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PHONOLOGICAL AWARENESS AND ADULT BEGINNING READERS

by

JOYCE CAMERON, B.Ed.

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of

Master of Arts

Department of Linguistics and Applied Language Studies

Carleton University

Ottawa, Ontario

22 September 1995

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submitted by Joyce Cameron
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the degree of Master of Arts

Thesis Supervisor

Graduate Studies Supervisor
Department of Linguistics and Applied Language Studies

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22 September 1995

ABSTRACT

This study examined adult beginning readers' phonological awareness and i) reading level measured by oral reading of connected text, ii) decoding strategies, and iii) teacher ratings of progress. The 33 participants were students from literacy programmes at two community colleges. All subjects were volunteers, spoke fluent English and were not literate in another language.

The results showed that students with low phonological awareness did not use grapheme-phoneme correspondence based strategies successfully. Multiple regression analysis indicated that skill with onset-rime accounted for a significant amount of the variance in choosing a "sounding out" decoding strategy; phoneme blending and rhyme judgement skill and letter sound knowledge each accounted for significant variance in success with sounding out. A relation between reading level and phonological awareness was not established most likely because of compensatory decoding strategies. The teacher ratings of progress suggested a relation between low phonological awareness and poor progress.

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INTRODUCTION

This thesis began as a search for answers to a practical issue faced by adult literacy practitioners and those of their students for whom learning basic decoding skills is an arduous if not impossible task. These students can be separated into two groups. The first consists of students who have entered literacy programs as non-readers, and who, despite high motivation and regular attendance, remain illiterate. The second group is made up of students who appear to have progressed beyond the initial stage of literacy acquisition, but who can decode unfamiliar printed words only when they are embedded in a context that is laden with clues and when the words are already a part of their oral vocabulary. Both groups include students who handle other aspects of their lives with competence and success and who in doing so have clearly demonstrated a capacity for abstract thought. These students may have been taught with a whole language approach, a phonics approach, or with an eclectic combination of the two. In considering the decoding problem of these two groups of students, this thesis proposes that limited phonological awareness is a common factor which causes their difficulties. The thesis also considers a theory of reading acquisition which can offer an explanation that encompasses both of these problems in reading development.

A substantial amount of experimental investigation into children's reading acquisition has led many researchers to conclude that the difficulties of most poor readers reside at the word level of reading (for example: Jorm and Share, 1983; Stanovich et al., 1984; Fowler, Lindamood et al., 1992; Nicholson, 1993b; Tunmer and Hoover, 1993; Samuels, 1994b; Spear-Swerling and Sternberg, 1994). Furthermore, a robust correlation has been established between children's ability to decode words and their phonological awareness - the ability to perceive and manipulate sounds in speech. Studies have found that i) early phonological awareness is a predictor of later reading skill (e.g., Jorm et al., 1984; Bradley and Bryant, 1985; Perfetti et al., 1987; Stuart and Coltheart, 1988; Wimmer et al., 1988), ii) phonological awareness can be taught (Lundberg, 1991; Bryne and Fielding-Barnsley, 1991; Torgesen et al. 1992) and iii) that instruction in phonological awareness influences reading acquisition (Williams, 1980; Baron and Treiman, 1983; Lundberg et al., 1988; Lencher et al., 1990; Blachman, 1991; Truch, 1994). This research has led to suggestions regarding the appropriate method for teaching phonological awareness and word decoding (Lewkowicz, 1980, 1987; Catts 1991; Truch, 1991; Lindamood et al., 1992; Nicholson, 1993b).

This perspective on children's reading difficulties has not gone unchallenged. The whole language school of thought, exemplified by Kenneth Goodman, attributes reading difficulties to inappropriate teaching methodology (Goodman, 1986, 1993, 1994a). Goodman has described the research on phonological awareness as "narrow and sterile" (1994a, p. 1102) and has claimed that written language "is easy to learn when we deal

with the whole of it as we use it functionally to make sense" (1993, p. 109). A consequence of the belief that reading is easily acquired if taught in an unfragmented fashion is that whole language does not adequately accommodate those readers with reading disabilities (Read, 1991).

The debate within the reading field between whole language proponents and proponents of direct instruction on decoding has often been described as one between advocates of a "top-down" approach and advocates of a "bottom-up" approach. The former view is that reading is a meaning driven process in which orthographic principles are acquired as beginning readers focus on the meaning of what they are reading (Moorman et al., 1994, p. 318). In contrast, the bottom-up view is that beginning reading should have a code emphasis and should "focus on the connections between phonology and orthography" (p. 318). This discussion about children's reading acquisition continues unabated. (For example, Reading Research Quarterly's fall 1994 issue is devoted to this debate.)

While the debate over the manner in which children acquire literacy has generated a great deal of research and literature, little of the literature in the adult literacy field has addressed possible cognitive aspects of adult illiteracy. Discussion, particularly in the public arena, has largely focused on the social aspects of adult illiteracy (e.g., Kozol, 1985; Calami, 1987; Horsman, 1990). Thus, adult literacy instruction has not had the benefit of a debate that centers on cognitive aspects of adult illiteracy and the consequent pedagogical implications that such debate might inform.

The absence of this debate is apparent in the two dominant instructional methodologies in adult literacy: whole language and phonics. The whole language school has been constructive in advocating the use of materials that are relevant to adult students' lives, but, consistent with the whole language approach to children's reading acquisition, it has not addressed the issue of adults with learning difficulties; it operates with the implicit assumption that adult illiteracy is a result of social and environmental problems (e.g., Davies and McQuaid, 1990). In contrast, teaching material that is based on a phonics approach focuses on decoding, for example, the Skill Book series in the Laubach programme (Laubach et al., 1981); however, the phonics approach operates on the assumption that thorough phonics instruction, possibly including a kinaesthetic approach (B.C. Ministry of Education, 1980), will suffice for students who have problems learning to decode. Instruction using the phonics approach with adult literacy students has remained uninfluenced by the extensive work on phonological awareness with children or the very few studies which have involved adult beginning readers.

Similarly, teaching manuals that are specifically directed towards practitioners working with adult reading disabled students have contributed little to further understanding the sources of learning difficulties for some adult beginning readers, although the manuals adhere to a cognitive explanation for reading disabilities. They offer suggestions regarding mnemonic strategies, systematic phonics instruction, compensatory strategies and the use of a kinaesthetic approach (B.C. Ministry of Education, 1980; Goldstein, 1989; ALBSU, 1989), but they do not examine the possibility that phonological awareness

may play a role in reading problems. One exception is a publication by the Learning Disabilities Association of Canada that makes a passing reference to phonological awareness (Learning Disabilities Association of Canada, 1991).

As mentioned above, research on the cognitive aspects of adult reading acquisition has thus far yielded only a scant few dozen articles. But within this literature a correlation has been established between phonological awareness and adult literacy acquisition (Morais et al. 1979, 1987; Ferguson, 1981; Read and Ruyter, 1985; Pratt and Brady, 1988; Minus, 1992). There is also support for a common factor underlying difficulties experienced by some students who remain non-readers and those who continue to have decoding difficulties (Bruck, 1992; Spear-Swerling and Sternberg, 1994; Truch, 1994).

Although this research is far from extensive, it indicates that phonological awareness is a possible source of adults' decoding difficulties. The purpose of the present study was to address the seemingly insurmountable decoding problems experienced by some adult learners by investigating phonological awareness and its relation to adult literacy students' reading levels and reading strategies. The question of whether or not a correlation exists between adult literacy students' phonological awareness skills and their reading levels has been addressed by some researchers. The work here will contribute to that literature by replicating some types of testing and by conducting some testing that has been done with children but not with adults. A second question was also examined: are differences in phonological awareness reflected in differences in strategies adult students employ when reading aloud connected text? Strategies have been addressed in some research in regard

to reading words or pseudowords in lists (Snow et al., 1986; Alexander et al., 1991), but the question of phonological awareness and reading strategies in the context of connected text has not appeared in the research literature, with the single exception of a study that examined only one aspect of phonological awareness, rhyme (Stuart-Hamilton, 1984). Connected text was used in the present study to explore the possibility that phonological awareness skills can offer an explanation of reading strategies and difficulties that are apparent in oral reading. An intent of the study was to develop a set of phonological awareness tests appropriate for use in adult literacy settings. Another objective of the study was to develop an approach to oral reading analysis that could provide information on i) the students' developmental progress in acquiring reading skills, ii) the student's reading level, and iii) his or her decoding strategy strengths and weaknesses.

Chapter One will review relevant literature on phonological awareness, its definition, relation to phonics, learning disabilities and reading acquisition and explore some of the issues which remain unresolved. Subsequent chapters outline the methodology of the study (Chapter Two), present and discuss the results (Chapter Three), and draw implications for teaching and further research (Chapter Four).

CHAPTER ONE

PHONOLOGICAL AWARENESS AND READING: A LITERATURE REVIEW

DEFINING PHONOLOGICAL AWARENESS

Spoken language can be conceived of as a stream of sound segments. These segments--words, syllables, phonemes, and other sub-lexical units--must be processed in accordance with their linear sequence and their temporal nature (Leong, 1991). This processing is accomplished by using an internal representation of speech, that is, a phonological code (Jorm and Share, 1983), and it is necessary for language accomplishments as basic and essential as distinguishing one spoken word from another. Using this code to gain meaning from speech is part of phonological processing, which can be defined as "the ability to analyze, synthesize and classify the phonological structure of spoken language" (Leong, 1991, p.225).

Phonological processing refers to all uses of a phonological code, whereas phonological recoding refers to the use of phonological codes to access words from print (Samuels, 1994). Phonological awareness is an aspect of phonological recoding, itself a subset of phonological processing (Jorm and Share, 1983). Phonological awareness has received

considerable attention in the last two decades, along with two other aspects of phonological recoding, phonological memory (the ability to store verbal material) and rate of access for phonological information (evident, for example, in tasks which require the rapid naming of digits, letters or objects). There is converging evidence from varied studies that demonstrates a relation between these processing skills and reading acquisition (Stanovich, 1982; Bowers, 1988; Torgesen, 1994). Of these phonological processing skills, research has yielded the greatest understanding of how to facilitate the development of phonological awareness (Blachman, 1994), which appears to be responsive to relatively short-term training (Torgesen, 1991).

Phonological awareness, sometimes called phonemic awareness, concerns the ability to be aware of and manipulate linguistic segments. A great deal of debate exists around an exact definition, but all those who take part in this research and discussion agree that phonological awareness is concerned with the awareness of phonemes and the ability to manipulate them in tasks such as segmenting and blending (eg., Stanovich 1982; Yopp, 1988; Liberman et al., 1989; Ehri and Sweet, 1991; Catts, 1991; Torgesen, 1991; Ball, 1993; Spear-Swerling and Sternberg, 1994; Share, 1995). The former involves breaking words or pseudowords into separate phonemes, and the latter involves synthesizing separate phonemes into words or pseudowords.

Despite the seeming simplicity of this skill for those who have achieved it, phonemic awareness does not necessarily develop spontaneously (Morais et al., 1979; Lundberg,

1991; Minus, 1992) and is in fact extremely difficult for some individuals to master even with explicit instruction (Blachman, 1994; Torgesen et al., 1994). Recognizing phonemes is more difficult than recognizing words or syllables because

there is no simple physical basis for recognizing phonemes in speech...it is not possible to segment a speech signal such that each segment corresponds to one and only one phoneme. Rather, the information necessary for identifying a particular phoneme often overlaps with that of another phoneme...phonemic segments do not exist in the acoustic signal per se, but must be constructed from it...(Tunmer and Rohl, 1991 p. 4).

THE IMPORTANCE OF PHONOLOGICAL AWARENESS TO ALPHABETIC SYSTEMS

Phonological awareness is important to reading acquisition because it allows beginning readers to recognize the connections between written and oral language (Alexander et al., 1991). Alphabetic orthographies use letters and strings of letters to represent meaningless units of sound, that is, phonemes, which are combined to form words (Perfetti, 1991). This connection between written letters and oral sounds has been called the "alphabetic principle" (Byrne and Fielding-Barnsley, 1989, p. 313).

While both phonemic awareness and letter-sound knowledge are necessary to understand the alphabetic principle (Byrne and Fielding-Barnsley, 1991), it is not necessary to know "*how* all the letters and sounds map onto each other, only that they do" (Spear-Swerling and Sternberg, 1994, p. 94, italics original).

In an alphabetic script it is possible to learn to read some words without knowing the alphabetic principle by using a 'whole word' strategy; however, this is possible only if the pronunciations are provided by a more accomplished reader so that paired associate learning can occur (Perfetti, 1991; Truch, 1991; Hoover and Tunmer, 1993; Bryne, 1993). Thus, phonological awareness is essential in alphabetic insight, which in turn is essential for the ability to decode unfamiliar words independently.

Researchers have not examined adult beginning readers' recognition of the alphabetic principle. However, Kolinsky et al. examined Portuguese illiterates' knowledge of the relation between spoken and written words. The subjects, who had not attended school, were asked to match the written and oral forms of long and short words. While half of the illiterate subjects performed well, half performed very poorly. This finding suggests that in the absence of reading instruction, even the relation between the length of oral and printed words may not be evident, much less the relation between phonemes and graphemes.

PHONOLOGICAL AWARENESS AND READING ACQUISITION

The fact that once accomplished, phonological awareness is implicit in grapheme-phoneme correspondence rules rather than readily apparent may account for the general failure of teachers to recognize the role of phonological awareness. There is, however,

an impressive amount of experimental research on this topic which now dates back three decades.

The Chall, Roswell and Blumenthal 1963 longitudinal study on the relation between auditory blending and reading acquisition was part of early work on phonological awareness. They reported that

auditory blending ability, whether tested in the first grade, second, third, or fourth grades, is positively correlated with oral and silent reading ability through the fourth grade (p. 116).

Researchers have continued to find relations between the tasks of blending and segmenting and reading acquisition. Jorm et al. (1984) conducted a two-year study to assess the influence of various factors on children's progress in reading acquisition. They concluded that, of 39 tests, letter-naming and phonemic segmentation had the highest predictive value. Similar findings have been reported by other researchers (e.g., Fowler et al., 1977; Beech and Harding, 1984; Perfetti et al, 1987; Vellutino and Scanlon, 1991; Peterson and Haines, 1992). As Mann (1991b) pointed out, research over the years has shown that measures of phonological awareness and processing are better predictors of future reading ability than IQ tests or tests of visual perception.

The research with adults, although limited, concurs with that done with children. Minus' work with 117 adult subjects, using phoneme segmentation as one of the tests of phonemic awareness, led her to conclude that

adults who are expert decoders have high phonemic awareness, whereas adults who are very poor decoders have low or no phonemic awareness (1992, p.6).

Similarly, Pratt and Brady's study (1988), conducted with adults from an adult basic education class, found that good and poor readers' scores differed significantly on three measures of phonological awareness.

Studies with children have gone beyond establishing correlations to demonstrate that training in phonological awareness has an impact on reading. For example, Williams (1980) found that children aged seven to twelve who had been identified as learning disabled and who were taught segmenting and blending skills out-performed a control group on decoding. She concluded that general decoding strategies had been learned because this decoding superiority was evident even on novel words.

Similar results have been found by other researchers (e.g., Treiman and Baron, 1983; Bradley and Bryant, 1985; Tunmer, Herriman and Nesdale, 1988; Cunningham, 1990; Torgesen et al., 1992). The results of the longitudinal study conducted by Lundberg and his colleagues demonstrated that phonemic awareness training can have a long-term effect.

We found that the trained children entered first grade better prepared to work with the alphabetic system than the untrained children. They significantly outperformed the untrained children on a transfer test of phonemic awareness at the beginning of the first school year and on four successive assessments of reading and spelling ability over the next 3 years (Lundberg, 1991, p. 52).¹

Only two studies have reported the results of phonological awareness training with adults.

One of the objectives of the study conducted by Minus (1992) was to determine if phonemic awareness could be taught to low-literate adults in one 45 minute lesson. The training effects were not statistically significant. Truch (1994) reported on phonological awareness training of approximately eighty hours with 24 adults. Gains in decoding were measured by pre- and post-test performances on the Woodcock Word Attack test. All subjects showed a gain, with 84% showing a gain of 4 or more years, measured in grade equivalents. Thus, large gains in decoding skill are possible for adults if sufficient training is provided on phonological awareness.

Although the question of the direction of causality between phonological awareness and reading remains under debate, the studies that have demonstrated that training in phonological awareness has a positive effect on reading suggest that phonological awareness is causally related to reading acquisition.

PHONOLOGICAL AWARENESS AND PHONICS

Instruction in phonological awareness is not equivalent to instruction in phonics. The former is concerned with the ability to apprehend phonemes; the latter is concerned with the connection between letters or letter strings and phonemes. Research has demonstrated that some minimal level of phonological awareness is necessary to take advantage of letter-sound instruction (Tunmer et al., 1988; Tunmer and Rohl, 1991). Ball and Blachman (1991) found that a group of kindergarten children who received training in

only letter names and sounds did not outperform a control group on post-test measures of reading and spelling; however, a group who received letter name and sound training and phonological awareness training showed significant gains over the control group. These results show that phonological awareness is both different from phonics and important to it. Similar findings have been reported by Liberman et al. (1974) and Byrne and Fielding-Barnsley (1989).

Phonics instruction has been attacked on the basis that it has not provided the solution to reading problems (Carbo, 1988; Goodman, 1994). Phonics instruction, however, may not be the culprit; the difficulty may lie with the lack of phonological awareness training prior to or as a part of phonics instruction. Truch (1992) gives an example of the type of problems that can prevent a student from benefitting from phonics instruction. If phonological awareness is lacking:

[w]e can tell a child that the /f/ in "fish" is represented by the letter "f" but unless the child can isolate that beginning sound for himself (and we generally assume he can), then the relationship between the letter and its underlying sound remains a mystery (p. 41).

The inadequacy of phonics instruction when phonological awareness is lacking has also been pointed out in a study with adults by Boraks and Schumacher (1981). They conducted an ethnographic study that involved observing teachers and students in adult literacy classrooms for one year. They concluded that

while ABR [adult beginning readers'] teachers often focus on decoding skills, students who cannot discriminate or segment taught phonemes are using visual skills or graphic

cues in responding to these lessons (1981, p. 25).

While phonics instruction may aid in the development of phonological awareness (Perfetti et al., 1987; Jorm and Share, 1983; Morais et al, 1991), Pratt and Brady (1988) argued that instruction that includes phonics is not enough for poor readers, as both children and adult poor readers in their study had received phonics instruction. They went on to say:

Our results showing persistent phonological awareness deficits for older poor readers indicate that inclusion of training in phonological awareness in standard reading programs could make an important difference (p.323).

Goodman has criticized phonics instruction, particularly when it involves children who have difficulty learning to read.

[I]nstead of building on the strengths of the learners, particularly their ability to learn language in meaningful, functional contexts, the schools remediate them with increased doses of out-of-context phonics and word-attack skills (1992, p. 111).

While taking issue with Goodman's description of children with learning difficulties as simply "uncertain" (p. 111) and his claim that they "have all the necessary strategies, but they lack confidence in their ability to use them" (p. 111), it is possible to recognize merit in his criticism of added doses of phonics as a remediation strategy. As Lindamood et al. (1992) pointed out,

[p]honics activities offer *practice* in phoneme segmentation. But unless there is a sufficient level of phonological awareness accessible at the beginning of phonics instruction, the activities may be frustrating rather than productive for students (p. 253, emphasis original).

Thus, where whole language suggests less attention on decoding strategies and in particular on phonics for students having difficulty with reading, those concerned with phonological awareness recommend training in phonemic awareness in order to make phonics accessible.

PHONOLOGICAL AWARENESS AND READING DISABILITIES

Visual-Perceptual Deficit Theory

Formerly it was thought that learning disabilities stemmed from the way in which visual information was processed. This seemed to be supported by the obvious difficulty that many children classified as learning disabled had with letter reversals such as b/d/p/g's. But Mark et al. (1977) claimed that there has been a "repeated failure to establish visual-perceptual deficits as a major problem in learning to read" (p. 623). They suggested that poor readers may have "deficiencies in certain subtle aspects of language development that are not evident even to trained observers" (p. 623). Evidence to support this lies in studies which have shown that errors in recalling letter or word sequences "were based on the sound of the letter or word, rather than on its visual appearance" (p. 624). A study conducted by Fowler et al. (1977) led them to similar conclusions. They stated that

visual factors contribute rather little to the difficulties of beginning reading -- certainly less than factors relating to the language, such as awareness of phonological segmentation, phonetic recoding, and the structure of the orthography (1977, p. 173).

In a summary of the research on visual information processing difficulties as causal sources of problems in learning to read, Stanovich (1981) pointed out that poor readers do not have difficulty with visual processing in studies that successfully isolate this type of task. It is only when visual processing tasks are confounded with speech recoding tasks that poor readers differ significantly from good readers. Stanovich also said that the use of letter reversals and transposition errors to distinguish learning disabled readers from normal readers is not justified. This is because i) the proportion of such errors to total decoding errors was not greater for learning disabled readers, and 2) "verbal/linguistic factors may be implicated in their occurrence" (p. 488).

Research by Lovett et al. (1990) also contradicts the visual-perceptual deficit theory. In a study conducted with two hundred and eighty-five dyslexic children, Lovett and her colleagues found that despite explicit instruction on grapheme-phoneme correspondences, an experimental group failed to learn the patterns that were specifically taught. But compared to the control group, the experimental group did make significant gains on the words which had been used during the training because they had memorized them as wholes. The subjects' abilities to memorize whole words contradicts a visual-perceptual interpretation of reading disability; their inability to make use of grapheme-phoneme correspondence (GPC) instruction supports a conception of reading disabilities as having a phonological origin.

The two explanations for reading difficulties, visual-perceptual deficits or phonological

awareness deficits, lead to different types of remediation strategies. Lindamood et al. (1992) maintained that in the absence of information on phonological awareness "it is common to find diagnostic confusion where visual processing is thought to be the primary cause of the decoding errors" (p. 251). They reviewed and took issue with a diagnostic summary which concluded that a boy who made errors in reading that included reversing letters, leaving out sounds and substituting sounds in words needed to pay more attention to visual details in letters. In contrast to the recommendation that remediation strategies should encourage reliance on the perceived auditory strength and develop whole-word memory and attention to visual details, Lindamood and her colleagues stated that they would recommend assessing phonological awareness, as the boy's errors are typical of a deficit in this area.

The above example demonstrates the pedagogical implications inherent in the two divergent paradigms. The research reviewed in this section has argued that remedial approaches based on the visual-perceptual view are not addressing the genuine origin of most poor or disabled readers reading difficulties.

Developmental Lag Theory

The developmental lag theory proposes that phonological awareness, specifically phoneme awareness, develops with age partly as a result of cognitive maturation, and that children lacking phonological awareness are developmentally delayed (Olson et al., 1984; Beech and Harding, 1984; Stanovich, 1986; Tunmer and Rohl, 1991). Proponents of this theory

do not discuss it in terms of adults, but it seems reasonable to assume that if an adult has not matured to a cognitive stage where phoneme awareness is realized, then it is unlikely that he or she will ever do so. Research with adults, however, has indicated that training rather than cognitive maturation is key. Research has shown that adults' awareness of language at the word and syllable level (Ferguson, 1988; Morais, 1991b) and at the phoneme level (Truch, 1994) can be improved with training.

Phonological Awareness Theory

Bradley and Bryant (1985) view phonological awareness skills as a developmental continuum; "[b]ackward readers are part of this continuum, but the wrong part" (p. 74). The pedagogical implications of this view are that learning disabled or dyslexic beginning readers require the same instructional components as other beginning readers.

Ehri (1989) has taken this one step further and concluded that dyslexia is an environmental product of poor teaching.

The kind of phonemic awareness that is deficient in dyslexics is a kind that evolves during the early years as children make progress in learning to read and spell...Inadequate instruction spawning limited reading and spelling development and limited phonological awareness is the primary cause of the dyslexics' reading disability (p. 356).

This view is not held by others who argue for a distinction between poor readers and dyslexics. Stanovich argues that while all poor readers have a phonological deficit, this is an isolated deficit for dyslexics, rather than being accompanied by other cognitive

limitations as is the case for poor readers (1988). A study by Das et al. (1994), gives support to Stanovich's position by finding significant differences between dyslexic and non-dyslexic readers on phonological coding (non-reading related) as well as on phonological recoding (reading related) tasks.

Torgesen et al. (1994) conducted a longitudinal study with 244 children who were tested on a range of phonological abilities, reading and prereading skills in the first half of kindergarten and at the beginning of grades one and two. They found that "individual differences in reading-related phonological skills are remarkably stable during the period in which children are receiving early reading instruction" (p. 281). They also found that "each of the five phonological processing abilities had a significant causal relation to subsequent reading development" (p. 282). The fact that phonological abilities at a prereading stage could predict later reading achievement calls into question Ehri's claim that dyslexia is primarily a product of inadequate teaching and suggests a genetic base.

Spear-Swerling and Sternberg (1994) take a position which is slightly different than Stanovich's. They contend that

there is as yet little evidence that individuals with RD [reading disabilities] differ from other kinds of poor readers, either in cognitive processes related to reading (especially decoding) or in the kind of instructional program they require (p.91).

However, they stated that this view does not preclude the possibility, as Stanovich and others (Liberman et al., 1989; Pennington et al., 1991; Lundberg et al. 1991) have

suggested, that a small minority of the children classified as learning disabled, i.e. those who would be considered dyslexic by more stringent definitions, may have biologically based deficits, probably located in phonological processing.

Little research specific to adult beginning readers and learning disabilities has been done. As Chall (1987) pointed out, the "vast research on reading disability...is seldom considered as a factor in adult literacy problems" (p. 249). Recently, however, Fowler and Scarborough (1993) have synthesized research on adult literacy and learning disabilities from a variety of fields and have concluded that

the persistence of word recognition and especially phonological decoding problems is seen both in adults with pure reading disability and in those with more general learning problems or lack of educational opportunity (p. 117).

This suggests that, as has been suggested with children, for both poor and disabled readers phonological awareness is central to their difficulties.

UNRESOLVED QUESTIONS ON THE DEFINITION OF PHONOLOGICAL AWARENESS

While a great deal of agreement exists amongst those researching phonological awareness on the issue of its centrality to the process of learning to read for normal, disabled and delayed or poor readers, there are outstanding questions which remain contentious. These questions will not be resolved by the present study, but nonetheless they relate to aspects of the assessments used in this study and to pedagogical issues. For these reasons they

will be explored here.

What is the Relation of Rhyme to Reading Acquisition?

There are varying views on whether or not rhyme constitutes a part of phonological awareness. For example, Tunmer and Rohl (1991) exclude rhyme because it is acoustically perceptible and therefore does not require reflection on an abstract representational level. Morais defined phonological awareness in a more inclusive manner, but proposed that "it is the specific relation between alphabetic literacy and phonemic awareness that makes [phonemic awareness] a special case of phonological awareness" (Morais, 1991a, p. 6).

But whether or not rhyme is considered to be part of phonological awareness, it is generally recognized as contributing to the development of phonological awareness. Mann (1991b) pointed to research which leads to the conclusion that:

...children who are lacking in sensitivity to rhyme or lacking in the awareness of syllables are likely to become poor readers; and children who are proficient in these areas are more likely to become good readers of an alphabetic transcription (p. 209).

Tunmer and Rohl stated that rhyme suggests "the development of a rudimentary form of phonological awareness, a form that may be crucial for the development of full-blown phonological awareness" (p. 8).

Morais has suggested that rhyming contributes to the development of phonological awareness by directing attention to the structure of speech (1991b), although he argues that while rhyme and segmental analysis share an underlying capacity, rhyme does not *necessarily* eventually lead to phonemic segmentation (1991b, p. 45).

Bradley and Bryant have agreed that rhyme promotes phonological awareness, but they have also proposed that rhyme plays a more significant role in the learning to read process. They maintained that

rhyme may affect reading in more than one way. One contribution is direct: Rhyming skills probably help children to learn about spelling categories (Bradley 1988). The other is indirect. Rhyme may be the first step in a sequence of phonological development that culminates in awareness of phonemes and thus makes it possible for the child to learn about the alphabet" (1991, p. 40).

Their study of rhyme, alliteration and reading acquisition lead them to conclude that

[i]t has been recognized for some time that children have to acquire other associations than single grapheme-phoneme correspondences and have to learn that associations with groups of letters probably form an important part of early reading [sic]....It now seems that experiences with rhyme may play a key role in preparing children for this kind of learning (Bradley et al., 1990, p.436).

Bradley and Bryant's study of sound categorization and reading acquisition, which provides the foundation for their views on rhyme, was conducted with 368 children. It included a component which trained a sub-group on rhyme, alliteration and medial sound categorization and another sub-group on categorization plus letter sounds. They

concluded that "training had a considerable effect" and that their results suggested "a causal relationship between sound categorization and reading and spelling" (p. 420). They appear to be overstating their results, however, because the differences between the sound categorization group and the control group did not reach significance; it was only when categorization was combined with letter-sound training that there were significant differences between the experimental group and the control group. The role of rhyme in and of itself has not yet been clarified.

Read and Ruyter (1985), Morais et al. (1987), and Roazzi et al. (1993) have investigated rhyme with adults who have low literacy skills. In the Morais et al. study, rhyme did not correlate significantly with other phonological awareness measures. In the Roazzi et al. study, correlations between rhyme and other measures of phonological awareness were not reported, but in their conclusions they said that there was a "dissociation between rhyme and certain other language abilities" (p. 547). The Morais et al. and the Read and Ruyter studies found a correlation between rhyme and reading level, but the Roazzi study did not. All three studies found results that were consistent with the view that rhyme does not require an analytical form of phonological awareness (Morais, 1991b). None of these studies with adults, however, allows conclusions to be drawn about the possible role of rhyme as a prerequisite to the development of phonemic awareness or about its direct or indirect contribution to reading. Thus, many questions about rhyme and reading acquisition, particularly with adults, remain unresolved. Consideration of rhyme and reading relates to work by Goswami (1986) and Treiman (1987, 1991) on word analogies

and onset and rime, another area of unresolved questions.

Is Onset-Rime a Linguistic Level?

Treiman proposed that in addition to the phoneme, there is another linguistic unit at the intrasyllable level (1987). She outlined an "hierarchical" view of the syllable, in which

the syllable is said to consist of two parts, an onset and a rime. These parts are in turn composed of phonemes. The onset of a syllable is the initial consonant or consonant cluster. Thus, the onset of "blast" is "bl". The rime of a syllable is the vowel and any following consonants. The rime of "blast" is "ast" (p. 1).

Her studies have shown that "it is easier for children to divide syllables into onsets and rimes than to divide them into phonemes" (1987, p.7).

The idea that onsets and rimes represent a linguist level is not completely accepted, although other research with children has also found that there seems to be a natural preference for dividing syllables into onset and rime rather than phonemes (Morais, 1991b; Peterson and Haines, 1992; Ehri and Robbins, 1992) and there is some indication that this is the case with adults, as well (Byrne and Ledez, 1983). Tunmer and Rohl proposed what they called "the pronunciation strategy hypothesis" (1991, p. 7) in which they suggested that because the "vowel segment of the syllable is always the easiest phonemic segment to perceive and pronounce in isolation," therefore

children may adopt what appears to be the natural strategy of first focusing on the steady-state vowel portion of the syllable, treating the vowel and any following sounds as an unsegmented whole and likewise for any segments

preceding the vowel (1991, p.6).

Carlisle (1991) agreed that this may be an alternative explanation. As well, she proposed two other possibilities for some of the findings:

a) a particular consonant in the initial position in a word is more salient than the same phoneme in a medial or final position, and b) consonant blends are often particularly strongly bonded together, so that in the initial position (the onset) children identify them as a single sound unit (p. 88).

Morais (1991b) also suggested that there may be other interpretations of Treiman and colleagues' findings and pointed out that in French it is easier to delete the final consonant of a consonant-vowel-consonant sequence than the initial consonant, i.e. to decompose the rime than to separate the onset from the rime (p. 41). This suggests that the onset and rime phenomenon might be specific to English.

Whether it is specific to English and does or does not comprise a linguistic level, there is evidence to suggest that in English onsets and rimes can be accessed more easily than phonemes and that they are used at an early stage in reading. Goswami's study demonstrated that at ages 6 and 7 children could take advantage of analogies between words based on onset and rime similarities to read novel words (1986). A study conducted by Treiman, Goswami and Bruck (1990) led them to conclude that "analogies or larger units become more important with increasing levels of reading skill" (p. 564). Because of the relation between rime and rhyme, they also said that "children's experiences with rhyme help them to recognize onset and rime units when they begin to

read" (p. 565).

Treiman has suggested that the studies of onset-rime should inform reading instruction. She advocated that onset and rime should be taught prior to instruction in phonemes (1987, 1991). Using the word 'bag' as an example, she said

[a]t this early stage, the letter groups would be taught as units. The child would not be expected to figure out that *ag* says /ag/ based on knowledge of the separate correspondences between *a* and /a/ and *g* and /g/ (1991, p. 176).

She went on to say that instruction in phonemes should follow mastery of the onset-rime level, and that then perhaps children would have more confidence and find it easier to learn the relationships between graphemes and phonemes (p. 176). She acknowledged that this approach is similar to the use of 'word families' in initial reading instruction and said that her research provided the basis on which this method could be "followed and evaluated in a more systematic manner" (p. 176).

Ehri and Robbins (1992) conducted a study to test Goswami's hypothesis about beginning readers' ability to use onset and rime to read new words. They found that children who were not able to decode nonsense words were unable to benefit from training to use analogies to read new words, whereas children with minimal ability to decode nonsense words did benefit from the training. They concluded that at least minimal ability to recode phonemically was necessary to make use of analogy relations. For those readers who possessed this ability, analogies were helpful, which they thought was probably

because the use of rimes reduced the amount of blending that was necessary. The view that a minimal level of phonemic segmentation skill is necessary to use analogies was also expressed by Peterson and Haines in the conclusion to their study (1992).

Earlier work by Treiman and Baron (1983) appears to be closer to Ehri's view and to stand somewhat in contradiction to Treiman's later position. As a conclusion to their 1983 study, Treiman and Baron provided a caution regarding using word families with students who do not have skill in phonemic analysis. They stated that their study suggested that using word families (eg. cat, bat, hat, etc.) will make it more difficult for children to learn GPC rules.

They will make more errors on words that embody the rule than on words that do not. Our results also show that phonemic-analysis training with the corresponding spoken words can overcome such negative effects and can, in some cases, produce a positive benefit (1983, p. 388).

Thus, this study, along with the one conducted by Ehri and Robbins, suggests that word families can not be used as an intermediary stage prior to phoneme awareness, but rather that some rudimentary level of phoneme awareness is necessary to read novel words using word families.

The differences expressed here make it evident that further research will need to be done to clarify issues around the theoretical understanding of onset-rime as a possible linguistic level and, more importantly, the pedagogical implications which should be drawn from such theoretical development. These issues have not been addressed in research with

adult beginning readers, rather the efficacy of reading instruction using word families is assumed without empirical support (e.g., Literacy Volunteers of American, 1986; Cameron and Rabinowitz, 1988; Learning Disabilities Association of Canada, 1991).

Is Phonological Awareness a Causal Factor in Reading Acquisition?

Although the importance of phonological awareness for reading acquisition has been agreed upon by researchers in this area (e.g., Bradley and Bryant, 1985; Vellutino, 1991; Mann, 1991b; Morais, 1991b; Bryne, 1993), questions regarding the exact nature of the relation between phonemic awareness and reading acquisition are still being resolved (Lundberg, 1991; Morais, 1991a; Mann, 1991; Tunmer and Hoover, 1993). From a pedagogical point of view, the question is an important one because it generates possibilities about how and when to intervene.

Prakash et al. (1993) briefly outlined the divergent views on the relation between literacy and phonological "language awareness" (p. 56). Is phonological awareness:

- 1) a prerequisite to learning to read and write?
- 2) a facilitator of learning to read and write? or
- 3) a consequence of learning to read and write?

The fourth view is an "interactionist view" that

suggests that a certain amount of metalinguistic awareness may be a prerequisite for literacy acquisition, whereas the literacy acquisition process itself may further facilitate the development of metalinguistic awareness (p. 56).

It is the latter, interactionist view that is finding the most support in experimental studies

(Tunmer and Hoover, 1993). It is supported by research findings such as Lundberg et al.'s (1988) that phonological awareness can be taught prior to reading and that this instruction has an impact on later reading acquisition for at least three years. The hypothesis that a minimal level of phonological awareness is necessary for literacy acquisition has been supported by studies which have shown that children who have learned letter names and sounds but who lack phonological awareness have not made significant gains in word reading (Byrne and Fielding-Barnsley, 1989; Ball and Blachman, 1991).

From Morais' and his colleagues' perspective, the interactive relation is between phonemic segmentation and reading and it begins at the point at which reading instruction commences (1991b). They consider that print is crucial for enabling sounds to be analyzed:

Segments appear to consciousness from the moment that corresponding units (letters) are seen outside and must be referred to components of speech" (1991b, p. 45).

Lundberg (1991) took strong issue with Morais' view that phonemic awareness can not develop prior to reading instruction. He pointed to the study that he and his colleagues conducted in 1980 which identified children who did not even know letter names but who demonstrated phonemic awareness as evidence that it was possible to develop phonemic awareness without alphabetic instruction. An interactionist view recognizes both the possibility of phonemic awareness prior to alphabet instruction, and the role this instruction can play in promoting phonemic awareness.

In terms of determining at what point remediation can begin, there is not necessarily a difference between Morais and Lundberg's positions. If rhyming is seen as a precursor to phonological awareness at the phonemic level, even Morais' view does not preclude there being opportunities to help develop phonological awareness prior to reading. What would differ is the type of remediation, for Morais' position would lead logically to the conclusion that it would be pointless to work on phonemic segmentation in the absence of direct reading instruction, for example, by teaching awareness of phonemes without alphabet letters. The efficacy of identifying prereaders who are weak in phonological awareness skills and providing training in this area which includes phoneme tasks most likely will be determined by further research and practise in classrooms. It is worth noting, however, that for adult learners the question is slightly different. In most cases, adults with phonological awareness difficulties will already have been confronted with the alphabet and phonics instruction and may have experienced confusion over what it is that these artifacts of alphabetic literacy represent. In their case, teaching alphabet letter-sound correspondences has not engendered alphabetic insight and may have created misunderstandings about how letters are supposed to aid reading. (This question is taken up further in Chapter Four.)

A study by Bruck (1992) has shown that for dyslexics, learning to read does not necessarily increase phonemic awareness. In a study with adult dyslexics reading at or above the grade seven level, Bruck found that

on the phoneme awareness tasks, dyslexics never approximate levels of performance that are appropriate for

their reading levels (p. 879).

But there was improvement at an intra-syllable level with units larger than phonemes. The study demonstrated that dyslexic *children* showed poorer awareness of onset-rimes than reading or age-matched subjects; however, the adult dyslexics reached a ceiling level on the onset-rime task. This indicates that "as reading skills improve, dyslexics eventually acquire appropriate levels of onset-rime awareness" (p. 882). Their improvement in onset-rime awareness supports an interactionist view. Their lack of phonemic awareness, coupled with their failure to become skilled readers, gives further correlational evidence of the importance of phonological awareness at the phoneme level.

THE DEVELOPMENT OF PHONOLOGICAL AWARENESS

Jorm and Share (1983) posit three stages of phonological knowledge: i) tacit (knowledge of speech) ii) conscious and iii) automatic. It is necessary to have the second, conscious level of knowledge in order to "use this knowledge to profit in learning to read" (p. 116).

It is generally agreed that conscious knowledge of speech develops first at the word level, then at the syllable level, and only later at the phoneme level (Adams, 1990; Fox, 1991; Morais, 1991b; Treiman and Zukowski, 1991; Peterson and Haines, 1992; Fowler and Scarborough, 1993).

When discussing the order of recognition of sub-word units--syllables, onset and rime, and phonemes--Morais suggested that they are first recognized in order from the largest to the smallest parts. This is because

highly embedded parts require more analytic effort than less embedded ones, and because their functional value tends to decrease with the degree of embeddedness...(Morais, 1991a, p. 35)

Although there is a general, sequential development of the recognition of words and intra-word units, this does not appear to occur in discrete stages. Sawyer (1991) pointed out that the perception of syllables begins to emerge before perception of words is fully mastered. She hypothesized that awareness of syllables is the first indication that attention is being shifted from the meaning of words to recognition of sound units. It is probable that the reason why syllables are recognized without explicit instruction in many cases is that, unlike phonemes, they are marked acoustically (Tunmer and Rohl, 1991). As well, unlike phonemes, syllables can be pronounced separately without the necessity of ignoring other acoustic signals.

While discussion continues on the chicken and egg question of which develops first, phonological awareness or reading, Mann's work on phonological awareness and language play has pointed out how games may draw attention to the elements Morais referred to as embedded (1991a), in effect, giving them a functional value for the purposes of the activity. Speaking of secret languages, she said that they involve a wide variety of manipulations which may include transposing, deleting or inserting phonemes, and are

found in languages which have written syllabaries or logographies (1991a). She said that the secret languages which she observed "provide additional evidence that phoneme awareness can sometimes be dissociated from knowledge of the alphabetic principle" (p. 59).

Another interesting consideration on the development of phonological awareness and reading acquisition is found in a study which concluded that

the best single predictor of a child's Grade 1 reading achievement is not his or her own phoneme-segmentation ability but the ability of his or her Grade 1 class peers (Jorm, et al., 1984, p. 1319).

The researchers suggested that the possible reason for this is that peer ability would influence the type of language play, e.g. rhymes, songs, and tongue-twisters that children would engage in that could influence the development of phonological awareness and thus, indirectly, reading achievement.

This hypothesis on the contribution of rhyming games to the development of phonological awareness has been further tested by MacLean et al. (1987). They asked English schoolchildren who were just three years and three months old to recite nursery rhymes. From then until the children were four and a half, the experimenters assessed the progress the children made on tasks including oddity tests (selecting which spoken word of three or four words differs in beginning, final or medial sound), rhyme and alliteration production and recognition of letters and words. They concluded that the children's early

knowledge of nursery rhymes seemed to be specifically related to their development of phonological awareness. It is logical to assume, then, that children who grow up without sufficient exposure to nursery rhymes and other forms of language play will be at risk for difficulties with phonological awareness.

The question of whether or not early demonstration of phonemic awareness leads to higher reading levels later on, compared to later development of phonemic awareness has been considered by Perfetti et al. (1987). They conducted a study with eighty-two first graders, most of whom were on a basal reading programme. Only one of the groups routinely received direct phonics instruction. The researchers concluded that early phonemic awareness leads to higher reading for children who were not receiving direct instruction on decoding, but it was not the case with the direct code group. They surmised that for the direct code group, passing the phonemic knowledge test early "may have been less important because a form of synthesis was eventually learned from the curriculum" (p. 312).

Further to the role of phonics or direct code instruction in developing phonological awareness, Morais (1991a) made strong statements about the value of instruction on the alphabetic code and the dangers of the whole-word method. When discussing a study that he and his colleagues conducted with first grade children in Brussels in 1982, he said that the five subjects who reached the highest level on the deletion task had received direct

code instruction. He went on to say that

...no child taught according to a pure whole-word method and coming from a family with low educational attainments could read (p. 19).

Perfetti et al.'s and Morais and colleagues' studies indicate that for children entering school with limited literacy experiences or limited phonological awareness, direct code instruction can help both the development of phonemic awareness and reading acquisition. The converse would be that without such instruction, these children may not develop the necessary phonemic awareness for proficient reading. Morais stated emphatically: "For culturally underprivileged children the whole-word method is a threat..." (p. 1991a, p. 19).

While Morais may be correct that whole language is detrimental for children who have not developed phonological awareness, it is also true, as discussed in an earlier section, that phonics instruction does not always improve phonological awareness. Not all children or adults who receive phonics instruction grasp the alphabetic principle.

The exact nature of the mechanism for the development of phonemic awareness, that is, the transition from the tacit level of knowledge awareness necessary for oral language to the conscious level necessary to appreciate the alphabetic principle, is not yet understood. Morais suggested that articulatory cues are the transitional mechanism (Morais, 1991b). This notion is supported by research with deaf readers. Hanson (1991) argued for recognition that "phonological units are linguistically defined primitives related to

articulatory gestures" (p. 154). She went on to say that while the ability to hear speech accurately "is an important component in establishing a phonological representation" (p. 155), there are alternative routes available to deaf readers. In an earlier paper (1989), Hanson described possible alternate routes as being "the motor events involved in speech production" (p. 73) and experience with lipreading and the written language.

One experiment on which she reported demonstrated that deaf subjects who were good readers were more sensitive to rhyming words (e.g. save-wave) even when compared to words which were as orthographically similar (e.g. have-cave). After summarizing her own experiments and those of others, Hanson concluded:

In sum, the evidence, which has been summarized here, indicates that it is possible for deaf readers to use phonology. The use of phonological information tends to be characteristic of deaf good readers, whether they are beginning readers...high school students...or college students (1989, p. 83).

Hanson's research makes a strong case for the role of articulatory cues in developing phonological awareness and refutes Goodman's later claim that "alphabetic writing systems don't relate to the phonology of the oral language in any useful way" for deaf learners (1994, p.75).

As stated in earlier sections, there is much evidence that phonological awareness can be improved through training. Torgesen et al. (1994), however, pointed out that an examination of the results of group effects of phonological training hide the fact that

within those groups there may be children who did not significantly benefit from training (p. 284). In a study Torgesen conducted with Morgan, Sharon and Davis (1992), they found that "almost a third (5) of the children in this group did not respond to the analytic training with which they were provided" (p. 369). Reflecting on this Torgesen et al. (1994) suggested that

training procedures that are more explicit or more intense than those typically found in the research literature may be required in order to have a substantial impact on the phonological awareness of many children with severe reading disabilities (p. 285).

Blachman (1994), in response to Torgesen et al., agreed with their concern about those who tend not to make progress in research training projects, but went on to describe the results of a phonological awareness training programme that extended over two years: "as length and complexity of treatment increased (i.e., as we continued to foster skills in phonological awareness, alphabetic coding, and automaticity), we also had fewer 'treatment resisters'" (p. 289). Blachman's study suggests that the longer appropriate remedial instruction in phonological awareness continues, the greater the gains will be in overcoming environmentally, and perhaps even genetically caused phonological deficits.

Belief in the need for intensive training and the essentialness of articulatory cues to the development of phonemic awareness are at the foundation of the Auditory Discrimination in Depth program by Lindamood and Lindamood (1975). This programme focuses on training poor readers to distinguish phonemes by recognizing the different movements of tongue, lips and throat. ADD has been reported as successful when used with children

and adults to improve their phonological awareness and promote reading acquisition (Alexander et al., 1991; Truch, 1994).

Definitive answers have not yet been found for questions regarding why phonological awareness does or does not develop. There are, however, strong indications that early language play and direct code instruction are conducive to phonemic awareness development. There is also evidence that intensive, extended phonological awareness training can result in improved skills in this area and in reading even for those who have failed to improve with less intensive programmes.

PHONOLOGICAL RECODING AND PHASES OF LEARNING TO READ

An understanding of phonological awareness as necessary to proficient reading allows for a conception of reading acquisition which recognizes qualitative rather than just quantitative development. It also provides a framework which is relevant to both children and adults and reading disabled as well as normal readers.

Basing their paradigm on a recognition of the role of phonological awareness, Ehri and Wilce (1985) postulated three phases of reading acquisition, which Ehri later elaborated and organized into four phases (1994). These are i) logographic, ii) novice alphabetic or phonetic-cue, iii) mature alphabetic and iv) orthographic. The choice of the word *phase*

rather than stage is made to avoid the suggestion that they are distinct, developmental sequences (Ehri, 1994). These phases are seen as the way in which reading must be acquired for both good and poor readers as well as for disabled readers (Spear-Swerling and Sternberg, 1994).

Logographic Phase

The logographic phase has also been called a visual cue phase of reading (Spear-Swerling and Sternberg, 1994). Readers at this stage identify words in the same manner they identify pictures, i.e. "treating the words as unique visual patterns" (Ehri and Wilce, 1985, p. 165). They read words in context such as on labels and signs by choosing a salient visual cue to remember (Gough et al., 1992).

The logographic phase of reading is non-alphabetic because, although letters may be used as visual cues, alphabetic insight has not been achieved (Spear-Swerling and Sternberg, 1994). This decoding strategy presents difficulties for readers of alphabetic scripts.

The associations formed between visual cues and words are hard to remember unless practised frequently because they are unsystematic and arbitrary. Visually similar words are mistaken for one another because the visual cues selected are not unique to individual words (Ehri, 1994, p. 326).

Because this is a visually based strategy which does not involve phonological recoding, good and poor phonological processors do not differ at this stage of reading acquisition

(Jorm and Share, 1983; Ehri and Wilce, 1985). (This offers further support to the view that most poor readers' problems are not visually based.) As well, because this is a non-alphabetic phase it may be argued, as Morais has (1991a), that it should rightly not be considered as reading. It can be legitimately be considered reading, however, in the sense that it represents a recognition that graphic forms convey meaning which can be translated into words, the same graphic form standing for the same words on each occasion.

Stuart and Coltheart (1988) claimed that not all readers need to pass through the phase of logographic reading. On the basis of their study, they stated that "[c]hildren who are phonologically skilled before learning to read might use their phonological skills from the beginning" (p. 149). This was not proven in their own study, however, as it did not assess children to see if they could already read words prior to entering school; instead Stuart and Coltheart only assumed that the children could not. Thus it cannot be concluded that the study captured the entire learning to read process of the subjects and it is possible that the logographic phase for some students preceded the study.

In Chall's (1987) outline of stages in the development of adult literacy, she omits the prereading stage which she includes for children and which would be similar to the logographic phase. Work by Malicky and Norman (1989), however, suggests a logographic phase for adult beginning readers. On a test which included environmental print items, they found that ten out of twenty-two low-literate adults performed significantly better on the picture than the print format. They concluded that the

relatively high level of accuracy on the logo format suggests that these adults were beginning to use print cues, although certainly the distinctive shapes of the store signs and product labels were of more assistance than the letters and words themselves (p. 200).

This description of adult students' reading strategies is in accord with the perspective which would see that they are emerging from a logographic phase and entering a phonetic cue phase of reading. On the basis of Malicky and Norman's study it appears that adults also pass through a logographic phase on their way to reading.

Novice Alphabetic Phase (Phonetic Cue Reading)

Readers in the novice alphabetic or phonetic cue phase can "read a few words out of context and have mastered letter names" (Ehri and Wilce, 1985, p. 165). Spear-Swerling and Sternberg stated that in order to enter the phonetic-cue phase it is not necessary for readers to know all the letter sounds, but to have achieved alphabetic insight, which requires "a rudimentary level of phonological awareness and some letter-sound knowledge" (p.93). In this phase readers use some letter-sound relations, particularly initial letters. The reading process is not as sophisticated as later decoding, but a rudimentary phonetic process is being used. "Phonetic cue reading involves forming access routes [to the mental lexicon] out of partial letter-sound correspondences" (Ehri, 1994, p. 329).

To illustrate, the first few times phonetic cue readers see and hear the word *milk*, they recognize how the initial and final letters correspond to /m/ and /k/ in the pronunciation. This creates an access route into lexical memory that enables them to retrieve the pronunciation when they see

the spelling again (Ehri, 1994, p. 329).

The shift from visual to phonetic cue reading is an important one because it represents the beginning of the application of the alphabetic principle. In addition, it is possible that even the minimal level of phonemic awareness and letter-sound knowledge of phonetic cue reading can enable self-teaching. Share (1995) speculated that phonetic cue reading forces reliance on contextual cues and that together these strategies allow beginning readers to engage in self-teaching, "sufficient perhaps to lay down primitive orthographic representations...well before a child has acquired 'conventional' decoding skills" (p. 163).

Fox' comments on the limitations of phonetic-cue reading suggested the impetus for moving beyond that phase.

As long as the words that children are called on to identify are visually and phonologically distinct, phonetic cue reading presents a useful means of word identification. Confusion arises, however, when several words share orthographic and phonological properties because children cannot rely on minimal visual-verbal clues as a means of differentiation (1991, p. 136).

Gough and Walsh (1991) discussed selective association (phonetic-cue word reading) and pointed out that "each word is harder than the last, so that it would be very difficult to acquire anything but a small sight vocabulary in this way" (p. 205).

Phases of reading development have not been a focus of attention for most of the studies with adult subjects. However, there is one study with adults that lends support to the

existence of a phonetic cue phase of reading for adult beginning readers. Boraks and Schumacher (1982), reporting on their ethnographic research, listed examples of errors made by adult beginning readers when reading words in texts. They then went on to say that

[t]hese renderings indicate a misuse of phonemic, graphic and semantic cues; but a close analysis of these miscues suggests the basic problem is with the systematic analysis and use of phoneme cues. The ABR [adult basic reader] (who read bake as book, kid) was using prominent initial and final letters interchangeably to cue word identification. Many ABR's in fact seem to take in and store words in terms of initial and final letters (p. 18 underscoring original).

They considered the adult beginning readers' "total and sustained disregard of letter sequence" (p. 20), to be unique and distinct from children's reading, but, on the contrary, it can be seen as typical of a phonetic cue phase.

Mature Alphabetic Phase

The mature alphabetic phase has also been called "cipher reading" by Gough and Walsh (1991). This phase requires mastery of the grapheme-phoneme correspondence rules and decoding using sounding out and blending. A major advantage of this use of phonological recoding is that it allows the independent reading of unfamiliar words (Ehri, 1994, p. 333).

It is in the mature alphabetic phase that phonological recoding, through the application of GPC rules, becomes a more reliable self-teaching mechanism. Jorm and Share (1983)

identified this self-teaching mechanism as critical in the development of skilled reading because it helps children to independently learn new words. While self-teaching may begin in the phonetic-cue phase, without good phonological recoding skills children are forced to rely more on context and may incorrectly practice and mislearn new words. The self-teaching mechanism is crucial in the ability to read text independently because direct instruction with a whole word approach can not deal with the "orthographic avalanche" (Share, 1995, p. 153) that readers encounter in the form of unfamiliar words.

Orthographic Phase

By the orthographic phase readers have learned the use of GPC rules and have recognized patterns across words. Orthographic knowledge may develop from experience with the phonological recoding of words with similar patterns and through recognizing and storing in memory the spelling of words with similar patterns (Ehri, 1994, p. 340). It is distinguished from the logographic phase by "being analytic in a systematic way" (Frith, 1985, p. 306). Another distinguishing feature is that unlike logographic reading, sight word reading in the orthographic phase allows the reading of unfamiliar text based on print cues alone (Ehri, 1994).

The question of at what point readers begin to use word analogies is presently one which is still being debated. Treiman et al. (1990) claim that analogies are used earlier than the phase of orthographic reading.

Our data show that *if* there is a stage at which children rely only on GPC's, it must be short. By the end of the first

grade, students reading at the first grade level were already using VC [rime] units. They did so even though 'he phonics instruction that they received stressed GPC's (Treiman et al., 1990, p. 565, emphasis original).

Ehri (1994) suggested that use of rimes to read using analogies occurs both in the novice alphabetic phase and the orthographic phase. This is because use of analogy can occur "by analogy to a single known word, by analogy to several known words sharing a spelling pattern, and by application of a generalized spelling pattern" (p. 345).

Spear-Swerling and Sternberg (1994) have named the last two of the four phases "controlled" and "automatic" word recognition (p. 94). These labels highlight the difference between the phases: controlled decoding requires "considerable effort," whereas in the automatic phase word recognition is "relatively effortless" (p. 94).

The method by which words are accessed in the mental lexicon is under much debate, the issue being whether or not it is possible to access the lexicon directly, without the use of a phonological code. Hoover and Tunmer (1993) suggested that in systems which use alphabetic scripts, either phonological recoding or direct access to the mental lexicon are at least theoretical possibilities.

From their study requiring comprehension of sentence meaning, Doctor and Coltheart (1980) concluded that

very young readers rely extensively on phonological recoding when reading for meaning; as they grow older, reliance on visual encoding [direct access to the mental

lexicon] becomes progressively more important (p. 195).

Jorm and Share described what is known as the dual access view which holds that skilled readers can access the lexicon by either phonological recoding or directly by visual coding.

These two forms of lexical access are believed to operate in parallel, with the visual route being faster and used for familiar words, while the phonological route is slower and used for unfamiliar words (Jorm and Share 1983, p. 104)

This view of readers moving from a stage of pre-lexical phonological coding to direct visual access as they gain proficiency is not held by all. Liberman et al.(1989) described the view that phonological coding only occurs with beginning readers while mature readers have a direct access to mental representations of words as a misunderstanding "about the nature of words and how they are perceived" (p. 6). Cui, too, expressed the perspective that phonological recoding continues to play a role in proficient reading (1994), thereby distinguishing her conception of the orthographic phase from Frith's (1985). Barron (1987) presented a critique of dual route theory with several possible alternative models, one of which is a single process model which attempts to take into account the interactions between orthography and phonology.

Despite the unresolved nature of the role of phonological recoding in skilled reading, there is agreement that an automatic level of word recognition exists that allows decoding to occur with the relative ease proposed by, amongst others, Laberge and Samuels (1974), Perfetti (1975), Stanovich (1980), Fowler and Scarborough (1993) and Spear-Swerling and

Sternberg (1994). Phonological awareness plays an important role in the process of developing the automaticity that is essential to proficient reading. In an alphabetic script, it remains necessary to recognize the alphabetic principle in order to achieve the automatic, orthographic phase of reading whatever the age of the beginning reader and no matter whether he or she is a normal or disabled reader.

THE INTERACTIVE COMPENSATORY STRATEGY

The theory of reading acquisition described above is based on a view of word decoding as central to the meaning getting process of reading. As such, it has implications for the understanding of the interaction of lower and higher levels of text processing. LaBerge and Samuels (1974) developed a model of reading which placed "heavy emphasis on the role of attention in the component processes of reading" (LaBerge and Samuels, 1974, p. 294). Their hypothesis, which is still present in the updated, more explicitly interactive model currently proposed by Samuels (1994b), was that proficient reading requires that decoding occur at an automatic level so that there is sufficient attention remaining for comprehension (Samuels, 1994b, p. 821). Perfetti and Hogboam (1975) were supporters of this view as well. They stated that decoding and comprehension were not independent processes and that they not only interacted, but shared "a limited capacity mechanism" (p. 461). Furthermore, a "mechanism which is heavily demanded by one process essentially becomes less available for other processes" (p. 461).

The interactive-compensatory theory, as developed by Stanovich, asserts that "the magnitude of contextual facilitation effects is inversely related to the word-recognition skill of the reader" (Stanovich, 1986, p. 369). This is the case because

the information processing system is arranged in such a way that when the bottom-up decoding processes that result in word recognition are deficient, the system compensates by relying more heavily on other knowledge sources (e.g., contextual information) (p. 369).

Stanovich maintained that word recognition is so rapid for fluent readers that context is only activated through the automatic process. This automatic activation may facilitate subsequent processing without using cognitive capacity. On the other hand, when word recognition is not rapid, "[h]igher-level processes of conscious contextual prediction become implicated in performance" (Stanovich et al., 1984, p. 673). Stanovich maintained that poor readers do use context when they can decode enough of the text to understand the context.

Stanovich (1980) referred to a study that he conducted with West in 1979 in which the errors of poor readers, compared to good readers, indicated that the former group identified words based on only some of the grapheme clues. "The more the field items approximated target items in structure, the more likely they were to be mistakenly checked" (p. 42). He said that this suggested that poor letter-analysis mechanisms rather than a failure to use redundancy, is the difficulty for poor readers.

Using hypotheses to facilitate word recognition may itself take cognitive capacity, thus leaving fewer resources for

higher-level comprehension processes such as drawing implications or integrating new information with old. If the contextual facilitation observed in poorer readers is of a type that takes attentional capacity, then these readers may have less capacity left over for comprehension processes (p. 52).

The interactive-compensatory theory has been supported by some studies, but there are other studies which are more supportive of Goodman's (1993) view and suggest that proficient readers make more and better use of semantic and syntactic cues than do less able readers (e.g., Leslie, 1980). Differences may in part be due to methodology (Goldsmith-Phillips, 1989; Kim, 1994), as most of the experiments supporting Stanovich's theory have been laboratory tasks, while those which have supported Goodman's view of context use by good readers have used the more naturalistic, miscue analysis.

Henshaw (1992) pointed out that one of the drawbacks of the research which uses miscue analysis has been that errors in word reading have been analyzed rather than the contribution that contextual information makes to successful reading. She conducted a study with 52 eleven-year old children who required remedial assistance in reading. The children read texts which they had individually written, each other's texts, and a passage from a classroom reader. As well, they read words in lists taken from the stories. All list words were words which the children had read successfully in context. Her conclusions were that the remedial readers made successful use of contextual cues and even appeared to depend on the contextual information. She further stated that the context dependency "was exacerbated by a very low level of graphic skills" (p. 18).

Thus, this naturalistic study supported Stanovich's interactive compensatory theory. Other studies have attempted to replicate Goodman's original work on the use of context (1965), but corrected his design flaw--Goodman had all subjects read the words first in a list and then in text--and these studies, too, found results which supported the compensatory strategy (Nicholson, 1991; Nicholson, 1993).

Malicky and Norman's 1989 study found that adult poor readers also were able to make use of contextual clues. On the basis of their miscue analysis they concluded that the "adult nonreaders in this study were not 'glued to print'" (p. 201).

Without prompting, most adults in this study spontaneously relied on their knowledge as they approached environmental print tasks and all types of passages (p. 201).

Kim et al. (1992) conducted a study in which they examined good and poor third and sixth grade readers' use of contextual and orthographic information in oral readings, word recognition and a short-answer comprehension test. From their results they concluded that "overall, poor readers were more reliant on semantic information for word identification than were good readers" (p. 184), and that the "use of orthographic information was significantly greater for good readers" (p.185). A final conclusion appears to contradict the interactive-compensatory theory:

[D]espite the prediction of the interactive compensatory hypothesis and common sense, poor readers' reading comprehension performance was as good as that of good readers (p. 186).

Appearances notwithstanding, this does not offer a challenge to Stanovich's theory, because, as Samuels stated, if poor readers "had unlimited quantities of attention to focus on the task there would be no problem, but this not the case" (1994a, p. 821). While at any give point, a reader does not have unlimited capacity, the accumulated capacity can be changed by increasing the time, assuming that the reader can decode enough words accurately to create a context. Kim et al. commented on the role of increased time, too, and noted that other researchers have found that "poor readers' comprehension can equal that of good readers when they are given sufficient time..." (p. 186).

Miscue analyses of adult poor readers' oral reading presents a mixed picture and the results are difficult to compare because of the differences in population and testing methodology. Raisner (1978) conducted a study with fourteen adult college students who had been designated as "non-proficient" readers (p. 39). She found that these students "gave great attention to the graphic display, and were somewhat aware of contextual cues" (p. 46). Following their miscue analysis of fourteen adult beginning readers' (ABRs) oral reading, Boraks and Schumacher (1981) stated that "most ABRs, even the most proficient ones, made little use of semantic cues" (p. 25). In contrast, Mudd (1987) conducted a study with both adult and children beginning readers. She found that "the adults show fewer differences between graphic and semantic scores than the children and considerably greater use of semantic cues" (p. 88). Malicky and Norman (1982) found that the adult literacy students in their study were "equally likely to use semantic cues" (p. 731) whether they were students who made low or high progress during the course of instruction. No

clear picture emerges on the basis of these studies.

In 1988 Norman, Malicky and Fagan conducted a study using miscue analysis and retellings of the oral readings of 122 adult literacy students. They concluded that the lowest of the seven groups that emerged from the data

need to balance attention to print cues by greater reliance on their knowledge as they read. All work on word identification should involve words in the context of passages rather than in isolation, and the focus should be on making predictions which made [sic] sense and sound right (p. 24).

This pedagogical approach makes sense within the framework of the whole language approach which sees uncorrected errors as occurring when "the reader is relying so heavily on analytical techniques using only cues within words that he has lost the meaning altogether" (Goodman, 1965, p. 642) and which assumes that "[i]n the same way as [readers] learned how to use phonology to make sense of speech, they come to control functional...phonic knowledge in the context of learning to read and write" (Goodman, 1994, p. 85). But another interpretation is possible for the Norman et al. (1988) data, if one approaches the results from the perspective of reading phases that recognize the importance of phonological awareness in reading development. In this light the poorest readers would be seen either as functioning at the phonetic cue or the novice alphabetic levels and as needing to improve their application of GPC rules. Although it is possible that using context along with letter-sound information can help beginning readers to become skilled in decoding (Nicholson, 1993; Share, 1995), diverting students attention

away from phonics and encouraging them to rely on predicting words is likely to hinder their reading development. Research on phonological awareness and phases of reading acquisition indicates that it is important to assess beginning readers' phonological awareness and ability to use both contextual and grapheme-phoneme based strategies before assuming that emphasis on contextual cues is an appropriate remedial approach. It is probable that the students in the Norman et al. study needed to continue to focus on the grapheme-phoneme aspect of word recognition (including phonological awareness training as required) in order to eventually increase the automaticity of their word recognition. According to the interactive-compensatory theory, this would allow them the attentional capacity necessary to improve their reading comprehension, which Norman et al. identified as a problem.

The research on contextual facilitation has not yet coalesced to a consensus, yet there is a trend in the results of studies conducted with children that indicates both that poor readers do use context to decode and that good readers decode automatically and do not rely on context for word decoding. At present there have not been enough studies done with adult beginning readers to confirm or disconfirm the interactive-compensatory theory. The resolution of this question has direct pedagogical implications. If adult poor readers already use context as a compensatory strategy to aid their word recognition, it is more appropriate to teach the decoding strategies in which they are deficient, than the context strategies which they already know.

CONCLUSION

Illiteracy is often not the adult literacy student's sole problem; the personal histories of many literacy students make evident that they face an array of social, economic and emotional difficulties which are likely to impinge on learning. This has been reflected in the fact that much of the focus on adult illiteracy has been on its social aspects. The complexity of the issues adult illiterates face can confound attempts to analyze what their instructional needs are. Despite the plethora of problems that obscure teaching and learning issues, there is a growing awareness of the need to confront cognitive issues and to deal with the possibility that reading disabilities may be the principal source of reading problems for illiterate adults (Fowler and Scarborough, 1993). Recognition of the possibility that cognitive rather than strictly socio-economic problems may lie at the origin of many adult students' difficulties arises from the experience of teachers who have worked with students who appear unable to overcome decoding problems.

The source of student's cognitive difficulty may be veiled by what Stanovich (1986) has called the "Matthew effect", i.e., those who begin reading well become better readers, and those who begin poorly come to lag even further behind as initial difficulties remain unaddressed and the possibility of independently practising skills is drastically reduced compared to more advanced readers. What was originally a limited difficulty can become more diffuse. Following a study with adult beginning readers, Read (1988) said

One characteristic of our adult poor readers, contrasted with

adequate readers from the same backgrounds, is that they have small reading (and listening) vocabularies. We suspect that their vocabularies grow very slowly because they cannot read or spell words that they have not already learned as wholes (p. 8).

The diffusion may even affect IQ, as limited exposure to written material may place constraints on IQ tested areas of intellectual growth (Fowler and Scarborough, 1993). Both the range of socio-economic difficulties many adult low-literates face and the diffusion of what once may have been more specific cognitive difficulties have hampered attempts to discern how best to intervene with adult beginning readers.

In the preceding sections of this chapter, research has been reviewed which supports the theory that phonological awareness is a critical component of explanations for both successful and unsuccessful reading acquisition. Phonological awareness is essential in order to achieve understanding of the alphabetic principle that letters map onto phonemes, thus phonological awareness is necessary in order to apply letter-sound knowledge. Proficient readers learn to apply grapheme-phoneme correspondence rules and progress from there to an automatic decoding level in which decoding takes little cognitive capacity. Failure to develop alphabetic insight leaves beginning readers unable to apply grapheme-phoneme correspondence rules and unable to advance beyond a logographic phase of reading. Research has demonstrated that phonological awareness can be improved through training and that such training leads to improvements in reading.

While the research with adult beginning readers has not been nearly as extensive, either

in quantity or in breadth, there is growing evidence that phonological awareness plays a similar role in adult reading acquisition. More research with adult beginning readers needs to be done in order to further understand the nature and role of phonological awareness in adult literacy and to develop appropriate teaching strategies. At present the total number of studies with adults is small and areas which have been investigated with children have not been examined with adults. For example, a literature search found only one article, a case study (Temple, 1988), which considered an adult's alphabet knowledge, yet knowledge of letter sounds and phonological awareness are considered corequisites for recognition of the alphabetic principle (Share, 1995). As well as confirming what has been verified with children, areas which have not been resolved, such as the role of rhyme and onset-rime in learning to read, should be further explored as there are implications for instruction.

A second area which warrants study is that of adult beginning readers' reading strategies as they interact with extended, connected text. To date, all exploration which has looked at both phonological awareness and adult reading strategies has done so only with words in isolation. Research linking phonological awareness and adult reading strategies in a more ecologically valid context would help to ascertain if the reading phases of children pertain to adults and would assist in identifying appropriate teaching/learning goals at various points in the reading acquisition process.

The following chapter outlines the study undertaken in order to contribute to addressing

these issues and to developing assessments for adult beginning readers. The study was conducted with the expectation of finding a correlation between levels of phonological awareness and both reading levels and reading strategies.

Note

1. The duration of the affect of this training is particularly noteworthy in light of recent reports on Reading Recovery, an intensive remedial programme for children. This programme, originating in New Zealand, has been widely instituted in the United States and is also used in several school districts in Canada. Despite its growing popularity as an answer to children's reading difficulties, a recent analysis of results (Hiebert, 1994) reported that

data from the three primary RR sites and from the longitudinal study (DeFord et al., 1990) produce an unconvincing scenario of the effects of RR on an age cohort. Even when the primary criterion is a task that is common in the RR tutoring--oral reading of text--levels of maintenance at Grade 4 are low (p. 23).

Another study conducted in Australia concurs:

At medium term evaluation (30 weeks) there were no longer any differences between the RR and control children on seven out of eight measures (Center, et al., 1995, p. 241).

CHAPTER TWO

METHODOLOGY

Because the present study makes use of assessments from two schools of thought--tests on phonological awareness from the school which sees a central role for decoding and oral reading analysis from the whole language school--these will be addressed separately. The chapter begins with a review of both types of tests, and then describes the tests and procedures designed for this study.

PHONOLOGICAL AWARENESS TESTS • DISCUSSION

As Yopp (1988) pointed out in her article, "The Validity and Reliability of Phonemic Awareness Tests" a wide variety of tasks have been used to assess phonological awareness. This is probably not surprising given the range of the debate about what constitutes phonological awareness, when it can be said to develop and what its relation is to normal and disabled reading development.

Both Lewkowicz (1980) and Yopp (1988) offered frameworks for categorizing phonological awareness tasks. Although Lewkowicz' work was based on reviewing research done to that date, and Yopp's was based on her own extensive study using ten

different phonological awareness measures with kindergarten children, there is a high degree of agreement between the two. Lewkowicz discussed the tests primarily in terms of their usefulness for instruction, whereas Yopp was concerned primarily with which test were the most reliable and predictive, so a direct parallel between the two is not possible; however, some comparisons can be made. Although not identical, their lists of tests were similar. They both included:

- i) word-to word-matching, e.g., "Does *fish* start with the same sound as *feather*?" (Lewkowicz, 1980, p. 687);
- ii) recognition of rhyme, e.g., "Does *fish* rhyme with *dish*?" (p. 687);
- iii) Isolation of beginning, medial, or final phoneme, e.g., "What is the first sound of *fish*?" (p. 687);
- iv) phoneme segmentation, e.g., "What are the (three) sounds in *fish*?" (p. 688);
- v) phoneme counting, e.g., "How many sounds do you hear in the word *fish*?" (p. 688);
- vi) phoneme blending, e.g., "What word is this--/f/ /i/ /sh/?" (p. 688);
- vii) phoneme deletion, e.g., "Say *fish*. Now say it without the /f/" (p. 688).

Lewkowicz' list did not include auditory discrimination or phoneme reversal, which was dropped from Yopp's; Yopp's list did not include sound to word matching or specifying which phoneme has been deleted. Both Lewkowicz and Yopp considered rhyme as an

easy phonological task and phoneme deletion as more difficult than phoneme segmentation.

Ball (1993) constructed a "developmental continuum" table of phonological awareness which she divided into "Emerging", "Simple" and "Complex" (p. 131). She placed rhyme play in the "emerging" category, and then as the easiest task at the "simple" level, with phoneme blending and then segmentation being more difficult tasks within that category. The "Complex" category included tasks of phoneme manipulation, such as deletion, substitution and reversal.

The high congruence between Ball's schema and Yopp's findings are not surprising as Ball was basing her continuum on a review of research, including Yopp's. Despite this, they appear to have a somewhat divergent view of rhyme. Ball states that although "performance on measures of rhyming ability should not be generalized to indicate a child's level of phonemic awareness in relationship to reading acquisition (Yopp, 1988...), it can serve as a first step (or red flag) in the assessment process" (p. 133).

Yopp appears to have been more dismissive of the value of rhyme as an indicator of phonological awareness. She performed a factor analysis and found that auditory discrimination and rhyme had low loadings on both of the two factors that emerged. She suggested that rhyming tasks "may tap a different underlying ability than other tests of phonemic awareness" (p. 172). As well, unlike the other tasks, neither "the rhyme test

nor the auditory discrimination test demands that an operation be performed on the stimulus item by the subject" (p. 173). Consequently, she developed a definition only of phonemic awareness, rather than phonological awareness, from which rhyme and auditory discrimination were excluded.

Regarding Yopp's factor analysis, Prakash et al. (1993) stated that "such factor analysis results alone cannot support the idea [that rhyme taps different underlying abilities]. We also conducted an elaborate but similar study...and the factor analysis revealed a complex relationship with varying factor patterns at different grade levels" (p. 58). Bryant et al. (1990) pointed out that one reason why rhyme may appear not to correlate significantly with other measures of phoneme detection or with reading acquisition may be that the rhyming tests are too easy and therefore a ceiling effect occurs.

Adam's (1990) review and description of tests used to assess phonological awareness is convergent with those mentioned above. Rhyme would fall into her category of "oddy tasks" (p. 42), which she said are simpler than phoneme segmentation or blending tasks because they only require that the subject be able to compare and contrast similarities and differences in the sounds of syllables. As well, she, too, placed phoneme manipulation, including phoneme deletion, at a more difficult level than phoneme segmentation.

Tunmer and Rohl (1991) proposed that tests of phoneme deletion and reversal
may place such a great strain on working memory that the
task can be performed successfully only if respondents are

able to reduce the load on their memory by generating orthographic images of the words presented to them. Children and adults with even a moderate amount of reading ability probably respond to the phoneme-reversal task by generating an orthographic image of the word, mentally reordering the word's letters, and then reading the result in their mind's eye. Inability to generate orthographic images may explain why adult illiterates and beginning readers generally cannot perform the phoneme reversal task (p. 11).

As the above indicates, based on the research, and despite disagreements over the role of rhyme, a consensus is developing regarding the type of testing that is used to assess phonological awareness and the rank ordering of the tests in terms of difficulty. The agreement that is emerging regarding the type of test is not reflected in the specifics of each test. Tests are seldom repeated from one experiment to another, and even less frequently so without adaptations. Lindamood et al. (1992) pointed out regarding phoneme segmentation that although it has been "identified as a primary factor in reading, there is no agreement on how to measure this ability" (p. 244). As a result, no standardized measures of phonological awareness have developed as of yet. Instead, the standard practise is for each researcher or group of researchers to design tests they deem appropriate to the study being conducted.

MISCUE ANALYSIS - DISCUSSION

As mentioned in Chapter One, miscue analysis has figured in discussions about word

recognition and the use of context. Analyzing oral reading to understand how print is being processed by the reader was popularized by Kenneth Goodman and his colleagues (Wixson, 1979). Goodman coined the term 'miscue' to replace 'error' and thereby promote the idea that all departures from a text are not negative (Goodman, 1965). He and his colleagues also wanted to emphasize that departures from text can be seen as indications of which of the three language cue systems that they identified are being used or not used: graphophonic, syntactic, or semantic (Goodman and Goodman, 1977, p. 331). More recently Goodman has renamed these systems in light of Halliday's systemic-functional linguistics: graphophonic, lexico-grammatical, and semantic-pragmatic (Goodman, 1994, p. 1119). The content of each system remains consistent with the earlier descriptors.

The assumption behind miscue analysis is that

[b]ecause an oral response is generated while meaning is being constructed, it not only is a form of linguistic performance but also provides a powerful means of examining process and underlying competence (Goodman and Goodman, 1977, p. 318).

And further, "[w]hen expected and observed responses...do not match and a miscue results, the researcher has a window on the reading process" (p. 319).

A problem with this 'window' is that "errors, although their study may be beneficial in terms of what it can reveal about the reading process, are examples of reading strategies gone awry" (Henshaw, 1992, p. 12). In other words, what we see when readers make

mistakes may not be exactly what they are doing when they are reading correctly. For example, a reader may be decoding automatically, relying on visual-lexical recall, but when he or she encounters an unfamiliar word, may resort to using context or applying GPC rules. But for the very reason that miscues occur when "reading strategies go awry" (p. 12) they can be used to provide insight into the strategies that students have available and choose to use when attempting to decode problematic words.

Miscue analysis has been used extensively by reading researchers, including those relatively few studying adult poor readers (Raisner, 1978; Boraks, Schumacher and Lavery, 1982; Malicky and Norman, 1982; Fagan, 1987; Mudd, 1987; Norman, Malicky and Fagan, 1988). As mentioned in Chapter One, a literature search yielded only one study which assessed subjects on phonological awareness and analyzed miscues in oral reading and this was done with children (Stuart-Hamilton, 1984). Stuart-Hamilton compared twenty pairs of students who were matched for reading and chronological age. Half the students were lacking in phonological awareness and half were not. The designation of having or lacking phonological awareness was made only on the basis of tests of rhyme and alliteration. The miscue analysis analyzed the substitution errors on the basis of their graphemic similarity and contextual acceptability. Despite the reading level match, Stuart-Hamilton found differences in strategies between those with and those without phonological awareness.

Within the miscue analysis research with children and adults there is considerable

variation of methodology. Key variations are those concerned with 1) reading material, 2) criteria and categorization of miscues and 3) the role of the researcher during the subject's reading. As these issues pertain to the oral reading analysis used in this study, they are taken up here.

Issues Regarding Miscue Methodology

Reading Material

Regarding material, Goodman and Goodman (1977) said that it must be "complete with a beginning, middle, and end. The text needs to be long and difficult enough to produce a sufficient number of miscues" (p. 320). The reason for the text to be complete is that this allows the reader the best opportunity to use meaning to both decode and comprehend. There must be enough miscues to "reveal the student's strategies for dealing with unknown words and accessing and monitoring meaning" (Klein, p.16). Klein qualified this by adding "[h]owever, the passage should not be so difficult for the student that she cannot recognise or work out enough words to make sense of the passage: if the struggle seems too great, try an easier passage!" (p. 17). Other researchers (e.g., Fagan, 1987; Norman and Malicky, 1987; Goldsmith-Phillips, 1989) have attempted to eliminate the subjectivity in deciding if a text is too difficult by establishing criteria regarding the number of errors that can be made before an article is considered so difficult that the subject can not use his or her usual strategies.

Another question regarding the type of material is that of whether to use expository or narrative text. Norman, Malicky and Fagan chose a test with expository texts because they felt that it was more appropriate for adult readers than other tests with stories (1988, p. 17). However, there are concerns about using expository text.

Darville (1989) pointed out that

learners often hesitate before the written word. Their hesitation involves more than a simple lack of skill. It is particularly likely to appear when they encounter an unfamiliar form of literacy, and the skills that they do have seem "out of place" (p.32).

And further:

[t]he practices used to produce and to read organizational accounts [expository text, reports, etc.] disorganize the narrative. They create a barrier for readers who depend upon narrative practices of reading, and thus make many readers "illiterate" (p. 33).

Fagan's (1987) findings from his study of low adult readers suggested that they do not use text genre to predict.

[T]he overall conclusion is that low reading achievers are not attuned to text characteristics relating to genre and tend to process all texts in a similar manner (p. 97).

When speaking of the limitations of miscue analysis, Wixson (1979) said that an unfounded assumption is made that all miscues are products of ineffective reading strategies, rather than admitting the possibility that the readers may not share a common language standard with the author (p. 172).

Fagan's research and Darville and Wixson's insights emphasize the impact which selection of material may have on the number and type of miscues. It is important, then, to select reading passages which provide as close a match as possible with the reader's life experiences and experience and knowledge of text and language.

Another issue lies in the question of the naturalness of the language. The whole language school of thought stresses the necessity to use natural language and the difficulties that phonetically controlled or 'primerese' language places on learning to read (Goodman, 1986; 1994a). This has not been wholly substantiated by research and, indeed, some research has indicated that "[w]hen the grapheme-phoneme regularity of initial reading materials in English is increased, either by vocabulary control or altered orthography, acquisition appears to be facilitated" (Jorm and Share, 1983, p. 137). Nonetheless, it seems a reasonable possibility that primerese texts may be read differently than text with more familiar language patterns, and there is some research support for this (Ammon et al., 1990).

Categories of Miscues

Although there is considerable variety in the number and naming of categories used to analyze miscues, the research literature does not appear to express concern for the quality of the categories. Rather, concern has been expressed for the length of time required and the difficulty posed for teachers by the procedure as it was first presented for teachers by Goodman and Burke in 1972 (Woodley, 1988). In 1987 Goodman, Watson and Burke

responded to these criticisms by developing an alternate, simpler process, and manuals for adult literacy practitioners have developed other versions (e.g. Cameron and Rabinowitz, 1988; Robson et. al., 1990; Klein, 1992).

Likewise, researchers have developed the versions most useful for the investigation which they are conducting in their current study. For example, in their 1982 study, Norman and Malicky used three categories: graphophonic similarity, grammatical acceptability and semantic acceptability (p. 733). In their 1988 study with Fagan, they used 5 categories: graphic similarity, grammatical acceptability, semantic acceptability, meaning change and corrections (p. 17). In his 1987 study, Fagan organized miscues into three clusters: a "code dominant cluster", a "meaning dominant cluster" and a "control cluster", the latter including corrected miscues, hesitations and repetitions (p. 93).

In general, miscue analyses, whether conducted by practitioners or researchers, has been interested in "how effectively the reader utilizes reading strategies and the cuing systems available" and "how effectively the reader applies knowledge of language while reading the text" (Woodley, 1988, p. 10). The categories for analyzing miscues have been accordingly adapted to the administrator's perception of the reading process.

Role of the Researcher

As mentioned above, the role of the researcher during the reading is handled in varying

ways. This is an important issue for the validity of miscue analysis, as Wixson (1979) pointed out when discussing research in this area:

Average readers in grade four who received immediate teacher feedback following each unexpected response produced a significantly greater percentage of graphophonically similar miscues than those who read without interruption. Further, readers who were interrupted produced a greater number of responses which changed the meaning of the text than those who were not (p. 169).

Goodman and Goodman (1977) insisted that

readers must receive no help, probe, or intrusion from the researcher. At most, if readers hesitate for more than thirty seconds, they are urged to guess, and only if hesitation continues are they told to keep reading even if it means skipping a word or phrase (p. 320).

Similarly, in research by Goodman and Gollasch (1980), they reported the following response of the researcher to a student who hesitated for a prolonged time:

If you really can't guess anything, you can leave it out and go on, but try to guess first and then if you can't, then you can go on if you want to (p. 13).

While this is presented as non-interference, it seems clear that there is a bias towards prompting a guessing strategy, rather than, for example, a 'sounding out' strategy. However, despite the problems inherent in interfering, it can be too frustrating for students if no assistance is given. Stuart-Hamilton (1984) dealt with this conundrum by supplying the word and instructing the subject to carry on reading if they had paused for at least 10 seconds or stated that they did not know the word. Hosenfeld (1977) encouraged students simply to, "Do what you usually do" (p. 112). These are both methods for assisting students to continue which attempt to mitigate the impact of the

tester's intervention.

The perspective taken on these issues that has been incorporated into the oral reading analysis for this study is described below in the "Oral Reading/Functional Reading Task" section.

METHOD

Subjects

The participants in both the pilot testing and the study were drawn from students already enrolled in Douglas College's or King Edward Campus of Vancouver Community College's basic literacy classes and/or one-to-one tutoring. Both colleges are community colleges in the Greater Vancouver region. All subjects were volunteers.

Pilot testing was conducted in February, 1995 with 10 students: 9 from King Edward and 1 student from Douglas College. The experiment itself, conducted in March and April of 1995, initially involved 37 subjects; however, 4 students were excluded from the analysis of results. They were excluded for the following reasons: one student was not a fluent speaker of English, one student had read the reading passage on a previous occasion, one student's nervousness clearly impacted his oral reading strategies (this

impression was corroborated through a discussion with his instructor regarding his usual strategies); and on one occasion the instructions for one test was administered incorrectly and there was a concern that the student's responses were biased accordingly.

All students included in the analysis of results had reading levels ranging from below grade one to approximately grade 6. 28 students had English as their first language, including two students who spoke a Jamaican dialect. 5 students had another first language: 1 Cree, 1 German and 3 French. All were fluent English speakers, and, with one exception, all had had reading instruction only in English. The one exception was a French Canadian who had had literacy instruction in French as a child, but who had not learned to read or write in that language. Thirty students were from Douglas College; three students were from King Edward Cam -els.

Interview

It was explained to each participant that the purpose of the testing was to help the researcher develop an understanding of what makes learning to read easier for some people and harder for others. The subjects were individually interviewed before the testing commenced, so that a brief form about their educational experiences could be completed by the researcher. (See Appendix A.) One question asked students what they felt they were able to read. The purpose of this was to aid in selecting the appropriate reading passage with which they should begin.

The form also included a three point scale for instructors to indicate the rate of progress they felt the student was making. This was added as a result of the pilot testing through discussions with the instructors, and arose from an interest in the possibility of a correlation between not only reading level, but also progress in reading acquisition. Teachers could circle "none - slow," "fair," or "good." The rating was done after the testing.

TESTS

General Description of Testing

The testing was conducted on an individual basis. The testing package consisted of the following five tests:

- A. letter name and sound knowledge
- B. rhyming skill
 - syllable, onset/rime, and phoneme blending
 - syllable and phoneme segmentation
- C. functional reading task and/ or oral reading passage

The test of letter name and sound knowledge was modified slightly from one that has been used in literacy assessments at Douglas College over the past twelve years. The oral reading passages were chosen from material that has been used in the Douglas College literacy classrooms. The oral reading analysis coding system was developed for the

present test and combines approaches from whole language miscue analysis and findings from research on phonological awareness and reading acquisition. The functional reading task was similar to assessments which the researcher has used for the past three years with students coming into the Douglas College programme. A flyer from a pizza restaurant was used for this task. The three tests of phonological awareness were developed during the summer of 1994 over a period of three months, during which time the tests were altered as initial use with four students suggested needed modifications.

As a result of the pilot testing, changes were made to the recording forms to include notation of the number of audible tries students required to correctly repeat each target word. As well, the phonological awareness tests were shortened by eliminating redundant items and the test of phoneme deletion was dropped. Deletion was dropped because the pilot indicated that all students had extreme difficulty with this task and thus it was not adding information about individual students to the assessments. The categories for the oral reading analysis were also altered to more clearly delineate the type of reading strategies that students employed. The categories and coding system were further refined as part of analyzing the data collected during the testing.

All participants were given the letter name and sound knowledge test first; some of the participants were then given the phonological awareness tests, followed by the flyer/reading passages, and others were given the phonological awareness tests after the flyer/reading passages.¹ The decision as to whether participants should be given the

functional reading task (questions based on the pizza advertising flyer) or the reading passages was based on their performance on the letter name and sound test and student provided information from the interview. As neither of these are sensitive measures of reading level, some participants did the functional reading task and then, if they were able to read some of the words on the flyer, proceeded to the reading passages.

Whenever possible the testing was done at one session; however, on seven occasions it was spread over two sessions. The phonological awareness testing was always completed in one session.

Letter Name and Sound Knowledge Test

Background

Letter name and sound knowledge tests and/or training often accompany tests of phonological awareness in research involving children (for example: Hohn and Ehri, 1983; Vellutino and Scanlon, 1987; Byrne and Fielding-Barnsley, 1989, 1991; Tangel and Blachman, 1992; Torgesen, Morgan and Davis, 1992). This has not been the case in research with adults, despite the fact that letter name and sound knowledge tests are commonly used when literacy teachers assess adult students. In the limited number of studies which have been conducted on adult beginning readers' phonological awareness, only one reported results from testing letter name and sound knowledge and this was a case study of one individual (Temple, 1988). It is possible that adults have not been

tested on letter name and sound knowledge because in most studies the subjects are beginning readers rather than non-readers (Ferguson 1981; Hamilton and Barton, 1983; Barton 1985; Read and Ruyter, 1985; Minus, 1992) and alphabet knowledge was assumed. An exception to this is work by Morais and colleagues, whose Portuguese studies (1979, 1987a, 1987b) involved complete non-readers as well as former non-readers. These studies did not use testing on letter name and sound knowledge, but in their 1979 study the researchers briefly mentioned that four of the subjects "had been taught by their children to identify letters" (Morais et al., 1979, p. 326).

Design

Letter name and sound knowledge is included in this study for four reasons. The first is that, as discussed in Chapter One, there is evidence to suggest that this knowledge is an important companion to phonological awareness in the acquisition of the alphabetic principle.

The second reason was that the names of the letters of the alphabet were highly likely to be known by all participants. It was hoped that beginning the testing with something familiar would help students to feel more relaxed.

The third reason was that by enlarging the scope of the test to include the request to provide a word which begins with the letter sound it was thought that it would be possible to screen students who should first, and possibly only, do the functional reading

task rather than begin with the reading passages. If a student had difficulty providing the letter sound or supplying words that begin with that sound, it was going to be taken as an indication that they should begin with the functional reading task.

The final reason was that asking subjects to provide a word that begins with each letter sound could yield information regarding his or her decoding strategies which could complement information gathered through the other tests. For example, if a student supplied the word *know* for the letter sound of 'k', this would suggest that a whole word approach was being used to learn words, as a letter sound approach would not yield a word beginning with 'k' as a silent letter. If a student could supply a word, but not the isolated sound, this would suggest, again, a whole word memorization strategy for decoding, as well as segmenting difficulty. While in and of themselves, these responses would not be sufficient data from which to draw conclusions, it was thought that they could support data from the other tests.

The letters 'q' and 'x' were excluded from the test. 'Q' was excluded because it does not normally appear in English without a 'u', and therefore it is not possible to give the sound of an isolated 'q'. 'X' was excluded because there are very few words in English which begin with 'x'. In those which do, the sound is either /z/, as in 'xylophone', or the name of the letter, as in 'X-ray', rather than /ks/, the common sound of 'x'. The pilot testing made evident that a demonstration of the task was necessary. The letter 'm' was arbitrarily chosen, and hence the test itself consists of 23 letters.

Procedures

Each student was given a deck of letter cards, with one letter printed in both upper and lowercase on each card. Both cases were used in order to maximize the student's chances of recognizing the letter. The cards were organized in random order.² Each student was asked to turn over the card and at his/her own speed, give the name of the letter, the sound the letter makes, and a word beginning with that sound. Both the most common and less common sounds of the letters were accepted as correct. Any word given which began with a sound of the letter was accepted as correct. For example, if the student gave the sound /j/ for the letter 'g' and then the word 'just', both responses would be considered correct. Also, if the student gave the sound /j/ and then the word 'go', both responses would be considered correct. If the student responded with a word which had the target sound in it, but not at the beginning, the response was recorded and he or she was prompted to give a word with the sound at the beginning ("You're right that that word has the sound of __ in it. Can you give me a word which begins with that sound?"). A consonant sound followed by the schwa sound was considered as a correct response, due to the difficulty (in some cases the impossibility) of isolating individual phonemes.

The students' incorrect responses were recorded (rather than simply marked as incorrect), as was their choice of vowel sounds and consonant sounds in those cases where there are more than one common sound, in order to assist in interpreting their performances.

Rhyming Skill Test

Background

The difficulties that some low literate and illiterate students have with rhyming tasks is acknowledged in manuals written for professional and volunteer literacy teachers (e.g., Rosenthal, 1987; Cameron and Rabinowitz, 1988). As outlined in Chapter One, debate continues around the question of whether or not rhyme should be considered a part of phonological awareness, a necessary precursor to phonological awareness, or as a skill which has different underlying cognitive demands than phonemic awareness tasks (Yopp, 1988; Bradley and Bryant, 1991; Lundberg, et al., 1991; Mann, 1991b; Morais, 1991a; Treiman, 1991; Tunmer and Rohl, 1991). Rhyming was included here because, whatever the relation between rhyme and phonological awareness, it was thought that problems with rhyming could reasonably be assumed to contribute to the difficulties students encounter when they attempt to learn decoding strategies dependent on analogies in the sounds and spellings of words (Bryant et al, 1990). Thus, assessing students' abilities to recognize and produce rhyme should assist in judging the likelihood of success they will have with teaching/learning strategies based on word analogies, such as working with "word families" (Treiman and Zukowski, 1991). It would indicate when training in rhyme is necessary before proceeding with this type of instruction.

Design

Ball (1993) outlined three types of tests which can be used to assess rhyming skill. The

subject may be asked to provide a rhyme for a given word, categorize words by rhyme (e.g., select the one word out of a group of four which does not rhyme with the others), or judge whether or not words rhyme (e.g. "Which word rhymes with belt: best or felt?") (p.133). In order to remove orthographic clues, it is essential that either pictures are used or that the test is oral. Lewkowicz (1980) recommended the use of pictures with no spoken words in rhyme recognition tasks and Bradley and Bryant used pictures in their study reported in 1983 and again in their later study conducted with MacLean and Crossland (Bryant et al., 1990).

Despite the precedence in the research literature, pictures were not used in this study for two reasons. The first was a concern that adults might feel the tasks were too child-like if pictures were used. (Some adult literacy students at Douglas College had expressed their dislike of classroom work which used pictures.) The second is that it is possible to label pictures differently, and thus the student may appear to make an error when in actuality he or she does understand rhyme. This could occur, for example, if a student saw a picture of a house and interpreted it as "home", and so categorized it as not rhyming with 'mouse'. Rhyme categorization without pictures is a more difficult task; it creates a load on memory because the student would be given a minimum of three words orally and asked to identify which ones rhymed. To avoid both pictures and an additional memory load, the rhyming test used in this study did not include categorization and asked subjects only to judge rhyme and provide a rhyme.

Another issue in designing a rhyming test is the level of difficulty to build into it. Bryant, MacLean, Bradley and Crossland (1990) used two types of rhyming tasks: a rhyme judgement test and a more complex test involving joint rhyme/alliteration choice. In the latter test they "showed children three pictures (e.g. coat, coach and boat) and asked them which one began with the same sound as, for example, *code* and ended with the same sound as *rote*" (1990, p. 431). This task involved deletion of the rhyming portion of the word (the 'rime'), deletion of initial phoneme, repeated substitution of phonemes, and word to word matching for similarities or differences. It is, therefore, much more difficult than rhyming as it is ordinarily understood. Other researchers have drawn a distinction between rhyme, which they see as an easier phonological awareness task, and phoneme deletion, which they see as more difficult (e.g., Stanovich et al., 1984; Yopp, 1988; Ball, 1993). Given the confounding of rhyme and deletion in Bryant et al.'s study, it is not surprising that there was significant correlation between their joint rhyme/alliteration task and their measures of phoneme deletion. Because of the possible value of rhyme as a "first step (red flag) in the assessment process" (Ball, 1993, p. 133) and, as stated above, as an indicator of what decoding strategies it is appropriate to teach, the rhyming test in this study is kept at the simple level and does not include phoneme deletion.

Ball suggested that

a developmental rhyme judgment scale that lends itself to an instructional sequence might include a sampling of foils with a) no phonemes in common, b) one phoneme in common in varying positions, and c) two phonemes in

common in varying positions (1993, p. 134).

Although it is valuable to construct a test that can easily give direction for instruction, it was decided to include only foils which had phonemes in common with the initial word in the actual test. Foils with no phonemes in common with the initial word are included in the training items. This was done to allow the testing procedure to be discontinued before the actual test began, if it were evident that the lack of rhyme concept was so complete that errors were made on words with no phonemes in common, or if these were the only ones which were responded to correctly. As well, excluding this type of foil word from the test allowed for the inclusion of words that rhyme but are spelled differently (e.g. kite, light) without the test becoming awkwardly long. Words which shared rimes but not spellings were included to detect orthographic interference amongst subjects who may have known how to spell the words.

The test was designed so that the words presented for the rhyme judgement portion of the test left common words available for the student to use in the rhyme provision portion. For example, with the stimulus 'steak,' the student could provide the word 'lake', as this was not used in the judgement task words.

In describing the design of her rhyme test, Yopp said that "[e]very attempt was made to use the words listed as most frequently occurring" (p. 165) in the Thorndike and Lorge 1963 list of word frequencies. In the present study it was not considered necessary to include only words with a high frequency; however, only words which were considered

likely to be in the students' spoken vocabularies were selected.

Procedures

At the beginning of the rhyme test, students were asked if they knew what it meant to say that two words rhyme. If the student said, "yes", then he or she was asked to give an example (a set of words that rhymed). If the student said "no," the researcher clarified that it meant that the beginning sounds are different, but the two words sound the same at the end. Examples were given: 'boy' and 'toy' rhyme, but 'boy' and 'bat' do not. Other examples were given if necessary until the student indicated that he or she understood. Then the following training items were given and after each pair the student was asked whether or not they rhymed:

meat, food

hog, dog

day, door

cable, Mable

The student also was asked if they could think of another word that rhymed with 'cable'. Any errors were corrected and it was again explained that rhyming words do not sound the same at the beginning, but sound the same at the end.

The test was explained in the following manner:

I'm going to say a word and then ask you if four other words rhyme with it. I'll give you the words one at a time so you can answer as we go along. I'd like you to repeat each word after I say it so that we can both be sure that I

have said the word clearly and you have heard it clearly.

Three training examples were then given:

hen *student repeats 'hen'*

pen *student repeats 'pen'*

Does 'pen' rhyme with 'hen'? And so on for the words 'back', 'had' and 'den'.

Can you give me another word that rhymes with 'hen'?

The next two training examples were administered in the same manner:

time - lake, dime, tame, lime

cob - cab, rob, slob, hat

Correct responses were scored as '1'. The total possible score was 15 and a minimum score of nine (i.e., above a chance level) was considered as necessary to proceed with the actual test; if a student scored below nine, the test was not administered. In this case, as overall the training items were easier than the test items, the student was given a score of zero on the test. This is consistent with the scoring method used in Stuart-Hamilton's (1984) similar study with children.

During the training examples errors were corrected, but they were not corrected during the test itself.

Throughout both the training and the test, care was taken that words were pronounced

2

PM-1 3 1/2" x 4" PHOTOGRAPHIC MICROCOPY TARGET
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PRECISIONSM RESOLUTION TARGETS

with similar stress so that no clues were given as to which words were foils or rhymes.

Bradley and Bryant (1978) reported that the

experimenter also always hid her mouth from the child's view with a card, so that the shape of her mouth would not provide any additional cue for any of the children (p.746).

This was not done in this test; the shape of the mouth while saying the words was considered a 'legitimate' clue that is usually present in spoken language.

On the test, correct responses were given one point; incorrect responses were scored as 0, with a total possible score of 20 on the rhyme judgement portion of the test, and 5 on the rhyme production. If the student provided a rhyme using a proper name or a pseudoword, it was scored as correct as these constitute evidence that the subject is able to use rhyme.

Blending and Segmenting Tests

Background

As discussed in Chapter One, correlations between blending and segmenting and reading acquisition have been established in studies over the past four decades (e.g., Chall and Roswell, 1963; Fox and Routh, 1976; Hohn and Ehri, 1983; Torgesen et al., 1992). Yopp (1988) found evidence for an underlying factor that is common to blending and segmenting. Torgesen, Morgan and Davis (1992), however, pointed out that despite

"previous assertions that both analysis (Liberman, Shankwiler, and Liberman 1989) and synthesis (Perfetti et al., 1987; Torgesen and Morgan, 1990) tasks require a correct conceptual understanding of the phonological structure of words", training and skill at blending does not transfer to segmenting (p. 368). Torgesen et al. also reported that in their experience "it was clear that synthesis skills are much easier to teach than analysis skills" (p. 369), which again suggested that these two phonological skills are distinct on some level. As both blending and segmenting have been identified as contributing to variance in reading acquisition, and may each require explicit instruction, a separate assessment of both blending and segmenting skills was included in the tests.

Blending Test Design

While the validity of onset and rime as a linguistic level has not yet been firmly established (Tunmer and Rohl, 1991; Carlisle, 1991), the blending test included onset-rime items with the rationale that doing so could provide some insight into whether or not it represents a more accessible linguistic level than the phoneme, and that inclusion would not adversely affect the value of the test or its interpretation. The first three items on the test were two-syllable words segmented into syllables, the next six items were one-syllable words segmented into onset and rime. The next three items were words with only two phonemes, followed by seven items that had from three to seven phonemes.

Blending Test Procedures

The test was administered by explaining to the student that the tester would stretch out

some words so that each sound would be said separately and that after each stretched out word, they were to say what the word would be when spoken normally. The following words were used to demonstrate the task, first by pronouncing each sound separately and then by saying the word normally:

r-i-m, br-own, l-ea-f, f-l-a-sh

Following the demonstration, six training items were presented. If the student responded correctly to two training items, the test was administered. Failure to respond to two items correctly within six training items resulted in only the syllable and onset-rime portions of the blending test being administered. As in the rhyme test, the subject was given a score of zero on the phoneme blending portion of the test. The six training items were:

n-ew, j-udge, l-i-ve, h-i-ll, n-a-me, s-l-u-sh.

Tunmer and Rohl (1991) pointed out that "non-phonemic segments," i.e., the schwa sound following some consonant sounds (e.g. 'b'-> /buh/) "...can be a problem in the demonstration trials preceding the test items" (p. 10). Their concern was that if, for example, the examiner presented /buh/ as the first sound of 'bat', the subject must first separate the initial segment of /buh/, and thus the task is more difficult than it initially seems. For this reason, the demonstration and training items included "only syllables with sounds that can be pronounced in isolation" (Tunmer and Rohl, 1991, p.10), so that the criterion of a minimum of 2 correct out of 6 testing items could be more easily achieved.

The test itself, however, included items with sounds that cannot be pronounced in isolation. The logic behind this was that inclusion of such words more accurately reflects the types of blending tasks that students encounter when "sounding out" words to decode in non-test situations.

The administration of blending tests is relatively standardized in the research: the experimenter speaks the words with a one second pause between phonemes and the subject responds by saying the whole word they think the sounds make (e.g., Perfetti et al., 1987; Lencher et al., 1990). In the test items, care was taken to keep the schwa segment following stop consonants as minimal as possible.

During the training items, if the student responded incorrectly the word was repeated in segmented fashion for a second try and if the response were incorrect again, the correct word was supplied. Incorrect responses were not corrected during the test itself; however, the item was repeated as often as the student requested prior to his or her attempt to synthesize it, and was repeated again if the student independently recognized that he or she had not successfully blended it and attempted to self-correct. These repetitions were recorded.

Correct responses were given one point; incorrect responses were scored as 0, with a total possible score of 19.

Segmentation Test Design

As Ball stated,

[a] number of informal measures of phoneme segmentation have been reported in the literature. Typically, these measures require the child to a) represent the individual phonemes in words with disks, blocks, or taps with a stick...b) articulate the sounds of words, separately and in order, without the use of concrete manipulatives, or c) count the number of phonemes (1993, p.135).

In designing a test for measuring ability to segment phonemes, tapping or counting tests were eliminated on the basis that these may involve aspects of number tasks, as well as tasks related to reading. Bryant et al. (1990) reported that phoneme tapping was not specifically related to reading because in their study a phoneme tapping test predicted children's arithmetic scores. During the development stage of the present test, it became obvious that it was difficult to distinctly hear whether or not students were separating each sound, or saying two or more sounds together. For this reason, it was decided that manipulatives would be used as has been done frequently in phoneme segmentation tasks (e.g., the "Lindamood Auditory Conceptualization Test" 1979, and the "Test of Awareness of Language Segments," 1987). Students were presented with five pennies (one more than was necessary to represent the phonemes in any of the stimuli) and, after several demonstrations, asked to move one penny forward while saying each sound. When this method was tried with students during the development of the test, it was easier to determine into how many phonemes the students were segmenting the item and it also appeared to make the task clearer to the students. This is consistent with the experience recently reported by Sawyer in a similar segmentation test (Sawyer, 1991).

Because the participants in the present study had a range of reading levels extending approximately up to a grade six level, there was a concern for the influence of orthographic knowledge on the performance of the segmentation task. In conclusions drawn from their study on the phonological awareness of good and poor third and fourth grade readers, Lenchner et al. recommended that

it would be important to reduce the possibility that subjects were using some kind of spelling strategy in their performance, through the use of either pseudowords or words that do not follow predictable spelling patterns (1990, p.246).

Initial development of the present test suggested that even amongst students with very low literacy levels the segmentation task was more difficult when real words were used. Apparently this was because students thought the researcher would expect them to know how to spell the words. Thus, rather than segment the words, the students tended to orally spell them whenever they knew at least part of the spelling, with the result that there was considerable orthographic interference. Because of this concern, the test was designed with pseudowords.

In his critique of Morais et al.'s 1986 study with Portuguese illiterate adults, Koppmans (1987) pointed out that "[f]or people who cannot read or write, a non-word is likely to be a difficult concept to grasp..." (p. 110). To counter the difficulty of working with pseudowords, care was taken to explain the development of the test to students, with the expectation that understanding the reason behind the nonsense words would help in understanding the concept. Using the example of the word 'light', the tester explained

that some students had moved five pennies because they knew that it had five letters, but the idea of the test was to move pennies for the sounds, so only three pennies should have been moved. The tester then explained that nonsense words were being used so that the student could concentrate on the sounds, and not be confused by worrying about the spelling.

Tunmer and Rohl (1992) suggested that in tests of segmentation ability, the test stimuli "should be restricted to nondigraph pseudowords" (p. 13). This is because errors made when subjects rely on orthographic knowledge rather than phonemes to segment digraphs would lead to total scores which would underestimate their ability to segment, while use of real words without digraphs could result in "artificially high scores" (p. 13). As discussed above, pseudowords were used; however, it was thought that using digraphs would be helpful in determining if students preferred an orthographic strategy over an exclusively sound based strategy, and hence consonant and vowel digraphs were included in the test. Diphthongs were not included, in order to eliminate the ambiguity of sliding vowels which could be perceived as one or two phonemes.

Research on both children (Fox and Routh, 1976) and adults (Morais et al., 1987) has shown that the ability to recognize syllables can arise spontaneously, although it can be improved through reading instruction (Morais et al., 1987). Consequently, five two and three syllable pseudowords were included at the start of the test, so that the test began at a level of segmentation that can develop without reading instruction. This was done for

two reasons: 1) to provide more detailed information about the segmenting abilities of those students who were unable to segment at the phoneme level, and 2) to increase the chances of each student being successful with some part of the test and hence being more relaxed during the testing.

Segmentation Test Procedures

The test was administered by explaining to the student that the tester would ask him or her to stretch out the sounds in some nonsense words so that each sound could be heard separately. This was followed by the explanation regarding pseudowords. The test was divided into two parts: part one was the two and three syllable segmentation task, followed by part two, the phoneme segmentation task.

Demonstration and training preceded each part. The following pseudowords were used to demonstrate the syllable segmentation task, first by saying the pseudoword and then by segmenting it while moving the manipulatives:

neshpum, dobon, reckell, invernov.

The phoneme segmentation demonstration was done in a similar manner, using the pseudowords

nove, flam, oo, oosh.

The demonstration pseudowords were designed to cover the range of item types that students would encounter in the test itself. As with the blending test, stop consonants were excluded from the demonstration and training items.

The training items were introduced following each demonstration. If the student responded correctly to two training items, the test proceeded. Failure to respond to two items correctly within six training items resulted in the segmentation test being abandoned at that point. As with the rhyming and blending tests, the student was then given a score of 0 on the remaining portions of the test. The six training items for the syllable portion were:

untem, presol, sijnoth, rishgruv, lesmif, lazhowt.

The six training items for the phoneme portion were:

zun, som, rive, hesh, lof, maz.

As with the demonstration items, the training items were designed to be similar to the test items; however, the training items did not include three syllable pseudowords, so that it was easier for students to reach the criterion and enter the testing stage.

With both the training items and the test items, the pseudoword was pronounced and the student was requested to repeat it prior to segmenting. This was done to ensure that the student had heard the pseudoword correctly. The number of tester repetitions required in order for the student to be able to correctly pronounce it was recorded. After incorrect responses to the training items, the correct response was demonstrated; incorrect responses to the test items were not corrected.

Correct responses were given a score of one; incorrect responses were scored 0, with a

total possible score of 5 on the syllable portion of the test, and 16 on the phoneme portion.

ORAL READING/FUNCTIONAL READING TASK

Background

In their study of adult literacy students' reading processes, Norman et al. concluded that "[w]hile there is some link between reading level and model of processing, it is clear that readers differ within as well as across reading levels. Hence, it is important to determine both level of reading as well as how adults read when planning instruction programs" (1988, p.24). The present study undertook to analyze students' oral reading to evaluate *how* adults decode in the context of coherent passages and the relation, if any, of their reading strategies to their level of phonological awareness. The intent was to develop an assessment method that adequately described students reading processes and that provided some insights into why those particular reading strategies had developed.

In the present study, miscue analysis was adapted to reflect current research on phases of reading acquisition. This was done because the goal was not to "classify the reader in terms of the degree to which each cue system is operational" (Page, 1973, p. 66), as is usually the case with miscue analysis, but rather to understand reading strategies in terms of the student's phase of development. As this necessitated substantial changes to miscue

analysis categories as usually applied by whole language researchers, it was decided to refer to the method used here as 'oral reading analysis.'

Selection of Reading Material

All four texts in the present study are complete stories, so that each text would provide students with the opportunity to use the entire story context to aid decoding.

Two other decisions regarding the selection of texts were made. The first was to use narrative passages for all subjects who were able to read at that level (i.e., for those who read above the pizza flyer level). The second was to choose stories that dealt with experiences and ideas familiar to the students, either through direct or indirect experience. Thus the readings include adult topics related to work and family relationships.

A third decision was to use language which is as "natural" as possible. The chosen texts at all four levels were not phonetically controlled. This consistency in the type of text was to ensure that within the group of subjects who were able to read at least one story, reading process differences would not be due to differences in the strategies used to respond to primerese versus more natural text.

Both the Fog (Gunning, 1952) and the Fry (Fry, 1969) readability assessments were done on the four selected stories. The results were as follows:

	Fog	Fry
Hello, World	1.5	1
A Long Road	2.3	2
A Good Man	2.8	3
All the Years of Her Life	4.4	4

All stories were retyped to eliminate pictures and to standardize type size. Times Roman font, 14 point was used with double spacing. This font was chosen as one that is easy to read; the size and spacing were those which a focus group of literacy students had earlier identified as the ones which they found most readable. The test was not justified on the right side, so that there were no abnormal spaces between words.

In light of the hypothesis that those students who were not able to read at the level of the first passage were most likely to lack phonological awareness, it was considered important to understand the reading strategies they employed. A pizza restaurant flyer was chosen because similar flyers are delivered door-to-door frequently and most, if not all students would have taken part in ordering pizza.

Categories and Analysis System

Selection of Words to Analyze

While recognizing the somewhat arbitrary nature of the number, this study applied the

guidelines suggested by Wixson (1979) of a minimum of twenty-five miscues for the majority of students, i.e., those students who did not reach a ceiling level on the reading passages.

A significant difference between the oral reading analysis used here and typical miscue analysis is that in this study, wherever possible, all words upon which the student paused to apply a decoding strategy were included along with the twenty-five miscues. If the strategy were not apparent, after the oral reading was completed subjects were asked if they could recall what they were thinking at that point in the text. It was thought that including all words which were not decoded automatically would provide for a more comprehensive analysis of the reading strategies employed by students, as well as allowing for the distinction between more or less successful strategies.

Categories for Analysis

In the present study, the analysis and scoring system was designed to serve two purposes. The first was to assess the reading strategies of students so that they could be meaningfully interpreted in terms of current research on phonological awareness and reading acquisition. The second was to design the data recording in such a way that its interpretation would be straight forward. That is, the student's more and less preferred and more and less successful strategies would be apparent. These concerns led to using the following categories for miscues and for words which were decoded using non-automatic strategies:

- i) letter calling
- ii) visual phonetic
- iii) sounding out
- iv) visual lexical recall
- v) schema driven context
- vi) prior context
- vii) passage context
- viii) strategy not apparent
- ix) successful decoding
- x) error recognition
- xi) attempted correction strategy
- xii) successful correction
- xiii) miscue meaning retention

This system of categories represents two significant departures from traditional miscue analysis. The first is that the emphasis was directly on reading strategies. For example, miscues are usually scored according to whether or not they are semantically and syntactically congruent with the text both within the prior/present sentence and the passage as a whole. In the scoring for this study, miscues and non-automatically decoded words were only scored in the categories of context if there were reason to think that context was actually used. Thus, for example, if a student did not appear to be re-reading or reading ahead, and if in the post-reading discussion he or she identified having used

a strategy which did not depend on contextual cues, then the miscue was not scored in a context category. Hesitations were treated in the same manner. This approach is consistent with the research discussed in Chapter One (e.g., Stanovich, 1981; Nicholson, 1991; Nicholson, 1993) which refutes the idea that readers "liberate themselves from detailed attention to print" (Goodman and Goodman, 1977, p. 324) and which has shown that each word, including "virtually every content word in a text receives a direct fixation...Even a content word that is highly predictable from previous text is fixated well over 50% of the time..." (Stanovich, p.486). While it is possible that students did not recognize when they were using a particular strategy, a ready explanation of an alternate strategy which was consistent with the tester's observations was accepted and recorded. On occasions when the students reported a strategy that seemed to contradict their behaviour, the miscue was recorded under the "strategy not apparent" column.

Further changes regarding the issues of identifying strategies and the use of context are evident in the replacement of semantic and syntactic categories. This is taken up further below.

The second difference between miscue analysis and the oral reading analysis used in this study also stems from an attempt to reflect current empirical research on phonological awareness and reading acquisition. To apply this research it was necessary to depart from the psycholinguistic view of reading as a top down process and therefore from the

categories generally used in miscue analysis. In traditional miscue analysis, some type of a category of "graphophonic miscues" is used, and words are scored to assess the graphophonic similarity of the miscue to the text. Behind this is the assumption that greater similarity suggests greater reliance on a graphophonic strategy, and that little similarity indicates reliance on another, contextual, strategy. The emphasis on context has pre-empted attention to empirically based theoretical work on word recognition such as that done by Stanovich (1982, 1986), Tunmer and Rohl (1991), Thompson and Fletcher-Flinn (1993), Ehri (1992, 1994), Johnson and Pugh (1994), and Spear-Swerling and Sternberg (1994), and consequently does not differentiate amongst graphophonic strategies. That is, this category does not distinguish amongst visual phonetic cuing, which represents an early stage of alphabetic knowledge, and sounding out, which represents a more advanced stage, nor does it indicate when a visual lexical recall strategy was used or when students have spelled the word (letter called) in an effort to decode it. A partial exception to this is the miscue system devised by Klein (1992), which has separate categories for miscues that are read using primarily visual (whole word) strategies and those that are read using a phonic strategy. But the criterion for placing a miscue in one category or the other is not clear. For example, why was the miscue "acclimatation" for the word "acclimatization" scored as a partial use of visual cues and a high use of phonic cues (p. 22)? The categories in the present study represent an attempt to refine the analysis of miscues and to more precisely identify the reading strategy.

Description of Categories

i) Letter Calling

This refers to the attempt to decode an unfamiliar word by saying the names of the letters (e.g., "'S' 't' 'e' 'v' 'e'," repeated several times in attempts to decode 'Steve'.) Letter calling was included as a category because the researcher had observed students using this strategy in classroom literacy tasks. As well, Boraks and Schumacher (1981) reported that adult beginning readers make "heavy use of graphic cues at all stages of beginning reading" (p. 31), and specifically, in their study with Lavery (1982), they noted that in their observations of adult literacy students' oral readings, repeating the spellings of words was commonly attempted as a decoding strategy (p. 15).

ii) Visual Phonetic Cuing

Miscues and non-automatically decoded words were marked in this category if the match between the phonemes in the response word and the phonemes represented by the graphemes in the text word was less than 50% (e.g., student reading 'of' for 'out'). This category represents the beginning phase of grasping the alphabetic principle and applying graphophonic rules. The criterion of less than 50% has been chosen as a somewhat arbitrary point to distinguish between words which are unsuccessfully recalled through a visual lexical strategy. This is similar to a category which Snowling, Stackhouse and Rack (1986) used, which they called "lexical-sounding--error" (p. 317). This type of error "shares less than 50 percent of letters with target, is always a real word, [and is] thought

to reflect partial use of grapheme-phoneme skills (e.g., hatch/ham, sausage/salt)" (Alexander, et. al., 1991, p. 200).

iii) Sounding Out

Words were marked in this category if the student could be heard attempting to sound out the word (e.g., /j/ /w/ /s/ /t/ for 'just'), or if he or she reported after the reading that this had been done quietly to him or herself. Words that were decoded into pseudowords, as well as words that were sounded and then read as real words either accurately or inaccurately were included in this category.

iv) Visual Lexical Recall

As familiar words are automatically decoded using a visual lexical recall method, this category was only used when the student had a) unsuccessfully decoded using this strategy or b) paused to consciously recall, or c) had corrected an error by using this strategy. Discussion with the student after the reading was used to determine if b or c had occurred.

v, vi, vii) Context - Schema-driven, Prior, Passage

Context is a particularly important category when analyzing the miscues of adults who are struggling to learn to read because

"...less skilled readers rely on context to compensate for their poor decoding skills, whereas good readers do not need to do so, since they already have good decoding skills" (Nicholson, 1993, p. 102).

The usual miscue categories which indicate the level of semantic and syntactic appropriateness of unexpected responses were telescoped into "Context" following the pilot testing. During the pilot testing and the subsequent analysis of students' oral reading, it became clear that semantic congruence (or lack of it) was not a strategy, although it may denote a strategy; the actual reading strategy was the use of context, whether meaning based or grammar based. As the purpose of the analysis was to distinguish strategies, it was decided to amalgamate the semantic and syntactic categories.

"Schema-driven" context was added because the pilot testing made evident that students sometimes departed from the text because of their expectations based on their prior experience with language, rather than the language of the text (e.g., 'mom' for 'mother'; 'drink' for 'drank' because the former was consistent with her dialect). Goodman and Goodman explained this phenomena in the following manner:

A *schema-driven* miscue is one that results from the use of existing schemata to produce or comprehend language....[readers] may use their existing schema to predict and comprehend, but sometimes the organization of the knowledge--that is, the schema on which the predictions are made--is so strong that it overrides the text and miscues occur (1994, p. 117).

viii) Strategy Not Apparent

A miscue was marked in this category if the researcher could not determine what strategy had been used, or when there was a conflict between what the student said and the researcher observed. For example, if the student said he or she had not read ahead, but the researcher thought she had heard the student subvocalize the remainder of the

sentence, the miscue was marked as in this category.

ix) Successful Decoding

Words were marked in this category when they were correctly decoded but the student did so using a non-automatic strategy. The purpose of this category was to aid in identifying more and less successful strategies.

x) Error Recognition

This category helped to identify which departures from the text were recognized by the student and which were not. Those which were not recognized were coded under the "Miscue Meaning Retention" category.

xi) Attempted Correction Strategy

Hosenfeld's method of "mapping" (1977, p. 114) provides for a representation and coding of the strategies which are used for each repetition of text words or phrases. This is valuable, as strategies may vary from one attempt to another, and consequently the reader's ability to use strategies may be revealed through a series of attempts. It is also worthy of note that Boraks and Schumacher (1981) claimed that for adult beginning readers, "successive attempts are very important. That is, these aspects of reading behaviour can be related to subsequent progress or lack of progress" (p. 20). For these reasons, all repetitions which involved words being decoded differently were recorded and the strategy used in each subsequent attempt to find the correct word was noted in the

"Attempted Correction Strategy" category.

xii) Successful Correction

The purpose of this category was simply to record the correction attempts which resulted in successfully decoding the word. Checks in this category were added to those in the "Successful Decoding" category to aid in assessing successful and unsuccessful strategies.

xiii) Miscue Meaning Retention

Miscues which the student did not recognize as departures from the text were coded on the basis of whether or not the meaning of the passage was violated, altered but plausible, or retained. This provided an additional indication, along with the context categories, of the extent to which meaning may have been a factor in the student's non-correction and thereby the extent to which attention may have been paid to meaning in these cases. This category, unlike the context categories, dealt only with uncorrected miscues and was used, along with the percentage of miscues to the number of words read, to calculate the students' frustration levels. ('Frustration level' is described further below.)

In addition to the above categories, the total number of words which were reread without decoding changes were recorded and scored as a percentage of the total number of words read to the 25 miscue point in the passage. This was done to provide an indication of the extent to which each student used rereading to confirm text words and meaning.

Role of Reasearcher

Many literacy students at Douglas College have expressed the feeling that oral reading can be embarrassing and frustrating. Intervention is sometimes essential in order to maintain students' cooperation. Therefore it was considered necessary, despite the desirability of complete non-intervention, to offer assistance to students who were becoming frustrated so that they could/would continue. The assistance was modelled on Hosenfeld's and Stuart-Hamilton's approaches. The student was asked what they usually did when they came to a word they did not know, and encouraged to use that strategy. If they still could not or would not continue with the reading, the word was provided and recorded as "P" in the "Attempted Correction Strategy."

Procedures

Each student was asked to select the reading passage which he or she felt was at his or her reading level. This was done by having the student look at the first few lines of the passages in order to choose the one which felt most comfortable. If the text turned out to be too difficult, then the student was asked to read passages at lower levels. Whether or not the material was too difficult was determined using uncorrected errors to determine the student's frustration level. This approach is consistent with other miscue analysis research with adult beginning readers (Fagan, 1987; Norman and Malicky, 1987; Malicky and Norman, 1982). For passages two, three and four, the frustration level was set at ten percent of uncorrected miscues of which at least 25% caused a major meaning change (Fagan, 1987). If the student read below this level of error and meaning change, he or she

was asked to read a more difficult passage (with the exception of those students who were already reading the most difficult passage). For passage one, double the frustration level of uncorrected miscues, i.e. 20%, was used as the criterion so that as many subjects were given the opportunity to read connected text as possible. Only those students who could not read any words on the pizza flyer were not asked to read passage one.

Each student was asked to read the passages aloud without first reading silently with the exception of the first few lines which they had seen when selecting the article. Although some research has had subjects read the complete text silently first (Ammon et al., 1990), the usual procedure in miscue analysis excludes silent reading so that the subject's first attempts at decoding and making meaning from the text are evident (Goodman and Goodman, 1994).

Extended hesitations were recorded as reminders to go back to these words after the student completed reading the text. At that point the tester said, "You paused before this word. Can you remember what you were thinking then?" The question was purposefully nondirective to ensure that the answer reflected the student's perception of his or her strategy and not the tester's (Hosenfeld, 1977). In some cases the question did not elicit a response and then the tester provided a range of possibilities that the student might choose from or add to: "Were you pausing to read back or to read ahead? Were you silently sounding out the word or trying to remember it, or was there something else you were trying?" The responses were recorded and used as anecdotal help in interpreting the

reading strategies employed.

The text markings used were:

omission	/
substitution	house home
insertion	^
self correction	[]
repetition	⌒ or ⌒
hesitation	H
word provided by tester	P
sounding out	S.O.
letter calling	sp.
student uncertainty	?
skipped (after attempt)	SK.
sub-vocal reading	' - - - - '

When using the pizza flyer to explore the reading strategies of beginning level students, the approach taken was consistent with that advocated in the *Ontario Test of Functional Literacy* (Jones and Librande, 1985). Students were told, "This is a flyer advertising a fast food restaurant," and then asked questions regarding the type of food served, price of a menu item, delivery charges and location on the menu of the "family dinners". (See

Appendix E.) After each question they were asked how they knew that was the answer. The students' responses were reported on the record sheet and analyzed to evaluate the extent to which they reflected that contextual/logographic, visual phonetic, or alphabetic strategies were being used.

No portion of the letter name and sound knowledge test, the phonological awareness measures or the oral reading was timed. It was expected that students would differ in the amount of time they required. For example, if a student was acquainted with the term and concept of rhyme, the training portion would proceed quickly; if they were not, then it would take considerably longer. During the piloting, the testing took from approximately one and a half hours to two and a half hours for each student. When the phonological awareness tests were revised after the pilot testing the test was approximately one half hour shorter.

Notes

1. It was originally intended that the flyer and reading passages would be before the phonological awareness testing half the time, and afterwards half the time. Due to an oversight, however, this was not done. In twenty-one testing sessions the phonological awareness tests were done prior to the reading.
2. The same random order was used for all students with the exception of two occasions when previous students had left the cards out of order and it was not noticed prior to the next testing session. It was considered more appropriate to continue than to interrupt the student and reorganize the cards.

CHAPTER THREE

RESULTS AND DISCUSSION

The results of this study were largely consistent with the research to date on phonological awareness and reading acquisition. The expectation that levels of phonological awareness skill would be reflected in levels of connected text reading was not met, but two other aspects of the study confirm the important role of phonological awareness in the reading and learning to read process: 1) phonological awareness skills were reflected in decoding strategies with those readers who had low skills having a restricted range of strategies that excluded the use of GPC rules; 2) low phonological awareness skills were associated with those students who teachers rated as making "none-to-slow" progress in reading.

The following presentation provides an elaboration and explanation of the above points. In addition, findings regarding the possibly important role of rhyme that are consistent with some studies and in conflict with others will be examined. As an intent of the study was to give practical guidance to literacy instruction, an analysis of selected sub-groups and individuals within the study follows the more general discussion. The study was also intended to contribute to developing assessment tests which could be used by classroom

instructors, so the chapter concludes with a critique of the tests used. Implications for assessment, instruction and further research are discussed in Chapter Four.

Throughout the study, *t*-tests were used to test the strength of differences. On occasions when the size of the groups differed, homogeneity of variance was calculated using Levene's test for equality of variance, and the resulting significance of differences were reported. Correlations among test scores were also examined, with $p < .05$ used as the criterion for significance. All statistical analysis was performed using SPSS version 6.1.

CORRELATIONS AMONG PHONOLOGICAL AWARENESS AND LETTER NAME AND SOUND KNOWLEDGE MEASURES

Phoneme Blending and Segmentation

Because both phoneme blending and phoneme segmentation are at the most sophisticated linguistic level of intra-syllable perception, there should be a high correlation between these measures. This was the case [.71 ($p = .01$)], which attests to the validity of these measures. Phoneme blending also correlated highly with letter sound and onset-rime blending and modestly with rhyme judgement. (See Table 1) Phoneme segmentation correlated significantly with all tasks except rhyme production.

Syllable Blending and Segmentation

Only three of the seven phonological awareness measures used in the study had low or

non-significant correlations with most other measures: rhyme production, syllable blending and syllable segmentation. The reasons for this are most probably different in each case and so will be taken up separately.

During the testing it became apparent that there were problems with the syllable portion of the segmentation test. Students seemed to have much greater difficulty in repeating the two and three syllable pseudowords on this portion of the test than they did with the one syllable pseudowords on the phoneme portion. When students had difficulty repeating the item before segmenting it, it was very difficult for the test administrator to repeat the pseudowords with clear enunciation without also making the syllabification obvious. In addition to this problem, the test did not have enough variation in syllable length. Of the five items, only four had two syllables. There should have been at least one one-syllable item and two with three syllables. Thus, the failure of syllable segmentation to yield meaningful correlations is probably partially an outcome of the design of the test. An additional explanation for the lack of correlations lies in the ceiling effect of this task, which may exist because of the design of the test or which may accurately reflect that this linguistic level is relatively easy to recognize. For these reasons the syllable segmentation results are reported only in Table 1 and are not included in the discussion of the results.

The reason for the consistently low and frequently not significant correlations between syllable blending and other measures, including letter sound, is probably because of a ceiling effect on this task: only three students failed to score 100%. The task included

Table 1

Phonological Awareness and Letter Sound Knowledge Correlations (n = 33)

	Letter Sound	Rhyme Judge.	Rhyme Product.	Syllable Blend.	O-R Blend.	Phoneme Blend.	Syllable Segment.
Rhyme Judge.	.5076**						
Rhyme Product.	.4877**	.6633**					
Syllable Blend.	.1441	.3714*	.2065				
O-R Blend.	.7130**	.6008**	.3241	.3797*			
Phoneme Blend.	.6429**	.3497*	.1853	.3784*	.7774**		
Syllable Segment.	.1281	.4560**	.2959	.1213	.1788	.2574	
Phoneme Segment.	.5176**	.5647**	.2186	.3715*	.7576**	.7117**	.3801*

* p < .05

** p < .01

only three items, each of which was two syllables. Expanding the test to include three syllable items would make it possible to discover if blending at the syllable level remains an easy task for beginning adult readers, or if the original test were at fault. The syllable blending results, like those of syllable segmentation, are reported in Table 1 but are not included in other tables.

Letter Name and Sound Knowledge

The Letter Name and Sound Knowledge test appeared to serve one of the intended purposes, which was to provide students with a successful experience at the outset of the testing. All the subjects could recognize letters with perfect or close to perfect accuracy. Similarly, performance on the consonant and vowel word task was at ceiling levels: only one individual scored below 90%. (See Appendix H.) Because of the limited range of scores, the latter task did not serve the purpose of identifying those subjects who should not read the pizza flyer as had been thought possible at the outset of the study.

There was much greater variation on the sound task. The mean was 82.2% (s.d.= 15.3) with only two students achieving a score of 100% on this measure. With only one exception, all students who did not get 100% on the sound portion found the word task easier. It is evident that some subjects were able to provide a word beginning with a consonant sound when they were not able to give the consonant sound in isolation. This suggests that they were responding to the word task orthographically, rather than following the oral instruction to give a word that began with the sound of the letter. For

example, one student gave the word "Ruben" for the letter 'r', and then gave the sound first as /oo/ and then as /roo/. Other evidence of orthographic strategy use was spelling the word prior to saying it, and giving a word in which the letter was silent, e.g., 'knight' for the letter 'k'. Only students who had difficulty providing the letter sounds appeared to use these approaches. Thus, the combination of the sound and word tasks supplied evidence that some students had visually (logographically) learned words to which they still could not apply the alphabetic principle of letter sound correspondence.

Although letter name and sound knowledge has not been tested in studies with adult beginning readers, this study has demonstrated that it cannot be assumed that all adults have gained mastery of the basic sound-symbol correspondences of English. The finding that, for this group, there was a significant and high correlation between sound knowledge and key phonological measures such as onset-rime blending, phoneme blending and phoneme segmentation suggests that when students exhibit weak knowledge of letter sounds their levels of phonological awareness should be explored. Literacy practitioners do not assume that adult beginning readers know basic phonics, thus letter sound knowledge is regularly a part of entry assessments; however, practitioners do not relate it to phonological awareness or to a conception of qualitatively different developmental phases of reading acquisition. Consequently, the information gathered is used only to establish an entry level for phonics instruction and this is not accompanied or preceded by what may be crucial phonological awareness training.

Scores from the "Name" and "Word" sections of the Letter Name and Sound Knowledge test were not included in Table 1 because of an obvious ceiling effect. The correlation between letter sound and other measures is not surprising, as it is thought that knowledge of letter sounds may foster development of phonological awareness (Morais, 1991a; Bradley and Bryant, 1991).

One student had low phonological awareness scores ('0' on both phoneme blending and phoneme segmenting) although he had a relatively high score on the letter sound measure (87%). This individual presumably learned the letter sound correspondences by rote memory, without developing linguistic awareness at the phonemic level. Because he appeared to lack phonological awareness, it is not surprising that despite his fairly good knowledge of letter sounds he was unsuccessful with the sounding out strategy, as it requires an understanding of the alphabetic principle.

Rhyme Judgement and Production

The relation between rhyme tasks and other phonological awareness tasks is not clear cut in the research. As mentioned in Chapter Two, rhyming tests with adults have sometimes found correlations with other tasks and sometimes not. In this study, rhyme production was significantly correlated only with rhyme judgement and letter sound. The explanation which seems most feasible is that rhyme production makes cognitive demands that are different than the other phonological awareness tasks, because it is a production task

which requires lexical access. In a population which has phonological awareness difficulties, some of the subjects may also have a further, perhaps subtle problem with the retrieval of phonological codes from memory (Felton et al., 1990). If this is the case, then the difficulties they have with phonological awareness may be compounded on a production task and may not appear on recognition tasks or tasks where the stimuli were first presented orally. This explanation is consistent with the finding that the mean scores were lower on the rhyme production than the rhyme recognition task.

Morais et al. (1987) reported a ceiling effect on the their rhyme judgement test. This may explain why rhyme judgement did not correlate with other phonological awareness tasks in their study, but did in this study where there was no ceiling effect. Another possible source of the differences, related to the ceiling effect in the Morais et al. study, resides in the nature of the subjects. Morais et al.'s subjects included unschooled illiterates, ex-illiterates, and college students, whereas the population in this study consisted of illiterates and low level literates, all of whom had had years of schooling. Thus, the likelihood of the population in this study having reading disabilities with phonological origins are far greater than in the Morais et al. study. This would explain why the correlations for rhyme judgement were more similar to those found in the Read and Ruyter (1985) study which was also with low literate adults who had had some schooling. The present study, along with the Read and Ruyter study, suggests that at least some measures of rhyme can be expected to correlate with phonological awareness measures with populations who have educational backgrounds similar to the subjects in these studies. Further, it suggests that

although acquisition of rhyme usually occurs at an early age, deficits can persist into adulthood even after exposure to reading. The results are consistent with the view that adult illiterates who have had previous access to education are likely to be reading disabled (Fowler and Scarborough, 1993).

RELATION OF PHONOLOGICAL AWARENESS TO READING LEVEL

One of the objectives of this study was to examine the relation between phonological awareness and reading level, measured on extended, connected text. It was hypothesized that there would be a significant relation because phonological awareness is necessary to achieve alphabetic insight and learn to decode independently. To discover if the hypothesis was supported, the means and standard deviations for letter sound and the phonological awareness measures of rhyme judgement, onset-rime and phoneme blending and phoneme segmentation were calculated for the subjects, grouped by pizza flyer and reading passage level. (It was necessary to use this approach because it was not appropriate to attempt to establish correlations as reading passage is not a true linear variable.) The scores of one student were excluded from this analysis because his rate of uncorrected miscues exceeded the frustration level of 10% on both passage one and passage two, but the rate was higher on passage one. Because of this anomaly it was not possible to assign him to a reading passage group.

Because there were too few cases in most of the reading level groups, it was not possible to use an ANOVA to assess differences between groups. Instead, the data was examined to find trends in the means.

Table 2 shows that the pizza group mean was considerably below the passage four group mean on every variable, and the passage four group consistently had the highest score on all measures; however, there was no other indication of a progression of means from the lowest group to the highest. For example, the group at the level of the first reading passage had higher means than the next group on all key measures, and the pizza level mean on phoneme blending was higher than that of the passage level two subjects. Consequently, it cannot be concluded that there was a trend of scores with letter sound and phonological awareness measures consistently increasing as reading levels progressed.

As other studies have found a significant relation between reading level and phonological awareness skills with adult subjects (e.g. Byrne and Ledez, 1983; Felton et al., 1990; Minus 1992; Truch, 1994), and as failure to find such a relation appears to undermine the claim for a central role of phonological awareness in reading acquisition, it is important to explain the seeming conflict in results. The explanation lies in the manner in which reading level was assessed. In the studies which found a correlation between the phonological awareness and reading levels of adult subjects, reading level was determined using lists of pseudowords, whereas in this study environmental print or connected text was used. The former type of assessment tool forces dependency on GPC rules or

Table 2
Phonological Awareness and Reading Passage Level

	Letter Sound		Rhyme Judge.		O-R Blending		Phoneme Blend.		Phoneme Seg.	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Pizza Flyer (n = 4)	66.0	13.1	28.8	33.8	58.0	21.4	35.0	43.6	12.5	25.0
Passage 1 (n = 6)	86.2	5.0	76.7	11.7	88.8	13.6	55.0	32.7	44.7	43.0
Passage 2 (n = 3)	75.3	17.2	61.7	5.8	72.0	34.8	23.3	40.4	16.7	28.9
Passage 3 (n = 2)	82.5	6.4	77.5	10.6	91.5	12.0	65.0	7.1	19.0	26.9
Passage 4 (n = 17)	88.1	13.2	77.9	23.4	91.1	13.5	68.2	27.7	64.1	29.2

orthographic strategies which make use of word analogies. The assessment in this study allowed subjects to use strategies, such as background experience and context clues, to compensate for deficiencies in ability to use GPC rules or orthographic strategies. As well, this study allowed students to retrieve words which they had previously stored in lexical memory by whole word memorization, whereas with pseudowords, although word analogies can still be used (Treiman et al. 1990), whole words can not be retrieved. Consequently, while the results in this study are not the same as those in studies using pseudoword lists, they are not in contradiction with those findings.

PHONOLOGICAL AWARENESS AND READING STRATEGIES

As stated above, various reading strategies were employed that allowed subjects to read text despite low phonological awareness skills. In order to examine the relation between phonological awareness and reading strategies, the subjects were divided into three groups based on their scores on the measures of phoneme blending and phoneme segmentation. The two tasks were the ones which previous research has shown to correlate significantly with reading acquisition. The Lowest PA group consisted of those students who scored 25% or below on either of these measures; the Middle PA group was made up of all those who scored between 25% and 75% on one or both measures, and the Highest PA group consisted of all those who scored 75% or more on both measures. The strategies were then examined to determine the total number of times each strategy was used by

each group, the percentage of times it was used successfully (i.e., the word was decoded correctly), the number of subjects within each group who employed the strategy, and the mean number of times they used the strategy. The calculations were based on the non-automatic or conscious use of decoding strategies, whether a miscue was made or the strategy was used after hesitation but without an actual error being made. For example, if a student hesitated before a word and then began to sound it out and did so correctly, this strategy use was included. All strategies used either in correcting miscues or following hesitations were included up to the point in the passage that twenty-five miscues were made. Miscues that subjects did not recognize and therefore did not attempt to correct are not included as they were not considered a conscious use of the strategy. The results are presented in Table 3.

It is evident from the table that the greatest difference in letter calling and sounding out is between the Lowest PA group and the two other groups. The Lowest PA group used sounding out much less frequently and with much less success, and it was the only group that used letter calling. As well, this group chose sounding out as a strategy only 14% of the time, compared to 30% of the time for the Middle PA group and 43% of the time for the Highest PA group. Thus, increasing phonological skill is associated with a greater preference for using sounding out as a decoding strategy for problem words.

Only six of the ten subjects in the Lowest PA group used sounding out. Furthermore, while in the other two groups everyone who used sounding out was successful with this

strategy at least once, in the Lowest PA group only three of the six subjects who used the strategy were able to use it successfully. It is noteworthy that these three students had the highest phonological awareness scores within their group. This suggests that while possessing phonological awareness skills does not guarantee the use of sounding out, as made evident by the one subject in the Middle PA group who did not make any use of this strategy, very weak phonological awareness skills precluded students in this study from successful employment of sounding out. This is consistent with a view of phonological awareness as necessary for applying GPC rules.

From Table 3 it can be seen that for all three groups the visual lexical strategy was important: it was used frequently and it was used by all students. The success of this strategy was high for the Lowest PA group, slightly higher for the Middle PA group, and extremely high for the Highest PA group. The frequent use of this strategy is not surprising for the Lowest PA group, as students who have difficulty using GPC rules would turn to whole word memorization. On the other hand, it is also not surprising that success with this strategy increases across the phonological groups, if phonological recoding ability is considered to support visual lexical access (Ehri, 1994; Share, 1995).

The Highest PA group made less use of each strategy as in general they were better readers (six out of eight read at the passage four level) and thus encountered fewer decoding difficulties. Their mean non-automatic use of all strategies was 13.5 compared to 18 for the Middle PA group and 20 for the Lowest PA group.

Table 3

Reading Strategies Used to Decode Difficult Words by Phonological Awareness Group

	Lowest P.A. Group (n = 10)				Middle P.A. Group (n = 11)				Highest P.A. Group (n = 8)			
	Total ^a	%Corr. ^b	Subj. ^c	Mean ^d	Total ^a	%Corr. ^b	Subj. ^c	Mean ^d	Total ^a	%Corr. ^b	Subj. ^c	Mean ^d
Letter Call.	75	60	5	15	0	-	0	0	0	-	0	0
Sounding	28	29	6	5	59	47	10	6	46	48	8	6
Vis-Lex.	53	77	10	5	90	82	11	8	50	96	8	6
Prior Con.	8	88	5	1	5	100	5	1	3	66	2	1
Pas-Con.	16	94	5	3	26	96	7	4	8	94	6	1
Vis-Phon.	0	-	0	0	3	0	2	1	1	0	1	1
Skipping	14	n.a.	5	3	12	n.a.	7	2	0	n.a.	0	0
Word Prov.	8	n.a.	4	2	4	n.a.	3	1	1	n.a.	1	1

^aTotal = the total non-automatic uses of each strategy.^bThe percentage of times the strategy led to correctly decoding the word.^cThe number of subjects within the group who used the strategy.^dThe mean number of times the strategy was used by subjects who used it, (a÷c).

It should be noted that the visual-phonetic strategy was used most frequently by the Lowest PA group, however, because it created miscues but was not chosen consciously to correct them, its high use by this group is not reflected on Table 3.

The following section looks more closely at the relation between sounding out and phonological awareness.

Sounding Out Strategy and Measures of Phonological Awareness

Sounding Out and Non-Sounding Out Groups

In order to identify a phonological awareness profile of those who used this GPC strategy and those who did not, comparisons were made between sounding out groups. The "Sounding" group consists of all those subjects (n=22) who used sounding out successfully on at least one occasion. The "Non-sounding" group consists of all those subjects (n=8) who did not use sounding out successfully on at least one occasion. (The 3 Pizza flyer readers who did not read passage 1 were excluded). Table 4 presents the means and standard deviations of the two groups on letter sound and phonological measures.

The differences were significant on all variables except rhyme production; in all cases the Non-sounding group's scores were below the Sounding groups. This is consistent with

Table 4

Sounding and Non-Sounding Groups by Letter Sound
and Phonological Awareness Measures

	Sounding (n = 22)		Non-Sounding (n = 8)		Sig. of Diff.
	Mean	S.D.	Mean	S.D.	
Letter Sound	88.2	11.6	71.8	15.7	**
Rhyme Judge.	78.6	12.5	63.8	30.4	
O-R Blend.	94.6	8.1	66.5	20.0	**
Phoneme Blend.	74.1	13.7	18.8	35.6	**
Phoneme Seg.	64.3	28.0	10.1	20.5	**
* p < .05 ** p < .01					

what was observed during the testing. In those cases where the readings were administered prior to the phonological awareness tests, the absence of sounding out or lack of success with this strategy suggested phonological awareness difficulties. Thus, an analysis of oral reading which pays attention to the use of GPC rules can provide an indication of phonological awareness problems. This is valuable because while many literacy programmes may not be willing to undertake phonological awareness testing of all students, they may be willing to test those students whose oral reading suggests possible problems in phonological awareness.

Predictors of Sounding Out

A multiple regression analysis was performed with sounding out as a percentage of all non-automatic strategies as the dependent variable. (See Table 5) Onset-rime blending was entered as the first step and accounted for 25% of the variance. This suggests that the ability to blend at the onset-rime level was important in order for these students to attempt to use sounding out as a strategy. The more comfortable subjects were with this skill, the more likely they were to use sounding out as a strategy when they encountered words they found difficult to decode. Other factors influencing the choice of sounding out are likely to include previous successful (or unsuccessful) experience with this strategy and instruction which does or does not emphasize this approach to decoding.

A second multiple regression analysis was performed with the number of correct uses of

the sounding out strategy as a percentage of all non-automatic strategies used correctly as the dependent variable. (See Table 6.) Phoneme blending was entered at the first step and accounted for 24% of the variance. Rhyme judgement was entered at the second step and accounted for an additional 14% of variance. Letter sound knowledge, entered at the third step, accounted for an additional 19% of variance. These three measures accounted for a total of 57% of the variance. Thus, for students to be successful with this strategy relative to other strategies they used, skill with phoneme blending, rhyme judgement and letter sound knowledge were important.

As discussed in Chapter 1, while not conclusive, there is support for the belief that onset-rime is a linguistic level which is more difficult to apprehend than the syllable level, but easier than the phoneme. The scores on the syllable blending, onset-rime blending and phoneme blending support this view of the relative difficulty of this intra-syllabic level. All students had higher scores on onset-rime blending than they did on phoneme blending; only one of the students out of the thirteen who did not score 100% on onset-rime had a lower score on syllable blending. [See Appendix B.] In light of the relative ease of onset-rime blending, the multiple regression analyses suggest that students in this study needed to have a less subtle level of phonological awareness before they attempted to apply GPC rules by sounding out words, but they required a more sophisticated level to be successful with this strategy.

The findings in this study indicate a role for onset-rime and rhyme judgement in the

Table 5

**Multiple Regression - Dependent Variable
Sounding Out as a Percentage of All Strategies**

Variable(s) Entered on Step Number					
1. ORBLEND					
Multiple R	.50				
R Square	.25				
Standard Error	.19				
Analysis of Variance					
	DF	Sum of Squares	Mean Square		
Regression	1	.321	.321		
Residual	27	.953	.035		
F -	9.10	Signif. F -	.01		
-----Variables in the Equation-----					
Variable	B	SE B	Beta	T	Sig T
ORBLEND	.006	.002	.50	3.01	.01
(Constant)	-.234	.178		-1.31	.20
-----Variables not in the Equation-----					
Variable	Beta In	Partial	Min Toler	T	Sig T
LETSOUND	.023	.020	.560	.10	.92
RHYMPROD	.249	.285	.980	1.52	.14
RHYMJUDG	-.328	-.343	.815	-1.86	.07
SYLBLEND	.110	.124	.952	.64	.53
PHOBLEND	.249	.189	.430	.98	.34
PHOSEG	.252	.200	.473	1.04	.31

Table 6

Multiple Regression - Dependent Variable Sounding Out as a
Percentage of All Successful Non-automatic Strategies

Variable(s) Entered on Step Number					
3. LETSOUND					
Multiple R		.76			
R Square		.57			
Standard Error		.22			
Analysis of Variance					
	DF	Sum of Squares		Mean Square	
Regression	3	1.33		.443	
Residual	20	.995		.050	
F -	8.91	Signif. F -		.01	
-----Variables in the Equation-----					
Variable	B	SE B	Beta	T	Sig T
LETSOUND	-.015	.005	-.510	-2.98	.01
RHYMJUDG	.008	.002	.535	3.38	.00
PHOBLEND	.008	.002	.595	3.67	.00
(Constant)	-.648	.381		1.70	.11
-----Variables not in the Equation-----					
Variable	Beta In	Partial	Min Toler	T	Sig T
RHYMPROD	.121	.136	.538	.60	.56
SYLBLEND	-.021	-.025	.478	-.11	.92
ORBLEND	-.330	-.377	.559	-1.78	.09
PHOSEG	-.130	-.141	.500	-.62	.54
End Block Number 1 PIN .050 Limits reached.					

choice and successful use of the GPC rule based decoding strategy, sounding out. The only other study which examined both phonological awareness and oral reading strategies is one conducted by Stuart-Hamilton (1984) with children. His phonological awareness tests consisted only of producing and judging rhyme and alliteration. On this basis he divided students into p.a.+ and p.a.- groups. His analysis of the children's oral reading errors did not examine the successful use of strategies, and hence comparisons with this study on that basis are not possible. However, in analyzing the miscues, he found that the pa+ group attempted to "use graphemic/phonemic cues to 'build up'" more words (p. 12) and their miscues revealed more graphemic processing than those of the pa- group. Thus, his study, too, gives support to a relation between skill with rhyme and the use of sounding out as a strategy.

PHONOLOGICAL AWARENESS AND TEACHER RATED PROGRESS

Following the testing, teachers were asked to rate students' progress as *none* - *slow*, *fair*, or *good*. Table 7 provides the progress ratings by phonological awareness group. (See Appendix I for further data.) There were eight students for whom it was not possible to assess their rate of progress. For four of the students this was because their attendance was so poor that instructors did not feel it was possible to judge their progress rate; four other students worked exclusively with tutors and it was felt that the tutors did not have experience with enough students to judge rate of progress, as this is inherently a

comparative measure.

The most notable point about the groups is that there was no student in the Lowest PA group whose progress was rated as *good*, and only one student whose progress was rated as *fair*. All other students in the group were considered to have made no progress or only slow progress. Likewise, despite the range of reasons apart from weak phonological skills why individuals could fail to make progress, only one student in the Middle PA group was considered to have made *none to slow* progress, and no student in the Highest PA group. Thus, for students in this study, low blending and/or segmenting at the phoneme level was associated with lack of progress, and middle to high phonemic awareness skills appear related to fair or good progress. (It should be noted that 'low' 'middle' and 'high' are used here as terms relative within this group of subjects. There is no reason to assume that those who can be considered to have good phonological awareness skills relative to the other students in this study would rank highly if compared to literate adults.)

EXAMINATION OF THE PHONOLOGICAL AWARENESS AND READING ACQUISITION OF SUB-GROUPS AND INDIVIDUALS

The results of this study, along with other studies with adult beginning readers (Read and Ruyter, 1985; Pratt and Brady, 1988; Felton, 1990; Minus, 1992), support the contention

Table 7

**Teacher Rating of Progress by Phonological
Awareness Skill Level**

P.A. Skill	None-Slow	Fair	Good
Lowest (n = 9)	89%	11%	0%
Middle (n = 10)	10	50	40
Highest (n = 6)	0	67	33

that there is a relation between adults' phonological awareness and their reading acquisition. The strongest evidence for this in the present study comes from the relation between teachers' rating of progress and phonological awareness. As predicted, phonological awareness appears to be related to the decoding difficulties of both non-readers with low progress and higher-level students who also are making low progress. The phonological awareness scores and reading strategies of individuals within three sub-groups are discussed here.

"Chinese" Readers

The Lowest PA group was made up of people who read at all five levels, including three subjects who read the most difficult passage. An examination of the oral reading strategies used by these three subjects explains how they were able to read at this level despite extremely weak phonological awareness skills.

"Chinese" is a label which has been used to describe readers who are poor at applying grapheme-phoneme correspondence rules and who rely on the memorization of whole words (Baron and Treiman 1983, p. 382). There are differences amongst researchers regarding this category of reader, but there is agreement that Chinese readers do not read alphabetic scripts with the proficiency of readers who are able to decode using GPC rules (Baron and Treiman, 1983; Gough and Walsh, 1991). EF, AH and VH can be considered Chinese readers because they have managed to read successfully to a certain extent with

reliance on visual memorization of whole words (uncorrected miscue rates on the level four passage were: EF 1%; VH 2%; AH 6%).

The strategies which each of these students employed to decode unfamiliar words demonstrated that they were reading without recourse to grapheme-phoneme correspondence rules; their strategies for dealing with new words were ones that were consistent with a 'whole-word' approach. All three students said that when they came to a word they did not know they would first ask someone what it was. Both EF and VH said that if no-one were available when they came to an unfamiliar word they would look it up in the dictionary and use the word's meaning along with the context and their own oral vocabulary to try to deduce which word it was. EF and AH said that they learned new words by writing the words on flashcards and repeating each word while looking at it.

AH tried to sound out words on five occasions but was not successful with any attempt. Neither EF nor VH made any attempt to sound out words. During the oral reading it appeared that EF was trying to sound out the word 'secretly'; however, when discussing the reading with him afterwards, he said that he thought he recognized some parts of the word ('ly' and 'cre') and tried to put them together to make a word that would fit the story. (His choice of 'sincerely' did make sense in the context.) Thus, what had appeared to be sounding out was in fact an attempt to recall the word based on visually familiar word parts.

Ratings on these three students' progress unfortunately is not available, as one student attended poorly and the other two students worked only with tutors and their progress rate was not known by the researcher or the instructor associated with the tutoring programme. It seems reasonable to assume, however, that unless these students have exceptional abilities to memorize whole words, they are or will be encountering difficulties progressing with their reading. In order to advance beyond a logographic stage and progress to more sophisticated phases of reading acquisition, they will need to achieve alphabetic insight. Research to date suggests that unless they are able to develop phonological awareness they will not become proficient readers, able to decode words independently.

Letter Callers

Another grouping within the Lowest PA group consists of those students who used letter calling as a strategy. Two of these students read passages at level one, two read passages at level two and one student cannot be classified as he read passage one with a higher rate of uncorrected miscues (17%) than he did passage two (13%). The following is an examination of the letter calling strategy and of one individual in particular who relied the most heavily on this strategy.

Because all of the letter callers were in the Lowest PA group, it is not surprising that their scores on letter-sound knowledge and most of the phonological measures were significantly lower when compared to all other subjects. (See Appendix J.) As well,

letter callers were amongst those who appeared to use an orthographic strategy to provide words on the letter name and sound test.

The letter calling strategy seems to have been a taught one, as one student remembered being told to learn and recall words in this fashion. None of the three students who relied on this strategy were first taught in Canada, and it is possible that this strategy, which generally ceased being taught at the end of the nineteenth century (Huey, 1918), continues to be taught in some other countries.

It is possible that this strategy is sometimes successful because most letter names carry their sounds within them. This would require first segmenting the sound from each letter name and then blending the sounds in order to recognize the word. Evidence in this study is against this being the case, as all letter callers scored '0' on the phoneme segmentation task and only one letter caller did not score '0' on phoneme blending. Given the low scores at the phoneme level, it is more likely that repeating the spelling of words operates at some level as a mnemonic device to assist in lexical access.

This strategy does not correlate significantly with other strategies (apart from a significant negative correlation with visual lexical) and is used only by students who have low phonological awareness. Thus it appears to be a compensatory strategy for those who have not been successful in developing other decoding strategies requiring phonological awareness. Consequently, for these students, letter calling may be an example of an

entrenched, non-productive strategy (Garner, 1990), one which hinders the development of phonological awareness and hence the ability to apply GPC rules to assist decoding.

IK

IK used this strategy more frequently and more exclusively than anyone else: fifty-six times within the twenty-five miscues. Forty out of the fifty-six times it was used successfully, i.e., she decoded the word correctly after letter calling. IK scored 100% on both the letter name and the word portions of the letter name and sound knowledge test. This stands in sharp contrast to her score of 57% on the letter sound portion and provides evidence that she used an orthographic strategy to supply words. This is supported by the fact that on this test she sometimes spelled out her responses before saying them.

IK's scores on phonological awareness measures indicate that she has developed those phonological awareness skills which are considered holistic (Moraes, 1991b) or global (Cardosa-Martins, 1994), i.e. rhyme and syllable blending and segmenting, but those at the intra-syllabic level which require more analytic linguistic skill remain undeveloped. (See Appendix H.)

IK's strategy of visually memorizing words and recalling them by repeating the letters when she encounters problems produces extremely laboured reading as the sample of a page from her oral reading analysis makes evident. (See Appendix K.) It is extremely difficult to acquire a large reading repertoire by initially memorizing words, rather than

using GPC rules as a self-teaching mechanism, and this would explain why, according to her teacher, she is making almost no progress.

While IK's performance on the letter name and sound knowledge test indicated that she used an orthographic strategy, it was orthographic only in the sense of obviously connecting printed letters with a spoken word. It was not orthographic in the sense of an advanced phase of reading acquisition as that would mean she was recognizing patterns across words and making connections between letter strings and sounds. The evidence that she did not connect letters and phonemes comes from her performance on the letter sound task and her use of only those strategies which did not require alphabetic insight. Not only did IK not use sounding out, she did not even use visual phonetic cuing. Far from reading at the level of the orthographic phase, IK approached each word as a separate phenomenon, that is, in a fashion most similar to logographic reading.

Despite ingenious compensatory strategies, IK, like the Chinese readers who read at the fourth passage level, appears to remain handicapped by her low phonological awareness. Lacking the prerequisite phonological awareness, IK has been unable to comprehend the alphabetic principle. Consequently she does not have access to GPC rules and the self-teaching mechanism this affords.

Pizza Flyer Readers

Regarding the relation between phonological awareness and reading strategies, one group

does not appear on Table 3 or 4. This is the group of students whose reading assessment involved responding to questions about the pizza flyer. Five of the six pizza flyer readers were in the Low PA group and one was in the Middle PA group. (One student was placed in the group because he had an uncorrected miscue rate of 27% on passage one. Unfortunately, he was not administered the pizza flyer test by oversight; however, because of his extreme difficulty with passage one, it was appropriate to consider him a pizza flyer reader.) The pizza group's mean scores were lower on the letter sound test and on all key phonological measures. (See Appendix L.) The differences reached significance in the categories of rhyme judgement, onset-rhyme blending, and phoneme segmentation. As well, the only three students who did not achieve 100% on the syllable blending task were in the pizza group.

With one exception, the subjects in this group used logographic strategies to answer some or all of the questions. These strategies included responding to the question requesting that they point out where "family dinners" were advertised on the basis of appearance ("This one's got more food." "They're in boxes stating different prices."), and reliance on pictures ("Looked like it by the picture.") All subjects who 'read' the pizza flyer used visual phonetic strategies. They made errors such as identifying 'pineapple' as 'pizza' and when asked "How did you know that?" they gave answers such as, "Starts with 'p'," and, "I looked for 'm'." Three of the five students also used alphabetic strategies (identifying a word by its complete spelling) at least once; two did not use alphabetic

strategies for any responses. (It is also possible that the spelling of words represented a letter calling strategy and did not reflect an understanding of the alphabetic principle.)

Within the pizza group, scores on phoneme tasks varied considerably--from 0 to 90 on phoneme blending and from 0 to 50 on phoneme segmenting. Both of the highest scores were achieved by one student, AF. Below is a comparison of two pizza flyer readers' phonological awareness scores.

	HO	AF
Letter Name	100	100
Letter Sound	87	65
Word (for letter)	96	91
Rhyme Judgement	75	65
Rhyme Production	80	60
Syllable Blending	33	100
Onset-Rime Blending	67	83
Phoneme Blending	0	90
Phoneme Segmenting	0	50

HO and AF have quite different educational backgrounds. HO had some schooling as child but entered the college tutorial programme as a non-reader. He worked with a tutor

for approximately 2 years and since entering the literacy classroom 6 years ago he has continued to work with a tutor. HO's attendance is good and his teachers report that he works hard while in class. His almost complete failure to learn to read can not be attributed to mental retardation as he is quite articulate, holds down a responsible job in which he has had to refuse promotion, and has an impressive range of skills which he has acquired without literacy. Taking the phonological awareness measures as a total score, there was only one subject in the study with lower scores than HO. His hard work at school is evident, however, in the higher score he achieved in the letter name and sound knowledge measures.

AF experienced a great deal of difficulty in learning to read as a child; however, it is possible that some of the problem resided in the fact that when he entered school he did not speak fluent English, the language of instruction. He did not return to school as an adult until recently and at the time of testing he had received approximately 50 hours of tutoring only. The instructor responsible for the tutoring programme said that at the time of his initial assessment he was a complete non-reader with little knowledge of the alphabet.

While AF's score on the sound portion of the letter name and sound knowledge test was lower than HO's (65 versus 87), he scored high enough on the measures of phoneme blending and segmenting that he was classified in the Middle PA group. He was able to read some words on the pizza flyer and, when presented with passage one, was able to

read as many words correctly on the first page as was HO, who was also given the opportunity to read this passage. In contrast to HO, AF was able to successfully decode words using a sounding out strategy and unlike HO he did not use a letter calling strategy. Again, in contrast to HO's none-to-slow progress rating, AF's progress was rated as good.

While it is not possible to generalize on the basis of two students, the profiles, phonological awareness scores and reading strategies of these students, and their respective rates of progress are consistent with the perspective that phonological awareness is causally related to reading acquisition. AF's ability to apply GPC rules in order to sound out words is evidence that he understands the alphabetic principle, while HO, despite many years of instruction and a superior knowledge of letter sounds remains unable to apply this knowledge because of a phonological awareness deficit.

SUMMARY

The findings in this study are consistent with the major premise advanced by other research regarding phonological awareness. That is, there is a relation between phonological awareness and reading acquisition. As adults, these students have had a longer time to develop a greater range of compensatory strategies and using these strategies has enabled some of them to reach relatively high reading levels despite very limited phonological awareness. As a result, phonological awareness did not predict

students' reading levels as measured on oral reading of connected text. Yet, it is still clear that lack of phonological awareness is having an impact on their reading: it is forcing them into compensatory strategies that are laborious, taxing on memory, and which do not allow independent decoding of unfamiliar words. As well, while by no means offering conclusive proof, the phonological awareness scores and teacher ratings of progress are consistent with there being a causal relation between phonological awareness and both initial and ongoing reading skill acquisition.

The phonological awareness scores suggest that students have varying degrees of weaknesses, consistent with the view of phonological awareness skills existing as a continuum, rather than an all or nothing ability. The lowest scores, particularly in the context of extensive exposure to reading instruction, indicate severe phonological deficits. Furthermore, the reading strategies employed by most subjects in the Lowest PA group point towards a failure to grasp the alphabetic principle. Subjects in the Middle PA and the Highest PA groups had more success on average with using grapheme-phoneme correspondence rules and thus generally appear to have reached an alphabetic phase of reading acquisition. In the absence of any norms it is not possible to tell if those students who had the highest scores are at or are close to what could be considered an average level of phonological awareness. For all subjects, the impact of phonological awareness on reading could best be determined by a further study which involved training in phonological awareness and pre- and post-testing on reading measures.

This study raises questions around the role of onset and rime. The lack of a ceiling effect on the rhyme judgement and production tests makes evident that for this particular group of adult illiterates the non-analytic phonological awareness skill of rhyming remains to be mastered. The contribution of onset-rime and rhyme in predicting respectively the choice and success of sounding out suggests that there may be an ongoing role for these phonological skills in the process of learning to decode unfamiliar words.

CRITIQUE OF TESTS

One of the intentions of the study was to develop a set of tests which could be used to assess students' phonological awareness and the reading strategies they employed in the context of connected text. The following is a critique of the tests and recommendations for alterations which could improve their effectiveness. The tests are taken up in the order in which they were presented in Chapter Two.

Student Interview Form

The interview form proved to be a useful part of the assessment package by providing information which helped to interpret other data. For example, the length of time in the programme and the educational background information collected on HO, who had had extensive adult literacy instruction, and AF who had had very limited instruction as an adult, was helpful in assessing the likely impact of their phonological awareness levels on their reading acquisition. The students' self-assessment of their reading usually

provided accurate general information about their level of reading and as such was often useful in determining which article they should read. The form did not take long to complete and although it would be possible to gather more information from students about their perceptions of their reading skills, more questions at that stage in the assessment may have been intimidating.

Letter Name and Sound Knowledge

As discussed above, this measure can contribute valuable information about students' basic phonics knowledge and indicate possible problems with phonological awareness. In order to gain information about phonological awareness, test administrators should record not only students' abilities to give letter sounds, but also the strategies they use to do that. Comparing students' letter sound knowledge with their production of words beginning with the sounds provided evidence of reliance on orthography in the context of a sound oriented task.

Phonological Awareness Tests

Rhyming Tests

Students' responses at the introduction to the rhyme task made it clear that explanation and training was a necessary preliminary to the test itself. Twelve students said they knew what rhyme was and gave an adequate example, but nineteen students were unable to do so. (An additional two students are excluded from these totals. One student said

she knew but could not think of an example, and the records for the other student do not make her answers clear enough to include). In some cases this appeared to be merely a matter of definition, i.e., some students seemed familiar with the concept of rhyme but not with what it was called. In other cases, such as for IK, rhyming seemed to be quite a new way to treat words. Consequently, the detailed training which accompanied this task was warranted and should be included where appropriate in subsequent administrations of the test.

The rhyme judgement portion of the test appears to be soundly constructed as there was neither a ceiling nor a floor effect and its significant correlation with phoneme segmentation suggests that it contributes a valid assessment of phonological awareness.

The rhyme production test did not appear to make a useful contribution to understanding students' phonological awareness. Nevertheless, because word families require students to generate rhyming words as well as recognize them, the production task would still be useful in assessing students' likelihood of success with this approach.

Blending tests

One of the purposes of the training test was to screen students who had so little skill with blending tasks that the test should not proceed. When the actual testing began, however, it became apparent that the training test did not provide a screening mechanism for the syllable and onset-rime portions of the test, so all students were administered those parts

of the test. This did not raise difficulties, so there does not seem to be any reason to alter this procedure in future use of the test.

There appeared to be a ceiling effect on the syllable blending test, as only three students failed to score 100%. The addition of three and four syllable words would help to indicate whether or not memory and sequencing of polysyllables were playing a role in blending and hence decoding and might eliminate the ceiling effect.

Onset-rime blending and phoneme blending correlated highly with each other and with phoneme segmenting. These correlations would be expected, and they indicate the validity of these measures.

Segmenting Tests

The failure of syllable segmentation to yield meaningful correlations and the likelihood that this is an outcome of the design of the test was mentioned at the beginning of this chapter. One of the concerns was the difficulty in clearly enunciating two and three syllable pseudowords. It is questionable whether or not pseudowords are necessary at the syllable level. Pseudowords are necessary for the phoneme level of segmentation in order to reduce orthographic interference, but this is not the case at the syllable level. Because the number of graphemes do not correspond to the number of syllables, students can not use the spellings of words as a basis for deciding how many syllables the word has. It seems, then, that there is no reason to use pseudowords on the syllable portion of the test

and using real words may make the test easier to administer.

The manipulatives were helpful both in enabling the student to understand the task and in making it clear how many phonemes were in their responses.

It is likely that even improved syllable level blending and segmenting tests would seldom yield information that was additional to the other phonological awareness tests. Despite this, the tests are worthwhile because i) they usually provided students with a successful experience and this helped them to feel more comfortable with the rest of the testing, and ii) these tests can identify the occasional student, such as HO, who has difficulties at the syllable level. Poor scores on these measures can alert instructors to the possibility of severe phonological deficits and the consequent need for extensive explicit instruction.

ORAL READING ANALYSIS

The oral reading analysis used in this study was an attempt to apply the framework of reading acquisition phases developed by Ehri (1994) and others (e.g. Frith, 1983; Spear-Swerling and Sternberg, 1994). Several difficulties were encountered in trying to apply this theoretical construct to oral reading analysis. Reading strategies such as letter-calling and sounding-out were relatively easy to identify, although even here it was necessary to make the assumption that both of these strategies were always done orally. The major difficulties, however, occurred with distinguishing the visual lexical category and

determining the use of context.

The visual lexical category is not clearly defined, even from a theoretical standpoint. How is it different from logographic reading? It is true that logographic reading is context dependent, but both strategies rest on some kind of recall. It is evident in this study that students can learn to memorize whole words sufficiently well that they can distinguish them out of context and yet not have the phonological awareness skills necessary to apply GPC rules. In what way does this kind of dependence on visual lexical access differ from logographic reading and in what way is it the same? If a miscue is scored as a visual lexical recall error, what does this tell us about the readers' developmental phase? At present, with no method for distinguishing it from logographic reading, it can not, by itself, tell us very much.

Similarly, while the relation between phonetic cue reading and visual lexical strategy can be seen as a developmental one, how are they distinguished in practice? The decision to use more or less than 50% of grapheme-phoneme similarity as a cut-off between the two categories is obviously arbitrary. For example, a number of students read "hated" as "had" in passage one. Should this be categorized as a miscue resulting from visual phonetic cue reading, or as a visual lexical access error? It is possible that as data is collected and understanding of reading phases deepens, phonetic cue reading may be distinguished from lexical access errors on the basis of phonological awareness levels. But in the present study that would have been tautological and at any rate not possible

in the absence of standard phonological awareness measurements.

The use of context was difficult to determine as well. Fox (1991) has suggested that context acts continuously as a constraint on lexical access, increasing the efficiency of that process. This seems at least theoretically possible, and if it is the case, then assessing the use of context in connected text becomes a matter of assessing the degree to which it is used or the cognitive capacity it requires.

There are also other difficulties with identifying context use as a strategy. If a student hesitates and then reads ahead to try and find contextual help but the text does not provide it, is the miscue then scored as one of context or not? Because the purpose of the oral reading analysis in this case was to establish strategies, the attempt could be recorded as such, and the error attributed to whatever second strategy is perceived as having been attempted, but whether or not the text is considered to offer decoding help remains a subjective decision. In this study, a great deal of assistance in making decisions regarding context use was gained by talking with students after they had finished the reading. Frequently they felt able to remember what they had been thinking and doing and could describe their strategy. This was very helpful, but nonetheless it only shifted the subjective interpretation from the researcher to the student, albeit the latter is probably better qualified to identify his or her own strategy.

Regarding context use, it is possible that because the students were not required to

respond to the content of the text they may have focused on the word level more than they normally would have. This could be rectified by including retelling and comprehension questions. Assessing comprehension would balance the focus between decoding and context strategies if students knew in advance that they should read for meaning.

Hosenfeld's method of recording all attempts at decoding a word proved valuable. It made it possible to include the strategy which caused the error and the strategy which was chosen by the student to try and correct the error. This was important for an understanding of the range of strategies which students had available to them. This, along with including hesitations which resulted in correct decoding, aided in an understanding of which strategies students had greatest command.

Future use of oral reading analysis should include all miscues, not just the first twenty-five. This is because theoretically there may be more reliance on context because the context base increases as the reader proceeds through the text. Also, in the present study it was noticed that one strategy changed as the reading progressed: the students who relied heavily on letter calling asked for more words to be provided towards the end of the text. This was probably because their decoding difficulty caused them to tire and possibly become frustrated.

It had originally been intended that the oral readings would be taped. As it turned out,

student discomfort with recording did not allow this to occur. It is possible that students could be made more comfortable with this by having previous experience taping their reading. This could purposely be made part of classroom or tutorial experience if the oral reading analysis was done after the student had entered the program.

There are inevitable problems with miscue analysis, as it is inherently a subjective measure. It is possible to fine tune the scoring by adopting more sophisticated methods of rating miscues within categories (e.g., Goldsmith-Phillips, 1989), but it is not possible to remove subjectivity around, for example, the syntactic appropriateness of an error, or, in this study, whether or not reading ahead provided enough context to influence the attempt to correct the error. As well, more sophisticated scoring becomes too unwieldy for day to day classroom use.

These difficulties draw attention to the need to continue refining both an understanding of the reading process and the skill with which this is brought to bear on oral reading analysis. Oral reading analysis provides a means of i) establishing a students' decoding level, ii) identifying reading strategy strengths and weaknesses, iii) indicating the students' developmental phase of reading, and iv) suggesting where phonological awareness skills should be examined. Thus, oral reading analysis can accomplish things which word or pseudoword lists cannot, because they do not afford the opportunity to use context, and which reading comprehension tests cannot, because they assess reading level but not decoding strategies. As well, reading comprehension tests can be misleading, if it is

assumed that scores beyond a beginning reading level indicate competence at the alphabetic phase of reading acquisition. Furthermore, oral readings followed by comprehension questions can be as valid a measure of reading level as standardized comprehension tests, given that the latter do not provide a precise grade level but rather "a band of scores within which the examinee's true score is most likely to lie" (Jones, 1989). Thus, efforts to refine oral reading analysis methods are warranted because, despite their present limitations and their inherently subjective aspects, oral reading analysis can be a valuable tool for reading assessment.

Overall the letter name and sound knowledge test and the phonological awareness tests did not seem to be too long for the students. This was an improvement over the pilot version which had more items and included a deletion task, and which seemed to exhaust students. The testing, including the oral reading, took approximately from one to two hours for each student. This time is similar to the time presently spent assessing each beginning reading student at Douglas College.

CHAPTER FOUR

PEDAGOGICAL IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The present study has contributed to the limited data that demonstrates that phonological awareness is as central to the reading acquisition of adults as it is to children. Although it is possible for some adults with phonological awareness deficits to learn to read to the grade four level or higher by using a range of compensatory strategies, an inability to understand the alphabetic principle constrains their reading strategies. They remain unable to read novel words independently if the words are outside their oral vocabulary and are not in a clue laden context. Those who are not as adept at using compensatory strategies or who use less productive strategies are hampered even further. Given the importance of phonological awareness, it is incumbent on educators to address this area in both assessment and instruction.

This chapter draws implications for assessment and instruction from the present study. These implications are discussed in the context of the constraints imposed by the present nature of literacy programmes. The chapter concludes by outlining some

recommendations for further research stemming from the study.

ASSESSMENT

The present author would argue that assessing both phonological awareness and reading strategies could be useful in developing remedial approaches for students. Analysis of individual scores and miscues made it possible to identify student's location in the developmental phases of decoding. Knowing to what extent a student has grasped the alphabetic principle and is able to apply grapheme-phoneme correspondence rules or orthographic strategies would make it possible to design an individual programme that recognizes what type of instruction is required to move the student towards more sophisticated reading strategies.

In this study, subjects were either acquainted with the researcher or had been well introduced by teachers who had gained the subjects' trust. This sense of familiarity was helpful because a 'safe' environment was important for the reliability of the testing. When people are nervous and intimidated, they are not likely to perform as well as they are capable, and hence assessments are likely to be inaccurate. One student had to be dropped from the study because excessive nervousness made his responses unreliable, and this pointed out the necessity to conduct the testing in a comfortable atmosphere.

The study also suggests that there are other benefits to testing students who have been part of supportive learning situations. It is probable that the students' recent positive reading experiences in their classes or tutoring situations made it possible for them to feel confident discussing their reading strategies after the oral reading. It is likely that this confidence stemmed from the attention and respect they had received. It may also have been a result of gaining familiarity with the language and process of reflecting on their reading. As stated in Chapter Three, students' responses to questions about their reading provided valuable information. Thus, the experience in this study indicates that in order to maximize the reliability of the results as well as the breadth of information obtained, it would be worthwhile to postpone some aspects of assessment until after the student has been a part of the literacy programme.

Within a two stage model of assessment, initial assessment could be directed at i) establishing the student's reading level through an informal reading inventory and ii) discovering interests, literacy needs, and the student's perceptions about his or her learning difficulties and strengths. During the interview prior to the assessment tests in this study, many students demonstrated a willingness, even an eagerness, to talk about their reading difficulties. Recording this information would make it possible to use the students' perceptions of their reading to help interpret the results and provide a context for future discussions with them about their reading. Phonological awareness testing and a taped oral reading for analysis could be conducted approximately one month later. There would then be information from the introductory interview and reading,

observations about the students' reading strengths and difficulties from class or tutoring work, and the phonological awareness and oral reading analysis on which to base an evaluation of the students' developmental phase of reading acquisition and to create an appropriate learning programme.

Using word lists and isolated reading tasks is an anathema to the whole language school and concern has been expressed elsewhere in the field. Fowler and Scarborough (1993) have spoken of the necessity for assessments to have "face validity" (p. 163). In other words, assessment of prospective students should use materials from daily life, such as newspaper ads and driver manuals that students want to learn to read, rather than lists of isolated words which may appear to have no relation to their goals. This point is valid and this type of material could be used at the initial assessment interview. But the experience of this study was that students did not react negatively to tasks involving isolated words or pseudowords. The students saw themselves as having decoding problems and, with some explanation, they did not have difficulty seeing the relevance of the testing tasks to their own reading problems. It does not seem necessary to forgo the benefit of word lists.

The absence of taping in this study made it difficult to review the miscue coding. Taping the oral reading and the discussion with the student following the reading at the second assessment would make it possible to go over the data carefully after the session. In this study the students expressed a great deal of interest about how they had done on the test

and what it might mean for their reading and they often responded to the feedback by offering their own insights, particularly regarding the reading strategies they had used when reading aloud. The student should be involved in a discussion of the assessment outcomes so he or she can have the opportunity to contribute his or her own ideas, ideas which are based on extended experiences attempting to interpret print and an adult's ability to reflect on these experiences.

The teachers' ratings of student progress proved to be a valuable complement to the data on a student by student basis. This is not a possible question when a student is first entering a programme, but post testing would provide the same information. A literature search revealed no adult literacy centre which reported pre- and post-testing of phonological awareness. (The Lindamood and Reading Foundation Clinics do such testing, but they are set up as remedial reading clinics and do not do ongoing reading instruction (Truch, 1995).) Such testing needs to be in place in order to assess students' progress and thereby the usefulness of various instructional methods. The testing could be another form of the initial phonological awareness test. A more informal version of post-testing could consist of the oral reading of a passage for the purpose of seeing if the student was using grapheme-phoneme correspondence rules. The latter would lack the precision of a phonological awareness test, but have the advantage of assessing the application of phonological awareness.

INSTRUCTION

Many of the adults in this study had been subjected to phonics instruction but, lacking the necessary phonological awareness, had been unable to benefit from it. HO, for example, did reasonably well on letter sounds, but had amongst the lowest scores on phonological awareness measures and his attempts to use sounding out as a strategy were unsuccessful. This does not mean that we should not provide HO with instruction in phonological awareness and phonics, which have been proven to be essential to proficient reading, but rather that we should find ways in which to teach them so that they are genuinely accessible to him. Phonological awareness instruction should not simply be a repetition of former phonics instruction as it has been accused of being (Paris and Parecki, 1994).

It is beyond the scope of this study to detail the content of a programme which would provide training in phonological awareness. What ensues is a discussion of some of the more general instructional issues that this study raises followed by a brief discussion of two specific pedagogical questions on which the results of this study bear but which remain unresolved and will require further research.

The Need for Systematic Phonological Awareness Instruction

The students in this study spoke with enthusiasm about their classes and instructors, often referring to the encouragement and support they received. Many of the subjects had been in classes where phonics instruction was provided; some had been in classes which used

a whole language approach. Yet despite the support they had received, few were on the road to proficient reading. For example, HO, GC, JF, KB and CMc had been in adult literacy classes or tutorial situations for a minimum of three years and still remained phonologically *unaware* and unable to decode independently. Some of the other students in the study who lacked phonological awareness had been able to use whole-word memorization, letter-calling and/or context as compensatory strategies, but, despite in most cases having several years of literacy instruction as adults, they remained unable to decode unfamiliar words. These students provide evidence that mere exposure to reading, even extended exposure in an encouraging environment, does not guarantee recognition of the alphabetic principle and progress towards independent reading. It is clear that while the "a little dab'll do ya" approach to introducing phonics only in the context of reading text (Goodman, 1994, p. 50) and without explicit phonological awareness training may be sufficient for the majority of children who arrive at school with the linguistic skills necessary to generalize from minimal instruction, it is not sufficient for those who lack those skills. As most students in adult literacy classes in Canada have already spent years in school, it is highly probable that they were amongst the children who did not have the linguistic skills needed to make sense out of the instruction they received. Thus it seems quite likely that the "a little dab'll do ya" approach will not do for them. The present study confirms that it cannot be assumed that all beginning readers will be successful at "cracking the alphabetic code" (Fowler and Scarborough, 1993, p.80) without direct, systematic instruction in the two prerequisites: phonological awareness and letter sound knowledge.

Phonological Awareness Training

The results of the present study are consistent with the idea that phonological awareness is not an all-or-nothing condition but a continuum of varying degrees of skill (Bradley and Bryant, 1985; Fowler and Scarborough, 1993). The range of scores on the phonological awareness measures suggest that varying degrees of training in phonological awareness would be necessary for this and similar groups of students. Intensive, individual instruction may be necessary only for those students who have severe phonological deficits (Truch, 1991). At the Reading Foundation Clinics, clients receive approximately 20 hours of instruction a week for four weeks, and those who have the most severe phonological deficits may attend for several weeks longer (Truch, 1994).

It is likely that students from the Lowest PA group, who scored between 0 and 25 on either or both of the phoneme blending and segmenting tests, and who had received years of adult literacy instruction, would require training as primary as the Lindamood Auditory Discrimination in Depth programme (1975), which begins with articulatory cues to phoneme recognition before introducing letters. This may be possible to administer by working with small groups of students, rather than individuals, in order to assist more students and to be more cost-effective. Students comparable to the Middle PA group of students in this study may benefit from less intensive instruction, which could be delivered in small groups as a part of regular classroom work. This level of phonological awareness instruction could more easily be accommodated in literacy classrooms.

Most of the Highest PA group students could probably still benefit from explicit instruction in this skill. While they were high relative to the other students in the study, all the subjects in the study were considered by their instructors to be reading at or below approximately the grade six level and hence as a group are likely to have low phonological awareness compared to more literate adults. For the Highest PA group of students, it may be sufficient to move more quickly through the material that would be suitable for the Middle PA group and then to use ongoing examples in the context of reading and spelling instruction.

At present phonological awareness training has not become an established part of adult literacy instruction and consequently a discussion of appropriate strategies for remedial work with adult beginning readers rests on limited practise and research. Nonetheless, the evidence that is available gives some reason to be hopeful about the possibility of training adult literacy students in phonological awareness and thereby helping them to become literate. Apart from the two studies (Alexander et al., 1991; Truch, 1994) which have reported success even with adult severe dyslexics using intensive, individual instruction, Boraks, Schumacher and Lavery (1982) provide evidence of successful phonological training in a group setting.

Most of these adults even while being exposed to an intensive single letter phonics program did not see the relationship between words and sounds. It took these adults six to eight sessions to develop ability to orally segment and blend phonemes. However, it was clear that this ability could be developed (p. 23).

Implications for Adult Literacy Programmes

It is likely that many adults in literacy classes are there at least partially as a result of unremediated problems in phonological awareness and hence, as the scores in this study suggest, a high proportion of them may require substantial help to become phonologically aware. (It should be noted that while the present study was not based on a random sample, all volunteers were accepted rather than selected on the basis of suspected phonological deficits.) Truch suggested that intensive training is most successful and that progress might otherwise be negligible (1995). This raises the question of how such instruction could be accommodated in adult literacy classrooms and tutoring programmes.

Classrooms

It is difficult to see how intense phonological instruction could be incorporated into the ongoing work of structured reading classes or drop-in learning centres. As an alternative, it may be possible in some settings to have small groups working together for periods of approximately a month prior to entering literacy classrooms or concurrent with their participation in classes. This type of addition to a literacy programme would require either substantial increases in funding or a reallocation of existing instructional resources. For example, a half-time instructor could provide twenty hours of phonological awareness instruction a week, which may be sufficient for students in two basic literacy classrooms over the course of a semester. Adding a phonological awareness component would also

require training teachers so they would have the necessary skills to administer the programme.

Less intense work on phonological awareness could more easily be accommodated into literacy classes. Small group work is already a regular feature of many classes and a programme such as the ABD's of Reading (Analysis, Blending, and Decoding) (Williams, 1980) which requires only one half hour per day may be appropriate or a similar programme could be developed specifically for adult.

Individual Tutoring

A large portion of literacy instruction is delivered on a one-to-one basis by volunteer literacy tutors. There are two major obstacles to introducing phonological awareness training into tutorial situations: i) at present, adult literacy tutors have not been trained to teach phonological awareness, and ii) tutoring is usually on a once weekly basis. Even assuming that it is possible to find or develop an appropriate programme to train tutors who have limited teaching experience, it may be difficult to gain the necessary commitment from tutors to take the additional training. Training for the Lindamood, ADD program, for example, is approximately sixty hours (Truch, 1995). It would certainly be difficult to get the commitment from both tutors and students for a very substantial increase in the number of tutoring hours per week. Truch (1995) reported that two weekly sessions of two hours each proved to be too little for substantial progress, even over a year's duration. This suggests that tutor and student pairs would have to at

least triple their number of weekly sessions before progress could be expected. On the other hand, is it legitimate to encourage adults who have failed at literacy before and who still lack insight into language at a phoneme level to believe that they will become literate with once-a-week tutoring? Or for that matter, is it legitimate to lead tutors to believe that they can significantly improve someone's literacy level if we suspect that this is highly unlikely?

One possible alternative is to develop the assessments and assessment process outlined here and to provide both tutor and student with the most accurate interpretation we can make, including regarding the possible time required. This would allow the student to make a more informed decision on how to proceed. Does he or she want to commit the time and energy necessary to overcoming this roadblock to reading acquisition or is it more reasonable to develop compensatory strategies to the extent possible? If the decision is to undertake phonological awareness training, then it would be necessary to attend a programme in which it is available. This would mean either leaving the tutoring or continuing with it as a support to the new programme.

In the case of less severe phonological deficits, it may be possible to provide suitable training to those tutors who would be prepared to make a less onerous additional time commitment. This programme might be modelled on one of the few existing programmes or developed on the basis of the experience and guidelines provided by researchers, speech pathologists and teachers.

There is no doubt that building phonological awareness training into literacy programmes will be extremely difficult, given the present lack of recognition of the role it plays in literacy acquisition and the restricted funding available for adult literacy education. Nevertheless, it remains an important source of hope for answering questions about students' decoding difficulties and offering them a way into literacy.

Phonological Awareness Training, Alphabet Letters and Onset-Rime Instruction

This section focuses on two specific pedagogical questions that are present in the literature and that arose in this study.

Introducing Alphabet Letters

The results of this study showed that two students who had a high rate of miscues with the first level of reading passage, i.e., who were very poor readers, scored above the mean on letter sound knowledge. One student made two attempts to sound out words and was unsuccessful both times; the other student made five attempts and succeeded once. Thus, it could be concluded that they had very limited skill in applying grapheme-phoneme correspondence rules despite knowing most of the letter sounds. Another group of students in the study, the letter callers, made use of a strategy which was exclusively rooted in the names of the alphabet letters; the strategy did not appear to involve relating the letter names to their sounds. The first two students had not managed to relate their

knowledge of letter sounds to decoding, and the second group used an inefficient strategy which seemed to exclude relating letters and sounds. All of these students had low scores on the phonological awareness tests. Both of these groups indicate that for some adult poor readers, learning about phonemes may entail some *unlearning* about how they have previously viewed the role of letters. The question, then, is how best to encourage these students to focus on sounds in order to gain conscious awareness of language at the phonemic level.

One suggestion is to begin phonological awareness instruction without using letters. This would help to avoid the confusion caused by difficulty in attending to the acoustic nature of the tasks and by entrenched strategies which concentrated on letters. The focus could be directed towards the articulatory cues which distinguish phonemes, and blending and segmenting could be taught on this basis. When students had developed the ability to recognize phonemes, letters could be introduced. In taking this approach, it would be essential to explain clearly to students the purpose of the tasks and their relation to reading and spelling (Cunningham, 1990).

Onset-Rime Instruction

Chapter One dealt at length with the issue of onset and rime as a linguistic level and the possible bearing this has on instruction. It is raised again here because the analysis of the data suggests an important relation between onset-rime and students' attempts to sound out words, and the possible role of rhyme judgement in using sounding out

successfully. The role of rhyme and onset-rime in learning to read is under debate within the research. The strength of the role of rhyme/rime in the application of GPC rules may have emerged for the first time in this study because of its unique design which included analysis of reading strategies in connected text.

It is acknowledged that focusing on underlying deficits does not necessarily bring about concomitant improvements in reading (Blachman, 1994). Nonetheless, given the indications from the multiple regression analyses regarding the role of rhyme judgement and onset-rime blending in sounding out, several questions present themselves. Should instruction be designed so that time is spent making certain that students have mastered rhyme judgment? Should we be teaching onset-rime segmentation and blending explicitly prior to phoneme segmentation and blending as groundwork for the application of GPC rules? Is it even possible to teach onset-rime prior to phoneme awareness, or as Ehri and Robbins (1992) claim, is some minimal level of phoneme awareness necessary to benefit from onset-rime training? At present the research to answer these questions does not exist.

The above questions concerning alphabet letter introduction and onset-rime instruction are issues which will require more investigation both in research studies and in the classroom. The present study and attendant literature review also suggest other research questions which have the potential to influence pedagogical practise.

RECOMMENDATIONS FOR FURTHER RESEARCH

There are some difficulties in conducting research with adult beginning readers, as they are an unstable population and the learning environments are much more diverse than those of child beginning readers (Boraks, et al., 1982). Nonetheless, there is a need to enlarge both the quantity and the scope of research which has been done with adult beginning readers. The following is a list of research which this study indicates would be helpful in advancing our understanding of adult literacy students' reading acquisition.

1. There is a need to accumulate data on a standard test of phonological awareness in order to develop norms. This would assist in identifying the extent of weaknesses in phonological awareness and indicating the type of remedial training programme that would be appropriate.
2. Further work is necessary to refine oral reading analysis, particularly so that it is possible to more accurately assess when visual-phonetic and/or visual lexical strategies are being used and to more adequately assess the use and role of context.
3. Additional studies examining the relation between phonological awareness skills and reading strategies are necessary to confirm (refute) and add to the data collected here.
4. To date this is the only study of adult literacy students which has attempted to address

the issue of phonological awareness and rate of progress. Longitudinal studies are necessary to more fully explore this issue and to complement research which accumulates data through assessment. Such studies could help to indicate under what conditions which levels of phonological awareness are critical. For instance, if a complete non-reader enters a programme with a Middle PA level of skills (e.g. AF), what type of programme is appropriate and what rate of progress can be expected?

5. Ethnographic studies such as that conducted by Boraks and Schumacher (1981) which take place in the classroom could provide much information on students' responses to teaching strategies. These studies, along with pre- and post-testing could address questions regarding what types of instruction (materials, methods, frequencies) are most effective for training at various levels of phonological awareness and phases of reading acquisition. Ethnographic studies could also address questions regarding what promotes and hinders teacher adoption of teaching strategies.

APPENDICES

APPENDIX A
STUDENT INTERVIEW FORM

STUDENT INTERVIEW

Student's first name _____ No. _____

Campus Location N.W. day N.W. eve. T.H. Coq. Tutoring KEC

Age _____ M/F _____

Schools/Educational Background

Self-assessment of reading (What types of things do you read? Do you read signs and labels? Do you ever look through the newspaper? etc.)

Length of time in present programme _____

First Language _____

Instructor Rating of Progress:

None - Slow

Fair

Good

Notes:

APPENDIX B
LETTER NAME AND SOUND KNOWLEDGE TEST

Student's first name _____ No. _____

Campus Location N.W. day N.W. eve. T.H. Coq. Tutoring KEC

LETTER NAME AND SOUND KNOWLEDGE

LETTER	NAME	SOUND	WORD	LETTER	NAME	SOUND	WORD
1. r				14. s			
2. h				15. d			
3. a				16. v			
4. z				17. y			
5. o				18. e			
6. j				19. p			
7. g				20. k			
8. w				21. b			
9. l				22. u			
10. f				23. c			
11. n							
12. t							
13. i							

APPENDIX C
PHONOLOGICAL AWARENESS TESTS

Student's first name _____ No. _____

Campus Location N.W. day N.W. eve. T.H. Coq. Tutoring KEC

RHYMING TEST

STIMULUS	RHYME CHOICES	STUDENT'S RHYMING WORD
1. man -	can, mike, mat, than	_____
2. kite -	bait, right, coat, like	_____
3. soup -	soul, lap, hoop, group	_____
4. pig -	wig, dig, stick, peg,	_____
5. steak -	rake, fake, hate, break	_____

Total score /20 judgement /5 production

NOTES

Student's first name _____ No. _____

Campus Location N.W. day N.W. eve. T.H. Coq. Tutoring KEC

BLENDING TEST

SEGMENTED WORD	REPETITIONS	RESPONSE
-----------------------	--------------------	-----------------

Syllables

1. re-cord		
2. ta-ble		
3. win-dow		
	/3	

Onset and Rime

4. c-all		
5. m-ake		
6. sh-op		
7. gr-ab		
8. ch-air		
9. st-ep		
	/6	

Phonemes

10. i-f		
11. d-o		

12. u-s _____
13. s-i-de _____
14. l-i-ght _____
15. c-a-n-d-le _____
16. s-p-r-ea-d _____
17. m-u-s-i-c _____
18. s-o-me-t-i-me-s _____
19. d-o-n-u-t _____

/10

Student's first name _____ No.

Location N.W. day N.W. eve. T.H Coq. Tutoring KEC

SEGMENTATION TEST

PART 1

PSEUDOWORD	REPETITIONS	RESPONSE
1. dapnag	_____	_____
2. stupnike	_____	_____
3. fimjore	_____	_____
4. scirpont	_____	_____
5. dispothing	_____	_____

PART 2

1. wop	_____	_____
2. jine	_____	_____
3. frain	_____	_____
4. rud	_____	_____
5. dat	_____	_____
6. tay	_____	_____
7. tob	_____	_____
8. nop	_____	_____
9. seeb	_____	_____

3 of/de 3

PM-1 3 1/2" x 4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

PRECISIONSM RESOLUTION TARGETS

10. po /poe/	_____	_____
11. haiv	_____	_____
12. tham	_____	_____
13. zee	_____	_____
14. thry /thri/	_____	_____
15. ik	_____	_____
16. ut	_____	_____

APPENDIX D**PIZZA FLYER****APPENDIX E****PIZZA FLYER QUESTIONS AND RECORD SHEET**

Salads

NOT 2 FOR 1

GREEK	Sm 4.75 Lg. 6.50
Tomatoes, Cucumbers, Onions, Green Peppers, Olives, topped with Feta Cheese and Olive Oil	
CAESAR	Sm. 4.75 Lg. 6.45
Lettuce, Onions, Green Peppers, Olives, Tomatoes, topped with Mozzarella Cheese	
ITALIAN	Sm. 4.75 Lg. 6.50
Lettuce, Onions, Green Peppers, Olives, Tomatoes, topped with Mozzarella Cheese	
TOSSED SALAD	1.50
GARLIC BREAD	1.00
POP	1.00
1 LITRE PEPSI	1.75
SUBMARINE SANDWICHES	
1 SALAMI, PEPPERONI, CHEESE	3.95
2 BACON, MUSHROOMS, CHEESE	3.95
3 SALAMI, PEPPERONI, BACON	4.50
OR CREATE YOUR OWN	

Pastas

2 FOR 1

Baked Lasagna	10.95
Our most popular dish with meat sauce	
Spaghetti a la Bolognese	10.95
Topped with mushroom meat sauce and covered with cheese	
Small Order	
Spaghetti	8.95
Lasagna	8.95
Ravioli	11.95
Small squares of pasta, packed with ground meat and topped with meat sauce	
Baked Spaghetti	10.95
Topped with meat sauce	
Above orders served with toasted pork bread	
Meat Balls with above	1.50
\$3.00 OFF On All Single Orders	

House Specialty

NOT 2 FOR 1

SOUVLAKIA	
BEEF	9.95
CHICKEN	10.95
MIXED SOUVLAKI	10.95
<i>A hearty combination of beef and chicken. Served with rice or baked potato, Greek salad & garlic bread.</i>	
B.B.Q. 2 FOR 1	
TENDER LEAN BAR-B-QUE	
BAR-B-QUE CHICKEN	15.95
Topped with our own tangy sauce	
CHICKEN AND B.B.Q.	
BACK RIBS	17.95
Above orders served with choice of baked potato, baked beans or spaghetti, salad and sour bread	

FREE!! LITRE OF PEPSI

With Any Order Over \$12

Pick-up only (Not Including Tax)

438-8151

Delivery Starts 4:00 p.m.

**LAST DELIVERY HALF HOUR
BEFORE CLOSING TIME**

OPEN 7 DAYS A WEEK

Monday to Thursday	4 p.m. to 11:30 p.m.
Friday	4 p.m. to 1:00 a.m.
Saturday	4 p.m. to 1:00 a.m.
Sunday & Holiday	4 p.m. to 10:30 p.m.

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MINIMUM DELIVERY \$ 6.50

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VILLAGE HOMETOWN PIZZA

SPAGHETTI HOUSE

(VILLAGE MALL)

7751 Champlain Crs.
Vancouver, B.C.

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FREE HOME DELIVERY

With \$6.50 Minimum Order

Limited Time Offer

1 Free Can of Pop
With over \$12.00

• DELIVERY ONLY • NOT INCLUDING TAX

FREE!! LITRE OF PEPSI

With Any Order Over \$12

Pick-up only

(NOT INCLUDING TAX)

**2 FOR 1
FREE
DELIVERY**

ITALIAN SPECIAL PIZZA	FACTORY SPECIAL
		Italian Sausage, Mushroom, Onions, Pepperoni, Cheese Tomato Sauce.	BACON, Sausage, Pepperoni, Mushrooms, Olives, Green Peppers, Cheese and Tomato Sauce
		13.45 18.45 18.85	12.15 15.95 18.25
		HOMETOWN SPECIAL	SPECIAL SALAD PIZZA
		Pepperoni, Mushrooms, Green Peppers, Onions, Olives, Cheese, Beef, Tomato Sauce.	SLICED TOMATOES, Green Peppers, Olives, Pineapple, Mushrooms, Feta Cheese, Spice of Great Oregon
		12.15 15.95 18.25	12.15 15.70 17.95

P-I-Z-Z-A

FREE!! LITRE OF PEPSI Pick-up only		With Any Order Over \$12 (Not Including Tax)	
		Small 10"	Med 12"
All pizzas are served with cheese & tomato sauce			
1. SHRIMPS, MUSHROOMS	11.35	14.70	16.95
2. CANADIAN HAM MUSHROOMS	11.35	14.70	16.95
3. CANADIAN HAM	10.95	14.20	16.85
4. CHEESE & TOMATO SAUCE	10.95	14.20	16.75
5. PEPPERONI, MUSHROOM, GREEN PEPPERS	11.85	14.70	17.45
6. MUSHROOMS, ONIONS	11.35	14.70	16.95
7. MUSHROOMS, GREEN PEPPERS	11.35	14.70	16.95
8. ITALIAN SALAMI and PEPPERONI	11.35	14.70	16.95
9. CANADIAN HAM, FRESH TOMATOES	11.35	14.70	16.95
10. CANADIAN HAM & PEPPERONI	10.95	14.20	16.75
11. MUSHROOMS	11.35	14.70	16.95
12. CANADIAN HAM & PINEAPPLE	11.35	14.70	16.95
13. PEPPERONI, MUSHROOM, ONIONS	11.85	14.70	17.45
14. PEPPERONI	10.95	14.20	16.85
15. CANADIAN HAM, PEPPERONI, MUSHROOM	11.85	14.70	17.45
16. ITALIAN SALAMI	10.95	14.20	16.85
17. ITALIAN SALAMI, MUSHROOMS	11.35	14.70	16.95
18. LEAN BEEF, GREEN PEPPERS, ONIONS	11.85	14.70	17.45
19. ITALIAN SALAMI, CAN. HAM, PEPPERONI	11.85	14.70	17.45
20. LEAN BEEF, MUSHROOMS	11.35	14.70	16.95
21. SHRIMPS, MUSHROOMS, GREEN PEPPERS	11.85	14.70	17.45
22. HOT PEPPERONI	10.95	14.70	16.85
23. MUSHROOMS, PINEAPPLE	11.35	14.70	16.95
24. PINEAPPLE	10.85	14.20	16.85
25. HOT PEPPERONI, MUSHROOMS	11.35	14.70	16.95
26. PEPPERONI, MUSHROOMS	11.35	14.70	16.95
27. CANADIAN HAM, ITALIAN SALAMI	11.35	14.70	16.95
28. BANANA PEPPERS, ONIONS, PEPPERONI	11.85	14.70	17.45
EXTRA TOPPING - For each topping		1.00	1.25 1.50

2 FOR 1

IT'S FASTER IF YOU ORDER BY NUMBER **\$4.00 OFF ON ALL SINGLE ORDERS**
 ALL OUR PIZZAS ARE MADE WITH FRESH DAILY INGREDIENTS **438-8151**
 FOR DELIVERY OR PICK UP Prices subject to change without notice

S P E C I A L S		THE FLAME	Small Medium Large 10" 12" 14"
		Capezio, Hot Pepperoni, Onions, Green Peppers, Cheese and Tomato Sauce	12.95 16.25 17.95
		ALL DRESSED, Pepperoni, Mushrooms, Shrimp, Gr. Peppers, Cheese, Tomato Sauce	2 FOR 1 12.95 16.25 17.95
		ALL BUT THE COOK	14.05 17.45 20.05
		ALL MEATS	12.05 16.95 18.05
		FREE!! LITRE OF PEPSI	
		With Any Order Over \$12 Pick-up only	

FAMILY DINNERS- (NOT INCLUDING TAX)	
1. ONE MEDIUM PIZZA	
3 toppings - your choice	
1/2 B.B.Q. CHICKEN	
with Spaghetti or Lasagna	
ONE GREEK SALAD	
OR CAESAR SALAD	
& GARLIC BREAD	
ALL FOR ONLY! \$18.95	
2. ONE LARGE PIZZA	
3 toppings - your choice	
ONE B.B.Q. RIBS	
with Lasagna or Spaghetti	
ONE GREEK SALAD	
OR CAESAR SALAD	
ALL FOR ONLY! \$22.50	

2 FOR 1
 FREE DELIVERY
 CALL AND YOUR ORDER
 WILL BE READY WHEN YOU ARRIVE
 MINIMUM DELIVERY \$6.50

Student's first name _____ No. _____

Campus Location N.W. day N.W. eve. T.H. Cog. Tutoring KEC

		CONTEXT LOGO.	VISUAL PHO.	ALPHA
a.1	Can you tell me what type of food the restaurant makes?			
a.1 i	(If unable to answer a.1) Can you find the word 'pizza'?			
a.2	How do you know that?			
a.2 i	How do you know that word is 'pizza'?			
b.1	Can you tell me how much I would have to pay for a small mushroom pizza?			
b.2	How do you know that?			
c.1	Is there a charge for delivery?			
c.2	How do you know that?			
d.1	Part of the flyer advertises family dinners. Can you show me where that is?			
d.2	How do you know that?			

APPENDIX F
READING PASSAGES

HELLO, WORLD

Zeke worked in a mill. The work was hard.

Carl was the foreman. He was a hard man to work for.

Carl said, "Keep it moving. Don't just stand there. Get a move on."

Zeke hated his job. He hated doing the same thing every day. He hated the low pay. And he hated Carl.

One day Carl came up to Zeke. Zeke was working hard.

Carl said, "Move it, Zeke."

Zeke said, "I am moving. Get off my back. And get lost."

Carl fired Zeke.

Zeke went home. Now he was out of a job. The only jobs in town were at the mill. But there were other towns. There were other jobs.

Zeke packed his bag. Then he walked to the bus station. He whistled on the way.

Zeke got on the bus. The bus pulled out. Zeke smiled. "Hello, world," he said.

From: Hello, World and Other Stories
by J. Anderson, B. Longnion and M. Gillis
Prentice-Hall Inc.
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reprinted with permission of the publisher

A LONG ROAD

It's not my real name, but you can call me Kate. Kate is such a simple name. It's almost too simple for the complicated life I've led. When I look back, it seems hard to believe the turns my life has taken.

My mother and dad were divorced. I wound up living with my grandparents.

They loved me very much, but they were very strict. They saw the outside world as a dangerous place. They wanted to keep me from all that they thought was bad. For instance, I could not go out with boys until I was out of high school.

The summer after I finished high school, I went to work. I also began going out with a boy I had known for a long time.

In a few months we were married. After less than a year our marriage was over.

Then came Steve. His childhood had been hard. But that only seemed to make him strong.

Steve was glad to have someone to love. He was very smart, even though he had not had very much schooling. I loved him and looked up to him. We were married soon after we met.

During the next ten years the changes came thick and fast. We had five children in six years. I love children and wanted all of them. Needless to say, they kept us very busy.

The biggest change was that Steve became an alcoholic. When we were first married, his drinking didn't seem like a big problem. But as time went on, it became a bad dream that had no end.

At first Steve drank only on weekends. He could hold down a job.

He drank to kill the pain of his early life. But when he drank too much, all that old pain and anger came out. It was turned against anyone who was around.

There came the time when Steve started to lose jobs. We had to move around. Sometimes we moved to find jobs. Sometimes we moved because we couldn't pay rent.

Other problems began to show up. We could not handle our second child, June. She had special problems. She would hurt her younger brother. Between Steve's drinking and our moving around, we could not give her the help she needed.

I have had to do many hard things in my life. One of the hardest was giving up June. She needed a family that could give her lots of extra time and help. Besides, the younger children were in danger. We had to do something. We could not put it off any longer. We signed the papers. June was adopted by a special, loving family.

As the years went by, the problems piled up. When Steve drank, he could tear a house apart. He lost jobs. We lost houses. Now he had to drown present pain as well as past pain. There were times when we had no place to live. Then the children had to stay with other people.

I learned to take one step at a time. I could not give up on Steve. I knew the man I loved was still there, under all the drinking and anger. I would not leave that Steve.

But it was hard sometimes. I saw what the drinking was doing to the children. I knew what it was doing to me.

It seems that the last five years have been both the best and the worst ones. At one time we were living in our car because we had no place to go. But soon after that Steve began to see how much he needed help. Three years ago in March he went to an alcoholic treatment center.

It seems right that it happened in March. Since then it has been like a long, late spring after a hard winter.

We have had some bad drinking since then. We have gone through other failures as well. But we are slowly turning things around.

Steve has joined AA, Alcoholics Anonymous. The children and I are in Al-Anon. Al-Anon helps the families of alcoholics.

I tell my family that you can never be sure about where life will take you. And I believe that. I also believe that there are some things you can be sure of. And no matter how long your own road is, you can travel it with your head up.

From: Easy Money the Hard Way and Other Stories
by J. Anderson, B. Longnion and M. Gillis
Prentice-Hall Inc.
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A GOOD MAN

"Sorry, John," Tom said. "I feel awful leaving you like this, but fishing in this town is dead. Everyone is going to work in the mill. The pay is better, and the hours are shorter. I don't have any choice. I'm going to work in the mill, too."

John's heart sank. Where would he find someone to take Tom's place? Tom was right. The mill did pay better, and the hours were shorter.

John remembered when there had been more than a hundred fishing boats in town. Fishing had been the main business.

But that was before the mill came. It was before the price of gas to run the boats went sky-high. Now it was hard to make a living by fishing. And you couldn't get help anyway.

Well, he wouldn't give up. The sea was his life. He'd grown up in the boat. He'd rather die at sea than go to work in the mill.

But he did need help. It was too much for one man. He could work alone for a short time, but he'd need help as soon as possible.

When John got home, Martha had dinner ready. After dinner John told her about Tom.

"You can't run the boat alone," Martha said. "It's too much, even for a younger man. And you're not young any more. You've just got to find someone to help you."

John knew Martha was right. But what could he do?

John went to see his friends who were still fishing. None of them had an answer. They were having a hard time finding help, too.

So John started working on his boat alone. It was hard, and the days were long. He didn't dare go out unless the forecast was good. He

knew it would be too hard to handle the boat in a storm.

One morning John was getting ready to go out. A girl came along the dock and stopped to talk to John.

"My name's Sarah Halem," she said. I hear you're looking for help. I'd like the job."

John blinked. She must be joking. Sarah was about the size of a twelve-year-old and a girl to boot. What did she think she could do on a boat? And, besides, women were bad luck at sea.

John cleared his throat. "Well, Now," he said. "What do you know about fishing?"

"I know a great deal," said Sarah. "My brother had a fishing boat. I used to help him."

"Was your brother Gus Halem?" asked John.

"Yes," said Sarah.

"He got lost at sea during the storm last August," said John. "Never found him or his boat."

"That's right," said Sarah. "But that's because I wasn't with him. It was too hard to run the boat by himself. If I'd been there. My brother would still be alive. We'd still have the boat and I wouldn't need a job."

"How old are you?" John asked.

"Nineteen," said Sarah. "And I'm strong--real strong. I know I don't look like it, but I'm good around boats. And I'm good with motors. I'll work hard--real hard. You'll see."

Sarah looked so serious that John wanted to laugh. This was crazy. No one in his right mind would hire a girl.

"Sorry," John said. "I'm not in the market for a hand." He

wondered if she knew that was a lie.

Sarah looked unhappy. "Well," she said, "thanks for your time. If you ever change your mind, let me know, will you?"

"Sure," said John. He knew he would never change his mind about the girl.

That night John told Martha about Sarah. John thought Martha would laugh. Instead she looked at John as if he were crazy.

"Listen, John," she said, "you should give her a chance. I know Sarah worked for Seth Hawkins for a while, and he said she was real good. But you know Seth. He never could keep his hands off a girl. I heard that he made a pass at Sarah, and she up and quit. And I know her brother thought she was good. He trained her himself after his father died. Why don't you try her? You're killing yourself running that boat alone."

John thought about it. Then he said slowly, "I'll give her a try. But how do you know I'll keep my hands off her any better than Seth?" He grinned at Martha.

Martha grinned back. She knew John. He'd asked her to marry him when they were in second grade. Why, he'd never even taken another girl out. They's always known that they would get married. And now they'd been married for almost thirty years.

Then Martha said, "Just remember, I swing a mighty mean rolling pin. Don't you dare fool around with anyone else, John Ware!"

John laughed. He walked over and sat on the arm of Martha's chair. He leaned over and kissed her hard.

"There's never been anyone but you," he said. "And I'll give the girl a chance. Maybe she'll change my luck."

Sarah started working for John the next day. He was amazed.

Sarah was good. She seemed to know everything there was to know about fishing. She never seemed to hurry, but she always got everything done in good order. John almost never had to tell Sarah what to do. And, best of all, she was genius with the engine.

John's boat was called the Martha Ann. He had owned her for fifteen years. She was a good boat, and she handled well. But the engine had always given John trouble. It wanted to conk out during emergencies.

Sarah knew how to handle the engine. She had a knack with it. She would take it apart and clean it and then put it back together again. The engine ran beautifully. Sarah talked to the engine just as though it was a friend. It always ran for her.

After Sarah had been working for about a month, she and John went out early one morning. The fishing was good, but they kept an eye on the sky all day. The clouds got lower, and the wind picked up.

"We'd better head back," John said.

"Yes," said Sarah. "I'll get her started." Sarah started the engine and headed for home.

Suddenly the weather closed in. The wind turned into a gale, and before long the rain started. It didn't just rain--it poured. Water came down in sheets, and it was hard to see.

The boat tossed like a cork, and Sarah fought to keep the boat on course. John was stowing the gear. He peered through the rain and saw how hard Sarah was fighting. He thought he'd better give her a hand, so he started toward Sarah. And then it happened.

John slipped and fell. Pain shot through his arm. He was sure it was broken.

"I think I broke my arm," John shouted.

Sarah turned and stared at John, who was sliding around in the bottom of the boat, trying to protect his arm.

"Hang on," Sarah shouted back. She had just started toward John when the engine stopped. John groaned aloud, more from the thought of the engine stopping than from pain. Sarah didn't bat an eye but turned around to get to the engine. She had to get it started, or they would be gone.

John watched as Sarah worked. She took each piece of the engine and checked it over. Then she dried it and replaced it.

John wondered if Sarah would ever get the engine going. He knew they must be close to the rocks along the shore. Would Sarah be able to save the Martha Ann?

The boat pitched harder, and John rolled and slid, unable to help himself. The rain kept coming, and it got colder. The wind was blowing

even harder now.

Finally Sarah replaced the last part and tried the engine. It turned over and kept going. The sound of the engine was the best thing John had ever heard. Sarah grinned at John and gave him a thumbs up signal.

It seemed to take hours, but at last they were home. Sarah tied up the boat and then went to take care of John.

First she took a rag and tied his arm tight to his body. Then she helped him ashore. John grunted with pain.

"I'll get you to the hospital," Sarah said. "I'll call Martha from there and tell her that you're all right."

"Yes, I'm all right," John said. "And it's thanks to you I am. If it hadn't been for you, I'd never have made it." John thought that whoever had said women were bad luck at sea was crazy. Without Sarah he'd be dead by now.

"We won't be going out until your arm mends," said Sarah. "I'll try to find some work until you're ready to go out again."

"No need to do that," said John. "You work for me, and I'll pay you whether we go out or not. I'll think of plenty of things for you to do to earn your pay."

"You don't have to pay me," Sarah said. "I'll come back when you're okay again."

"No, sir," said John. "Like I said, you work for me and no one else. I don't want to lose you. A good man is hard to find."

Sarah laughed. He'd called her a good man. Well, that was all right with her. She didn't care whether he called her a good man, woman, or chicken, for that matter. Just as long as she could work at sea.

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ALL THE YEARS OF HER LIFE

It was closing time at the drugstore. Alfred Higgins had just put on his coat. Mr. Carr, the drugstore owner, stood behind the cash register. As Alfred started to leave, Mr. Carr said, "Just a moment, Alfred. One moment before you go."

The way Mr. Carr said it made Alfred nervous. Alfred had been working in the drugstore for six months. In all that time, he had never heard Mr. Carr speak so quietly.

"May I ask you to take a few things out of your pocket?" Mr. Carr said. "You can leave them here before you go."

"What things?" Alfred asked nervously. "What are you talking about?"

"You've got a compact of face powder and a lipstick. You've also got at least two tubes of toothpaste."

"What do you mean?" Alfred said. "Do you think I'm crazy?"

Mr. Carr, who was now standing by the door, nodded. Alfred got scared, and he didn't know what to say. He put his hand into his coat pocket. He took out a compact, two tubes of toothpaste, and a lipstick. He put them on the counter, one by one.

"How long has this been going on?" Mr. Carr said quietly.

"This is the first time I ever took anything," Alfred said.

"It won't do any good to lie," Mr. Carr said. "Do I look like a dope? Do you think I don't know what goes on in my own store?"

Ever since Alfred had quit school, he had been getting into trouble on his jobs. A familiar fear began growing inside him. He felt it every

time he got into trouble like this.

"I liked you," Mr. Carr said. "I would have trusted you. Now look what I have to do. I don't like to call in a cop. Maybe I should call your father and tell him what a fool you are. Maybe I should let him know you could go to jail."

"My father's not home," Alfred said. "He works nights."

"Is anybody home?"

"My mother, I guess."

"Then we'll see what she says," Mr. Carr said. He went to the phone and dialled the number.

Alfred wasn't ashamed. but that fear kept growing inside him. When he spoke, he tried to sound like an adult.

"Just a minute," he said. "You don't have to bring anybody else into this. You don't have to tell her."

He wanted to sound like a big guy who could take care of himself. But he secretly hoped that someone at home would come and help him.

"Yeah, that's right," Mr. Carr was saying at the phone. "He's in trouble. You'd better come down in a hurry."

Mr. Carr hung up and looked out the door. "I'll keep my eye out for a cop," he said.

Alfred knew how his mother would come rushing in. She would rush in with fire in her eyes. Or maybe she would be crying. If he tried to talk to her, she would push him away. She would make him feel stupid and worthless. Still, he hoped she would arrive before Mr. Carr saw a cop.

While they waited, neither of them said a word. Finally, there was

a tapping on the door. Mr. Carr unlocked it and said, "Come in, Mrs. Higgins." His face looked hard.

Mrs. Higgins walked inside with a little smile on her face. She didn't look the way Alfred thought she would. She held out her hand to Mr. Carr.

"I'm Mrs. Higgins," she said politely. "I'm Alfred's mother."

Mr. Carr was a little embarrassed by her politeness. For a moment, he didn't know what to say.

"Is Alfred in trouble?" she asked.

"He is," Mr. Carr said. "He's been taking little things from the store. I caught him tonight. He takes stuff that he can sell easily."

"Is it true, Alfred?" she asked.

"Yes," Alfred said.

"Why have you been doing it?"

"I needed more money," he said.

"For what?" his mother asked.

"Just going around with the guys," Alfred said.

Mrs. Higgins turned to Mr. Carr. She touched his arm. "What did you plan to do, Mr. Carr?" she asked.

"I was going to call a cop. That's what I should do."

"I suppose so," she said. "But sometimes a little good advice is the best thing for a boy his age."

Alfred couldn't understand why his mother was so quiet and calm.

If they had been at home, she would be shouting at him. Instead, she was standing there with a gentle, sad smile on her face.

"Don't you think it might be better," she said, "if you let him come home with me?"

Alfred realized that Mr. Carr was puzzled by his mother. Mr. Carr had expected her to come in and beg him for mercy. Instead, her calmness and understanding were making him feel a little ashamed.

"Well," Mr. Carr said, "I don't want to be too hard. I'll tell you what I'll do. I'll just fire him and forget about it. How's that?"

Mrs. Higgins shook his hand. "I'll never forget your kindness," she said warmly.

Mr. Carr said just as warmly, "I'm sorry we had to meet this way. I just wanted to do the right thing."

"Meeting like this is better than never meeting at all," she said, smiling. Then they parted as if they were old friends.

The mother and son walked along the street together. Alfred was afraid to speak to her. But the silence made him aware of her strength and toughness. He began wondering what she was thinking of. She seemed to have forgotten that he was walking next to her.

Finally, he said, "I'm sure glad it turned out like that. I certainly won't do anything like that again."

"Be quiet," she said firmly. "You've disgraced me again and again."

"That's the last time. That's all I'm saying."

"Have enough sense to be quiet," she said. She walked on, looking straight ahead.

When they got home, she made him feel afraid again. "You're just no good," she said. "God forgive you. It's always been one thing after another. Why are you standing there looking stupid? Go to bed."

He turned to go. She said, "I'm going to have a cup of tea. Don't say a word about this to your father."

Lying in bed, Alfred listened to his mother moving around in the kitchen. He felt no shame. But he did feel admiration for her strength and calmness.

"She certainly was smooth," he thought. "I'd like to tell her how well she handled the whole thing."

He got up and went to the kitchen. He stood in the doorway, and she didn't see him. He saw the fear in her face. It wasn't anything like the face of the woman who was so confident in the drugstore.

When she picked up the kettle to pour the hot water, her hand was

shaking. He watched her raise the cup. Her lips moved for the cup, as if they might never reach it. Her hand was still shaking. She looked very old.

Alfred realized that this was the way it had always been when he'd been in trouble. The shaking fear had really been inside her as she had rushed out to the drugstore. He remembered the night his younger sister had insisted that she was going to get married. He understood why his mother had sat alone in the kitchen all that night.

Now he felt everything his mother had been thinking about as they walked home a little while ago. At that moment, his youth seemed to be over.

He understood all the years of her life from the way her hand shook as she raised the cup. It seemed to him that this was the first time he had ever really seen his mother.

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by Morley Callaghan

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APPENDIX G
ORAL READING RECORD SHEET

APPENDIX H

**READING LEVELS, LETTER NAME AND SOUND KNOWLEDGE
AND PHONOLOGICAL AWARENESS SCORES FOR ALL
SUBJECTS**

Individual Scores (in Percentages)

	Reading Passage			Letter Name and Sound Knowledge		Rhyme		Blending		Segmenting	
	Name	Sound	Word	Judgement	Production	Syllable	Onset - Rime	Phoneme	Syllable	Phoneme	
GIC	2	96	43	100	50	40	100	50	-	80	-
RE	PZ	96	48	61	-	-	66	33	-	80	-
JN	4	100	96	100	65	60	100	83	80	80	75
JK	4	100	96	100	80	100	100	83	80	100	75
SA	4	100	96	100	85	80	100	100	80	100	81
DM	4	100	100	100	70	100	100	100	80	80	88
EF	4	100	70	100	85	80	100	66	-	100	25
DR	4	100	96	91	65	40	100	100	90	100	75
KB	PZ	100	73	91	50	60	100	50	-	60	-
RB	PZ	96	78	91	-	-	66	66	50	60	-
AF	PZ	100	65	91	65	60	100	83	90	100	50
LH	1	100	91	100	65	80	100	100	70	100	50
CMc	1	96	91	100	55	20	100	83	50	20	19
EH	1	100	83	100	85	100	100	83	70	80	-
AH	4	100	70	100	-	-	100	66	60	60	-
AM	1	100	91	100	75	100	100	100	90	80	75
DW	4	100	96	100	90	100	100	100	70	80	75

Individual Scores (in Percentages)

Reading Passage	Letter Name and Sound Knowledge			Rhyme		Blending			Segmenting		
	Name	Sound	Word	Judgement	Production	Syllable	Onset - Rime	Phoneme	Syllable	Phoneme	
JG	3	100	87	91	85	80	100	100	60	100	38
GC	2	100	78	100	55	100	100	83	—	40	—
JS	4	100	100	100	75	40	100	100	90	100	63
VH	4	100	78	91	80	40	100	67	—	100	—
HO	1	100	87	96	75	80	33	67	—	80	—
CL	4	96	96	96	80	60	100	100	90	100	63
DG	4	100	96	100	95	100	100	100	80	100	69
DQ	4	100	52	96	65	0	100	100	60	80	94
ShC	4	100	91	100	95	75	100	100	70	60	81
AB	1	96	78	100	85	20	100	100	40	80	80
EO	4	100	87	100	100	60	100	83	80	100	100
BB	2	100	87	100	85	60	100	100	80	80	94
JH	4	100	87	100	95	100	100	100	60	100	69
IK	2	100	57	100	65	80	100	33	—	100	—
JF	3	100	78	100	70	60	100	83	70	60	—
TB	4	100	91	100	100	80	100	100	90	100	56

APPENDIX I

**PHONOLOGICAL AWARENESS SCORES AND
TEACHER RATINGS BY PHONOLOGICAL AWARENESS
GROUP**

**Phonological Awareness Groups - Reading Level,
Phoneme Scores and Progress Rating**

Lowest P.A. Group				
Name	Passage Level	Pho. Blend	Pho. Seg.	Progress Rating
GC	2	0%	0%	n-s
VH	4	0	0	--
HO	pz	0	0	n-s
IK	2	0	0	n-s
JF	3	70	0	n-s
GIC	2	0	0	fair
RE	pz	0	0	n-s
EF	4	0	25	--
KB	pz	0	0	n-s
RE	pz	50	0	--
CMc	pz	50	19	n-s
EH	1	70	0	n-s
AH	4	60	0	--
Middle P.A. Group				
Name	Passage Level	Pho. Blend	Pho. Seg.	Progress Rating
JS	4	90%	63%	fair
CIL	4	90	63	n-s
DG	4	80	69	fair
JH	4	60	69	fair
TB	4	90	56	good
AF	pz	90	50	good
AB	1	40	80	good
JG	3	60	38	fair
LH	1	70	50	--
ShC	4	70	81	good
DQ	4	60	94	--
DW	4	70	75	fair
pz = Pizza flyer n-s = none to slow				

**Phonological Awareness Groups - Reading Level,
Phoneme Scores and Progress Rating**

Highest P.A. Group				
Name	Passage Level	Pho. Blend	Pho. Seg.	Progress Rating
EO	4	80%	100%	good
BB	1	80	94	fair
JK	4	80	75	fair
JN	4	80	75	good
SA	4	80	81	--
DM	4	80	88	fair
DR	4	90	75	fair
AM	1	90	75	--
pz = Pizza flyer n-s = none to slow				

APPENDIX J**LETTER CALLERS AND OTHERS BY LETTER SOUND
AND PHONOLOGICAL AWARENESS MEASURES**

**Letter Callers and All Others¹ by Letter Sound
and Phonological Awareness Measures**

	Letter Callers (n = 5)		Others (n = 24)		Sig. of Diff.
	Mean	S.D.	Mean	S.D.	
Letter Sound	69.6	18.8	87.5	11.5	**
Rhyme Judge.	66.0	14.3	76.9	20.5	
O-R Blend.	63.2	21.7	92.3	12.2	**
Phoneme Blend.	14.0	31.3	67.5	24.7	**
Phoneme Seg.	0	0	60.2	30.6	
¹ Pizza flyer readers excluded					
* p < .05 ** p < .01					

APPENDIX K
IK ORAL READING ANALYSIS SAMPLE

^{SP} pain and ^{SP} anger came out. ^{turned} ^{against} ^{ness} It was ^{SP} turned ^{SP} against ^{SP} anyone ^{SP} who ^{SP} was ^{SP} around.

^{Here} ^{come} There came the time when Steve ^[start] ^{loss} started to ^{SP} ^{SP} lose jobs. We had to move

around. ^{SP} Sometimes ^{SP} we ^{SP} moved ^{SP} to find jobs. ^{SP} Sometimes ^{SP} we ^{moved} moved ^{SP} because ^{SP} we ^{SP} couldn't pay rent.

Other ^{SP} problems ^{SP} began to ^{SP} show up. ^{SP} ^{handle} We ^{SP} could ^{SP} not ^{SP} handle ^{SP} our ^{SP} second ^{SP} child, ^{SP} ^{spiritual ? P} ^{SP} ^{spiritual} ^{SP} June. ^{SP} She ^{SP} had ^{SP} special ^{SP} problems, ^{SP} She ^{SP} would ^{SP} hurt ^{SP} her ^{SP} younger ^{SP} brother. ^{SP} Between ^{SP} ^{was} ^a ^{SP}

Steve's drinking ^{and} our moving around, we could not give her ^{the} help she ^[need] needed

I have had to do ^{SP} ^{SP} ^{SP} many ^{SP} hard things in my life. One of the ^{SP} hardest was ^{SP} giving up June. ^[need] She ^{SP} needed ^{SP} a family ^{SP} that ^{SP} could ^{SP} give ^{SP} her ^{loss} ^{SP} lots ^{SP} of ^{SP} extra time and

APPENDIX L**PIZZA GROUP AND ALL OTHERS BY LETTER SOUND
AND PHONOLOGICAL AWARENESS MEASURES**

**Pizza Group and All Others by Letter Sound
and Phonological Awareness Measures**

	Pizza (n = 6)		Others (n = 27)		Sig. of Diff.
	Mean	S.D.	Mean	S.D.	
Letter Sound	73.7	15.7	84.1	14.8	
Rhyme Judge.	40.8	32.8	75.7	20.1	*
O-R Blend.	63.7	19.4	88.1	17.9	**
Phoneme Blend.	31.7	37.6	60.7	31.7	
Phoneme Seg.	11.5	20.3	52.8	35.6	**
<p style="text-align: center;">* p < .05 ** p < .01</p>					

REFERENCES

- Adams, Marilyn Jager
1990 *Beginning to Read: Thinking and Learning about Print.*
Cambridge: MIT Press.
- Adams, Marilyn Jager
1994 Modeling the Connections Between Word Recognition
and Reading. Pp. 838-863 in *Theoretical Models and
Processes of Reading.* Robert Ruddell, Martha Rapp
Ruddell and Harry Singer, eds. Newark, Delaware:
International Reading Association, Inc.
- Alexander, Ann, Kytja Voeller, Joseph Torgesen
1991 Phonological Awareness Training and Remediation of
Analytic Decoding Deficits in a Group of Severe
Dyslexics. *Annals of Dyslexia*. 41: 193-206.
- Ammon, Paul, Herbert Simons and Charles Elster
1990 *Effects of Controlled, Primerese Language on the Reading
Process.* Technical Report No. 45. Center for the Study
of Writing, Berkeley, CA.
- Awaida, May, and John R. Beech
1995 Children's Lexical and Sublexical Development While
Learning to Read. *Journal of Experimental Education*.
63(2): 97-113.
- B.C. Ministry of Education
1980 Teach Them the Way They Learn: A Means to Identify
and Teach Learning Disabled Adults. Delta, B.C.: Delta
Continuing Education.

- Backman, Joan, Margaret Bruck, Martine Hebert, and Mark S. Seidenberg
1984 Acquisition and Use of Spelling-Sound Correspondences in Reading. *Journal of Experimental Child Psychology*. 38: 114-133.
- Ball, Eileen W.
1993 Assessing Phoneme Awareness. *Language, Speech, and Hearing Services in Schools*. 24: 130-139.
- Ball, Eileen W., and Benita A. Blachman
1988 Phoneme Segmentation Training: Effect on Reading Readiness. *Annals of Dyslexia*. 38: 208-225.
- Barron, Roderick W.
1986 Word recognition in early reading: A review of the direct and indirect access hypotheses. *Cognition*. 24: 93-119.
- 1991 Proto-Literacy, Literacy and the Acquisition of Phonological Awareness. *Learning and Individual Differences*. 3(3): 243-255.
- Barton, David
1981 Literacy and Awareness of Segmental Structure in Adult Learners. Paper presented at the Annual Meeting of the American Association for Applied Linguistics. New York, NY.
- 1985 Awareness of Language Units in Adults and Children. Pp. 187-205 in *Progress in the Psychology of Language*, A.W. Ellis, ed. Hillsdale, NJ: Lawrence Erlbaum, Associates, Inc.
- Beech, John R., and Leonora M. Harding
1984 Phonemic Processing and The Poor Reader From a Developmental Lag Viewpoint. *Reading Research Quarterly*. 19(3): 357-366.

- Bergeron, Bette, S.
1990 What Does the Term Whole Language Mean? Constructing a Definition from the Literature. *Journal of Reading Behavior*. 22(4): 301-329.
- Bertelson, Paul
1986 The Onset of Literacy: Liminal Remarks. *Cognition*. 24: 1-30.

1993 Reading Acquisition and Phonemic Awareness Testing: How Conclusive are Data from Down's Syndrome: Remarks on Cossu, Rossini, and Marchall, 1993. *Cognition*. 48: 281- 303.
- Bertelson, P., J. Morais, J. Alegria, and A. Content
1985 Phonetic Analysis Capacity and Learning to Read. *Nature*. 313: 73-74.
- Biemiller, Andrew
1970 The Development of the Use of Graphic and Contextual Information as Children Learn to Read. *Reading Research Quarterly*. 5: 75-96.
- Blachman, Benita A.
1991 Phonological Awareness: Implications for Prereading and Early Reading Instruction. Pp. 29-36 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan A. Brady and Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.

1994 What We Have Learned From Longitudinal Studies of Phonological Processing and Reading, and Some Unanswered Questions: A Response to Torgesen, Wagner, and Rashotte. *Journal of Learning Disabilities*. 27(5): 287-291.
- Boraks, Nancy E.
1982 The Learning-to-Read Process of the Adult Beginning Reader. Paper read at the Twenty-third Annual Adult Education Research Conference, Lincoln, Nebraska.

Boraks, Nancy, and Sally Schumacher

- 1981 *Ethnographic Research on Word Recognition Strategies of Adult Beginning Readers*. Richmond, Virginia: School of Education, Virginia Commonwealth University. [Summary Report for the U.S. Department of Education and the Virginia Department of Education].

Boraks, Nancy E., Sally Schumacher, and Lois Lavery

- 1982 *Ethnographic Research on Reading Instructional Strategies For Adult Beginning Readers*. Richmond, Virginia: School of Education, Virginia Commonwealth University. [Summary Report for the U.S. Department of Education and the Virginia Department of Education].

Bowers, Patricia Greig

- 1988 Naming Speed and Phonological Awareness: Independent Contributors to Reading Disabilities. Paper read at the Thirty-seventh Annual Meeting of the National Reading Conference, Tucson, AZ.

Bradley, Lynette, and Peter E. Bryant

- 1978 Difficulties in Auditory Organization as a Possible Cause of Reading Backwardness. *Nature*. 271: 746-747.
- 1983 Categorizing sound and learning to read - a causal connection. *Nature*, Vol. 301, 419 - 421.
- 1991 Phonological Skills Before and After Learning to Read. Pp. 37-46 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady and Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.

Brady, Susan Amanda

- 1991 The Role of Working Memory in Reading Disability. Pp. 129-151 in *Phonological Processes in Literacy: A Tribute to Isabelle Y Liberman*. Susan Brady and Donald P. Shankweiler, eds. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

- Braun, Carl, Barbara J. Rennie, and Christine J. Gordon
1986 An Examination of Contexts for Reading Assessment. Paper presented at the Annual Meeting of the National Reading Conference, Austin, TX.
- Brecht, Richard D.
1977 Testing format and instructional level with the informal reading inventory. *The Reading Teacher*. 31(1): 57-59.
- Bruck, Maggie
1992 Persistence of Dyslexics' Phonological Awareness Deficits. *Developmental Psychology*. 28(5): 874-886.
- Bryant, Peter, and Lynette Bradley
1985 *Children's Reading Problems: Psychology and Education*. Oxford: Basil Blackwell Ltd.
- Bryant, Peter, and Lawrence Impey
1986 The Similarities Between Normal Readers and Developmental and Acquired Dyslexics. *Cognition*. 24: 121-137.
- Bryant, Peter E., Morag MacLean, Lynette Bradley, and James Crossland
1990 Rhyme and Alliteration, Phoneme Detection, and Learning to Read. *Developmental Psychology*. 26(3): 429-438.
- Bunner, Linda G.
1983 The Remediation of a Graphophonic Decoding Deficit in an Adult. *Journal of Reading*. 27(2): 145-151.
- Byrne, Brian, and Ruth Fielding-Barnsley
1989 Phonemic Awareness and Letter Knowledge in the Child's Acquisition of the Alphabetic Principle. *Journal of Educational Psychology*. 81(3): 313-321.
- 1990 Acquiring the Alphabetic Principle: A Case for Teaching Recognition of Phoneme Identity. *Journal of Educational Psychology*. 82(4): 805-812.

- 1991 Evaluation of a Program to Teach Phonemic Awareness to Young Children. *Journal of Educational Psychology*. 83(4): 451-455.
- 1992 Procedure for Reading: Rationale, Hypotheses, and Data. Pp. 1-34 in *Reading Acquisition*. Philip Gough, Linnea Ehri, and Rebecca Treiman, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Byrne, Brian, and John Ledez
1983 Phonological Awareness in Reading-Disabled Adults. *Australian Journal of Psychology*. 35(2): 185-197.
- Calami, Peter
1987 *Broken Words: Why Five Million Canadians are Illiterate: the Southam Literacy Report*. Toronto: Southam Communications.
- Cambourne, Brian
1994 The Rhetoric of "The Rhetoric of Whole Language." *Reading Research Quarterly*. 29(4): 330-333.
- Cameron, Joyce and Myrna Rabinowitz.
1988 *A Guide for Tutoring Adult Literacy Students*. North Vancouver, B.C.: North Shore Continuing Education. [Prepared for Ministry of Advanced Education and Job Training, Province of British Columbia.]
- Carbo, Marie
1988 Debunking the Great Phonics Myth. *Phi Delta Kappan*. 70: 226-240.
- Cardoso, Claudia Martins
1994 Rhyme Perception: Global or Analytical? *Journal of Experimental Child Psychology*. 57: 26-41.

- Carlisle, Joanne F.
1991 Questioning the Psychological Reality of Onset-Rime as a Level of Phonological Awareness. Pp. 85-95 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady and Donald P. Shankweiler. eds. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.
- Carpenter, Tracy
1986 *The Right to Read: Tutor's Handbook for the SCIL Program*. Toronto: Frontier College.
- Cataldo, Suzanne, and Nick Ellis
1988 Interactions in the Development of Spelling, Reading and Phonological Skills. *Journal of Research in Reading*. 11(2): 86-109.
- Catts, Hugh W.
1991 Facilitating Phonological Awareness: Role of Speech-Language Pathologists. *Language, Speech, and Hearing Services in Schools*. 22: 196-203.
- Chall, Jeanne S.
1987 Reading Development in Adults. *Annals of Dyslexia*. 37: 240-251.

1989 Learning to Read: The Great Debate 20 Years Later - A Response to 'Debunking the Great Phonics Myth'. *Phi Delta Kappan*. 70: 521-537.
- Chall, Jeanne, Florence G. Roswell, and Susan Hahn Blumenthal
1963 Auditory Blending Ability: A Factor in Success in Beginning Reading. *Reading Teacher*. 17: 113-118.
- Center, Yola, Kevin Wheldall, Louella Freeman, Lynne Outhred, and Margaret McNaught
1995 An Evaluation of Reading Recovery. *Reading Research Quarterly*. 30(2): 240-263.

- Coltheart, Max
1987 Varieties of Developmental Dyslexia: A Comment on Bryant and Impey. *Cognition*. 27: 97-101.
- Clay, Marie M.
1979 *Reading: The Patterning of Complex Behaviour*. Auckland, N.Z.: Heinemann Educational Books.
- Content, Alain, Regine Kolinsky, Jose Morais, and Paul Bertelson
1986 Phonetic Segmentation in Prereaders: Effect of Corrective Information. *Journal of Experimental Child Psychology*. 42: 49-72.
- Cunningham, Anne Elizabeth
1990 Explicit Versus Implicit Instruction in Phonemic Awareness. *Journal of Experimental Child Psychology*. 50: 429-444.
- D'Angelo, Karen
1981 Correction Behavior of Good and Poor Readers. *Reading World*. December: 123-129.
- Darville, Richard
1989 The Language of Experience and the Literacy of Power. in Pp. 25-40 in *Adult Literacy Perspectives*. Toronto, Ont.: Culture Concepts Inc.
- Das, J.P., Rama K. Mishra, and John R. Kirby
1994 Cognitive Patterns of Children with Dyslexia: A Comparison Between Groups with High and Average Nonverbal Intelligence. *Journal of Learning Disabilities*. 27(4): 235-242, 253.
- Davies, Paula, and Ann McGuaid
1990 *Whole Language and Adult Literacy Instruction*. Prince George, BC: College of New Caledonia. [Final Report to Ministry of Advanced Education, Training and Technology, Province of British Columbia.]

Doctor, Estelle Ann, and Max Coltheart

- 1980 Children's Use of Phonological Encoding When Reading for Meaning. *Memory and Cognition*. 8(3): 195-209.

Ehri, Linnea C.

- 1989 The Development of Spelling Knowledge and Its Role in Reading Acquisition and Reading Disability. *Journal of Learning Disabilities*. 22(6): 356-364.

- 1992 Reconceptualizing the Development of Sight Word Reading and Its Relationship to Recoding. Pp. 107-153 in *Reading Acquisition*. Philip Gough, Linnea Ehri and Rebecca Treiman. Hillsdale, N.J.: Lawrence Erlbaum Associates.

- 1994 Development of the Ability to Read Words: Update. Pp. 323-358 in *Theoretical Models and Processes of Reading*. Rober Ruddell, Martha Rapp Ruddell and Harry Singer, eds. Newark, Delaware: International Reading Association, Inc.

Ehri, Linnea C., and Claudia Robbins

- 1992 Beginners Need Some Decoding Skill to Read Words by Analogy. *Reading Research Quarterly*. 27(1): 13-27.

Ehri, Linnea C., and Jennifer Sweet

- 1991 Fingerprint-reading of Memorized Text: What Enables Beginners to Process the Print? *Reading Research Quarterly*. 26(4): 442-462.

Ehri, Linnea C., and Lee S. Wilce

- 1985 Movement Into Reading: Is the First Stage of Printed Word Learning Visual or Phonetic? *Reading Research Quarterly*. 20(2).

- 1987 Does Learning to Spell Help Beginners Learn to Read Words? *Reading Research Quarterly*. 22(1): 47-65.

- Elkonin, D.B.
1973 U.S.S.R. Pp. 551-580 in *Comparative Reading: Cross-National Studies of Behavior and Processes in Reading and Writing*. John Downing, ed. New York: MacMillan Company.
- Ellis, Nick
1990 Reading, Phonological Skills and Short-term Memory: Interactive Tributaries of Development. *Journal of Research in Reading*. 13(2): 107-122.
- Fagan, William T.
1987a *The Learning and Teaching of Reading: An Interactive Processes Model*. Edmonton: Eotas Education Consulting.
- 1987b Low Readers and Low Comprehensible Input. *Canadian Journal of Special Education*. 3(1): 89-101.
- Felton, Rebecca H., Cecile E. Naylor, and Frank B. Wood
1990 Neurospsychological Profile of Adult Dyslexics. *Brain and Language*. 39: 465-497.
- Ferguson, Charles A.
1981 *Cognitive Effects of Literacy: Linguistic Awareness in Adult Non-Readers*. California: Stanford University, Department of Linguistics. [Final Report to National Institute of Education, Washington, D.C.].
- Fontenot, Karen
1983 Adult Beginning Reading Skills Diagnosis: From Theory to Practice. ERIC.
- Foorman, Barbara R., David J. Francis, Diane M. Novy, and Dov Liberman
1991 How Letter-Sound Instruction Mediates Progress in First-Grade Reading and Spelling. *Journal of Educational Psychology*. 83(4): 456-469.

- Foorman, Barbara R., and Dov Liberman
1989 Visual and Phonological Processing of Words: A Comparison of Good and Poor Readers. *Journal of Learning Disabilities*. 22(6): 349-355.
- Fowler, Anne E.
1991 How Early Phonological Development Might Set the Stage for Phoneme Awareness. Pp. 97-117, in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady and Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.
- Fowler, Anne E., and Hollis S. Scarborough
1993 *Should Reading-Disabled Adults Be Distinguished From Other Adults Seeking Literacy Instruction? A Review of Theory and Research*. Philadelphia, PA: University of Pennsylvania. [Report to the National Center on Adult Literacy].
- Fowler, Carol A., Isabelle Y. Liberman, and Donald Shankweiler
1977 On Interpreting the Error Pattern in Beginning Reading. *Language and Speech*. 20: 162-173.
- Fox, Barbara J.
1991 Acquiring Recoding Competence: Toward a Meaning Driven Interactive Model. Pp. 127-128 in *Phonological Awareness in Reading: The Evolution of Current Perspectives*. Diane J. Sawyer and Barbara Fox, eds. N.Y.: Springer-Verlag.
- Fox, Barbara, and Donald K. Routh
1976 Phonemic Analysis and Synthesis as Word-Attack Skills. *Journal of Educational Psychology*. 68(1) 70-74.
- Freebody, Peter, and Brian Byrne
1988 Word-reading Strategies in Elementary School Children: Relations to Comprehension, Reading Time, and Phonemic Awareness. *Reading Research Quarterly*. 23: 441-453.

- Frith, U.
1985 Beneath the Surface of Developmental Dyslexia. Pp. 301-330 in *Surface Dyslexia*. K.E. Patterson, J.C. Marshall, and M. Coltheart, eds. London: Lawrence Erlbaum Associates, Inc.
- Fry, Edward B.
1989 Reading Formulas - Maligned but Valid. *Journal of Reading*. 32: 292-297.
- Gambrell, Linda B., and Betty S. Heathington
1981 Adult Disabled Readers' Metacognitive Awareness About Reading Tasks and Strategies. *Journal of Reading Behavior*. 13(3): 215-222.
- Garner, Ruth
1990 When Children and Adults Do Not Use Learning Strategies: Toward a Theory of Settings. *Review of Educational Research*. 60(4): 517-529.
- Gerber, Paul J.
1994 Researching Adults with Learning Disabilities From an Adult-Development Perspective. *Journal of Learning Disabilities*. 27(1): 6-9.
- Gibson-Geller, Linda
1983 Children's Rhymes and Literacy Learning: Making Connections. *Language Arts*. 60(2): 184-193.
- Goldsmith-Phillips, Josephine
1989 Word and Context in Reading Development: A Test of the Interactive-Compensatory Hypothesis. *Journal of Educational Psychology*. 81(3): 299-305.
- Goldstein, Ricki
1989 *Taking the Mystique Out of Learning Disabilities: A Practical Guide for Literacy Tutors*. Saint John, N.B.: Laubach Literacy of Canada.

Goodman, Kenneth S.

- 1965 *A Linguistic Study of Cues and Miscues in Reading. Elementary English.* 42: 639-643.
- 1974 *Miscues: Windows on the Reading Process.* Pp. 3-14 in *Miscue Analysis: Applications to Reading Instruction.* Kenneth Goodman, ed. Urbana, Ill.: ERIC Clearinghouse on Reading and Communication.
- 1986 *What's Whole in Whole Language?* Richmond Hill, Ont.: Scholastic-TAB Publications Ltd.
- 1993 *Phonics Phacts.* Portsmouth, N.H.: Heinemann.
- 1994 *Reading, Writing, and Written Texts: A Transactional Sociopsycholinguistic View.* Pp. 1093-1130 in *Theoretical Models and Processes of Reading.* Robert Ruddell, Martha Rapp Ruddell and Harry Singer, eds. Newark, Delaware: International Reading Association, Inc.
- 1994b *Deconstructing the Rhetoric of Moorman, Blanton, and McLaughlin: A Response.* *Reading Research Quarterly.* 29(4): 340-347.

Goodman Kenneth S., and Yetta M. Goodman

- 1977 *Learning about Psycholinguistic Processes by Analyzing Oral Reading.* *Harvard Educational Review.* 47(3): 317-333.

Goodman, Kenneth S., and Frederick V. Gollasch

- 1980 *Word Omissions: Deliberate and Non-deliberate.* *Reading Research Quarterly.* 16(1): 6-31.

Goodman, Yetta M., and Kenneth S. Goodman

- 1994 *To Err Is Human: Learning about Language Processes by Analyzing Miscues.* Pp. 104-123 in *Theoretical Models and Processes of Reading.* Robert Ruddell, Martha Rapp Ruddell and Harry Singer, eds. Newark, Delaware: International Reading Association, Inc.

- Goswami, Usha
1986 Children's Use of Analogy in Learning to Read: A Developmental Study. *Journal of Experimental Child Psychology*. 42: 73-83.
- Gunning, Robert
1968 The FOG Index After Twenty Years. *Journal of Business Communication*. 6: 3-13.
- Hamilton, Mary E., and David Barton
1983 Adults' Definitions of 'Word': The Effects of Literacy and Development. *Journal of Pragmatics*. 7, 581-594.
- Hanson, Vicki L.
1989 Phonology and Reading: Evidence from Profoundly Deaf Readers. Pp. 69 - 89 in *Phonology and Reading Disability*. Donald Shankweiler and Isabelle Y. Liberman, eds. Ann Arbor, Michigan: University of Michigan Press.
- 1991 Phonological Processing Without Sound. Pp. 153 - 161 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady and Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.
- Henshaw, Ann
1992 Remedial Readers Reading for Meaning: The Use of the Linguistic Context When Words are Read Correctly. *Educational Research*. 34(1): 11-21.
- Hiebert, Elfrieda H.
1994 Reading Recovery in the United States: What Difference Does it Make to an Age Cohort? *Educational Researcher*. 23: 15-25.
- Hohn, William E., and Linnea C. Ehri
1983 Do Alphabet Letters Help Prereaders Acquire Phonemic Segmentation Skill? *Journal of Educational Psychology*. 75(5): 752-762.

- Hoover, Wesley A., and William E. Tunmer
1993 *The Components of Reading. Pp. 1-19 in Reading Acquisition Processes. G. Brian Thompson, William Tunmer and Tom Nicholson, eds. Philadelphia: Multilingual Matters Ltd.*
- Horsman, Jennifer
1990 *Something in My Mind Besides the Everyday: Women and Literacy. Toronto: Women's Press.*
- Hosenfeld, Carol
1977 *A Preliminary Investigation of the Reading Strategies of Successful and Nonsuccessful Second Language Learners. System. 5: 110-123.*
- Huang, H.S., and J. Hanley
1994 *Phonological awareness and visual skills in learning to read Chinese and English. Cognition. 54: 73-98.*
- Hurford, David P.
1990 *Training Phonemic Segmentation Ability with a Phonemic Discrimination: Intervention in Second- and Third-Grade Children with Reading Disabilities. Journal of Learning Disabilities. 23(9): 564-569.*
- Huey, Edmund Burke.
1918 *The History and Pedagogy of Reading. New York: MacMillan Company.*
- Johnson, Neal F., and Kenneth R. Pugh
1994 *A Cohort Model of Visual Word Recognition. Cognitive Psychology. 26: 240-346.*
- Jones, Stan.
1989 *Tests for Adult Basic Education and Adult Literacy. Pp. 217-226 in Adult Literacy Perspectives. Maurice Taylor and James Draper, eds. Toronto: Culture Concepts Inc.*

- Jones, Stan, and Linda Librande
1985 *Ontario Test of Functional Literacy*. Ottawa: Carleton University.
- Jorm, Anthony F., and David L. Share
1983 An invited article: Phonological recoding and reading acquisition. *Applied Psycholinguistics*. 4: 103-147.
- Keefe, Donald, and Valerie Meyer
1980 Adult Disabled Readers: Their Perceived Models of the Reading Process. *Adult Literacy and Basic Education*: 120-124.
- Keefe, Donald, and Valerie Meyer
1988 Profiles of and instructional strategies for adult disabled readers. *Journal of Reading*. 31(7): 614-619.
- Keefe, Donald, and Valerie Meyer
1991 Teaching adult new readers the whole language way. *Journal of Reading*. 35(3): 181-183.
- Kim, Yeu Hong, and Ernest T. Goetz
1994 Context effects on word recognition and reading comprehension of poor and good readers: A test of the interactive-compensatory hypothesis. *Reading Research Quarterly*. 29(1): 179-187.
- Klein, Cynthia
1992 *Diagnosing Dyslexia: A Guide to the Assessment of Adults with Specific Learning Difficulties*. London, England: Adult Literacy and Basic Skills Unit.
- Kolinsky, Regine, Luz Cary, and Jose Morais
1987 Awareness of words as phonological entities: The role of literacy. *Applied Psycholinguistics*. 8: 223-232.
- Kozol, Jonathan
1985 *Illiterate America*. Markham, Ont.: Penguin Books.

- LaBerge, David, and S. Jay Samuels
1974 Toward a Theory of Automatic Information Processing in Reading. *Cognitive Psychology*. 6: 293-323.
- Laubach, Frank, Elizabeth M. Kirk, and Robert S. Laubach.
1981 *Laubach Way to Reading*. Syracuse, N.Y.: New Readers Press.
- Learning Disabilities Association of Canada
1991 *Bringing Literacy Within Reach: Identifying and Teaching Adults with Learning Disabilities*. Ottawa: Learning Disabilities Association of Canada.
- Lenchner, Orna, Michael M. Gerber, and Donald K. Routh
1990 Phonological Awareness Tasks as Predictors of Decoding Ability: Beyond Segmentation. *Journal of Learning Disabilities*. 23(4): 240-247.
- Leong, Che Kan
1991 From Phonemic Awareness to Phonological Processing to Language Access in Children Developing Reading Proficiency. Pp. 217-254 in *Phonological Awareness in Reading: The Evolution of Current Perspectives*. Diane J. Sawyer & Barbara Fox, eds. N.Y.: Springer-Verlag.
- Leslie, Lauren
1980 The Use of Graphic and Contextual Information By Average and Below-Average Readers. *Journal of Reading Behavior*. 12(2): 139-149.
- Levin, Joel R.
1991 Editor's Introduction to Three Studies on Reading Acquisition. *Journal of Educational Psychology*. 83(4): 435-436.
- Lewkowicz, Nancy K.
1980 Phonemic Awareness Training: What to Teach and How to Teach It. *Journal of Educational Psychology*. 72(5): 686-700.

- 1987 On the question of teaching decoding skills to older students. *Journal of Reading*. 31: 50-57.
- Liberman, Isabelle Y. and Alvin M. Liberman
1992 Whole Language Versus Code Emphasis: Underlying Assumptions and Their Implications for Reading Instruction. Pp. 343-366 in *Reading Acquisition*. Philip Gough, Linnea Ehri and Rebecca Treiman, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Liberman, Isabelle Y., Donald Shankweiler, F. William Fischer, and Bonnie Carter
1974 Explicit Syllable and Phoneme Segmentation in the Young Child. *Journal of Experimental Child Psychology*. 18: 201-212.
- Liberman, Isabelle Y., Donald Shankweiler, and Alvin M. Liberman
1989 The Alphabetic Principle and Learning to Read. Pp. 3-33 in *Phonology and Reading Disability: Solving the Reading Puzzle*. Donald Shankweiler & Isabelle Y. Liberman, eds. Ann Arbor: University of Michigan Press.
- Lindamood, Patricia C., Nancy Bell, and Phyllis Lindamood
1992 Issues in Phonological Awareness Assessment. *Annals of Dyslexia*. 42: 242-259.
- Literacy Volunteers of America
1986 Phonics/Word Pattern Basic Reading Tutor Training Workshop. (video). Syracuse, N.Y.: Literacy Volunteers of America, Inc.
- Liu, In-mao, Ying Zhu, and Jei-tun Wu
1992 The Long-term Modality Effect: In Search of Differences in Processing Logographs and Alphabetic Words. *Cognition*. 43: 31-66.

- Lovett, Maureen W.
1991 Reading, Writing, and Remediation: Perspectives on the Dyslexic Learning Disability from Remedial Outcome Data. *Learning and Individual Differences*. 3(4): 295-305.
- Lovett, Maureen W., Nancy J. Benson, and Janet Olds
1990 Individual Difference Predictors of Treatment Outcome in the Remediation of Specific Reading Disability. *Learning and Individual Differences*. 2(3) 287-314.
- Lundberg, Ingvar
1991 Phonemic Awareness Can Be Developed Without Reading Instruction. Pp. 47-53 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady & Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Lundberg, Ingvar, Jorgen Frost, and Ole-Peter Petersen
1988 Effects of an Extensive Program for Stimulating Phonological Awareness in Preschool Children. *Reading Research Quarterly*. 23: 263-284.
- Lundberg, Ingvar, and Torleiv Høien
1991 Initial Enabling knowledge and Skills in Reading Acquisition: Print Awareness and Phonological Segmentation. Pp. 73-95 in *Phonological Awareness in Reading: The Evolution of Current Perspectives*. Diane J. Sawyer & Barbara J. Fox, eds. New York: Springer-Verlag.
- Macleod, Morag, Peter Bryant, and Lynette Bradley
1987 Rhymes, Nursery Rhymes, and Reading in Early Childhood. *Merrill-Palmer Quarterly*. 33(3): 255-281.
- Malicky, Grace, and Charles A. Norman
1982 Reading strategies of adult illiterates. *Journal of Reading*. 25: 731-735.

- Malicky, Grace, and Charles A. Norman
 1989 The Reading Concepts and Strategies of Adult Nonreaders. *Journal of Reading*. 33: 198-202.
- Mann, Virginia
 1986 Phonological Awareness: The Role of Reading Experience. *Cognition*. 24: 65-92.
- 1991a Are We Talking Too Narrow a View of the Conditions for Development of Phonological Awareness? Pp. 55-64 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady & Donald P. Shankweiler. eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- 1991b Phonological Awareness and Early Reading Ability: One Perspective. Pp. 191-215 in *Phonological Awareness in Reading: The Evolution of Current Perspectives*. Diane J. Sawyer & Barbara J. Fox, eds. N.Y.: Springer-Verlag.
- Mark, Leonard S., Donald Shankweiler, and Isabelle Y. Liberman
 1977 Phonetic Recoding and Reading Difficulty in Beginning Readers. *Memory & Cognition*. 5(6): 623-629.
- Mattingly, Ignatius G.
 1991 Modularity, Working Memory, and Reading Disability. Pp. 163-171 in *Phonological Awareness in Reading: The Evolution of Current Perspectives*. Diane J. Sawyer & Barbara J. Fox, eds. N.Y.: Springer-Verlag.
- Mattran, Kenneth J.
 1980 Breaking Through the Decoding Barrier: A Case Study in Adult Literacy. *Adult Literacy and Basic Education*. Fall: 159-169.
- McCormick, Sandra
 1994 A Nonreader Becomes a Reader: A Case Study of Literacy Acquisition by a Severely Disabled Reader. *Reading Research Quarterly*. 29(2): 157-176.

- McGee, Lea M., and Richard G. Lomax
1990 On Combining Apples and Oranges: A Response to Stahl and Miller. *Review of Educational Research*. 60(1): 133-140.
- Metz, Elizabeth
1990 Issues in Adult Literacy Assessment. *Journal of Reading*. March: 468-469.
- Meyer, Valerie, and Donald Keefe
1988 The Laubach Way to Reading: A Review. *Lifelong Learning; An Omnibus of Practice and Research*. 12(1): 8-10.
- Moorman, Gary B., William E. Blanton, and Thomas McLaughlin.
1994 The Rhetoric of Whole Language. *Reading Research Quarterly*. 29(4): 308-329.
- Miller, Samuel D., and Nina Yochum
1991 Asking Students about the Nature of Their Reading Difficulties. *Journal of Reading Behavior*. 22(4): 465-483.
- Minus, Molly E.
1992 The Relationship of Phonemic Awareness to Reading Level and the Effects of Phonemic Awareness Instruction on the Decoding skills of Adult Disabled Readers. Paper read at the National Reading Conference, San Antonio, Texas.
- Morais, Jose
1991a Constraints on the Development of Phonemic Awareness. Pp. 5-27 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady & Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.

- 1991b **Phonological Awareness: A Bridge Between Language and Literacy.** Pp. 31-71 in *Phonological Awareness in Reading: The Evolution of Current perspectives.* Diane Sawyer & Barbara J. Fox. eds. New York: Springer-Verlag.
- Morais, Jose, Luz Cary, Jesus Alegria, and Paul Bertelson
1979 **Does Awareness of Speech as a Sequence of Phones Arise Spontaneously?** *Cognition.* 7: 323-331.
- Morais, Jose, and Regine Kolinsky
1994 **Perception and Awareness in Phonological Processing: the Case of the Phoneme.** *Cognition.* 50: 287-297.
- Morais, Jose, Paul Bertelson, Luz Cary, Jesus Alegria
1987 **Literacy Training and Speech Segmentation.** Pp. 44-64 in *The Onset of Literacy: Cognitive Processes in Reading Acquisition.* P. Bertelson, ed. Cambridge, Mass.: MIT Press.
- Mudd, Norma
1987 **Strategies Used in the Early Stages of Learning to Read: A Comparison of Children and Adults.** *Educational Research.* 29(2): 83-94.
- Nicholson, Tom
1991 **Do Children Read Words Better in Context or in Lists? A Classic Study Revisited.** *Journal of Educational Psychology.* 83(4): 444-450.
- 1993a **The Case Against Context.** Pp. 91-104 in *Reading Acquisition Processes,* G. Brian Thompson, William Tunmer and Tom Nicholson, eds. Cleaveland: Multilingual Matters Ltd.
- 1993b **Reading Without Context.** Pp. 105-122 in *Reading Acquisition Processes,* G. Brian Thompson, William Tunmer and Tom Nicholson, eds. Philadelphia: Multilingual Matters Ltd.

- Nicholson, Tom, Christine Lillas, and A. Anne Rzoska
1988 Have We Been Misled by Miscues? *The Reading Teacher*. 42: 6-10.
- Norman, Charles A., and Grace Malicky
1987 Stages in the Reading Development of Adults. *Journal of Reading*. 30(4): 302-307.
- Norman, Charles A., Grace Malicky, and William T. Fagan
1988 The Reading Processes of Adults in Literacy Programs. *Adult Literary and Basic Education*. 12(1): 14-26.
- Nurss, Joanne R.
1989 Assessment Models and Instruments: Adult Populations. Paper read at the Assessment Issues Forum, Macon, Georgia.
- Olson, Richard K., Brian J. Davidson, Reinhold Kliegl, and Susan E. Davies
1984 Development of Phonetic Memory in Disabled and Normal Readers. *Journal of Experimental Child Psychology*. 37: 187-206.
- Page, William.
1974 Clinical Uses of Miscue Research. Pp. 65-76 in *Miscue Analysis: Applications to Reading Instruction*. Kenneth Goodman, ed. Urbana, Ill.: Eric Clearinghouse on Reading and Communication.
- Partridge, Susan
1992 Phonemic Awareness versus Meaning Instruction in Beginning Reading: A Discussion. *ERIC*.
- Pennington, Bruce F., Guy Van Orden, Donald Kirson, and Marshall Haith
1991 What is the Causal Relation Between Verbal STM Problems and Dyslexia? Pp. 173-186 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady & Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Perfetti, Charles A.

1986 Cognitive and Linguistic Components of Reading Ability. Pp. 11-40 in *Acquisition of Reading Skills: Cultural Constraints and Cognitive Universals*. Barbar Foorman and Alexander Siegel, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.

1991 On the Value of Simple Ideas in Reading Instruction. Pp. 211-218 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady & Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.

1992 The Representation Problem in Reading Acquisition. Pp. 145-174 in *Reading Acquisition*. Philip Gough, Linnea Ehri, and Rebecca Treiman, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Perfetti, Charles A., Isabel Beck, Laura C. Bell, and Carol Hughes

1987 Phonemic Knowledge and Learning to Read are Reciprocal: A Longitudinal Study of First Grade Children. *Merrill-Palmer Quarterly*. 33(3): 283-319.

Perfetti, Charles A., and Thomas Hogaboam

1975 Relationship Between Single Word Decoding and Reading Comprehension Skill. *Journal of Educational Psychology*. 67(4): 461-469.

Perfetti, Charles A., and Sulan Zhang

1995 Very Early Phonological Activation in Chinese Reading. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. 21(1): 24-33.

Peterson, Margareth E., and Leonard P. Haines

1992 Orthographic Analogy Training with Kindergarten Children: Effects on Analogy Use, Phonemic Segmentation, and Letter-Sound Knowledge. *Journal of Reading Behavior*. 24(1) 109-127.

- Pinnell, Gay Su, Carol A. Lyons, Diane E. DeFord, Anthony S. Bryk, and Michael Seltzer
1994 Comparing Instructional Models for the Literacy Education of High-risk First Graders. *Reading Research Quarterly*. 29(1): 9-39.
- Prakash, P., D. Rekha, R. Nigam, and P. Karanth
1993 Phonological Awareness, Orthography, and Literacy. Pp. 55 - 70 in *Literacy and Language Analysis*. Robert J. Scholes. ed. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Pratt, Anne C., and Susan Brady
1988 Relation of Phonological Awareness to Reading Disability in Children and Adults. *Journal of Educational Psychology*. 80(3): 319-323.
- Pumfrey, P.D., and J. Fletcher
1989 Differences in Reading Strategies Among 7 to 8 Year Old Children. *Journal of Research in Reading*. 12(2): 114-130.
- Rack, John, Charles Hulme, Margaret Snowling, and Joanne Wightman
1994 The Role of Phonology in Young Children Learning to Read Words: The Direct-Mapping Hypothesis. *Journal of Experimental Child Psychology*. 57: 42-71.
- Raisner, Barbara
1978 Adult Reading Strategies: Do They Differ From The Strategies of Children? *Reading World*:. 37-47.
- Rasinski, Rimothy V.
1995 Commentary: On the Effects of Reading Recovery: A Response to Pinnell, Lyons, DeFord, Bryk, and Seltzer. *Reading Research Quarterly*. 30(2): 264-271.
- Read, Charles
1988 *Phonological Awareness and Adult Readers*. ERIC.

- 1991 Access to Syllable Structure in Language and Learning. Pp. 119-124 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady and Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Read, Charles, and Lyda Ruyter
1985 Reading and Spelling Skills in Adults of Low Literacy. *Remedial and Special Education*, 6(6): 43-52.
- Read, Charles, Zhang Yun-Fei, Nie Hong-Yin, and Ding Bao-Qing
1987 The Ability to Manipulate Speech Sounds Depends on Knowing Alphabetic Writing. Pp. 31-44 in *The Onset of Literacy: Cognitive Processes in Reading Acquisition*. Cambridge, Mass.: MIT Press.
- Reutzel, D. Ray, Linda K. Oda, and Blaine H. Moore
1989 Developing Print Awareness: The Effect of Three Instructional Approaches on Kindergartner's Print Awareness, Reading Readiness, and Word Reading. *Journal of Reading Behavior*. 21(3): 197-217.
- Roazzi, Antonio, Ann Dowker, and Peter Bryant
1993 Phonological Abilities of Brazilian Street Poets. *Applied Psycholinguistics*. 14: 535-551.
- Robson, Ed, Marsha DeVergilio, and Donna DeButts
1990 Litstart: Literacy Strategies for Adult Reading Tutors. Lansing, Michigan: Michigan Literacy, Inc.
- Rosenthal, Nadine
1987 Teach Someone to Read: A Step-by-Step Guide for Literacy Tutors. Belmont, Ca.: Fearon Education.
- Rummelhart, David E.
1994 Toward an Interactive Model of Reading. Pp. 864-894 in *Theoretical Models and Processes of Reading*. Robert Ruddell, Martha Rapp Ruddell and Harry Singer, eds. Newark, Delaware: International Reading Association Inc.

- Rupley, William H., and Bonnie O. Longnion
1990 *Sources of Variance Influencing Adults' Reading Strategies and Comprehension.* ERIC.
- Samuels, S. Jay
1994a Word Recognition. Pp. 359-380 in *Theoretical Models and Processes of Reading.* Robert Ruddell, Martha Rapp Ruddell and Harry Singer, eds. Newark, Delaware: International Reading Association, Inc.
- 1994b Toward a Theory of Automatic Information Processing in Reading, Revisited. Pp. 816 - 837 in *Theoretical Models and Processes of Reading.* Robert Ruddell, Martha Rapp Ruddell and Harry Singer, eds. Newark, Delaware: International Reading Association, Inc.
- Sawyer, Diane J. Inquiry into the Nature and Fundtion of Auditory Segmentian Abilities: In Search of the Roots of Reading. Pp. 97-126 in *Phonologocial Awareness in Reading: The Evolution of Current Perspectives.* Diane J. Sawyer and Barbara J. Fox, eds. New York: Springer-Verlag.
- Sawyer, Diane J., and Barbara J. Fox
1991 Epilogue. Pp. 255 - 262 in *Phonologocial Awareness in Reading: The Evolution of Current Perspectives.* Diane J. Sawyer and Barbara J. Fox, eds. New York: Springer-Verlag.
- Schickedanz, Judith A.
1990 The Jury Is Still Out on the Effects of Whole Language and Language Experience Approaches for Beginning Reading: A Critique of Stahl and Miller's Study. *Review of Educational Research.* 60(1): 127 - 131.
- Schumacher, Sally
1983 Adult Development and Adult Beginning Reading Behaviors: An Exploratory Study. Paper presented at the Annual Meeting of the American Educational Research Association. Montreal, Canada.

- 1984 **Ethnographic Methodology in a Study of Word Recognition Strategies of Adult Beginning Readers. Paper presented at the Adult Education Research Conference. Raleigh, NC.**
- Scliar-Cabral, Leonor, L. Arruda Nepomuceno, and J. Morais.
1990 **The Role of Context to Guarantee the Optimization of Linguistic Communication. ERIC.**
- Scott, Judith Ann, and Linnea C. Ehri
1990 **Sight Word Reading in Prereaders: Use of Logographic vs. Alphabetic Routes. *Journal of Reading Behavior*. 22(2): 149-166.**
- Seidenberg, Mark. S.
1992 **Dyslexia in a Computational Model of Word Recognition in Reading. Pp. 243-273 in *Reading Acquisition*. Phillip Gough, Linnea Ehri and Rebecca Treiman, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.**
- Seidenberg, Mark S., Margaret Bruck, Gail Fornarolo, and Joan Backman
1985 **Word Recognition Processes of Poor and Disabled Readers: Do They Necessarily Differ? *Applied Psycholinguistics*. 6: 161-180.**
- Shankweiler, Donald
1992 **How Problems of Comprehension Are Related to Difficulties in Decoding. Pp. 35-68 in *Phonology and Reading Disability: Solving the Reading Puzzle*. Donald Shankweiler and Isabelle Y. Liberman, eds. Ann Arbor: University of Michigan Press.**
- 1992 **Identifying the Causes of Reading Disability. Pp. 175-305 in *Reading Acquisition*. Philip Gough, Linnea Ehri and Rebecca Treiman, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.**

- Shapiro, Jon, Gary W. Nix, and Steven F. Foster
1990 Auditory Perceptual Processing in Reading Disabled Children. *Journal of Research in Reading*. 13(2): 123-132.
- Share, David L.
1995 Phonological recoding and self-teaching: Sine qua non of reading acquisition. *Cognition*. 55: 151-218.
- Share, David L. Anthony F. Jorm, Rod Maclean, and Russell Matthews
1984 Source of Individual Differences in Reading Acquisition. *Journal of Educational Psychology*. 76(6): 1309-1324.
- Snowling, Maggie, Joy Stackhouse, and John Rack
1986 Phonological Dyslexia and Dysgraphia - A Developmental Analysis. *Cognitive Neuropsychology*. 3(3): 309-339.
- Spear-Swerling, Louise and Robert J. Sternberg
1994 The Road Not Taken: An Integrative Theoretical Model of Reading Disability. *Journal of Learning Disabilities*. 27(2): 91-103,122.
- Stahl, Steven A.
1990 Riding the Pendulum: A Rejoinder to Schickedanz and McGee and Lomax. *Review of Educational Research*. 60(1): 141-151.
- Stahl, Steven A., and Patricia D. Miller
1989 Whole Language and Language Experience Approaches for Beginning Reading: A Quantitative Research Synthesis. *Review of Educational Research*. 59(1): 87-115.
- Stanovich, Keith E.
1980 Toward an Interactive-compensatory Model of Individual Differences in the Development of Reading Fluency. *Reading Research Quarterly*. 16: 32-71.

- 1982 Individual Differences in the Cognitive Processes of Reading: I. Word Decoding. *Journal of Learning Disabilities*. 15(8): 484-493.
- 1986 Matthew Effects in Reading: Some Consequences of Individual Differences in the Acquisition of Literacy. *Reading Research Quarterly*. 21(4): 360-407.
- 1988 The Right and Wrong Places to Look for the Cognitive Locus of Reading Disability. *Annals of Dyslexia*. 38: 154-177.
- Stanovich, Keith E., Anne E. Cunningham, and Barbara B. Cramer
1984 Assessing Phonological Awareness in Kindergarten Children: Issues of Task Comparability. *Journal of Experimental Child Psychology*. 38: 175 - 190.
- Stanovich, Keith E., Anne E. Cunningham, and Dorothy J. Feeman
1984a Intelligence, Cognitive Skills, and Early Reading Progress. *Reading Research Quarterly*. 29(3): 278-303.
- 1984b Relation Between Early Reading Acquisition and Word Decoding With and Without Context: A Longitudinal Study of First-Grade Children. *Journal of Educational Psychology*. 76(4): 668-677.
- Stanovich, Keith E., Dorothy J. Feeman, and Anne E. Cunningham
1983 The Development of the Relation Between Letter-naming Speed and Reading Ability. *Bulletin of the Psychonomic Society*. 21(3): 199-202.
- Stanovich, Keith E., Ruth G. Nathan, and Marilyn Vala-Rossi
1986 Developmental Changes in the Cognitive Correlates of Reading Ability and the Developmental Lag Hypothesis. *Reading Research Quarterly*. 21: 267-283.

- Stanovich, Keith E., Richard F. West, and Anne E. Cunningham
 1991 Beyond Phonological Processes: Print Exposure and Orthographic Processing. Pp. 219-235 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady & Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associate.
- Stuart, Morag, and Max Coltheart
 1988 Does Reading Develop in a Sequence of Stages? *Cognition*. 30: 139-181.
- Stuart, Morag, and Jackie Masterson
 1992 Patterns of Reading and Spelling in 10-Year Old Children Related to Prereading Phonological Abilities. *Journal of Experimental Child Psychology*, 54, 168 - 187.
- Stuart-Hamilton, Ian
 1984 The Role of Phonemic Awareness in the Reading Style of Beginning Readers. ERIC.
- Swank, Linda K., and Hugh W. Catts
 1991 Phonological Awareness. ERIC.
- Tangel, Darlene M., and Benita A. Blachman
 1992 Effect of Phoneme Awareness Instruction on Kindergarten Children's Invented Spelling. *Journal of Reading Behavior*. 24(2): 233-261.
- Temple, Christine M.
 1988 Developmental Dyslexia and Dysgraphia Persistence in Middle Age. *Journal of Communications Disorders*. 21: 189 - 207.
- Thompson, G. Brian, and Claire M. Fletcher-Flinn
 1993 A Theory of Knowledge Sources and Procedures for Reading Acquisition. Pp. 20-73 in *Reading Acquisition Processes*. G Brian Thompson, William Tunmer, Tom Nicholson, eds. Philadelphia: Multilingual Matters Ltd.

- Thompson, G. Brian, and Rhona S. Johnston
 1993 The Effects of Type of Instruction on Processes of Reading Acquisition. Pp. 74-90 in *Reading Acquisition Processes*. G Brian Thompson, William Tunmer, Tom Nicholson, eds. Philadelphia: Multilingual Matters Ltd.
- Torgesen, Joseph K.
 1991 Cross-Age Consistency in Phonological Processing. Pp. 187-193 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady & Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Torgesen, Joseph K., Sharon T. Morgan, and Charlotte Davis
 1992 Effects of Two Types of Phonological Awareness Training on Word Learning in Kindergarten Children. *Journal of Educational Psychology*. 84(3): 364-370.
- Torgesen, Joseph K., Richard K. Wagner, and Carol A. Rashotte
 1994 Longitudinal Studies of Phonological Processing and Reading. *Journal of Learning Disabilities*. 27(5): 276-286.
- Torneus, Margit
 1984 Phonological Awareness and Reading: A Chicken and Egg Problem? *Journal of Educational Psychology*. 76(6): 1346-1358.
- Treiman, Rebecca
 1987 Levels of Phonological Awareness. ERIC.
- 1991 Phonological Awareness and Its Roles in Learning to Read and Spell. Pp. 157-189 in *Phonological Awareness in Reading: The Evolution of Current Perspectives*. Diane J. Sawyer and Barbara J. Fox, eds. New York: Springer-Verlag.

- Treiman, Rebecca, and Jonathan Baron
 1983 Phonemic-analysis Training Helps Children Benefit from Spelling-sound Rules. *Memory and Cognition*. 11(4): 382-389.
- Treiman, Rebecca, Usha Goswami, and Maggie Bruck
 1990 Not All Nonwords Are Alike: Implications for Reading Development and Theory. *Memory & Cognition*. 18(6): 559-567.
- Treiman, Rebecca, and Andrea Zukowski
 1991 Levels of Phonological Awareness. Pp. 67-83 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady and Donald P. Shankweiler, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Truch, Steve
 1991 *The Missing Parts of Whole Language*. Calgary, Alberta: Foothills Educational Materials.
- 1994 Stimulating Basic Reading Processes Using Auditory Discrimination in Depth. *Annals of Dyslexia*. 44: 60-80.
- 1995 The Hole in Whole Language. Workshop. Vancouver, B.C.
- Tunmer, William E., Michael L. Herriman, and Andrew R. Nesdale
 1988 Metalinguistic Abilities and Beginning Reading. *Reading Research Quarterly*. 23: 134-158.
- Tunmer, William E., and Wesley A. Hoover
 1993 Language-related Factors as Sources of Individual Differences in the Development of Word Recognition Skills. *Reading Acquisition Processes*. G Brian Thompson, William Tunmer, Tom Nicholson, eds. Philadelphia: Multilingual Matters Ltd.

- Tunmer, William E., and Andrew R. Resdale
 1985 Phonemic Segmentation Skill and Beginning Reading. *Journal of Educational Psychology*. 77(4): 417-427.
- Tunmer, William E. and Mary Rohl
 1991 Phonological Awareness and Reading Acquisition. Pp. 1-30 in *Phonological Awareness in Reading: The Evolution of Current Perspectives*. Diane Sawyer and Barbara J. Fox, eds. New York: Springer-Verlag.
- Uhry, Joanna K., and Margaret Jo Shepherd
 1993 Segmentation/Spelling Instruction as Part of a First-Grade Reading Program: Effects on Several Measures of Reading. *Reading Research Quarterly*. 28(3): 219-233.
- Underwood, Geoffrey, and Katherine Bargh
 1982 Word Shape, Orthographic Regularity, and Contextual Interactions in a Reading Task. *Cognition*. 4(12) 197-209.
- Vellutino, Frank R.
 1991a Introduction to Three Studies on Reading Acquisition: Convergent Findings on Theoretical Foundations of Code-Oriented Versus Whole-Language Approaches to Reading Instruction. *Journal of Educational Psychology*. 83(4): 437-443.
- 1991b The Preeminence of Phonologically Based Skills in Learning to Read. Pp. 237-252 in *Phonological Processes in Literacy: A Tribute to Isabelle Y. Liberman*. Susan Brady and Donald P. Shankweiler, eds. Hillsday, N.J.: Lawrence Erlbaum Associates.
- 1995 Semantic and Phonological Coding in Poor and Normal Readers. *Journal of Experimental Child Psychology*. 59: 76-123.

- Vellutino, Frank R., and Donna M. Scanlon
 1987 Phonological Coding, Phonological Awareness, and Reading Ability: Evidence from a Longitudinal and Experimental Study. *Merrill-Palmer Quarterly*. 33(3): 321-363.
- Vellutino, Frank R., Donna M. Scanlon, and Debra Spearing
 1995 Semantic and Phonological Coding in Poor and Normal Readers. *Journal of Experimental Child Psychology*. 59: 76-123.
- Walsh, Daniel, Gary Glen Price, and Mark G. Gillingham
 1988 The Critical But Transitory Importance of Letter Naming. *Reading Research Quarterly*. 23(1): 108-122.
- Wasik, Barbara A., and Robert E. Slavin
 1993 Preventing Early Reading Failure With One-to-one Tutoring: A Review of Five Programs. *Reading Research Quarterly*. 28(2) 179-201.
- Williams, Joanna P.
 1980 Teaching Decoding With an Emphasis on Phoneme Analysis and Phoneme Blending. *Journal of Educational Psychology*. 72(1): 1-15.
- Willich, Yve, Margot Prior, Geoff Cumming, and Tom Spanos
 1988 Are Disabled Readers Delayed or Different? An Approach Using an Objective Miscue Analysis. *British Journal of Educational Psychology*. 58: 315-329.
- Wimmer, Heinz, Karin Landerl, Renate Linortner, and Peter Hummer
 1991 The Relationship of Phonemic Awareness to Reading Acquisition: More Consequence Than Precondition But Still Important. *Cognition*. 40: 219-249.
- Wixson, Karel L.
 1979 Miscue Analysis: A Critical Review. *Journal of Reading Behavior*. 11(2): 163-175.

- Woodley, John W.
1988 Reading Assessment from a Whole Language Perspective.
 Guides. ERIC.
- Yaden, David B., Laura B. Smolkin, and Laurie MacGillivray
1993 A Psychogenetic Perspective on Children's Understanding
 About Letter Associations During Alphabet Book
 Readings. *Journal of Reading Behavior*. 25(1): 43-68.
- Yopp, Hallie Kay
1988 The Validity and Reliability of Phonemic Awareness
 Tests. *Reading Research Quarterly*. 23(2): 159-177.

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