a one-to-one correspondence between what they are saying and what is there in the sentences of their text, they become very much word readers; they chop each word off with very clear juncture. At this stage, the attention to words is facilitative. We have been telling teachers that when the children are not really matching word-by-word, they will read fluently, as in their oral speech. They become word-by-word readers, as they begin to coordinate speech with print. Once they have achieved this integration, you should begin to encourage the phrasing again, so that within two or three months, the good reader is again phrasing.

RESNICK: So the teacher's major problem would be to judge when this word attention strategy had gone on too long and to determine whether it was going on too long because the children hadn't mastered it, or because they hadn't gotten the clue that they were supposed to do something else instead.

CLAY: Exactly. It can become habituated.

JOHNSON: Is there a standardized curriculum for spelling the written language or writing, and if so, do any self-corrections emerge as the child learns to write?

CLAY: Yes. The complement of this whole program is that the children learn to write as soon as they come to school. In their books, they are starting with sentences and working down to letters. At the same time, they are writing letters, which they very soon build up into small statements. There are two complementary processes going on the whole time. The writing is made up of creative, meaningful statements, about what they have read.

PRESENTATION BY CAROL CHOMSKY

RESNICK: Our next speaker is Carol Chomsky. The title of Carol's paper is "Approaching Reading Through Invented Spellings."

sound: BOT boat, JMEZ jimmies, FEL feel, KAM came, TIGR tiger. Short vowels are represented by the letter name which contains the closest sound: A [ey] for BAD bed, FALL fell; E [iy] for FES fish, FLEPR Flipper; I [ay] for GIT got, CLIK clock; O [ɔw] for OL all, WOTR water; U [yuw] for TUK took, LUKS looks. Typically L and R function syllabically with no vowel at all: GRL girl, FRN fern, KLR color. Nasals before consonants are standardly omitted: WOT won't, PLAT plant, BOPY bumpy, AGRE angry. Letters are sometimes used according to their full name: YL while, R are, THAQ thank you, NHR nature, PPL people.

What is most interesting is that different children invent very much the same system of spelling. Features that may appear to be idiosyncratic in one child's spelling turn out on inspection to be common to all the children. English contains some forty sounds but the alphabet provides only twenty-six symbols. The children all cope with this dilemma in much the same way, combining sounds into groups represented by a single letter. E.g., the sounds [ey], [e] and [æ] are all written with the letter A, so that bait, bet and bat are all spelled BAT. Other similar vowel combinations are made. Furthermore the children fail to represent certain phonetic distinctions that they do have the alphabetic means to represent, such as certain forms of nasality and voicing. They write KAT for both cat and can't, and use S for the plural marker in both caps KAPS and cabs KABS.

The significant thing is the systematic nature of the spellings and the uniformity from child to child. It would be an intellectual feat of some scope if the children merely produced an accurate phonetic transcription of their language. Apparently they do even better, classifying sounds into categories efficiently on the basis of perceived similarities. This is a fairly sophisticated form of linguistic abstraction.

Some samples of early messages will be of interest. R U ΘF [Are you deaf?], IYUKANOPKAZIWILCEVUAZAXOPENR [If you can open cans I will give you a can opener], 5 year old boy (Bissex, 1976); FES SOWEMEC EN WOODR [fish swimming in water],