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Routes to Comprehension for Second-Graders With  
Reading Problems:  
One-to-One Tutoring in Repeated Reading  
Versus Comprehension Strategy Instruction

Patricia F. Vadasy

a dissertation to be submitted in partial fulfillment

of the requirements for the degree of

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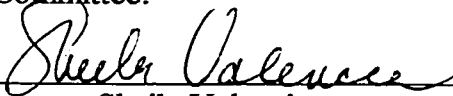
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Abstract

Routes to Comprehension for Second-Graders with  
Reading Problems:  
One-to-One Tutoring in Repeated Reading  
Versus Comprehension Strategy Instruction

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This year-long study compared two types of one-to-one tutoring for second graders with a history of reading problems. The purpose of this study was to examine two approaches to improving comprehension skill: through developing students' reading fluency, or through teaching students strategies for monitoring their understanding. Reading Partners treatment provided repeated reading practice with expository passages. Thinking Partners treatment provided scaffolded instruction in five comprehension strategies coordinated with reading grade-level trade books: keeping track, thinking ahead, understanding words, making connections, and making questions. Two major research questions were addressed: 1) the relative effects of treatments on reading rate and accuracy, and on reading comprehension; and 2) the student and tutor characteristics that influence the effectiveness of each tutoring approach, including students' precursor reading skills, tutor implementation of instruction, and program variables.

Forty three students participated in the study, 27 in Thinking Partners and 16 in Reading Partners. Students were randomly assigned to treatments which occurred in nine elementary schools. Students in each treatment received one-half hour of individual tutoring four days a week for an average of 39 hours of instruction. Data were collected on: student reading skills at pretest, student reading rate in daily Reading Partners lessons, student strategy use in Thinking Partners lessons, tutor implementation, and student reading skills at posttest. Reading skills were assessed on both standard and experimenter-designed measures.

Four types of findings emerged from analysis of the data. First, reading skills improved significantly in both groups from pretest to posttest. Second, there were no significant differences between groups in reading skills at posttest. Third, rapid letter naming was the only significant predictor of student fluency and accuracy scores, and PPVT was the only significant predictor of comprehension. Student fluency gain in Reading Partners lessons was significantly predicted by rapid letter naming. Quality of tutoring did not significantly influence student reading outcomes. Fourth, there were no differential treatment effects for students based on their entry level reading skills. Fifth, there were no program or student variables that significantly predicted strategy use by Thinking Partners students.

Findings are discussed in light of verbal efficiency theory and the complexity of reading fluency.

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## Chapter 1

## Statement of the Problem

Reading for meaning is the primary goal of reading instruction in the early elementary grades. This goal may be momentarily eclipsed for those first and second graders who experience the greatest difficulties learning to read. For them, the focus in the picture presented in the simple view of reading (Gough & Tunmer, 1986), which explains reading as the product of decoding and listening comprehension, is on their problems in decoding. Word identification, or decoding, is the first obstacle to reading comprehension that teachers identify for a large group of students, and those students with phonologically based reading disabilities. As Stanovich's (1986) Matthew effects are hypothesized to operate, children with poor phonological decoding skills who have problems with word identification consequently experience less print exposure, less positive attitudes about reading, and more school and classroom disadvantages than students with good decoding skills. These at-risk students may even come to equate decoding with reading (Myers & Paris, 1978), and as a consequence fail to fully construct the meaning of a text.

Students with poor word identification skills often encounter obstacles to comprehension. In many cases, these comprehension deficits are not specific, but rather are lags in performance relative to the comprehension of their average achieving peers

(Wise & Olson, 1991). The efficacy of letter-code access and access to phonologically coded information in memory strongly influences the young reader's comprehension of text (Jackson & McClelland, 1979). These individual differences in letter-code access contribute not only to the reading skills of beginning readers, but also continue to differentiate high- and low-skilled adult readers in their decoding and lexical decision performance (Bell & Perfetti, 1994; Cunningham, Stanovich, & Wilson, 1990; Jackson & McClelland, 1979).

Two theories may account for comprehension problems in at-risk beginning readers. Perfetti's verbal efficiency theory (Perfetti, 1985; Perfetti & Hogaboam, 1975) is that efficient word recognition processes made possible by readily accessible lexical representations allow the reader to make high quality text representations and efficient comprehension. As the verbal efficiency theory developed (Perfetti, 1992; Perfetti & McCutchen, 1987), the role of working memory in reading became central. Working memory has both a storage and processing component, and information is coded based on phonological structure (Siegel, 1998). Inefficient word identification taxes the reader's phonological storage. When decoding skills are poorly developed, word recognition consumes the reader's attention and leaves few cognitive resources for processing meaning, as also described by LaBerge and Samuels' (1974) automaticity theory. These theories suggest that one approach to improving comprehension is to develop basic word recognition and automaticity in decoding in order to free up cognitive resources for comprehension. This view is supported by the developmental lag

hypothesis that poor readers follow the same trajectory as good readers but are delayed in their skill acquisition (Shankweiler, Crain, Brady, & Macaruso, 1992), first in decoding, and consequently in comprehension. One strategy for developing automaticity is through repeated readings, and research on repeated reading techniques suggests that gains in reading fluency transfer to improved comprehension outcomes (Dowhower, 1987; Samuels, 1979; Stoddard, Valcante, Sindelar, O'Shea, & Agozzine, 1993).

Another theory attributes the comprehension deficits of at-risk readers to their lack of knowledge of effective strategies for understanding text, and their poor metacognitive skills for monitoring their reading (Baker & Brown, 1984; Torgesen, 1977). Children with poor comprehension have problems making inferences (Oakhill, 1984), integrating text (Yuill, Oakhill, & Parkin, 1989), and monitoring comprehension (Baker, 1979, 1985a; Garner, 1980). This theory suggests remediation to address the cognitive and metacognitive processes that operate during reading. These processes include evaluation and regulation skills required to monitor and fix up obstacles to comprehension (Baker, 1985b). Evaluation skills allow the reader to notice problems in the text that affect comprehension, such as unfamiliar vocabulary and syntactic structures. Regulation skills enable the reader to complete a comprehension task effectively, by planning and choosing appropriate strategies to remediate problems encountered in text.

These deficits in metacognitive comprehension skills may have various causes. Students with poor decoding skills read less and have limited experience with text structures and

formats. The structural lag hypothesis suggests that delays in syntactic knowledge, which may result from limited exposure to complex text, contribute to the comprehension problems of poor readers. Further, students who spend more time engaged in word-level instruction may receive less exposure to comprehension instruction than good readers (Calfee & Drum, 1987), an example of the passive organism-environment correlations described by Stanovich (1986). Due to lack of practice, low readiness to utilize classroom comprehension instruction, and other factors, poor readers fail to learn the strategies used by successful readers. They are less active and less skilled in solving problems they encounter when they read. Being both young and less skilled, they also lack the metacognitive awareness about reading needed to monitor and evaluate their understanding. Evidence indicates that children gradually acquire metacognitive skills (Baker & Brown, 1984; Garner, 1987; Kobasigawa, Ransom, & Holland, 1980; Myers & Paris, 1978), and that more successful readers have greater metacognitive awareness about reading (Baker, 1982; Paris & Myers, 1981; Raphael & Pearson, 1985), suggesting that students who are trained in these reasoning strategies will be better readers. Research on strategy instruction indicates that children often learn these strategic skills interacting with adults (Carr, Kurtz, Schneider, Turner, & Borkowski, 1989), and that classroom instruction may not provide sufficiently explicit instruction for the struggling reader in strategies needed to construct understanding from text, such as how to integrate, structure, or transform text through reasoning or connecting it to prior knowledge (Vauras, Kinnunen, & Kuusela, 1994).

This intervention study tested the effectiveness of two treatments for low-achieving second-grade readers with a prior history of phonological skill deficits. The subjects started out in first grade in the lowest 20% of their classrooms in reading skills and received individual tutoring in phonological reading skills during the first grade, and although their average word reading skills at the end of first grade were at grade level, when they were last administered standardized comprehension tests at the end of first grade, their mean scores were below grade level. The two treatments were based on the two theories of comprehension failure described above. One group received a repeated reading intervention designed to develop automaticity in grade-level passage reading. This intervention was hypothesized to enable students to direct their attention to text content by increasing students' word reading rate and accuracy. The other group received scaffolded instruction in active comprehension monitoring, particularly the evaluation (as contrasted to the regulation) aspect of comprehension monitoring. This treatment was hypothesized to increase students' access to text meaning by providing them with models for text processing strategies, and scaffolded practice with grade-level readers in actively monitoring understanding through strategy use. Both groups received one-to-one instruction from nonteacher tutors in their respective treatments.

### Objectives

The study addressed the following questions:

1. What are the relative effects on reading rate and accuracy, and on reading comprehension of two one-to-one tutoring interventions to improve comprehension skills in second graders at risk for reading disability: an adaptation for one-to-one tutor use of the Read Naturally (Hasbrouck, Ihnot, & Rogers, 1999) program in repeated readings, and an experimenter-designed active comprehension monitoring intervention?
2. What are the student and program characteristics that influence the effectiveness of each tutoring approach, including student reading skills and student school behavior, and tutor implementation of the instruction?

The answers to these questions will help inform the choice of supplementary reading instruction for low-skilled second-grade readers. Is it more effective to provide them with extra practice in fluency activities like repeated reading, or with scaffolded instruction in specific comprehension strategies like summarizing and predicting? The findings will also provide information on the effectiveness of nonteachers in developing these skills through one-to-one tutoring. Finally, inasmuch as most research on comprehension strategy instruction reports on average-skilled students in grades 3 through 6 (National Reading Panel, 2000), this study sought evidence on the effectiveness of instruction in multiple widely used comprehension strategies for younger low-skilled second graders.

## Chapter 2

## Review of the Literature

Although the simple view (Gough & Tunmer, 1986) addresses the two necessary components of skilled reading, its label is deceptive in that comprehension is hierarchically layered (Adams, 1990), and builds up from the bottom layer of word recognition. Reading comprehension includes relatively simple tasks like recalling what is read, as well as more demanding tasks like integrating information from noncontiguous parts of a lengthy text, and making inferences from the text. Successful reading comprehension, particularly as text difficulty increases, also depends upon the reader's ability to process text efficiently. The reader must recognize words quickly enough to be able to remember them as part of a syntactic unit of meaning. The "bottleneck" hypothesis holds that decoding speed and comprehension are interrelated, and that slow decoding inhibits comprehension (Perfetti & Hogaboam, 1975). When decoding becomes automatic and fluent, the reader is able to dedicate resources to process the meaning of text. LaBerge and Samuels (1974) described an information processing model in which automatic word recognition frees attention for meaning construction. This correlational relationship between decoding and comprehension forms the basis for repeated reading techniques to increase reading rate and accuracy (Fleisher, Jenkins, & Pany, 1979; Herman, 1985; LaBerge & Samuels, 1974; Samuels, 1976, 1985, 1997).

As text demands increase in difficulty, successful comprehension also becomes characterized by a self-conscious or metacognitive component. Research in cognitive psychology offers insights into the strategies that successful readers use to understand text above the word level. Strategies are goal-directed cognitive operations designed to enhance student performance on academic tasks like text comprehension. These comprehension strategies include procedures for monitoring understanding and for overcoming roadblocks to meaning. Research and theory from cognitive psychology have informed the design of interventions to help students develop the comprehension strategies that characterize skilled readers.

The following sections review several areas of research on these two aspects of comprehension, the relation of decoding efficiency and comprehension, and the role of strategy use. This review begins by first examining how the developmental course of decoding skills influences the emergence of comprehension skills. Next I examine the nature of strategic skills used by young readers, including the strategic skill deficits of at-risk readers. Because reading comprehension reflects an active cognitive process, it also is influenced by a student's inferencing skills, general listening skills, background knowledge, and motivation. Research on these aspects of comprehension will be summarized.

### Predictors of Comprehension

Decoding skills. Between kindergarten and grade three, decoding undergoes changes that affect comprehension. The mechanics of reading, in particular word reading, often consume the resources of beginning readers, limiting the attention available for the meaning of text. According to the limited resource theory and the processing limitation hypothesis (Shankweiler, Crain, Brady, & Macaruso, 1992), phonological skill deficits are the most common cause of decoding failure, and these deficits constrain comprehension. Strong support for the link between decoding skills and comprehension comes from both correlational and path analysis studies (Catts, Fey, Zhang, & Tomblin, 1999; Conners & Olson, 1990; Stanovich, Cunningham, & Freeman, 1984). Instruction in letter sound knowledge and phonological skills can be used to remediate these reading problems (Ball, 1993; Bradley & Bryant, 1985; Byrne & Fielding-Barnsley, 1993; Cunningham, 1990; Hatcher, Hulme, & Ellis, 1994; Torgesen, Morgan, & Davis, 1992). The important role of word identification in reading is underscored in several component analyses of children's reading skills at different ages. Curtis (1980) identified component skills that contributed to comprehension in skilled and unskilled second, third, and fifth graders. She found that the amount of variance in reading comprehension ability explained by speed of processing visual stimuli decreased with grade level (multiple correlations at grade two,  $R=.84$ ; grade five,  $R= .53$ ,  $p < .05$ ). Results indicated that younger students who were more skilled decoders and could monitor their attention to

words had more attention available for higher level processing of meaning, and Curtis recommended that comprehension instruction include practice in word identification.

A study by Kinnunen, Vauras, and Niemi (1998) examined more closely the role of beginning readers' decoding skills in comprehension. They found that first graders who were poor decoders (as determined in part by performance on a lexical decision task) were less active in monitoring their comprehension, although even the poor decoders showed some signs of monitoring at the sentence level. As Kinnunen et al. observed, when decoding speed increases it no longer consumes as much working memory and children can regulate their reading and overcome obstacles to comprehension. These findings support intervention to improve comprehension skills via fluency building practice. Poor readers who increase reading rate and accuracy should be better able to benefit from text experiences and from classroom comprehension instruction.

Strategy use by young readers. Although they often encounter obstacles to comprehension due to their immature decoding skills, beginning readers are less likely to spontaneously use strategies that experienced readers use to solve these text problems. Poor readers are often not aware of when they don't understand what they read, whereas self reports indicate that good readers regulate their comprehension (Garner & Kraus, 1981-82; Garner & Reis, 1981). Research by Flavell and his colleagues (Flavell, 1970; Salatas & Flavell, 1976) showed that young children are better able to use a cognitive strategy when prompted than independently. Kinnunen, Vauras, and Niemi (1998) found

that beginning readers are only beginning to show signs of actively monitoring comprehension or solving problems they encounter in text, and their earliest efforts tend to be evaluative rather than regulatory. Myers and Paris (1978) in their comparison of second- and sixth-grade students' metacognitive knowledge about reading found that the younger students were less likely to report an awareness of strategies that readers use to resolve comprehension problems. The second graders were insensitive to the semantics of a text and the overall meaning, and approached reading as decoding rather than meaning construction. Myers and Paris speculated on the causes for these age differences, including teacher focus on word-level instruction in the early grades, which may be even more intense for poor readers. Markman's (1977) research demonstrated that young children failed to engage in the constructive processes required to detect comprehension failure. When children in grades 1-3 were given incomplete instructions how to perform a task, the third graders recognized that information was missing before the younger children. The researchers had to induce the first graders to attempt the tasks before the students recognized that they did not understand the directions. Markman hypothesized that young children are not aware of their limited comprehension and therefore do not initiate remedial activities, such as reviewing the instructions, requesting clarification, or questioning the tester. They process information more superficially and are less able to verbalize the problems they appear to detect.

Young children's limited comprehension monitoring skills may also be a consequence of their limited background knowledge. In studies of adult readers, prior knowledge seems

to allow poor readers to compensate for their reading skills and for information that must be inferred from text. Alexander and Schwanenfluegel (1994) studied a group of first and second graders who were trained in the independent use of an organization strategy. They found that children's knowledge base was significantly related to their strategy use, and that a less well integrated knowledge base seemed to serve as a cue for strategy use. These findings suggest that prior knowledge may account for individual differences in comprehension. Further, young children may compensate for their less developed knowledge base by using strategies to complete a cognitive task like comprehending text. The research suggests that low-skilled second graders may be receptive to strategy instruction as a means of understanding text for which their knowledge base is incomplete or unfamiliar.

Self-regulation behaviors in young readers. Self regulation is a characteristic of successful readers, and self monitoring skills are included in several successful comprehension interventions (Palincsar & Brown, 1984; Paris & Jacobs, 1984). Eye-movement methodology is often used to measure the monitoring behaviors of young readers. Using on-line videotaped assessment of good and poor sixth graders reading inconsistent stories, Zabrocky and Ratner (1989) examined their look-back behaviors, reading speed, and verbal reports. These multiple measures revealed that good readers engaged in more look backs, discriminated more incongruent text, and generally applied regulation strategies once they detected problem text. Poor readers, on the other hand, tended to skip over difficult text and to be less active in constructing meaning. Poor

readers appeared to detect inconsistencies in text (i.e., evaluation) but did not engage in regulation to implement a strategy to act upon a comprehension question. These findings suggest that low skilled and less experienced readers may not yet have the skills to address obstacles to comprehension, but may be better able to learn to recognize that a comprehension problem exists.

Poor readers appear to be particularly deficient in regulation strategies and although they may recognize obstacles to comprehension, they are less likely to identify an appropriate strategy to overcome an obstacle. Garner and Reis (1981) gave a group of good and poor comprehenders, grades 6-8, an expository passage to read in which the researchers embedded obstacles to understanding. Students engaged in increasing number of look backs with increasing age and experience. Good comprehenders engaged in more look-back behaviors than the poor comprehenders. Some students were aware that they had encountered a comprehension obstacle, but did not know how to respond. The authors emphasized the need to teach students how to use and evaluate remedial strategies.

In their investigation of strategy instruction, Kinnunen and Vauras (1995) described differences in the monitoring and comprehension of high and low achievers. The fourth-grade subjects (ages 10-12 years from time of pretest to posttest) were individually assessed through on-line eye movement recording while they read passages. Measures of comprehension monitoring were students' reading time and the number of their regressions (lookbacks) in the text. The low-achieving students were instructed in

cognitive and metacognitive strategies, either alone or combined with training in motivation to reduce negative coping strategies (e.g., negative emotional reactions, self deprecations, avoidance). The high achievers were faster readers, comprehended the main ideas of the text better, and reread text with obstacles significantly more than low achievers. The low achievers who received training increased their reading times for internally inconsistent text, although they did not yet develop effective strategies to resolve text inconsistencies. Kinnunen and Vauras suggested that the skills involved in monitoring comprehension differ according to reading level. Students' earliest monitoring behaviors were to simply notice that they did not understand the text. This initial noticing may be an indefinite awareness that something is wrong, and may only later develop into the ability to identify the problem, and to select and use the appropriate remedial strategy. Students who are not able to decode effortlessly are unlikely to accomplish these monitoring acts without disrupting their reading:

The progress in reading comprehension seems to involve increased speed in reading with increased number of regressions in general, and more efficiently regulated reading speed and more accurately targeted regressions in relation to comprehension obstacles first at lexical and propositional, then at local and finally at global levels of text. (p. 162)

Kinnunen and Vauras's (1995) findings describe the hierarchical layering of comprehension that Adams (1990) emphasized, and support that there is a

developmental order in which children acquire strategies to locate information in text. Text lookback strategies in particular appear to be especially useful and amenable to instruction for young low-skilled readers. These text lookback strategies allow the developing reader to actively process text depending upon the demands of a particular reading task. Garner, Macready, and Wagoner (1984) found that both good and poor readers acquire text lookback strategies in the same sequence, beginning with undifferentiated rereadings, then text sampling, then question differentiation, and finally text manipulation. Based on Kinnunen and Vaurus's (1995) findings I examined the relationship among decoding skills, fluency, and monitoring behaviors in the present study to determine how lower-level word identification skills influence higher level metacognitive performance.

Inference making skills. One of the most important comprehension skills that skilled readers use is inferencing, or making connections between ideas and parts of the text. Two types of inferencing skills are commonly distinguished (Baker & Stein, 1981): text-connecting and gap-filling. Readers make text-connecting inferences when they integrate information provided throughout the text. They make gap-filling inferences when they use their experience and general knowledge to make connections in the text. Poor comprehenders may fail to make inferences for several reasons. First, they may not remember details they previously read in the text needed to make an inference. Second,

they may lack the knowledge how to make a gap-filling inference. Third, they may not know that they should try to make inferences. Cain and Oakhill (1999) conducted a study to determine whether inferencing has a causal relation to comprehension, and why poor comprehenders fail to make inferences. Their comprehension-age match design used three groups: skilled and less-skilled comprehenders ages 7-8 years matched for age and reading accuracy on the Gates-MacGinitie Vocabulary Test (Gates & MacGinitie, 1965) and the Neale Analysis of Reading Ability-Revised British Edition (Neale, 1989), and a comprehension-age match of 6–7-year-olds matched for comprehension with the older, less-skilled comprehenders. The children read short stories aloud and were asked a set of questions that tested literal memory and that required text-connecting or gap-filling inferences.

Cain and Oakhill (1999) found that the groups did not differ in their memory for text or their responses to literal questions. The less skilled comprehenders, however, were significantly poorer than the skilled and the comprehension-age match on text-connecting questions, and poorer than the skilled comprehenders on the gap-filling questions.

Although all groups performed at or near ceiling when they were given access to the text to help them answer the questions, the less skilled and comprehension-age match groups continued to perform below the skilled comprehenders. Finally, when the groups were directed to the relevant parts of the text after they failed to answer a question correctly,

the less-skilled and comprehension-age match groups still could not make gap-filling inferences. Cain and Oakhill's findings in this comprehension age-match design suggest that poor inferencing skills at least contribute to poor comprehension, rather than poor comprehension causing poor inferencing. When the groups were directed to the text, the poor comprehenders were able to make inferences comparable to the other two groups, suggesting that their failure to do so initially may be due to their focus on word accuracy in reading. The poor comprehenders' failure to make gap-filling inferences was found not to be due to lack of general knowledge, suggesting that they lack knowledge of strategies or how and when to use the strategies to integrate background knowledge in their reading.

Background knowledge and comprehension. Although children's word-level skills strongly influence their reading comprehension, other factors also play a role, including the student's level of background knowledge, listening comprehension skills, and motivation. Beginning readers are gradually accumulating background knowledge, which they use to help understand what they read (Anderson & Pearson, 1984; Bransford & Johnson, 1972), and research on comprehension in the 1970s and early 1980s clearly demonstrated how a reader's background knowledge affects comprehension of text (Anderson, Reynolds, Schallert, & Goetz, 1977; Bransford & Johnson, 1972; Reynolds, Taylor, Steffensen, Shirley, & Anderson, 1982). The meaning that readers construct

from text “is the product of individual word meaning, nuances, and disambiguations of word meaning foregrounded by the semantic and syntactic contexts provided by surrounding words and the larger semantic context in which the words were encountered” (Reynolds, 2000, pp. 172-173). Background knowledge is necessary for the reader to construct the schema (Anderson & Pearson, 1984) or situation model (van Dijk & Kintsch, 1983) of the text required for reading comprehension beyond the literal level. The relation of background knowledge to reading comprehension is reciprocal. Young children have lower levels of background knowledge than older readers. Background knowledge typically increases as a result of reading. As Stanovich and Cunningham (1992) tested in correlational analyses, print exposure is associated with cognitive differences after controlling for general ability correlates. Young readers with poor word identification skills are likely to have less exposure to print than good decoders, and thus have less background knowledge and vocabulary to draw upon in their reading (Stanovich, 1986). Disadvantages in background knowledge are difficult to address, but it is to the advantage of all readers to know to use their background knowledge in reading. Low-skilled readers from non-English speaking and from low-income backgrounds may also have lower levels of the background knowledge needed to understand texts that assume familiarity with standard English dialect and culture (Snow, Burns, & Griffin, 1998).

Listening and reading comprehension skills. Although reading and listening comprehension are highly correlated in adult readers (Sticht & James, 1984), the role of listening comprehension skills in reading comprehension appears to change as the child develops, and according to Sticht's (1972) developmental model, listening comprehension develops early in childhood, whereas reading comprehension emerges later. Smiley et al. (1977) studied the reading and listening comprehension of good and poor readers in grades one and seven. They found that good readers outperformed the poor readers on both listening and reading comprehension and concluded that listening and reading draw upon the same underlying processes. In their study of information processes involved in reading (i.e., response to visual, lexical, or semantic stimuli) Palmer, MacLeod, Hunt, and Davidson (1985) administered visual search, visual matching, and visual and memory span tasks to undergraduate students to differentiate skills unique to reading and those related to language comprehension. They found that reading speed and comprehension were two distinct abilities, with reading speed more closely related to visual processes than reading comprehension, whereas reading and listening comprehension were strongly related (with correlations ranging from .68 to .80).

Others who have examined the listening and reading comprehension skills of poor readers have found that both types of processing influence reading, although the two

skills may be more differentiated in beginning readers. Carlisle and Felbinger (1991), using sentence verification tasks, found that it was difficult to distinguish students (grades four, six, and eight) with poor reading skills from those with poor reading and poor listening skills, and they advised caution in using listening comprehension performance to predict reading comprehension capabilities. Using four types of auditory and visual stimuli, Sinatra (1990) found that listening and reading comprehension converge at the word level, and diverge at the level of connected text. Perfetti (1987) suggested that the relation between the two skills may vary at different stages of reading development, and in her study of developmental changes in the relationships among reading skills, Curtis (1980) demonstrated that word identification skill accounts for more variance in younger (grades 2 and 3) and in less-skilled readers, and listening comprehension accounts for more variance in older (grade 5) and in more skilled readers. Once decoding skills are well developed, language and listening comprehension skills become more important influences on reading ability (Sticht, 1979). Listening comprehension is a better predictor of reading comprehension for older than younger students, for whom decoding skills account for more variation in reading comprehension (Joshi, Williams, & Wood, 1998). In the present study, I examined the role of listening comprehension in students' reading comprehension outcomes.

Motivation and reading comprehension. Finally, students' self esteem and motivation for reading also influence their comprehension. Wigfield and his colleagues (Baker &

Wigfield, 1999; Wigfield & Guthrie, 1997) distinguished three types of motivation central to reading: intrinsic and extrinsic motivation; competency beliefs; and social motivation. Basic word identification skills strongly influence the beginning reader's sense of reading competence. As Stanovich's (1986) Matthew effects principle describes the widening gap between good and poor readers, children whose initial reading experiences are negative develop poor self concepts about reading, and Chapman and Tunmer (1995) found that by grades 4 and 5, students' perceptions of difficulty and competence about reading began to be significantly related to their reading comprehension. Likewise, by grade 5 their attitudes toward reading were significantly related to their comprehension.

The struggling reader with negative beliefs about her reading skills is less likely to read as actively as the good reader. Wigfield and his colleagues found that reading amount was related to children's reading motivation, and as noted earlier, reading amount or exposure relates strongly to comprehension (Cunningham & Stanovich, 1977).

Motivation may also be a product of competent strategy use. In their training study Paris and Oka (1986) provided third and fifth graders with explicit instruction in reading strategies. Classroom teachers used the Informed Strategies for Learning (ISL) intervention to provide classroom instruction in: awareness of reading goals, plans, and strategies; components of meaning in text; constructive comprehension skills; and,

strategies for monitoring and improving comprehension. Paris and Oka found that the level of students' awareness of their cognitive competence increased with age.

Regression analyses indicated that motivational variables entered more significantly as important predictors of reading scores after intervention. Borkowski, Weyhing, and Carr (1988) reported that training in reading strategies that includes a motivational component is most effective for children with a history of poor self esteem and negative attributions about their reading skills. One of the benefits of both proposed individual tutoring interventions may be the increase in self-esteem and motivation that results from increased levels of fluency or comprehension, as well as from the student's regular contact with a caring adult. Strategy use is associated with intrinsic motivation (Guthrie, Van Meter, et al., 1996), suggesting that the strategy instruction intervention may have a particularly strong effect on student motivation, although this is a difficult characteristic to measure.

### Considerations in Designing Strategy Instruction for Second Graders

If we consider the prerequisites of strategy use, the challenge of teaching these skills to second graders with very poor reading skills becomes apparent. First, as Dole, Duffy, Roehler, and Pearson (1991) characterized these reading strategies, they are intentional and deliberate, and "under the control of the reader" (p. 242). Second, strategy use often

requires reasoning and critical thinking skills that many low-skilled second graders do not yet possess. Third, readers must be flexible and able to adapt strategies to varied texts, judgments that inexperienced readers may find difficult to make. Fourth, readers must reflect on their reading in order to evaluate and regulate comprehension, and both their immature skills and the nature of primary reading texts make it less likely that beginning readers monitor their understanding. In summary, cognitive strategies require that the reader be active and critical. These strategy use requirements suggest that students with newly acquired and tentative decoding skills may not be ready to use strategies and might be confused and cognitively overwhelmed by an extensive cognitive strategy model. For these reasons most strategy instruction interventions target children in third grade and older (National Institute of Child Health and Human Development, 2000).

The research design for this study is based on two assumptions that are supported by research on reading comprehension and cognitive strategy instruction. The first assumption is that certain individual differences in comprehension strategies are due to developmental changes in cognitive monitoring (Saarnio, Oka, & Paris, 1990), and to differences in decoding skill (Stanovich, 2000). First and second graders will be able to access different strategies than older readers, and they may be less aware of advanced reading objectives (Myers & Paris, 1978), therefore the developmental order of these

cognitive and metacognitive abilities should be considered when selecting comprehension objectives for beginning readers. Furthermore, poor readers are less aware that good readers use strategies to understand text, may not have the attributions that support confident strategy use (Borkowski, Carr, & Pressley, 1987), and often do not know how to use strategies effectively (Paris, Jacobs, & Cross, 1987). Monitoring skills are influenced by background knowledge, and poor readers often fail to use their prior experience and knowledge to understand text (Garner, 1990). The second assumption on which the research design is based is that the effectiveness of actively monitoring comprehension has been demonstrated, as reflected in particular in several well researched programs, Reciprocal Teaching (Brown & Palincsar, 1989), Informed Strategies for Learning (Paris & Jacobs, 1984), Transactional Instruction of Comprehension Strategies (Pressley, El-Dinary, et al., 1992), and the explicit verbal explanation approach developed by Duffy and his colleagues (Duffy et al., 1986, 1987). I will therefore examine the findings on these effective instructional models that support this assumption underlying the second-grade intervention.

This study examined the relationship of word reading, reading rate, and student use of text monitoring strategies to comprehension. A repeated reading fluency treatment was designed to remove word-level processing obstacles to comprehension by addressing rate and accuracy. A comprehension monitoring treatment was designed to provide

students with models and text-based practice in actively constructing meaning, and in noticing obstacles at the word and sentence levels, the places where students will most often need to make connections between text propositions in second-grade level readers.

Two concerns raised in the literature relate to the age of the target population in the proposed research. Studies of children's use of regulation strategies demonstrate the age effects of strategy instruction. Cross and Paris (1988) used cluster analysis techniques to study patterns of reading skills in students who differ in age and instruction. Using third and fifth graders who received instruction in Informal Strategies for Learning (ISL) (Paris & Jacobs, 1984), a comprehension monitoring strategy, Cross and Paris examined short- and long-term metacognitive and reading outcomes. They found that about one third of their beginning third-grade readers demonstrated a significant discrepancy between reading performance and reading awareness, whereas by the time students were in fifth grade the correlations among metacognition and reading comprehension measures were quite strong. Between grades three and five, students appeared to integrate their strategic knowledge with their reading performance. One finding in the Cross and Paris (1988) study that is of concern in the present study is that third graders with both poor reading performance and awareness failed to benefit from the strategy instruction. The authors suggested that these young unskilled readers required either more reading awareness or more intervention (i.e., longer than the 15-18 weeks that was provided) in

order to benefit from strategy instruction. Both treatments in the proposed study extended for one full school year, and the comprehension treatment included a metacognitive focus to increase student awareness of the benefits of using the taught skills.

Others have questioned the findings (e.g., Markman, 1977) that beginning readers are unlikely to independently monitor their comprehension. Revelle, Wellman, and Karabenick (1985) proposed that the nature of the task, setting, and stimuli used in studies like Markman's (1977) study of first-third graders underestimate young children's comprehension monitoring abilities. The decoding demands of the reading task may likewise obscure the child's actual comprehension monitoring skills, which may be more apparent in the nonreading task situations. Revelle et al. (1985) studied the comprehension skills of preschool children in play interactions. The children, ages 2 ½ - 4 ½ years, engaged in a sandbox or tea party play session in which a female tester requested certain objects, such as a spoon, or a ball. The tester also made problem requests which involved ambiguity, memory overload, or were unintelligible. Revelle et al. (1985) found that the 3-year-olds discriminated between the requests and used appropriate strategies to solve the problem requests. The 4 ½ year-old subjects were able to successfully monitor all types of problems. One implication of findings like these is that even preschool children are able to monitor their listening comprehension. Although

reading comprehension is strongly influenced by word-level skills, even young readers like those in the present study bring general comprehension monitoring skills to their reading tasks.

### Effectiveness of Comprehension Strategy Instruction

The last assumption on which this study is based is that metacognitive strategy instruction is effective. Four comprehension practices in particular have generated well respected research (National Reading Panel, 2000) on student outcomes relevant to the proposed study, including awareness and use of comprehension strategies, active regulation of understanding, and increased standardized reading comprehension scores.

Reciprocal Teaching. One of the most well researched instructional practices to improve reading comprehension is Reciprocal Teaching (Brown & Palincsar, 1989), designed for classroom delivery by a teacher with small groups of students. Initial studies were conducted with seventh- and eighth-grade students. The teacher models cognitive strategies and then guides students through feedback, coaching, and shifting responsibility for implementing the strategies. As students become familiar with the strategies, they engage in dialogue with one another. Students learn to use four strategies: questioning, summarizing, predicting, and clarifying. Rosenshine and Meister

(1994) reviewed the research on Reciprocal Teaching, including both published and dissertation studies. Several findings in this review are particularly noteworthy in regards to my study. First, the effectiveness for the three types of outcome measures differed considerably. The average effect size was 0.32 for studies using standardized tests, was 1.00 for experimenter-designed short-answer tests, and was 0.85 for experimenter-designed summarization tests. Below-average students had an average effect size of 0.08 on standardized tests, and 1.15 on experimenter-designed tests. These findings underscore the importance of near-transfer as well as standardized reading measures of student outcomes in comprehension instruction. Second, although the number of strategies taught in the studies ranged from 2-10, there was no relationship between the number of strategies taught and student achievement. Further, there was no relationship between students' ability to generate questions and their performance on reading comprehension measures. Rosenshine and Meister (1994) speculated that instruction in one strategy may result in the development of a different strategy. They reported that significant results were obtained in studies that taught only one strategy (question generation), and they suggested that the most effective reciprocal teaching strategies were question generation and summarization. Pressley et al., (1989) reviewed the research on strategy instruction and also identified question generation and summarization as strategies supported by research and suitable for use in regular classroom instruction.

In a later review of intervention studies that taught and evaluated the transfer of question generation strategies, Rosenshine, Meister, and Chapman (1996) found that the median effect size for this cognitive strategy was 0.36 on standardized measures, and 0.86 on experimenter-developed comprehension tests. They found that interventions that used signal words were among the most successful (i.e., providing students with words like “who,” “why,” or “how” to generate a question). Among the effective instructional elements used in these studies were: providing models of appropriate response, providing a cue card, guiding student practice, and providing feedback and corrections— elements included in the present comprehension intervention. The review of question generation strategies did not include students below third grade, and the review of reciprocal teaching strategies did not have sufficient data to evaluate effectiveness for students below fourth grade. Nevertheless, the findings support including in a second-grade intervention the question generation and summarization strategies, as well as the procedural prompt and instructional elements associated with the highest comprehension gains.

Strategy instruction might be more effective for low-skilled young readers by making it more explicit and systematic. In a recent longitudinal study (Brand-Gruwel, Aarnoutse, & van den Bos, 1998) of students with poor reading comprehension and poor decoding skills, reciprocal teaching was supplemented with direct instruction techniques. Subjects

were 10-11-year-olds, half with poor and half with normal listening comprehension. Students received small-group instruction in the four reciprocal teaching strategies. Each strategy was introduced individually before students practiced the strategies in combination. The strategies were taught by alternating reading and listening lessons. One of the study objectives was to determine if training had differential effects for poor readers with poor or normal listening skills. Brand-Gruwel et al. (1998) reported positive effects of training on strategic knowledge and error detection. Like Rosenshine and Meister (1994) however, they found limited evidence of transfer to general reading comprehension measures. There were no differential effects for readers with poor or normal listening comprehension skills. Of importance to my study, however, is that Brand-Gruwel et al. demonstrated that students with poor decoding skills as well as poor comprehension skills may benefit from instruction in text comprehension strategies. Their study, as well as the studies of reciprocal teaching all used teacher modeling to teach the strategies to students. Modeling was used in the present study, and it is made even more explicit in the following instructional approach.

Mental modeling. Gerald Duffy and his colleagues at Michigan State University (Duffy et al., 1986) trained teachers to provide direct instruction in comprehension strategies. Teachers received 10 hours of training in how to incorporate direct instruction in the strategies that good readers use to solve text problems. Students received mental

modeling by teachers making their thinking public about using comprehension skills in the context of reading selections from classroom basal textbooks. Teachers talked about their thinking, modeled using strategies, and offered fifth-grade students opportunities to practice and apply new skills. The direct instruction intervention was based on the assumption that teachers, with training, can provide explicit metacognitive explanations of how to use reading strategies. The intervention relied primarily on the classroom teacher as the primary vehicle for instruction, rather than on instructional modules or components, and the success of the treatment depended on the teacher's instructional expertise. The research on the intervention showed that students who received explicit instruction were more aware of what they learned in the lessons, and when and how to use the strategies (Duffy et al., 1986). In a later study, the researchers found that low-skilled third graders who received the instruction were more aware of strategic processes and also scored higher on standardized, nontraditional, and maintenance measures of reading comprehension (Duffy et al., 1987). Duffy, Roehler, and Hermann (1988) distinguished mental modeling of comprehension from modeling the steps in the process. The former makes the teacher's thinking visible, whereas the latter describes the process from the outside. The authors emphasized the importance of allowing students to observe the teacher's cognitive activity. In the present comprehension intervention tutors mentally modeled questioning and inferencing activities, and students had opportunities to practice these skills strategically with highly engaging grade-level texts. A major focus

in the present intervention, therefore, was on building awareness of active reading through tutor modeling and student practice.

Informed Strategies for Learning. The work of Paris and his colleagues (Paris, Cross, & Lipson, 1984; Paris & Jacobs, 1984; Paris, Jacobs, & Cross, 1987; Paris & Oka, 1986) on the Informed Strategies for Learning (ISL) program is another example of an intervention in which the teacher provides direct explanations about effective reading strategies. In Paris and Jacobs (1986) the teacher provided whole class instruction to third and fifth graders in construction of text meaning (inferencing, elaborating, integrating, activating prior knowledge, summarizing) and monitoring comprehension (rereading, self questioning, clarifying, paraphrasing). The researchers provided teachers with metaphors and analogies which were illustrated in bulletin boards and posters. Built into the instruction to encourage student practice were teacher modeling, student practice, and teacher feedback through structured group discussions. Children in both grades demonstrated increased awareness of reading strategies, and gained in performance on cloze passages, a measure of inference and prediction skills, and in semantic and syntactic error detection in a reading passage. The intervention, however, failed to show significant effects on a standardized reading comprehension measure (Gates-MacGinitie), on student self-perceptions (motivation) about reading, or on perceived self competence. My intervention incorporated aspects of ISL instruction, in

particular inferencing, summarizing, and self questioning, as well as teacher coaching and faded support as students learn to initiate strategies.

Transactional Strategies Instruction. The work of Duffy and his colleagues provided one stimulus for other direct forms of comprehension strategy instruction, including the work of Michael Pressley and his colleagues on transactional strategies instruction (Pressley, El-Dinary, et al., 1992). The emphasis in this instruction was on groups of readers thinking together about a text, with the teacher and students sharing their thoughts and influencing each other's interpretations. Transactional strategies instruction includes direct explanations and teacher modeling of a few powerful comprehension strategies. Students engage in guided practice with the teacher. The teacher frequently emphasizes the utility of the strategies, and discusses when and how to apply them. Instruction is usually long term. Evaluations of transactional strategies instruction include its use with second graders (Brown, Pressley, Van Meter, & Schuder, 1996), as well as with middle and high school students (Anderson, 1992; Anderson & Roit, 1993; Collins, 1991).

One particular implementation of transactional strategies instruction, the Students Achieving Independent Learning (SAIL) program, has been described and evaluated (Pressley, El-Dinary, et al., 1992) and is of particular interest for my study. The SAIL program was used in a quasi-experimental study of second-grade low-achieving students

(Brown, Pressley, Van Meter, & Schuder, 1996). This evaluation is of interest in the present study for several reasons. It also focussed on low-skilled second graders. The SAIL program included instructional components used in the present study, including:

students relating their reading to their prior knowledge

students making predictions

students generating questions

students summarizing text periodically

students being encouraged to think aloud

teachers providing direct explanations, modeling, coaching, and scaffolding practice

When the SAIL students were compared to a group of students receiving typical second-grade reading instruction, after one year of intervention the SAIL group showed advantages on several types of measures. On a qualitative interview measure about strategy use, the SAIL students reported more comprehension and word-level strategies than the non-SAIL students. In a test of recall of stories covered in the lessons, the SAIL students provided more interpretive recalls than the non-SAIL students, and the SAIL students recalled more literal information. During a think-aloud protocol, the SAIL students demonstrated significantly more independent use of strategies than the non-SAIL group. Finally, the SAIL students scored significantly higher than non-SAIL students on a standardized comprehension measure.

These findings on the use of transactional strategies instruction with second graders provide support that trained teachers can successfully teach multiple strategies to even low-achieving primary-level students, whose comprehension instruction is often limited to single strategies, and who are often not expected to engage in strategy coordination and independent use, or in construction of knowledge through transactions with others and through linking text to their prior knowledge. In the present study trained tutors taught multiple strategies to low-skilled second graders and engaged in conversations about the texts.

Implications for Instruction. The research on developmental and individual differences in comprehension ability and on effective comprehension strategy instruction offers guidelines useful for planning an intervention for fragile second-grade readers. First, most formal strategy instruction (teaching procedural knowledge of the steps good readers follow when they read) has been designed for use by older students (as young as second graders in a few studies, but beginning with third and fourth graders in most studies). Strategy instruction must be less cognitively demanding for low-skilled second graders who have only recently attained grade-level decoding skills, who may be at risk for listening comprehension delays, and who are likely to have low levels of metacognitive awareness about reading. Interview studies with average skilled readers ages 8-12 years indicate that the youngest students were not aware of the variables that

affect reading comprehension, or the strategies that good readers use (Myers & Paris, 1978). Little is known about how good readers develop their skills in comprehending meaning, although differences in home and school learning opportunities seem one likely cause (Nagy & Anderson, 1984). Therefore, one way in which tutors may be effective in teaching reading comprehension skills is to engage in story reading to model and provide scaffolded practice in active reading.

Second, the research suggests that poor readers are less likely to detect text inconsistencies that good readers notice and act upon. In this study, tutors were trained to model active reading, including making inferences from prior knowledge or other parts of the text, and noticing unfamiliar words and parts of text that are confusing. Through exposure to repeated tutor modeling with different narrative and expository texts, young readers with fragile decoding skills may become familiar with several effective strategies used by skilled readers.

Third, some poor readers may have listening comprehension problems that are not identified. That is, impoverished language systems rather than reading mechanics may be the source of comprehension problems for some of the study subjects. Measures of listening comprehension were administered to determine if deficits in general language

skills characterized a subset of the students with reading comprehension problems and influenced response to treatment.

Fourth, instructional features in the comprehension strategy instruction studies that appear associated with successful comprehension outcomes include explicitness, initial demonstration, modeling at the word level, scaffolding, and use of multiple strategies. In the present study, tutors used scripts, which were needed to enable nonprofessionals to deliver the instruction with reliability. These scripts explicitly labeled and described each target skill. Students were expected to learn the label that described each skill. The scripts were designed to enable tutors to clearly explain their thinking and reasoning as they constructed the meaning of the text. The instruction began with tutors modeling each strategy and later providing opportunities for student practice. Finally, the strategies that were taught incorporated several basic text analysis activities— on-line summarizing, questioning, clarifying, and predicting. Research suggests that instruction in more than a single comprehension strategy (but not too many, especially for young fragile readers) is particularly effective (National Reading Panel, 2000).

#### A Cognitive Processing Model for Comprehension Strategy Instruction

The diversity of the population of students with reading disabilities is a challenge to practitioners and researchers. The population for the present study had in common a

history of low phonological awareness and significant decoding problems as first graders. With regards to component skills for comprehension, however, they were quite heterogeneous. Some but not all were expected to have deficits in working memory, global language comprehension, metacognitive skills, long-term memory retrieval, and background knowledge. About 20% of the students did not have English as their native language. This heterogeneity of students with low levels of skill in these components of comprehension has been addressed directly by others (Oakhill & Yuill, 1996; Perfetti, 1985). Perfetti, Marron, and Foltz (1996) identified the processing components-- lexical access, metacognition, inference making, and working memory--that most seriously undermine comprehension of text. Prior knowledge plays an important role in drawing inferences. As Cornoldi, DeBeni, and Pazzaglia's (1996) case study analyses revealed, no single deficits are found to be universally present in students with comprehension problems. I chose to address in this intervention those components of comprehension that appear to be most often involved, most potentially damaging for beginning readers, and most amenable to remediation by supplementary instruction delivered by nonteacher tutors. Below I briefly review the deficits that may characterize the subjects who received the strategy intervention in the present study, and that may have influenced their receptivity to treatment.

Lexical access. Students in the study had a history of word identification problems, and in light of this some may have entered the intervention regarding the goal of reading as word identification rather than understanding. Subjects were likely to have continued difficulty decoding as well as regulating their word recognition, leading them to substitute an incorrect word or to decode a word without noting or understanding its meaning. The early part of the strategy instruction included tutor modeling and prompts to notice words that the student may not know and that are central to the stories. Over the course of the school year tutors withdrew their prompts and models and encouraged students to independently monitor word-level processing of text. Word-level attention is hypothesized to benefit low-skilled beginning readers by enabling them to construct an adequate textbase (van Dijk & Kintsch, 1983).

Metacognition. Poor readers are often unaware of the comprehension strategies that good readers use (i.e., summarizing, questioning, planning), and lack the skills to implement these strategies. As first defined by Flavell (1976), metacognition is “knowledge concerning one’s own cognitive processes” and includes metacognitive knowledge and metacognitive monitoring. When the tutors first introduced each strategy they explicitly talked aloud (using the lesson script) in the manner described by Duffy and his colleagues (Duffy et al., 1986, 1987) to make their thinking about the stories visible. Further, tutors were specifically trained to talk about the connections they were

making, both to other parts of the text and to their own background knowledge, to make sense of the story. Tutors modeled these statements that demonstrated active thinking about the text, and scaffolded the student's practice in the strategy. Gradually tutors encouraged the student's independent monitoring and active reading, and reinforced students' independent metacognitive efforts. Frequent monitoring of the student's active thinking about the macrolevel propositions in the text is hypothesized to benefit the student's situation model (van Dijk & Kintsch, 1983).

Working memory. Kintsch and his colleagues (Kintsch, 1993, 1998; van Dijk & Kintsch, 1983) have clearly shown that memory is a constructive process that begins at the level of propositions that are strung together, first at the phrase and sentence level, and later at the level of syntactic boundaries (Swanson, 1984). Beginning readers who continue to be challenged at the word level are likely to have problems coordinating information even at the smallest level of the microstructure. Initially, therefore, tutors prompted the students in on-line summaries of chunks of text. The purpose of these summaries was to model and provide students with practice in constructing the sense of the story in manageable pieces of several pages that the beginning reader can successfully reconstruct, and to identify problems in the student's understanding before too much damage has occurred. On-line summaries of propositions are hypothesized to scaffold the student's construction of the textbase. The final recall summaries of each storybook may be,

according to Kintsch, intermediate measures that sometimes reflected mere recall of the textbase, that is, elements derived directly and solely from the text, and at other times the construction of the situation model that incorporated the reader's experience and prior knowledge. Tutors prompted and modeled for the student to produce final retells that reflected a situation model of the text.

Inference making. One consequence of a beginning reader's tendency to focus on word identification and to overlook meaning is the failure to draw inferences. Even in the second-grade level storybooks that the students read, they needed to integrate information between sentences, and to draw upon common or presumed background knowledge to construct an adequate situation model. Tutors modeled and prompted students in instructional strategies to make connections between sentences, and to construct a situation model tied to information in the text. These early inferences are often, as described by Kintsch (1993), bridging gaps in the text by retrieving prior knowledge. Tutors sometimes scaffolded inferencing by directing students to the text when they lost a link to prior text information in long-term memory.

In summary, the intervention strategies addressed common deficits in cognitive processes that may disrupt comprehension in young beginning readers. Most of the individual strategies selected for use in this study were found to be effective in the National

Reading Panel's (2000) meta-analysis of comprehension instruction, and the Panel reported "very strong empirical, scientific evidence that the instruction of more than one strategy in a natural context leads to the acquisition and use of these reading strategies and transfers to standard comprehension tests" (p.4-107).

## Chapter 3

## Methods

Overview

The subjects in this study participated in one of two programs of instruction, Thinking Partners or Reading Partners. Thinking Partners provided instruction in comprehension strategies. Reading Partners provided repeated reading practice to build fluency. Instruction in each program was delivered by trained tutors in half-hour one-to-one sessions, four days a week, for the entire school year (average 20 weeks, or 78 half-hour tutoring sessions). Students were tutored in their schools during the school day. Both treatments are described in detail later in this chapter.

Subjects

The students eligible for participation in this study were subjects in a 5-year longitudinal study of early reading interventions. As first graders, these students received one year of one-to-one tutoring in phonological awareness and early reading skills in a program called Sound Partners (Vadasy, Jenkins, Antil, Wayne, & O'Connor, 1997). The subjects were drawn from nine Seattle area elementary schools. The gender distribution of the

sample is 59% male, 41% female. Ethnicity is 22% African American, 33% Caucasian, 17% Asian, 18% Latino, 4% Native American, and 6% other. Twenty percent of the sample was determined by their schools through a variety of methods, including parent self identification, as having English as their second language, and 35% were eligible and were served in Title I programs. At the end of first grade, 4% of the sample was served in special education programs; half of these students were classified as learning disabled.

Subject selection. After one full year (30 minutes a day, four days a week) of individual Sound Partners tutoring in phonological reading skills in the first grade, the subjects were posttested on measures that included the Woodcock Reading Mastery, Word Identification and Word Attack subtests. Students were selected based on their spring, 1999 posttests to be eligible for this study, and were pretested in September, 1999 and randomly assigned to one of the two treatment groups. Of the 43 first graders posttested who entered this study, 21 (49%) scored below grade level on the Word Identification subtest, 20 (47%) scored below grade level on the Word Attack subtest, and 7 (16%) scored below grade level on both subtests. Thus all students began second grade with three weeks of Sound Partners review tutoring in word identification skills in September, 1999 before being randomly assigned based on their tutor assignment to their treatment group.

### Group Selection

A total of 18 students received the Reading Partners instruction, and 29 students received Thinking Partners instruction (both treatments described below in Procedures). When I examined the distribution of the groups on pretest measures, I found four students were extreme outliers on the WRMT Word Identification pretest and on age at pretest. I therefore removed two students who scored more than two standard deviations ( $SD = 8.00$ ) below the Reading Partners group mean (24.75) on the WRMT Word Identification pretest. I also removed two Thinking Partners students who were more than four standard deviations ( $SD = .31$  years) above the mean (7.19 years) age at pretest. The remaining 16 students in the Reading Partners group and 27 students in the Thinking Partners group were included in the analyses that will be described. In the Reading Partners group, 8 subjects were males and 8 were females; 10 were from minority backgrounds, and 3 were classified by the schools as having English as their second language. In the Thinking Partners group, 16 subjects were males and 11 females; 19 were from minority backgrounds, and 6 were classified by schools as having English as their second language. Other group characteristics are found in Table 1.

## Design

The study design was a two group design with groups matched on pretests. The two treatments were: an adaptation of Read Naturally (Hasbrouck et al., 1999) fluency building for individual instruction; and, an experimenter-designed active comprehension instruction. Tutors at each school site were randomly assigned to one of the treatments, and students were assigned to tutors based on school tutoring schedules.

The primary research questions I addressed in this study are:

1. What are the relative effects of two one-to-one tutoring treatments, repeated reading and active comprehension instruction, for low-skilled second graders on:
  - a. word level skills
  - b. listening comprehension
  - c. reading comprehension
  - d. fluency
  - e. strategy use
  
2. Are there differential effects of treatments based on students' entry-level reading skills?

3. What student, tutor, and program variables (student attention, student classroom behavior, student attendance, tutor implementation) influenced reading outcomes?
  
4. What student (word reading, listening and reading comprehension skills, attention) and program (tutor fidelity of implementation) variables influenced student strategy use?

#### Procedures for Comprehension Instruction

The instructional model for the tutor's role in Thinking Partners instruction was a hybrid suggested primarily by the four comprehension practices reviewed earlier, and by the instructional approaches of Vygotsky on scaffolding (1978), Meichenbaum (1977) on cognitive behavior modeling, Rosenblatt (1978) on transactional instruction, and the theoretical work of Flavell (1976), van Dijk and Kintsch (1983) and Perfetti (1992, 1996). Furthermore, this previous research and theory on comprehension instruction was translated into instructional strategies that were useable by tutors without previous teaching experience or training. That is, I did not rely on tutors to individualize and make skilled judgments about the instructional content and prompts, and the instruction was therefore designed to suit the needs of a broad group of low-performing students.

Active comprehension instruction. Thinking Partners intervention was a one-to-one version of strategy instruction in comprehension monitoring that targeted the evaluation skills of low-achieving beginning readers. The primary objectives of the instruction were to:

1. Provide opportunities for students and tutors to interact with text that is selected at the students' reading level and with content that stimulates student interest and inquiry.
2. Provide tutors with the training and materials that enable them to model their monitoring of the text and scaffold the student's use of effective reading strategies, and active thinking and talking about text.
3. Provide opportunities for students to practice strategies and active construction of their understanding of text.

Instruction was focussed on five primary strategies: keeping track, understanding words, making connections, thinking ahead, and making questions.

Keeping track. The first skill that tutors introduced to students was keeping track. This was an on-line summarizing strategy the student used to describe the part of the story just read. The lessons identified stopping points in each storybook for the tutor and student to update the story progress. At these stopping points the tutor prompted the student by asking "What's happening so far?" or "What did you learn?" to recount the

most important ideas in the text she had just read. If the student had difficulty the tutor added a prompt (“Where did we leave off?”) or modeled how to monitor understanding of what was just read by starting the on-line summary for the student (“So Mr. Putter went to buy ingredients for a cake. Then what happened?”). After the student became familiar with the skill, the tutor faded her prompts, and the student independently stopped reading at the flags in the book and provided a brief summary or update of the story events. In the case of an expository text, the student summarized what she learned from the chunk of text she just read. Over time, the tutors tried to encourage shorter and more concise summaries from their students. As Pressley, El-Dinary, et al. (1992) pointed out in their review of research-based strategies, the use of summarization with students younger than age ten is suggested by the Jenkins, Heliotis, Stein, and Haynes (1987) study in which third and fourth graders with learning disabilities were successfully taught a summarization strategy.

Understanding words. This strategy was taught to help students monitor their word-level comprehension. Either during the reading or at a stopping point in the text, the tutor pointed out words that the student read but was not likely to know or did not appear to comprehend. The tutor modeled how a good reader might stop to ask herself “I wonder what *deliver* means” or “I need to figure out what *counting on you* means.” Tutors were given cues for modeling this strategy, and these cues included both individual words and

phrases or expressions. When the tutor no longer needed to prompt the student to notice words, the student was able to notice an unfamiliar word by stopping and often pointing to her laminated cue card for understanding words. The tutor then either helped the student try to figure out the meaning of the word from context, or told the student the meaning of the word. For example, a tutor prompted by asking “I wonder what *poked* means?” and the student thought and responded “It means he put his head out of the tent.” The tutor later prompted, “I wonder what *gorp* is?” and when the student did not know, the tutor explained that “It means trail mix, it stands for good old raisins and peanuts.” For an ESL student a tutor prompted “I wonder what *honey* is?” and when she confirmed that the student did not know what it was, she explained that it was something very sweet that bears often like.

Making connections. Making connections was by far the most difficult of the group of strategies for tutors to learn and to teach to their students. It describes the skill of connecting what the student has just read to the rest of the story, and to things the student already knows. The lessons provided examples of how to model making connections at points in the text where the reader was likely to need to draw on background knowledge, or to remember or reread an earlier part of the text. However, student gaps in background knowledge, for example, are not standardized, making it difficult to provide tutors with standard prompts for having students use this skill. To

introduce the skill, the tutor modeled wondering statements that a good reader might ask herself to identify gaps in understanding at the sentence or text level. These statements most often required the reader to draw upon background knowledge or information in other parts of the text. For example, in a story about a character who collects things, the tutor asked, “Do you have a collection of anything?” and the student thought and shyly confided that she collected bent nails! Then the pair talked about what it was like to collect things, enabling the student to access her schema about collections. The tutors prompted their students to think about a part of the text by asking “What do you need to figure out?” or “What are you thinking about here?” The tutors initially modeled appropriate self monitoring statements and gradually faded these models as the student supplied a response. By helping students monitor their reading to detect gaps and contradictions and become sensitive to text structure, tutors led students to make inferences when needed and integrate the text into their personal schema.

Thinking ahead. Good readers think about and anticipate what will happen in the text. Prediction has been included in effective strategy instruction reviewed previously (i.e., Reciprocal Teaching, SAIL). When Baumann, Seifert-Kessell, and Jones (1992) compared a think-aloud monitoring treatment to a prediction-verification treatment for fourth graders, they found that the prediction treatment group performed as well as or better than the think-aloud group on cloze and error detection tasks, leading them to

speculate that prediction alone may be sufficient to boost comprehension monitoring behavior. In the present study, the tutor introduced thinking ahead as trying to predict or guess what will happen next in the story. Where appropriate at each stopping point in the text, the tutor prompted “What do you think will happen next?” In the early lessons the tutor modeled these predictions for the student, and gradually faded these prompts and responded to the student’s predictions. This was a relatively straightforward strategy for tutors to teach, and students often learned this strategy quickly and were able to apply this strategy successfully, like the student who eagerly initiated “I’m going to think ahead now.”

Making questions. The tutor introduced making questions at lesson #29 (after the tutor and student practiced using the first four strategies with the first 28 storybooks). As noted, making connections turned out to be a difficult strategy for tutors to understand and teach. Making questions was added to provide additional opportunities for the student to make connections and draw inferences from the texts. Pressley et al. (1989) reported that one of the demonstrated effects of question generation was improved performance on inferential test questions. Self-questioning may be a relatively straightforward regulatory mechanism to check comprehension, and it has been taught to students with learning disabilities to improve comprehension (Chan & Cole, 1986; Singer, 1978; Wong & Jones, 1982). Because tutors had difficulty modeling and using

making connections to induce the student to make causal connections in the text, we asked tutors to model and prompt students to ask “why” questions about the pages just read. Many or most of these modeled “why” questions required the student to make inferences about the story, either by connecting parts of the story or by filling in the gaps in the story with background knowledge. Tutors modeled “why” questions like “Why was Little Bill so excited about being on the team?” “Why did they all want to sleep in the middle of the bed (at the scary pajama party)?” “Why did Henry’s Careful Cousin Annie look worried when she saw Mudge?” Later, students spontaneously generated “why” questions like: “Why do people train dolphins?” “Why does the dolphin want to play with the man?” “Why does the dinosaur have such a long tail?” With practice in making questions, some of the students began to reveal that they were answering their own questions: “Why do they teach dolphins words– oh, I see, so they can talk to each other and understand each other!” “Why do gorillas play with frogs– oh, it’s because frogs hop!”

General comprehension procedures. Tutors and students read one storybook approximately every two days. First-grade level readers were used during the first stage of instruction to allow all students to direct their attention to the story content and learn the first four basic reading strategies with minimal word-level obstacles. Grade-level storybooks were gradually introduced after the first 8 weeks of the program, and by

lesson #18 only second-grade level texts were used. Many of the text selections were recommended by Dr. Sam Sebesta for their suitability to stimulate discussion and interest. Expository texts were introduced in the second half of the intervention, and they comprised about 15% of the storybooks read. (A list of books used in Thinking Partners is in Appendix A.) Tutors stimulated prior knowledge before they began to read each new storybook with the student. According to Duffy (1999, personal communication) “the key to comprehending better is always accessing what you already know.” The tutor prompt for directing students to their background knowledge was: “What do you already know about that?” The emphasis in the second half of the intervention was on consolidating student skills in strategy use with extensive practice in varied storybooks, including several expository texts.

The tutors introduced the skills one at a time to the students, beginning with keeping track. The student practiced each skill for four days on two different stories before a new skill was introduced. After keeping track was introduced, the tutor presented making connections, understanding words, and thinking ahead. The four primary skills were introduced by lesson #8.

Tutors used a similar procedure for introducing each skill to their students. The procedure follows the recommendations that Pressley et al. (1989) derived from their

review of research-based strategy instruction for explicit, intensive, and extensive instruction that includes teacher reinforcement, feedback, and explanations. First the tutor modeled the skill. Then once the student had seen what the skill looks like, the tutor used prompts to scaffold the student's practice. Each lesson included prompts and models for tutors to use to teach each skill. Tutors were trained to use them to help a student who did not independently respond with skill use, or who required a model. Finally, when the student became familiar with the routine of the lessons and the expectations at the stopping points, the tutor faded the prompts and scaffolded the student's attempts to use the skill. For example, the tutor introduced keeping track by modeling a summary of the portion of the text the student just completed reading. In the early part of the year, this chunk might be only a couple of pages, and by the end of the year the student might be summarizing an entire chapter in a storybook. After the student was familiar with models of keeping track, the tutor prompted the student to keep track at points in the books marked by flags. The tutor scaffolded the student's summary by asking questions like, "What else happened?" or "What happened after that?" Finally, the goal was for the student to independently stop at the flags in the book to conduct the keeping track strategy, and ultimately the tutor encouraged the student to name each skill whenever the student used it independently. This sequence of instruction was similar for each of the five skills the tutors taught. At the beginning and end of each lesson the tutors asked the students to name the strategies they learned, and to describe what they

did when they used each strategy. Most of the students could name the strategies easily, and some students were able to describe the strategies in their own words. For example, after the tutor prompted a student to describe making connections, the student explained “That’s like– it happened to me before.” Or for understanding words, one student explained “You say ‘I don’t know that [word], then you talk about it together.”

In the later lessons tutors gradually decreased their prompts and models and required students to independently respond with on-line summaries, questions, and application of background knowledge. At the end of each story, the student was asked to retell the story, and tutors used prompts to scaffold these retells.

On the second day (although the later books often took more than one day for the first reading) each storybook was read, the student read the book independently “for fun” and again retold the story without the text. The first 27 lessons included one or two short questions the tutor used to stimulate discussion of the book after the second reading. Appendix B includes a sample of a tutoring lesson used in the first 16 sessions. Once the second-grade level storybooks were introduced to students, some began to have difficulty with word-level readings, suggesting that students’ word reading skills were not yet at grade level. In order to address these problems, 5 students in the comprehension treatment group also received tutoring in decoding during half of their

sessions. Tutors scaffolded reading in the trade books for these students, using echo reading, or reading difficult words for the student.

In conclusion, the strategy instruction was scaffolded such that early lessons included higher levels of tutor modeling and prompts, and students were gradually encouraged to use the strategies independently in the later lessons.

### Procedures for Repeated Reading Intervention

The treatment comparison in this study was a repeated reading activity. Repeated reading of passages is one of the oldest instructional approaches used to improve fluency. As the National Reading Panel (National Institute of Child Health and Human Development, 2000) found in their meta-analysis of fluency studies with experimental designs, repeated reading also has a moderate effect size for comprehension. The assumption upon which repeated reading is based is that effortless decoding is necessary to allow the reader to allocate limited cognitive resources to constructing meaning from the text. Repeated reading is based on automaticity theory (LaBerge & Samuels, 1974). Fluent readers decode text effortlessly and can direct their attention to processing meaning.

Many educators subscribe to methods of repeated reading to improve students' fluency and comprehension, and the level of practitioner faith in the procedure is supported by findings on the effectiveness of repeated reading. One group of studies examines the relationship between fluency and reading level, and not surprisingly, good readers had faster reading rates and higher levels of accuracy than poor readers (Baker & Hall, 1994-95; Shinn, Good, Knutson, Tilly, & Collins, 1992; Stanovich, Cunningham, & Freeman, 1984; Young & Bowers, 1995). Students receiving practice in repeated reading have demonstrated increases in rate, accuracy, and comprehension (Dowhower, 1987; Herman, 1985; Homan, Klesius, & Hite, 1993; Mathes & Fuchs, 1993; O'Shea, Sindelar, & O'Shea, 1985; Rasinski, 1990; Stoddard, Valcante, Sindelar, O'Shea, & Algozzine, 1993).

The Read Naturally (Ihnot & Ihnot, 1999) program is a widely used structured program in repeated reading and fluency development. Its extensive use in classrooms together with the support for repeated reading practice in the research literature provided the basis for using Read Naturally as the treatment contrast in this study. The secondary research questions I addressed in this study may provide information on the types of children who may best profit from this fluency approach. In its adapted form, Read Naturally provided an alternative route to developing successful comprehension skills. It

offered intensive practice to build fluency skills through repeated reading of passages selected at each student's independent reading level.

Read Naturally repeated reading tutoring. Read Naturally consists of a set of reading passages for primary students organized by reading level. The levels from 0.8 to 2.7 are determined based on the Fry/Spache readability formula. The levels approximate independent reading levels at the same grade level. Each reading level, from 0.8 to 7.0 includes 24 passages. The last passage in each level was removed in this study and saved for use at post testing, leaving each tutor with 23 passages at each level to use with each student. Project staff initially placed each Read Naturally student in a passage at the appropriate reading level, determined when the student can read 40-60 words correct per minute (wcpm) on the first cold reading with no practice. The student and tutor then completed the following steps for each passage:

1. Student is timed for 1 minute orally reading the passage for the first time
2. Student and tutor graph the number of words read correctly in the "cold" 1-minute timing.
3. Tutor and student read the entire passage together twice. The tutor models reading the passage fluently and with prosody.
4. Student reads the entire passage alone once. Tutor makes corrections as the student reads.

5. Student reads the passage aloud for a 1-minute practice timing.
6. Student reads the passage aloud for 1 minute alone for a “hot” timing. Tutor times the student, subtracts errors, and marks the rate on the graph.

Some students completed two passages per session once they began to increase in fluency, but other students read only one passage per day. Students in the Read Naturally group usually read all 23 passages at each level before moving on to the next level. If one of the tutor supervisors observed that a student had read three of the last five passages at a cold reading rate at or above 100 wcpm, the supervisor moved the student up to the next level. It is estimated that a realistic goal for students' fluency gains at grade 2 is an increase of 1.5 words per week (Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993).

After the first two months of tutoring, 6 of the students in the Read Naturally group demonstrated word reading problems that necessitated supplementary decoding instruction in order to read the passages. These students were reading at level 0.8 or 1.0, and had a cold reading rate less than 65 words correct per minute on three out of five passages. To address these students' word reading problems, their tutors practiced only one Read Naturally passage with them per session, and provided instruction in word level skills during the remainder of the lesson. For the word level portion of instruction,

tutors either worked on word reading and text reading fluency with these students, or they reviewed instruction in word reading skills (decoding, sight word reading, silent-e words, letter pair sounds) using the Sound Partners decoding script that tutors used with students in first grade.

### Measures

Subjects were pretested in autumn of second grade and posttested at the end of second grade on measures of decoding, word identification, fluency (rate and accuracy), and comprehension skills (listening and reading), including inferencing and retelling.

Assessments were selected to test the transfer of effects for both the fluency and active comprehension treatments. In addition, as noted, all subjects had been previously tested at the end of first grade after tutoring in phonological reading skills on an extensive battery of assessments, including measures of: rapid letter naming, word reading (accuracy and efficiency), phonological coding, phoneme segmentation, comprehension, and orthographic choice. These measures were of primary interest in evaluating the first-grade treatment.

The measures of interest in the present study were selected to address the three research questions outlined above. Standardized word identification and word attack measures

provided information on the relation of these basic word level skills to both fluency and comprehension. Multiple fluency and comprehension measures were used to provide composite scores for these two major outcome variables. Composite scores were used due to the lack of adequate standardized measures in these areas. For comprehension in particular, typical standardized measures using cloze procedures, like the Woodcock Reading Mastery, would not provide a sensitive near-transfer measure of inferencing skills taught in the intervention. For this reason I used passages that were specifically designed for use in previous research (Oakhill, 1984) to elicit these higher level comprehension skills. Other measures, such as the Comprehensive Test of Phonological Processing (CTOPP) (Wagner, Torgesen, & Rashotte, 1999) Word Reading Efficiency subtest, and the Woodcock Reading Mastery Test (Woodcock, 1987) and the Wide Range Achievement Test-Revised (Jastak & Wilkinson, 1984) Reading subtest were used because they had age and grade norms, and had been used in similar intervention studies and would allow comparison of treatment outcomes and effect sizes.

### Beginning of First Grade Pretests

Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981). The PPVT-R is an individually administered, norm-referenced test of receptive vocabulary. From four simple black-and-white illustrations arranged in multiple-choice format,

children select the picture that best illustrates the meaning of the stimulus word presented orally by the tester. One point is awarded for each correct response. Age-based standard scores were used.

Syllable Deletion Test. Students were given a version of the Rosner Test of Auditory Analysis (Rosner, 1979), modified by Berninger, Thalberg, DeBruyn, and Smith (1987). The student is required to segment multiple syllable words by deleting one syllable. Five items require deletion of the initial syllable, and five items require deletion of the final syllable. The score is the total items correctly segmented.

Alphabet Writing (Berninger, 1990). Students write the alphabet in lower case letters. Capital letters, omissions, additions, transpositions, and reversals count as errors. This task is scored as the number of correct letters written in the first 15 seconds, as well as total time and total correct.

Rapid Letter Naming. Students are presented with a card displaying all of the upper case letters of the alphabet in random order. Students name as many letters as they can within 1 minute. Letter sounds are accepted as correct responses. The score is the number of letters (or letter sounds) named per minute.

Comprehensive Test of Phonological Processing (CTOPP) (Wagner, Torgesen, & Rashotte, (1999). Rapid Letter Naming, Segmenting Words, and Nonword Repetition subtests. The 72-item CTOPP Rapid Letter Naming Subtest measures the speed with which the student names the letters on two pages. Each page contains four rows and nine columns of six randomly arranged letters which the student most first demonstrate she can identify. If the student cannot first name all of the letters correctly, even after correction, testing is discontinued. The score is the total number of seconds to name all of the letters on both pages. The CTOPP Rapid Letter Naming subtest requires the student to name only a subset of six letters, whereas the previously described Rapid Letter Naming Test requires the student to name all of the letters. This CTOPP subtest is a measure of verbal efficiency, whereas the Rapid Letter Naming Test described above measures letter recognition. The test-retest reliability for the CTOPP Rapid Letter Naming Subtest for 5-7 year olds is .97.

The CTOPP Segmenting Words subtest measures the student's ability to say the separate phonemes that make up a word. It consists of 20 items. The student is instructed to repeat a word then say it one sound at a time. The score is the number of correct test items up to the ceiling of three missed items in a row. The test-retest reliability for this subtest for 8-17 year olds is .79. The CTOPP Nonword Repetition subtest consists of 18 items to measure the student's ability to repeat nonwords ranging in length from 3 to 7

sounds. The student listens to the made up words on an audiocassette, and is told to repeat each word exactly as she heard it. The score is the total number of nonwords read with all of the phonemes produced correctly, up to the ceiling of three consecutive missed items. The test-retest reliability for this subtest for 5-7 year olds is .68.

Test of Word Reading Efficiency (TOWRE) (Torgesen, Wagner, & Rashotte, 1999).

The TOWRE consists of two subtests. The TOWRE Sight Word Efficiency subtest includes a list of 104 real words. It assesses the number of printed words the student can accurately identify within 45 seconds. The test-retest reliability for this subtest for 6-9 year olds is .97. The TOWRE Phonemic Decoding Efficiency subtest includes a list of 63 pronounceable nonwords. Both lists increase in difficulty. Each subtest includes a practice list. The tester presents the student one of the lists and asks the student to read the words as fast as she can. The tester stops after 45 seconds. The test-retest reliability for this subtest for 6-9 year olds is .90. The score for each subtest is the number of words or nonwords read correctly within 45 seconds. The TOWRE is normed for use with individuals from 6 to 24 years old.

Wide Range Achievement Test-Revised (WRAT-R) Reading and Spelling subtests

(Jastak & Wilkinson, 1984). The WRAT-R is a norm-referenced achievement test for basic academic skills. The WRAT-R Reading subtest consists of a formal reading level of

letters and words which the student must name. The student is asked to write his/her first name and to identify 13 upper case letters. The student is then required to read and pronounce words of increasing difficulty until 10 consecutive errors are made. The number of words and letters correctly identified is transformed to an age-based standard score. The WRAT-R Spelling subtest requires the student to copy marks, print his or her name, and spell from a list of 45 increasingly difficult words the tester dictates until 10 consecutive errors are made. The number of items is transformed to an age-based standard score. The internal consistency reliability for seven-year-olds for the Spelling subtest (average of two forms) is .92, and for the Reading subtest (average of two forms) is .95.

Woodcock Reading Mastery Test (WRMT)- Word Attack and Word Identification subtests (Woodcock, 1987). The Word Attack subtest consists of 45 nonwords of increasing difficulty, 10 of which include within-syllable consonant clusters. Items are grouped in 10 items per page, increasing in difficulty from the beginning to the end. The tester directs the student to read the nonwords (“Tell me how they sound”). Testing discontinues after the child makes 6 consecutive errors. The Word Identification subtest consists of 106 increasingly difficult words. The tester points to each word and asks the student to read it, until the student makes 6 consecutive errors. The split-half reliability

for the Word Attack subtest for first graders (for either form) is .94, and for the Word Identification subtest (for either form) is .98.

### End of First Grade Posttests

All of the pretests except for the PPVT and the Syllable Deletion Test were also administered at posttest at the end of first grade. In addition, the following measures were added at posttest.

Yopp-Singer Segmentation Test (Yopp, 1988). Students segment sounds of 22 orally presented words with correct feedback. Testing continues until students miss 10 consecutive items. The score is the total number of words segmented correctly.

Bryant Pseudoword Test (Bryant, 1975). A list of 50 pseudowords is read until five consecutive items are missed. One point is assigned to each correct response.

Dolch Word Recognition Test (Dolch, 1939). The student reads from a list of 220 short, frequently used words arranged in groups according to basal reading levels until 10 consecutive items are missed. The score is the total number of words correctly identified.

Orthographic Choice (Berninger, Yates, & Lester, 1991). This measure tests the retrieval of the orthographic image of a word. The test consists of 25 stimulus pairs, one real word and one word that is pronounced the same but spelled differently. The tester asks the student to point to the one that is a real word. The score is the number of correct responses divided by the total number of items.

### Beginning of Second Grade Pretests

Listening comprehension. Two passages, one first-grade level (“Nate”- Level 1-3) and one second-grade level (“Peter”- Level 2-3) were adapted from the Informal Reading Inventory (Burns & Roe, 1999) and read to the student. The tester then asks eight comprehension questions about each passage, including main idea, detail, vocabulary, and inference questions. The score is the number of questions correct out of 16.

Reading comprehension. The student reads aloud two entire passages from the Informal Reading Inventory (Burns & Roe, 1999), one first-grade level (“Lydia”) and one second-grade level (“Pet dog”). The tester records the student errors and the reading time. The tester then asks the student eight comprehension questions per passage, similar in type to the listening comprehension questions. The score is the number of questions correct out of 16.

Fluency. The student reads aloud for one minute each from two passages, one first-grade level (“With my Brother” Level 1-3) and one second-grade level (“To Catch a Thief” Level 2-3), from the Houghton-Mifflin Invitations to Literacy program. The tester records the number of words read correct per minute. The Houghton-Mifflin passages were chosen because they were normed on a large student population in Minnesota, and grade norms were available (Marston, personal communication, August 19, 1999). Because accuracy as well as rate was of interest, the percent of words read correctly was also computed for all fluency passages.

#### End of Second Grade Posttests

Woodcock Reading Mastery Test (WRMT)- Word Attack and Word Identification subtests (Woodcock, 1987). These subtests were readministered at the end of second grade.

Wide Range Achievement Test-Revised (WRAT-R) Reading and Spelling subtests (Jastak & Wilkinson, 1984). These subtests were also readministered at the end of second grade.

Test of Word Reading Efficiency (TOWRE) (Torgesen, J.K., Wagner, R.K., & Rashotte, C.A., 1999). The two TOWRE Sight Word Efficiency and Phonemic Decoding Efficiency subtests were readministered at the end of second grade.

Reading Comprehension Passages. A group of four reading passages were selected to test students' comprehension skills. Passages were selected to control for text type (decodable or nondecodable, narrative or expository). Two passages from the Read Naturally program were selected as a near transfer measure and adapted to conform to these text categories: one decodable expository passage ("Moose"), and one nondecodable expository passage ("The Puff Adder"). Two passages were provided by Jane Oakhill from her comprehension studies (Oakhill, 1984; J. Oakhill, personal communication, March 13, 2000) and adapted to conform more closely to text types: one decodable narrative ("Tom got up early"), and one nondecodable narrative ("The big game"). Reliability data are not available on the Oakhill passages, which were selected to provide opportunities for students to make inferences from the text. Each of the four reading passages was accompanied by a set of five to seven comprehension questions that included inference and literal questions. Two of the passages, one decodable narrative and one nondecodable expository, required the student to retell the main ideas in the passage. The student is instructed to read the passage, after which the tutor asks

the students questions. The score is the number of questions correct out of a total of 25 questions (16 inference, 9 literal).

Listening Comprehension Passage. The tester reads the student a second-grade level passage (“A Summer Day”) and then asks the student a set of seven comprehension questions (5 inference, 2 literal). The passage (J. Oakhill, personal communication, March 13, 2000) was used for its suitability for asking inference questions.

Reading Motivation (Juel, 1988). The tester asks the student six questions about reading preferences and attitudes: Would you rather watch television or read? Would you rather play with friends or read? Would you rather clean your room or read? Then the student is asked to rate her response to the following questions on a scale of 1-4: Do you like to read? Do you like to write? Do you like school? How much?

Fluency. The student reads two second-grade passages (“My Trip to Shay Lake”- Level 2-2, “To Catch a Thief”- Level 2-3) from the Houghton-Mifflin reading program,

Invitations to Literacy (1999). The tester records the number of words read correctly in one minute. The passage “To Catch a Thief” (Level 2-3) was administered at the fall pretest as well as spring posttest.

Multiple Grade Inventory for Teachers (Torgesen et al., 1999). Classroom teachers were asked to rate each student on his or her classroom behaviors (activity level, attention, adaptability, and social behavior). This was used as a measure of student school behavior.

Student attention was also rated on a scale of 1-5 by one of the observers and the student's tutor, and the average of these two ratings was used.

Program measures. Quality of tutoring was measured on a checklist that observers used each time they observed a tutor. The checklist included several essential activities or tutor behaviors that were required in each component of the instruction. The observer also checked whether the tutor was organized and managed the tutoring session effectively. A copy of the observation checklist for both Thinking Partners and Reading Partners is included in Appendix C. Tutors recorded student attendance, and these records were used to determine the total number of tutoring sessions attended by each student.

In addition to these formal measures, the tutors in the fluency treatment recorded the student's reading rates at each first (cold) and last (hot) timed reading. For each Read

Naturally passage the student read, the tutor recorded the total words correctly read per minute at each cold and hot timing.

The tutors in the Thinking Partners treatment recorded several pieces of information on student performance during their lessons. Beginning with the first storybook, each tutor recorded the number of main points the student included in a retell of the story. Later in the treatment, tutors were asked to record the number of times the student used each strategy during a lesson, either with or without a tutor prompt, and whether the student independently identified or labeled the skill being used.

### Tutor Training

Tutors were trained in late August and September, 1999. Each tutor was trained to deliver one of the treatments only, in order to increase treatment fidelity and not overwhelm nonteacher tutors with two treatment protocols.

Thinking Partners tutors were trained by the author. They were first introduced to the goal of the program-- to help students become active readers. The comprehension problems of students with low reading skills were discussed, and the research on the effectiveness of teaching students to use specific reading strategies was reviewed. Each

comprehension strategy was individually introduced and discussed. Training also addressed the sequence of instruction for each strategy: introduce and name the strategy, model using the strategy, prompt the student to practice using the strategy, and fade modeling and prompting to encourage independent student use of the strategy. Tutors were encouraged to use the lesson scripts as a guide for modeling strategy use with each storybook. Training emphasized the importance of tutor modeling of each strategy— of thinking aloud, making questions about the text, and thinking ahead about what will happen next. Tutors were reminded to provide students with adequate wait time before providing a correction or a model. Tutors were told to refer to the strategies by name whenever they or the student used a strategy, to help students learn to recognize and be aware of their strategy use. Tutor training included the trainer reading a short passage from a New Yorker magazine article and thinking aloud on-line while reading to demonstrate the typical on-line monitoring of a skilled reader. During this reading the trainer demonstrated using each of the skills to understand the text.

Reading Partners tutors were trained by a special education teacher who had completed the Read Naturally training provided by Candace Innot, one of the program's developers. The trainer provided an overview on the research study and the research on the relation of fluency and comprehension. Tutors were introduced to the format for the repeated readings and were given a set of tutoring materials. Then the trainer modeled

and discussed the procedures for implementing each step of the repeated readings. After the trainer modeled each step, the trainees practiced with their partners. The trainer then answered questions about the procedures. The trainer reviewed procedures for error corrections and praise. Finally, the trainer and tutors viewed and discussed a videotape of Reading Partners tutoring.

By October, all students were matched with their treatments and tutors. Follow-up training was provided to tutors on site in response to tutor need and supervisor observations. Students received one-half hour of tutoring four days a week, excluding school holidays. Tutors were monitored a minimum of once a week by staff who rated tutor instruction observed at each visit based on fidelity of treatment criteria (See forms in Appendix C). Staff provided ongoing follow up assistance to the tutors in both treatment groups during these visits. Students were posttested between late April and early June, 2000.

### Human Subjects

In accordance with University of Washington policies, this research was reviewed by the University's Human Subjects Review Committee and approved in July, 2000. This

research was also reviewed by the Washington Research Institute's Human Subjects Review Committee, and by the Seattle School District's Office of Research.

Table 1

Descriptive Characteristics of Subjects

	Thinking Partners ( <u>n</u> =27)	Reading Partners ( <u>n</u> =16)
	<u>M</u>	<u>M</u>
Total days of tutoring grade two	76.95 (17.31)	79.81 (20.44)
Tutor attention rating	3.85 (1.19)	3.94 (1.24)
Teacher behavior rating	56.67 (24.40)	53.92 (14.15)
Sex	16M, 11F	8M, 8F
Minority students	19	10
ESL students	6	3

Note: Standard deviations are in parentheses. M=male; F=female.

Table 2

Study Measures

<u>Pretest at Beginning of First Grade</u>	<u>Pretest at Beginning of Second Grade</u>
<p>Peabody Picture Vocabulary Test-Revised (PPVT-R)            Syllable Deletion Test            Alphabet Writing            Rapid Letter Naming            Comprehensive Test of Phonological Processing (CTOPP)              Rapid Letter Naming              Segmenting Words              Nonword Repetition            Test of Word Reading Efficiency (TOWRE)              Sight Word Efficiency              Phonemic Decoding            Wide Range Achievement Test-Revised (WRAT-R)              Reading              Spelling            Woodcock Reading Mastery Test (WRMT)              Word Attack              Word Identification</p>	<p>Listening Comprehension (2 passages)            Reading Comprehension (2 passages)            Fluency (2 passages, first passage is identical at pretest and posttest)</p>
<u>Posttest at End of First Grade</u>	<u>Posttest at End of Second Grade</u>
<p>Alphabet Writing            Rapid Letter Naming            Comprehensive Test of Phonological Processing              Rapid Letter Naming              Segmenting Words              Nonword Repetition            Test of Word Reading Efficiency              Sight Word Efficiency              Phonemic Decoding            Wide Range Achievement Test -Revised              Reading              Spelling            Woodcock Reading Mastery Test              Word Attack              Word Identification            Yopp Singer Segmentation Test            Bryant Pseudoword Test            Dolch Word Recognition Test            Gray Oral Reading Test            Woodcock Reading Mastery Test              Passage Comprehension            Orthographic Choice</p>	<p>Woodcock Reading Mastery Test            Word Attack            Word Identification            Wide Range Achievement Test -Revised              Reading              Spelling            Test of Word Reading Efficiency              Sight Word Efficiency              Phonemic Decoding            Reading Comprehension (4 passages)            Listening Comprehension (1 passage)            Reading Motivation            Fluency (2 passages)            Multiple Grade Inventory for Teachers</p>

## Chapter 4

## Findings

Data were analyzed using SPSS 10.0. Prior to data analysis the data were reviewed to identify missing data and scores out of range for each measure. Descriptive statistics were run to obtain means and standard deviations on each measure. Graphs of student means on key reading outcomes were visually analyzed to ascertain if there was an interaction on any of the factors.

Data analysis addressed five major questions concerning 1) reading skill growth for students in both treatments; 2) the relative effects of the two approaches to comprehension instruction on reading outcomes; 3) the influence of student and program variables on reading outcomes; 4) differential treatment effects for students based on their entry-level reading skills (i.e., aptitude-by-treatment interactions); and 5) student and program variables that influence strategy use by the Thinking Partners students. Because in some instances group mean differences were not the same for the raw and standard scores for a standardized measure, I report both types of pretest and posttest scores for all standardized measures. However, I used raw scores for all regression analyses.

Prior to these analyses, I created composite scores for fluency and comprehension, both at pretest and posttest. The fluency pretest composite is an average of the following fluency (word correct per minute) scores: a reading passage given at the end of grade one, two one-minute timings of Houghton-Mifflin passages given at the beginning of grade two, and two timings (total time recorded) for two comprehension passages given at the beginning of grade two. The comprehension pretest composite reflected the total items correct for two comprehension passages given at the beginning of grade two (16 possible points, based on 8 questions per passage).

I created two similar posttest composite scores. The fluency posttest composite is the mean of the following fluency scores from the end of grade two posttest: two one-minute timings of Houghton-Mifflin passages, and timings (total time recorded) for the four comprehension passages (which represented decodable, nondecodable, narrative, and expository text). The comprehension posttest composite is the total items correct for the same four comprehension passages (25 possible points).

Reliability of the composite scores. Because norm-referenced measures of the fluency and comprehension skills that were of primary interest in this study were not available, I used raw scores for these two reading measures. To estimate the reliability of these

scores I computed correlations, using a larger group of second-grade students which included treatment students ( $n = 93$ ) (Tables 3 and 4).

All of the pretest fluency measures were significantly correlated ( $p < .01$ , 2-tailed). One-minute timings were more highly correlated ( $r = .92$ ) with each other than they were with the two complete text timings (mean  $r = .53$ ), as was the correlation between the two complete texts ( $r = .93$ ).

For the fluency posttest measures, the correlation between the two one-minute scores ( $r = .94$ ) was similar for that with full text scores (mean  $r = .91$ ). The fluency pretest and posttest composites were also significantly correlated ( $r = .80$ ,  $p < .01$ ).

Correlations among the comprehension measures were less robust, although also significant ( $p < .01$ ). The correlation between the two pretest passage scores was .61. The correlations among the four posttest passages ranged from .38 to .48 (mean  $r = .42$ ). The correlations between the two expository and two narrative posttest passages were similar, as were the correlations between the decodable and nondecodable passages. Finally, the comprehension pretest composite was significantly correlated with the posttest composite ( $p < .01$ ). Correlations of the posttest comprehension measures, including individual items and composite scores, with the end-of-grade-one norm-

referenced comprehension measures and with the listening comprehension measures were all less than .50.

### Pretest Performance

Table 5 shows the pretest means and standard deviations for both treatment groups for age at pretest, PPVT, CTOPP Rapid Letter Naming, WRMT Word Identification and Word Attack, WRAT-R Reading, Dolch, and the Fluency, Reading Comprehension, and Listening Comprehension composite scores. Although the groups did not differ significantly on age, there were group differences on several raw scores not corrected for age, though not on their respective standard scores. Independent t-tests revealed that Thinking Partners performed significantly higher than Reading Partners at pretest on WRMT Word Identification raw, WRAT-R Reading raw, and fluency composite scores ( $p < .05$ ).

### Posttest Results

Students in the treatments received an average of 77 tutoring sessions (average 39 hours). The posttest analyses address: students' improvement over time, group

differences, predictors of reading outcomes, predictors of strategy use, aptitude-by-treatment interactions, and a small group analysis.

### Improvement Over Time

To determine whether students' scores increased from pretest to posttest, a series of repeated measures ANOVAS was conducted. As shown in Table 6, both groups increased significantly from pretest to posttest on all raw scores. As also seen in Table 6, WRMT standard scores for both groups were generally lower at posttest, and Thinking Partners decreased significantly on the WRMT Word Attack standard score. Both groups increased their fluency rate, Reading Partners by 47 correct words per minute, and Thinking Partners by 46 correct words per minute. Both groups also increased in accuracy, Reading Partners by 18%, and Thinking Partners by 12%.

### Group Differences

To determine whether there were group differences in posttest performance, I conducted a series of analyses of covariance (ANCOVAs), using relevant pretests as the covariates, on all measures that were given both at pretest and posttest. At pretest, as noted above, the raw scores for Thinking Partners students were significantly higher than the Reading

Partners students in word level skills and fluency, and the remaining pretest scores for Thinking Partners students tended to be generally (though not significantly) higher than those for Reading Partners students. For all adjusted posttests except reading accuracy and listening comprehension, Reading Partners' means were somewhat (though not significantly) higher than those of Thinking Partners (Table 7).

In addition, I disaggregated the comprehension scores into detail, inference, and retells. I also analyzed separately comprehension of narrative and expository text. Because Thinking Partners emphasized inferencing and summarizing, I anticipated that student performance in these skills might differ. Likewise, because Reading Partners utilized expository text only, I anticipated that the groups might differ based on text type. At posttest, 66% of the comprehension questions were inference questions, and 34% were literal or detail questions. Both groups answered 40% of the inference questions correctly and 59% of the detail questions correctly. At posttest there were approximately equal numbers of questions about narrative and expository texts. Both groups answered about 56% of the expository text questions correctly, and 62% of the narrative questions correctly. I then conducted ANCOVAs, using composites of inference and detail questions from pre- and posttests as the dependent and covariate variables. Students were asked to retell two of the reading passages only at posttest and for this ANCOVA I used the pretest comprehension composite as the covariate. There were no significant

differences between groups on detail, inference, or retell scores after controlling for pretest (Table 8).

Posttest passages represented both expository and narrative, as well as controlled and uncontrolled text. Because both groups had one year of tutoring in decoding skills they might be expected to have higher performance on controlled (more decodable) than uncontrolled (less decodable, more high frequency words) text. Groups did not differ in their performance based on these text characteristics, after controlling for pretest comprehension composite (Table 9).

### Predictors of Outcomes

To examine predictors of reading posttests for four major reading outcomes (word identification, fluency, reading accuracy, and comprehension) I used two categories of predictors: reading skills (i.e., word identification, word attack, verbal efficiency, comprehension, and fluency) and program variables (i.e., quality of tutoring, student attendance, and lesson coverage). For each of the four outcome categories, I computed a series of 2-step hierarchical multiple regression analyses to predict posttest, entering the appropriate pretest at step 1 (thus controlling for differences in students' pretreatment abilities), and entering the theorized predictors individually in each regression at step 2. I

tested both reading skill and program variables. Identification of significant predictors of outcomes has implications for analyzing treatment differences.

Word identification. In a hierarchical multiple regression after controlling for word identification pretest, measures of word attack and verbal efficiency were examined as predictors of word identification performance. None of the measures significantly predicted word identification performance. Nor did program variables (i.e., ratings of tutor instruction, lesson coverage, student attendance) significantly predict word ID. The mean number of tutoring days was 79.81 ( $SD = 20.44$ ) for Reading Partners and 76.95 ( $SD = 17.31$ ) for Thinking Partners. Number of sessions attended, however, did not significantly predict performance on any of the word-level posttests, after controlling for pretest.

Fluency. For the fluency posttest composite, after controlling for the fluency pretest composite, measures of verbal efficiency, word identification, and listening and reading comprehension skills were examined as predictors of fluency performance. The CTOPP Rapid Letter Naming pretest was the only significant predictor (Table 10). After controlling for pretest, no program variables significantly predicted fluency performance.

Because word level skill and syntactic knowledge may contribute to fluency, I examined these factors more closely by dividing the Reading Partners students into two groups based on their word identification and listening comprehension (as a measure of syntactic skill) posttest scores. First I divided Reading Partners students into two groups, 1) at and above the median raw score on the WRMT Word Identification posttest, and 2) below the median score. I conducted an independent samples t-test and found that the two groups did not significantly differ on the composite one-minute or complete passage fluency gain scores. I also grouped Reading Partners students based on their WRMT Word Identification standard pretest scores (at and above grade level, or below grade level) and also found no significant differences between groups on reading comprehension gain.

Finally to determine whether syntactic knowledge contributes to fluency, I divided the Reading Partners students into two groups based on their listening comprehension pretest composite scores (at and above the median, and below median). When I compared the one-minute and complete passage composite fluency gain scores for these groups, using an independent samples t-test, there were no significant differences.

Reading accuracy. In a similar 2-step hierarchical multiple regression, measures of word identification, reading comprehension, and verbal efficiency were examined as predictors

of posttest reading accuracy after taking into account pretest reading accuracy. CTOPP Rapid Letter Naming was the only significant predictor (Table 11). Program variables did not significantly predict reading accuracy after controlling for pretest.

In light of the unique contribution of CTOPP Rapid Letter Naming to fluency and accuracy, I reexamined whether controlling for rapid naming would affect the ANCOVA findings for group differences on the major reading outcomes (word identification, fluency, accuracy, comprehension). I conducted another series of ANCOVAs using respective pretests and CTOPP Rapid Letter Naming as covariates, but there were no differences between groups on these dependent variables.

Reading comprehension. In a series of hierarchical multiple regressions, receptive vocabulary (PPVT), decoding, word identification, listening comprehension, and fluency were examined as predictors after taking into account pretest reading comprehension. Only PPVT significantly explained unique variance in comprehension (Table 12). Like other analyses, program variables were not significant in predicting comprehension. The finding that individual differences in receptive vocabulary at pretest uniquely predicted reading comprehension is one supported by other research (Torgesen et al., 1999) on predictors of word-level and comprehension skills. In theories of reading development,

both general language skill and decoding ability play important roles (Chall, 1983; Gough & Tunmer, 1986).

In this study PPVT seems to have measured an aspect of general language ability that was not captured by the reading comprehension pretest. I conducted another ANCOVA to determine if controlling for both comprehension and PPVT pretest influenced the findings on group differences. I found there was still no difference between groups on comprehension performance.

Although listening comprehension failed to significantly predict reading comprehension after accounting for pretest reading comprehension, I considered an alternative means of testing for its contribution. Shany and Biemiller (1995) have reported that reading comprehension gains were predicted in their assisted reading treatment by the difference between listening and reading comprehension at pretreatment. In their study students with larger pretreatment differences between listening and reading comprehension made larger reading comprehension gains. To test whether differences between pretest listening and reading comprehension predicted comprehension gains in my study, I computed listening and reading comprehension standard scores from my pretest composite measures, and then subtracted the reading standard score from the listening standard score to create a standard difference score. When I conducted a step-wise

multiple hierarchical regression to predict reading comprehension gains, entering group at step 1 and the standard difference score at step 2, the difference score was not significant. Neither was it significant in predicting comprehension or fluency posttests.

Finally, because verbal efficiency theory (Lesgold & Perfetti, 1978) predicts that speed of processing text should explain comprehension skill after accounting for word identification skill, I conducted a series of multiple hierarchical regressions to examine whether the posttest fluency composite or CTOPP Sight Word Efficiency predicted posttest comprehension after accounting for posttest word identification skill. Entering WRMT Word Identification posttest raw score at step one, and the fluency composite posttest at step 2, I found that although word identification skill was significant [ $F(1,41) = 14.65, p < .001$ ], fluency composite was not significant [ $F(1,40) = .08, p = .79$ ]. Likewise, when I entered CTOPP word reading efficiency posttest at step two, it did not significantly predict comprehension posttest.

Fluency gains on texts used in reading lessons. I examined an additional measure of fluency growth focussing on the gain made by Reading Partners on practice passages between their first (cold) and last (hot) timing. Students in this treatment gained an average of 16.53 words between the first and the last weeks of intervention in their “cold timing” (timing for the first reading of a passage) rates. Cold timings probably reflect

students' typical rate in reading new material. Regression analysis was used to first examine measures of precursor reading skills that are hypothesized to influence fluency, including phonological, orthographic, and verbal efficiency measures. In these regression analyses, after controlling for beginning of treatment cold reading rate, only performance on CTOPP Rapid Letter Naming significantly predicted gain for the cold timing fluencies (Table 13). Results were similar when these same precursor reading skills were used to predict the average cold timing rate at the end of the treatment. I next examined program variables (student attention rating, student behavior rating, student attendance) that might influence students' fluency gains as reflected in the increase in their cold timing rates. After controlling for the average cold timing rate at the beginning of treatment, both student attentiveness and student attendance significantly predicted fluency gain (Table 14).

Verbal efficiency theory predicts that students' level of word identification skill should predict fluency gain. To test this I divided the Reading Partners group into those students at or above grade level, based on WRMT Word Identification standard pretest score, and examined group differences in pre-post gains on fluency composites. An independent samples t-test showed no significant differences in fluency gains between these groups. In order to compare students both on their skill level within the group and on their grade level word identification skill, I next divided the Reading Partners group

into two new groups based on a median split on their WRMT Word Identification raw pretest scores (median score and higher vs lower than median). An independent samples t-test showed no significant differences in fluency gains between these groups.

Because student's syntactic knowledge may contribute to fluency, I examined the contribution of listening comprehension skills to fluency gain. I divided the Reading Partners students into two groups using a median split on their listening comprehension pretest composite (median and higher vs below median). There were no significant differences in fluency gains between these groups.

Quality of tutoring. In previous research conducted with colleagues on tutor instruction (Vadasy, Jenkins, Antil, Wayne, & O'Connor, 1997) we found that the instructional skills of tutors significantly influenced student reading outcomes. In this study ratings of tutor instruction averaged 93% for both groups, ranging from 64% to 100 % for Thinking Partners tutors, and from 76% to 100% for Reading Partners tutors. I therefore examined more closely the comprehension outcomes for students in Thinking Partners in relation to the quality of tutoring they received. I divided students into two groups based on their tutors' average score in implementing the instructional components of Thinking Partners lessons (high = 90% and above accuracy,  $n= 17$ ; low = less than 90% accuracy,  $n= 10$ ). I conducted a series of one-way ANOVAs to determine whether

tutor quality influenced students' outcomes in overall comprehension, comprehension subskills (detail questions, inference questions, retells), fluency, cold timing gain, and strategy use during lessons. There were no significant differences between the two groups of tutors on any of these outcomes (all  $p$ s > .06).

#### Aptitude-by-Treatment Interactions

An important question regarding treatment effects is whether there was differential response to the two treatments by higher or lower performing students (at pretest). To examine aptitude-by-treatment interactions for measures given at both pretest and posttest I computed new hierarchical multiple regressions in which group and pretest standard score were entered at step 1, and the interaction (group X pretest standard score) at step 2. Regressions were computed for word identification, fluency, reading accuracy, and comprehension. In these particular regressions I used standard scores when available. These scores provided an age-adjustment and permitted regression lines to be plotted in a 2-dimensional figure, which would not be possible if both age and raw pretest scores were entered at step 1. Thus standard scores were used in order to plot and visually examine the regression lines for trends. None of these ATIs were significant (See Figures 1-17).

### Predictors of Strategy Use

The fifth research question addressed was whether any specific reading skills or program variables uniquely predicted Thinking Partners' observed strategy use. Tutor records of strategy use in the last months of the treatment indicated when the student used each of the five strategies, and whether the student used the strategy with or without a tutor prompt. Strategy use variables were only modestly correlated with comprehension for two of the strategy variables (keeping track, and overall strategy use with a tutor prompt,  $r = -.57$ ,  $p < .01$ ), and correlations for the other strategy use variables and comprehension were not significant. Multiple regression analysis where all predictors were entered simultaneously, was used to determine if the following variables contributed to strategy use: decoding, word identification, fluency, listening and reading comprehension, tutor rating, student attendance, teacher behavior rating, or lesson coverage. Two sets of regressions were computed, one using reading skill predictors of strategy use, and one using program predictors. None of the hypothesized predictors were significant.

### Small Group Analysis

One serious limitation of this study and its findings is that both groups on average entered second grade with above average word level skills. Pretest standard score means for both groups were above the 50<sup>th</sup> percentile for WRMT Word Attack and Word identification, and nearly so for WRAT-R Reading. This is likely the result of having received one year of individual tutoring in word level skills in grade one. Although all students had entered first grade in the lowest 20% of their class in reading skills, to include these now average-achieving students in the analyses might be expected to reduce the chance of detecting the effects of interventions designed to supplement instruction for low-achieving students. Therefore, I conducted another group of analyses that included only those subjects who met two more stringent criteria at pretest: a WRAT-R Reading standard score below 90, and a fluency rate below 50 wcpm. This allowed me to test the benefits of the interventions with students who were in fact low in the two central components of reading that are expected to influence comprehension-- word identification and fluency. Applying these criteria reduced the size of the groups to 7 Reading Partners and 6 Thinking Partners. Repeated-measures analysis of variance failed to detect significant differences from pretest to posttest between the two groups for the major word identification, fluency, or comprehension posttests (Table 15).

Thinking Partners students scored somewhat but not significantly higher than Reading Partners students on comprehension and fluency composite posttests.

Table 3  
Intercorrelations for Fluency Passages Based on Correct Words Per Minute

Passages	1	2	3	4	5	6	7	8	9	10	11	12
<u>Pretests</u>												
1. Text A - 1 min.	--											
2. Text B - 1 min.	.92	--										
3. Text C - Full	.50	.50	--									
4. Text D - Full	.56	.55	.93	--								
5. Pretest composite	.88	.87	.79	.82	--							
<u>Posttests</u>												
6. Text A - 1 min.	.83	.82	.48	.54	.78	--						
7. Text B - 1 min.	.83	.83	.46	.51	.77	.94	--					
8. Text C - Full	.76	.76	.42	.46	.71	.85	.86	--				
9. Text D - Full	.84	.81	.50	.56	.79	.93	.93	.91	--			
10. Text E - Full	.86	.84	.51	.56	.80	.93	.94	.87	.95	--		
11. Text F - Full	.84	.83	.45	.51	.77	.93	.94	.87	.94	.95	--	
12. Posttest composite	.85	.84	.49	.54	.80	.97	.97	.93	.98	.98	.97	--

Note: Letters refer to different texts.  $N = 93$ . All correlations are significant at  $p < .01$ .

Table 4

Intercorrelations for Comprehension Measures

Measure	1	2	3	4	5	6	7	8
1. Pretest passage 1	--							
2. Pretest passage 2	.61	--						
3. Pretest passage composite	.91	.89	--					
4. Posttest passage 1	.41	.50	.50	--				
5. Posttest passage 2	.51	.48	.55	.40	--			
6. Posttest passage 3	.42	.50	.51	.38	.43	--		
7. Posttest passage 4	.37	.44	.45	.45	.48	.37	--	
8. Posttest passage composite	.57	.63	.67	.72	.79	.72	.77	--

Note:  $N = 94$ . All coefficients are significant at  $p < .01$ .

Table 5  
Group Differences on Pretest Measures

<u>Variable</u>	<u>Thinking Partners (n=27)</u>		<u>Reading Partners (n=16)</u>		<u>t</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Age	7.19	.31	7.01	.38	1.68
PPVT					
raw	66.96	18.11	62.19	22.29	-.77
standard	89.70	20.87	88.81	21.36	-.13
CTOPP Rapid Letter Naming	29.65	7.69	32.91	7.54	1.35
Bryant	21.22	9.39	17.75	8.61	1.21
WRMT Word Attack					
raw	13.89	7.85	11.06	4.68	1.31
standard	107.85	11.20	108.13	8.25	-0.90
WRMT Word ID					
raw	32.67	10.41	24.75	8.00	2.61*
standard	104.59	10.84	104.56	9.19	.01
WRAT-R Reading					
raw	47.85	9.19	41.38	6.49	2.47*
standard	99.30	14.72	94.63	12.69	1.06
Dolch	142.67	39.28	124.31	42.24	1.44
Fluency Composite	39.71	19.97	28.39	12.51	2.04*
Reading Comprehension Composite	9.94	3.29	8.16	3.04	1.77
Listening Comprehension Composite	8.11	3.66	8.50	3.45	.34

\*p<.05.

Table 6  
Means, Standard Deviations, and Repeated Measures Analyses of Variance for Reading Measures and Time of Test  
for Reading Partners and Thinking Partners Subjects

Variable	Pretest		Posttest		Anova F(1, 15)
	M	SD	M	SD	
WRAT-R Reading raw	41.38	6.49	57.38	7.13	86.78***
standard	94.62	12.69	99.31	13.44	3.96
WRMT Word ID raw	24.75	8.00	49.31	8.28	188.06***
standard	104.56	9.19	102.63	6.97	1.21
WRMT Word Attack raw	11.06	4.68	18.94	9.02	16.25**
standard	108.13	8.25	104.00	11.30	2.99
Fluency 1-minute timing	21.13	14.56	68.37	21.62	112.26***
Reading accuracy	.74	.15	.92	5.89	34.40***
Reading comprehension	8.16	3.04	14.75	5.79	26.44***

\*\* p < .005.  
\*\*\* p < .001.

Variable	Pretest		Posttest		Anova F(1, 26)
	M	SD	M	SD	
WRAT-R Reading raw	47.85	9.19	60.04	8.09	45.88***
standard	99.30	14.72	99.89	12.81	.05
WRMT Word ID raw	32.67	10.41	50.63	10.42	128.34***
standard	104.59	10.84	101.78	8.79	2.40
WRMT Word Attack raw	13.89	7.85	20.19	9.23	15.21**
standard	107.85	11.20	102.85	11.52	5.36*
Fluency 1-minute timing	32.22	21.36	78.00	30.64	185.87***
Reading accuracy	.82	.12	.94	6.25	44.90***
Reading comprehension	9.94	3.29	15.00	4.56	64.27***

\* p < .05.  
\*\* p < .005.  
\*\*\* p < .001.

Table 7  
Adjusted Means, Standard Deviations for Reading Skills, and Analyses of Covariance (ANCOVA) Comparing Treatments

<u>Variables</u>	Pretest				Adjusted Posttest				<u>F(1,40)</u>	<u>Eta squared</u>
	Thinking Partners		Reading Partners		Thinking Partners		Reading Partners			
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
<b>WRMT Word Attack</b>										
raw	13.89	7.85	11.06	4.68	19.82	9.23	20.34	9.02	.07	.00
standard	107.85	11.20	108.13	8.25	102.36	11.30	103.34	11.52	.10	.00
<b>WRMT Word ID</b>										
raw	32.67	10.41	24.75	8.00	49.54	10.42	53.35	8.28	2.61	.06
standard	104.59	10.84	104.56	9.19	101.40	8.79	102.26	6.97	.16	.00
<b>WRAT-R Reading</b>										
raw	47.85	9.19	41.38	6.49	58.63	8.09	59.58	7.13	.00	.00
standard	99.30	14.72	94.63	12.69	97.68	12.81	100.06	13.44	.34	.01
Fluency Composite	39.71	19.97	28.39	12.51	75.48	31.52	79.83	23.63	.76	.02
Reading Accuracy	.82	.12	.74	.15	.94	6.25	.92	5.89	.18	.01
Reading Comprehension Composite	9.94	3.29	8.16	3.04	14.33	4.56	15.80	5.79	1.14	.29
Listening Comprehension Composite	8.11	3.66	8.50	3.45	5.18	.30	4.58	.39	1.49	.04

Table 8  
Adjusted Means, Standard Deviations for Comprehension Subskills, and Analyses of Covariance (ANCOVA) Comparing Treatments

<u>Composite Variables</u>	<u>Adjusted Posttest</u>				<u>F(1,40)</u>	<u>Eta squared</u>
	<u>Thinking Partners</u>		<u>Reading Partners</u>			
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
<u>Detail Questions</u>	6.46	1.67	6.47	1.86	.00	.00
<u>Inference Questions</u>	8.37	3.39	8.57	4.35	.03	.00
<u>Retells<sup>a</sup></u>	3.71	2.04	3.07	2.16	.27	.01

Note. <sup>a</sup> = variables for which there was no corresponding pretest and for which the pretest comprehension composite is used as covariate.

Table 9  
Adjusted Means, Standard Deviations for Text Type, and Analyses of Covariance (ANCOVA) Comparing Treatments

<u>Composite Variables</u>	Adjusted Posttest						<u>F(1,40)</u>	<u>Eta squared</u>
	Thinking Partners		Reading Partners		<u>M</u>	<u>SD</u>		
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>				
Narrative <sup>a</sup>	8.15	2.73	8.06	3.53			.58	.01
Expository <sup>a</sup>	6.85	2.55	6.69	2.55			1.32	.26
Controlled	8.81	2.73	9.06	2.93			2.63	.11
Uncontrolled	6.19	2.42	5.69	3.20			.08	.77

Note. <sup>a</sup> = variables for which there was no corresponding pretest and for which the pretest comprehension composite is used as covariate.

Table 10

Hierarchical Multiple Regression Analysis Summary for Reading Skill VariablesPredicting Students' Fluency

Variable	<u>B</u>	<u>SEB</u>	<u>β</u>	<u>R<sup>2</sup></u>	<u>ΔR<sup>2</sup></u>
Step 1				.63	
Fluency composite pretest	1.26	.15	.79		
Step 2				.70*	.07
CTOPP Rapid Letter Naming pretest	-1.25	.41	-.33		

Note. N = 43.

\*p < .005.

Table 11

Hierarchical Multiple Regression Analysis Summary for Reading Skill VariablesPredicting Reading Accuracy

Variable	<u>B</u>	<u>SEB</u>	<u>β</u>	<u>R<sup>2</sup></u>	<u>ΔR<sup>2</sup></u>
Step 1				.39	
Reading accuracy at pretest	.28	.06	.63		
Step 2				.47*	.08
CTOPP Rapid Letter Naming pretest	-2.57	.00	-.32		

Note. N = 43.

\*p < .05.

Table 12

Hierarchical Multiple Regression Analysis Summary for Pretest Skills Predicting  
Reading Comprehension

Variable	<u>B</u>	<u>SEB</u>	<u>β</u>	<u>R<sup>2</sup></u>	<u>ΔR<sup>2</sup></u>
Step 1				.34	
Reading comprehension pretest composite	.88	.19	.58		
Step 2				.48**	.14
PPVT (raw)	.12	.04	.48		

Note. N = 43.

\*\*p < .005.

Table 13

Hierarchical Multiple Regression Analysis Summary for Reading Skills at Pretest  
Predicting Students' Gains in Cold Timing Rates During Reading Partners Intervention

Variable	<u>B</u>	<u>SEB</u>	<u>β</u>	<u>R<sup>2</sup></u>	<u>ΔR<sup>2</sup></u>
Step 1				.29	
Average cold timing WCPM for first 5 lessons	-.57	.21	-.58		
Step 2				.65	.40*
Orthographic choice	-.74	.91	-.18		
CTOPP rapid letter naming	-1.45	.48	-.66**		
YOPP segmentation	-.62	.47	-.21		

\*p < .05.

\*\*p < .005.

Table 14

Hierarchical Multiple Regression Analysis Summary for Student Variables Predicting  
Gains in Cold Timing Rates During Reading Partners Intervention

Variable	<u>B</u>	<u>SEB</u>	<u>β</u>	<u>R<sup>2</sup></u>	<u>ΔR<sup>2</sup></u>
Step 1				.19	
Average cold timing WCPM for first 5 lessons	-.45	.27	-.44		
Step 2				.63	.44
Attention rating	8.59	3.65	.72*		
Teacher behavior rating	.10	.30	.09		
Student attendance	-.49	.21	-.69*		

\*p < .05.

Table 15  
Means, Standard Deviations, and Repeated Measures Analyses of Variance for Reading Measures and Time of Test  
for Reading Partners and Thinking Partners Subjects (Small Group Analysis)

Variable	Reading Partners (n=7)				Anova
	Pretest		Posttest		
	M	SD	M	SD	F(1, 6)
WRAT-R Reading					
raw	34.86	6.01	50.86	7.01	30.37**
standard	81.00	4.25	86.14	8.90	1.49
WRMT Word ID					
raw	19.71	11.07	42.86	12.54	101.85***
standard	96.14	6.26	96.00	5.54	.00
WRMT Word Attack					
raw	7.43	5.38	13.00	8.78	5.63
standard	99.29	7.02	94.86	6.79	2.11
Fluency 1-minute timing	22.86	17.78	54.57	16.57	71.37***
Reading accuracy	.62	.23	.84	.11	11.37*
Reading comprehension	6.00	2.93	13.29	7.74	12.39*
Listening comprehension	7.86	3.93	4.29	2.50	7.91*

Variable	Thinking Partners (n=6)				Anova
	Pretest		Posttest		
	M	SD	M	SD	F(1, 5)
WRAT-R Reading					
raw	40.33	5.32	54.17	5.91	34.41**
standard	80.67	6.86	84.67	7.15	.94
WRMT Word ID					
raw	26.33	7.61	47.00	10.35	27.78**
standard	92.67	6.59	94.67	4.63	3.67
WRMT Word Attack					
raw	8.50	7.04	17.83	10.87	12.98*
standard	95.17	5.46	98.17	9.56	.79
Fluency 1-minute timing	23.30	4.98	55.10	14.81	35.53**
Reading accuracy	.74	5.27	.91	4.49	50.31**
Reading comprehension	9.08	2.65	15.33	2.07	35.65**
Listening comprehension	8.08	3.31	5.50	1.22	4.03

\*p&lt;.05.

\*\*p&lt;.005.

\*\*\*p&lt;.001.

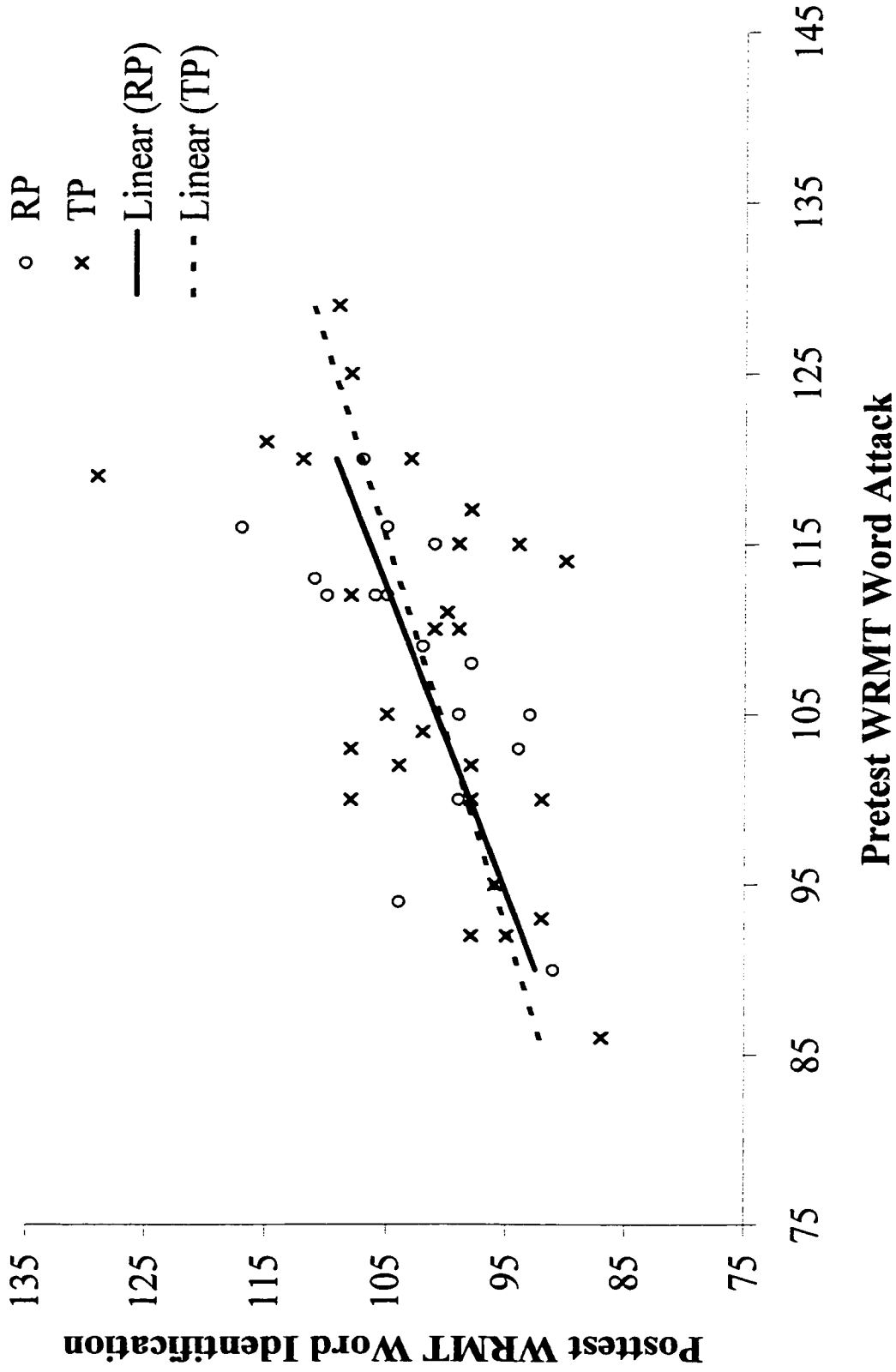


Figure 1. Pretest WRMT Word Attack Standard Score and Program as Predictors of Posttest WRMT Word Identification Standard Score.

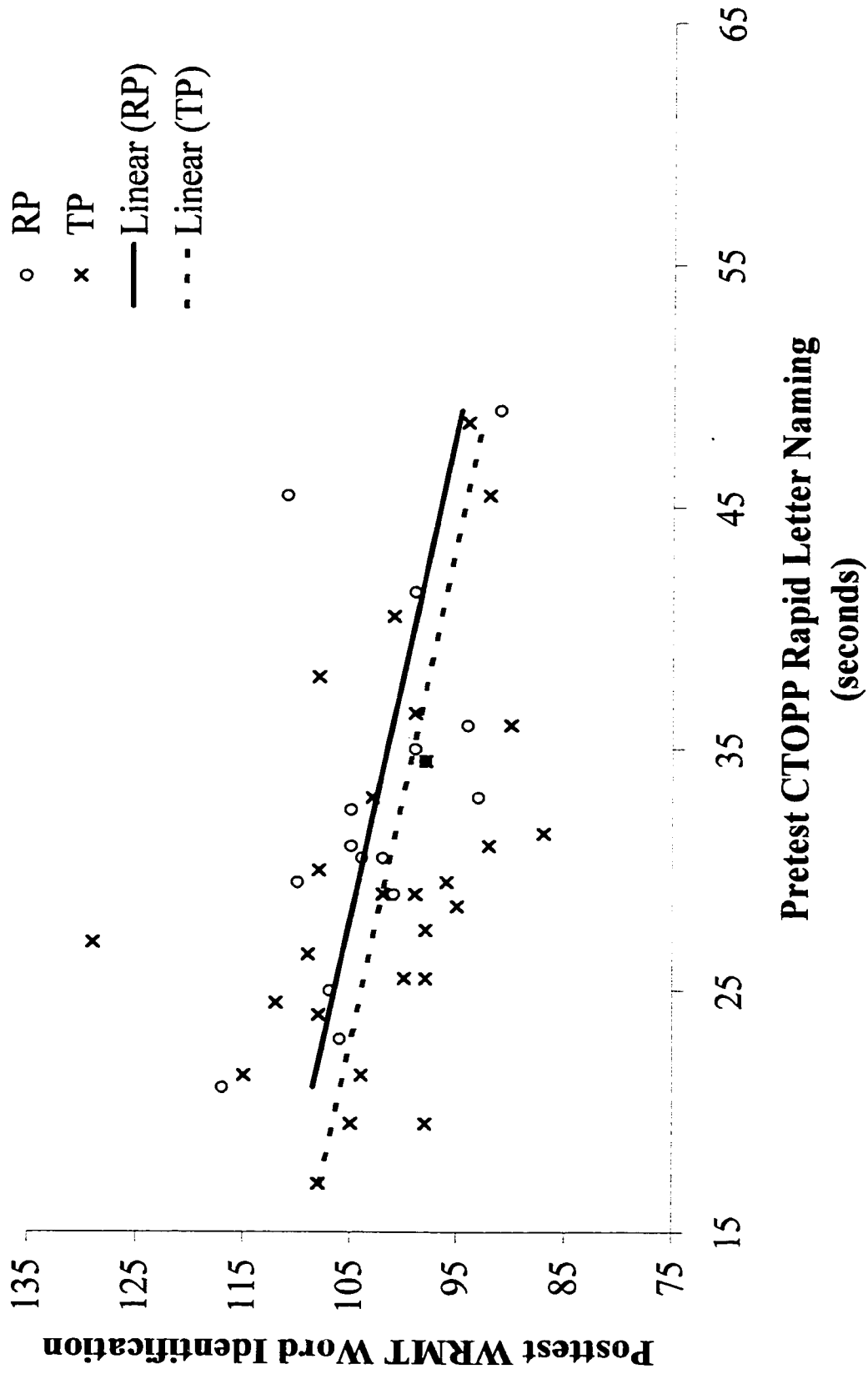


Figure 2. Pretest CTOPP Rapid Letter Naming and Program as Predictors of Posttest WRMT Word Identification Standard Score.

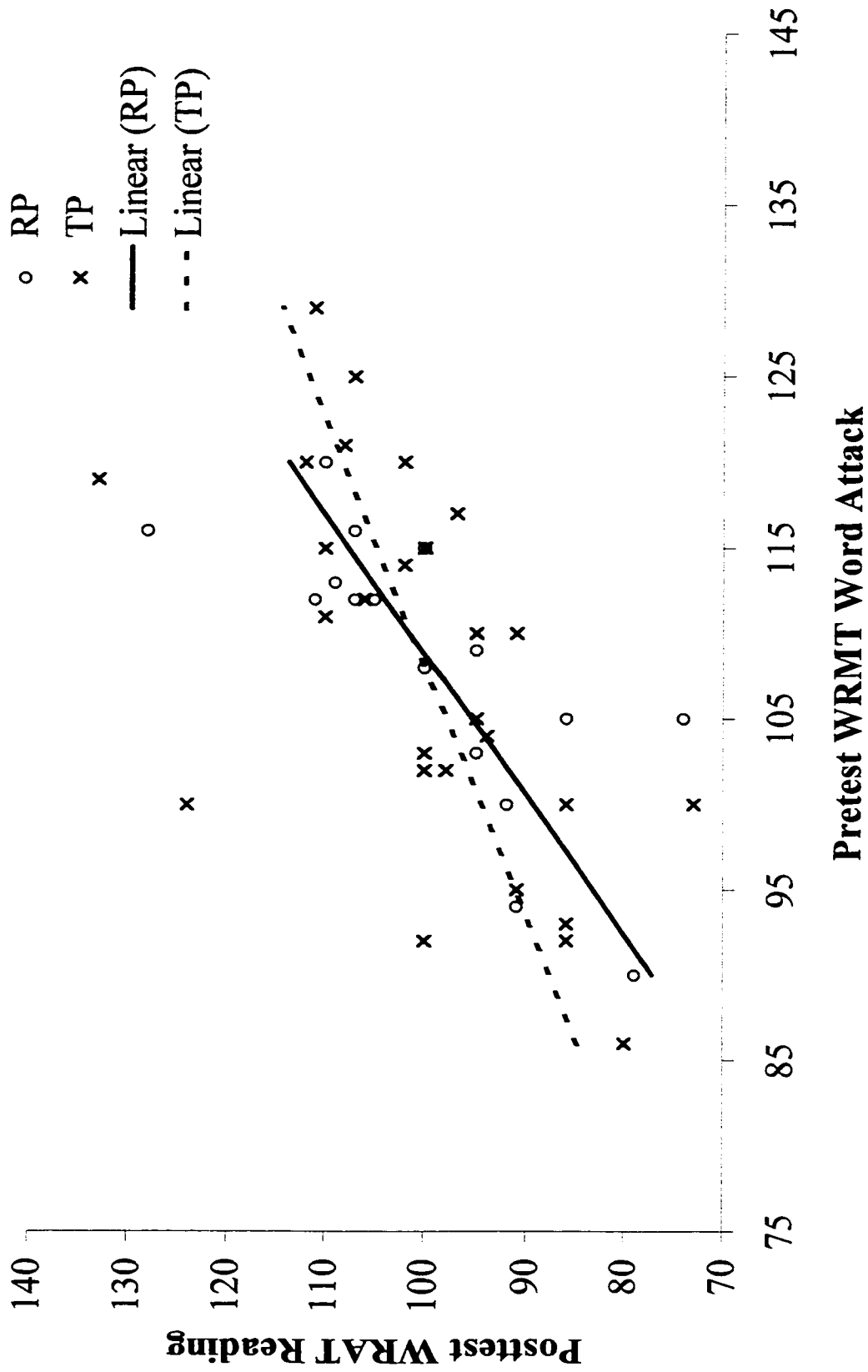


Figure 3. Pretest WRMT Word Attack Standard Score and Program as Predictors of Posttest WRAT Reading Standard Score.

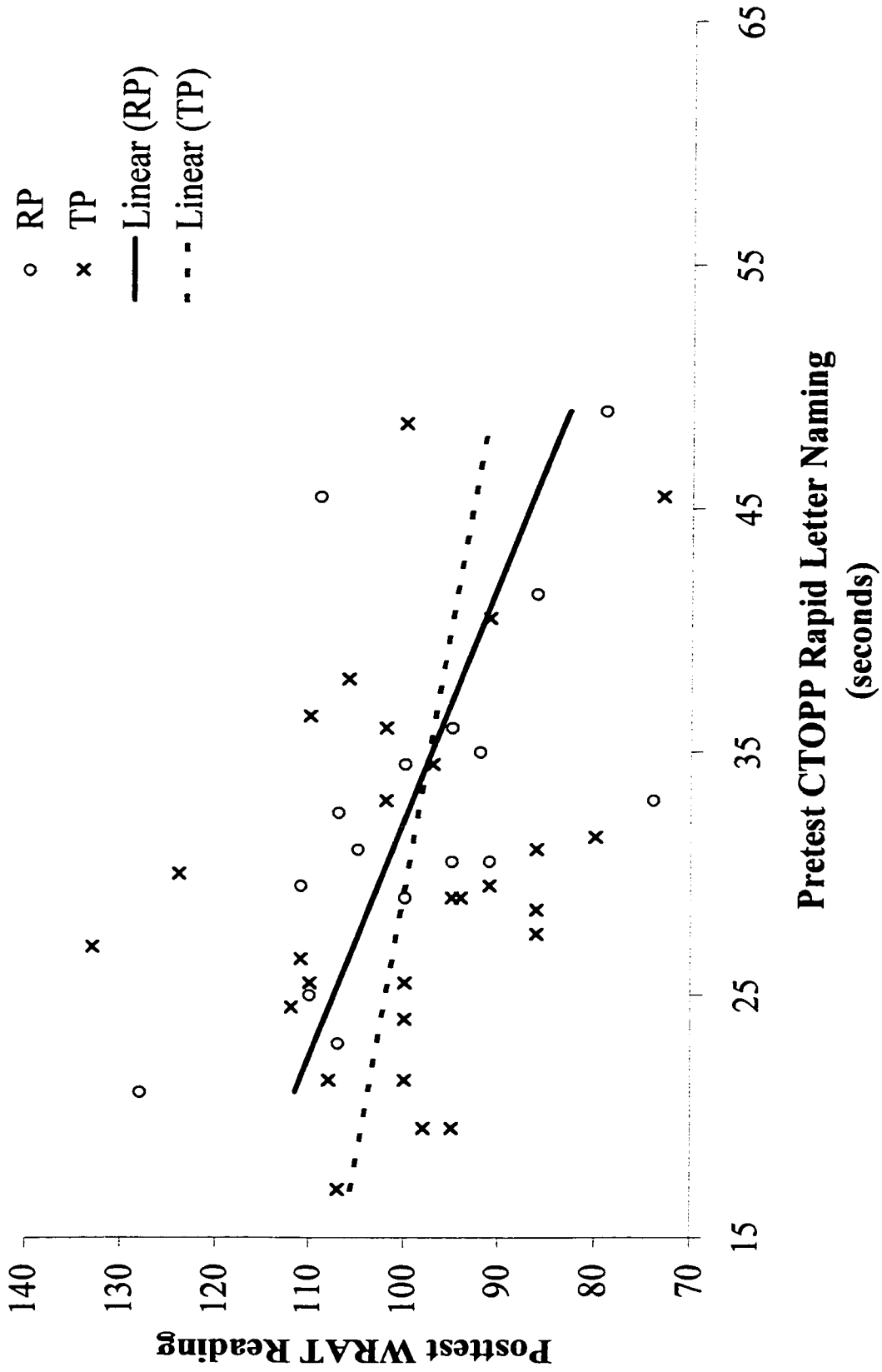


Figure 4. Pretest CTOPP Rapid Letter Naming and Program as Predictors of Posttest WRAT Reading Standard Score.

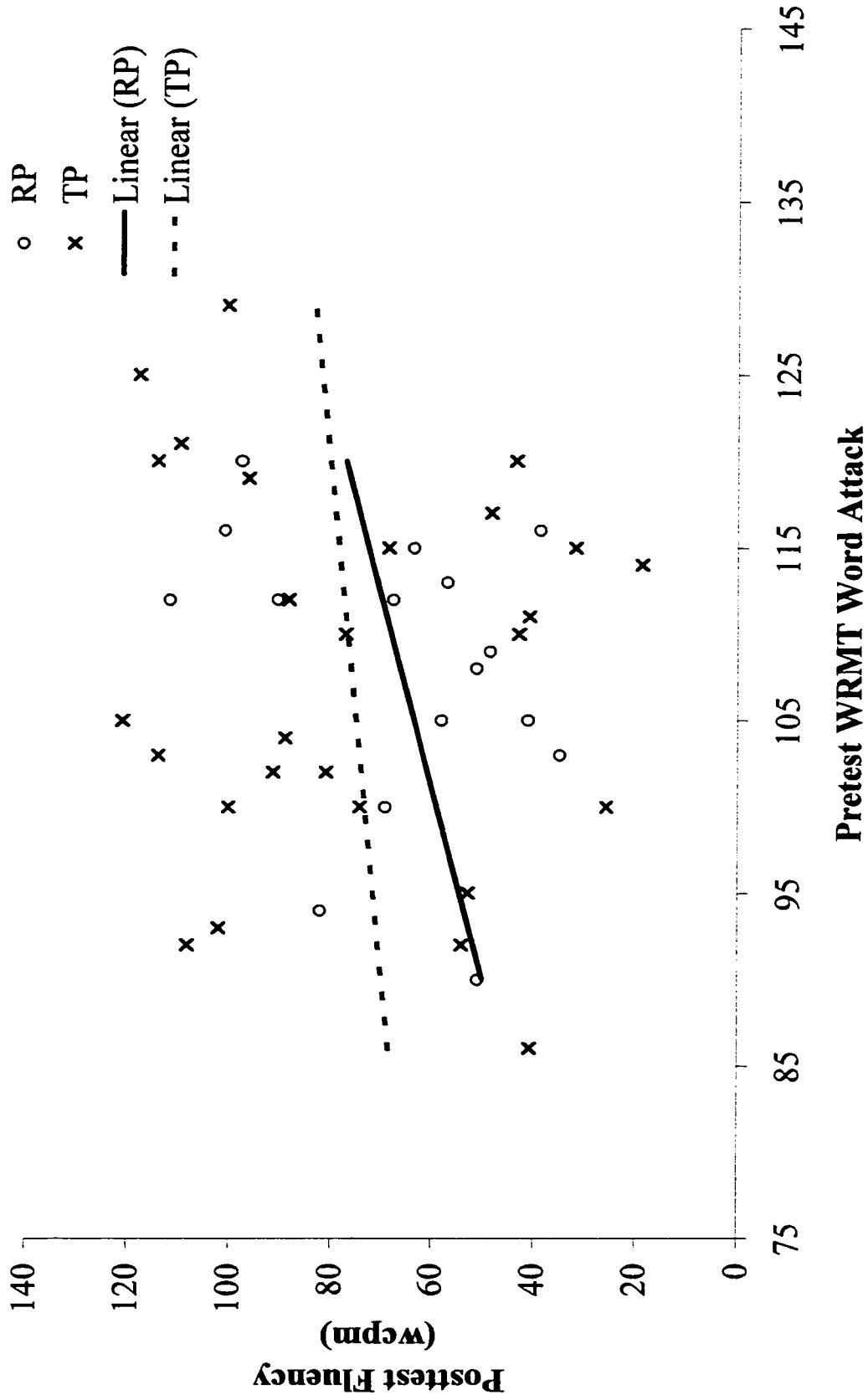


Figure 5. Pretest WRMT Word Attack Standard Score and Program as Predictors of Posttest Fluency Composite.

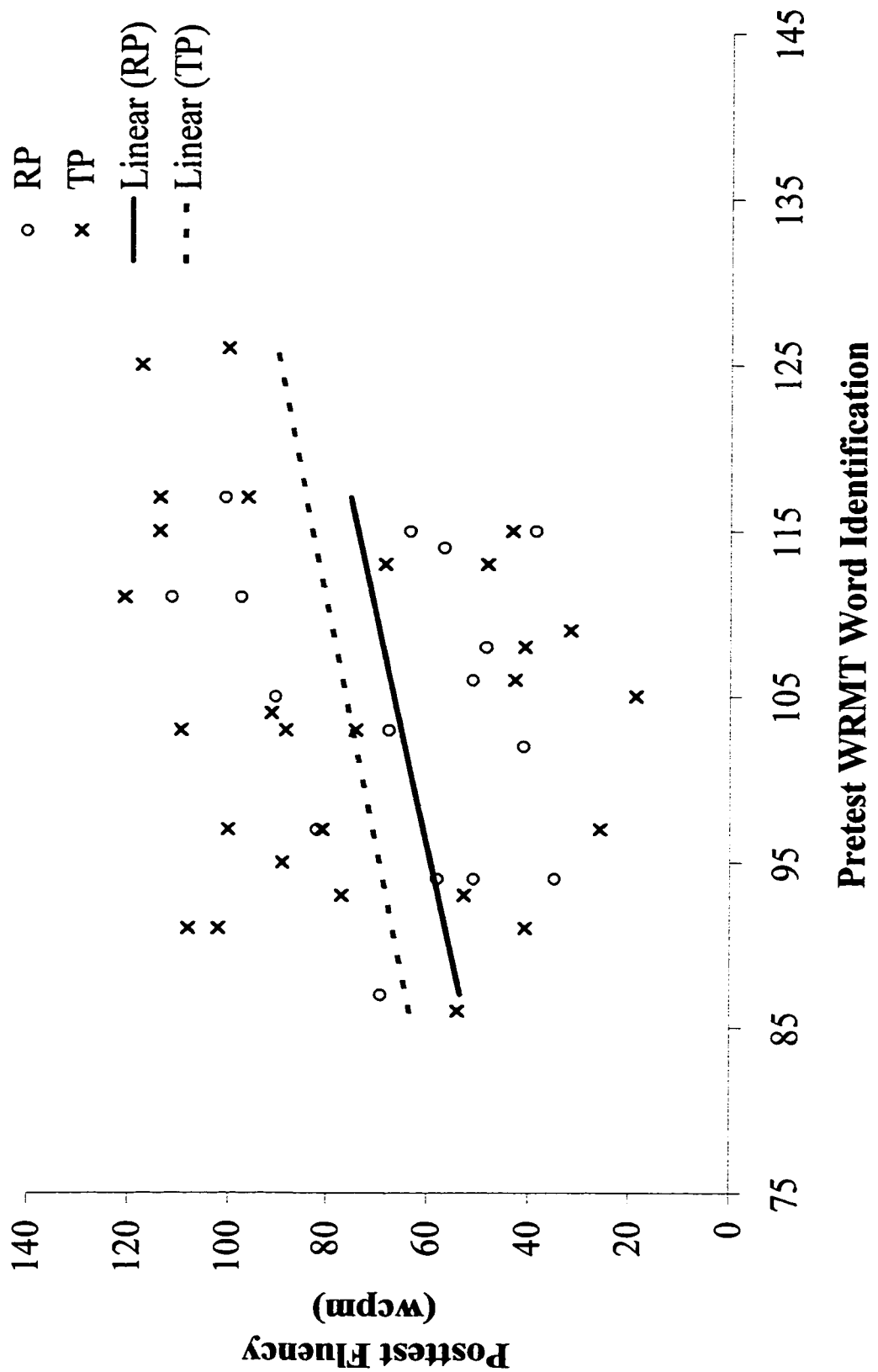


Figure 6. Pretest WRMT Word Identification Standard Score and Program as Predictors of Posttest Fluency Composite.

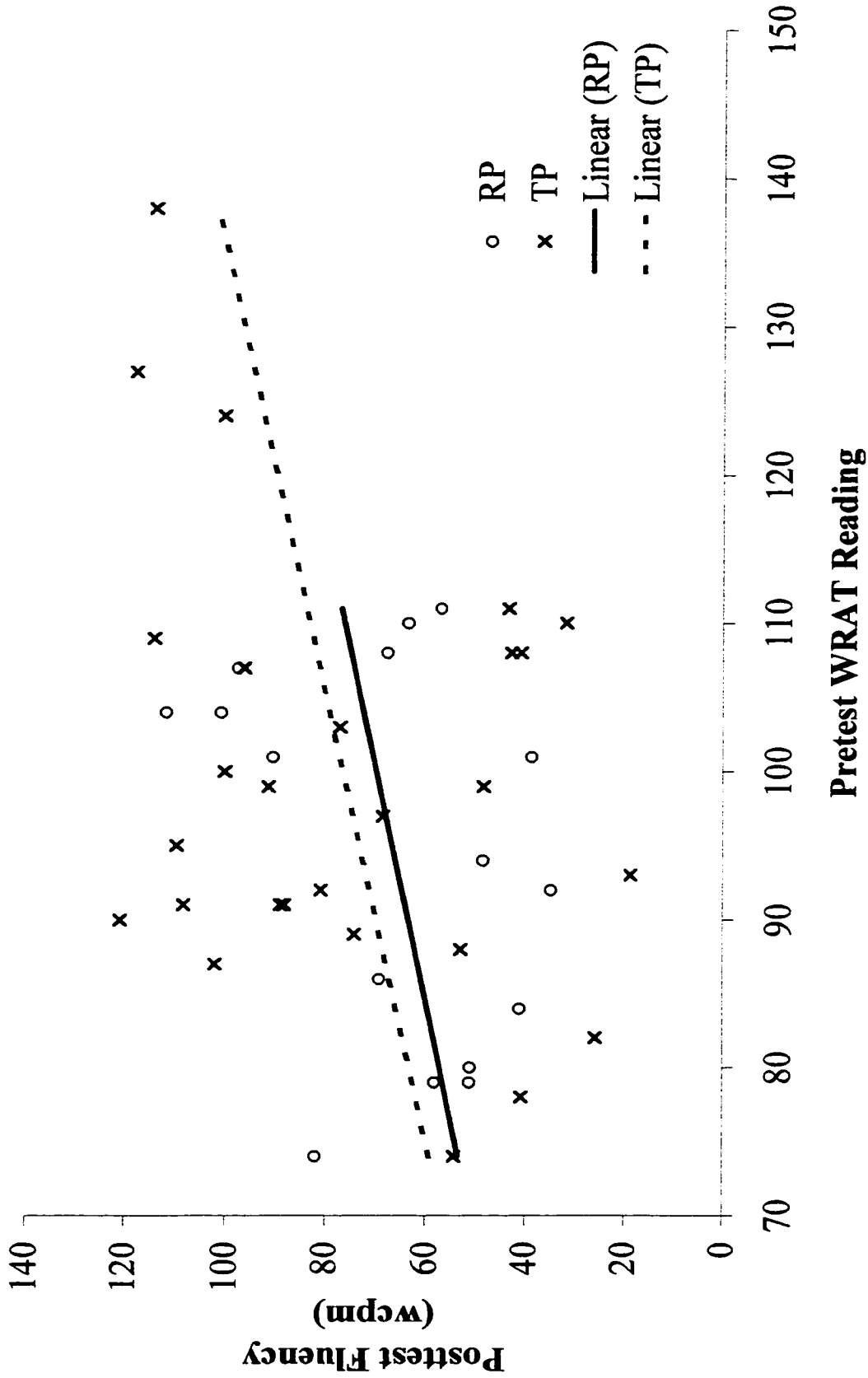


Figure 7. Pretest WRAT Reading Standard Score and Program as Predictors of Posttest Fluency Composite.

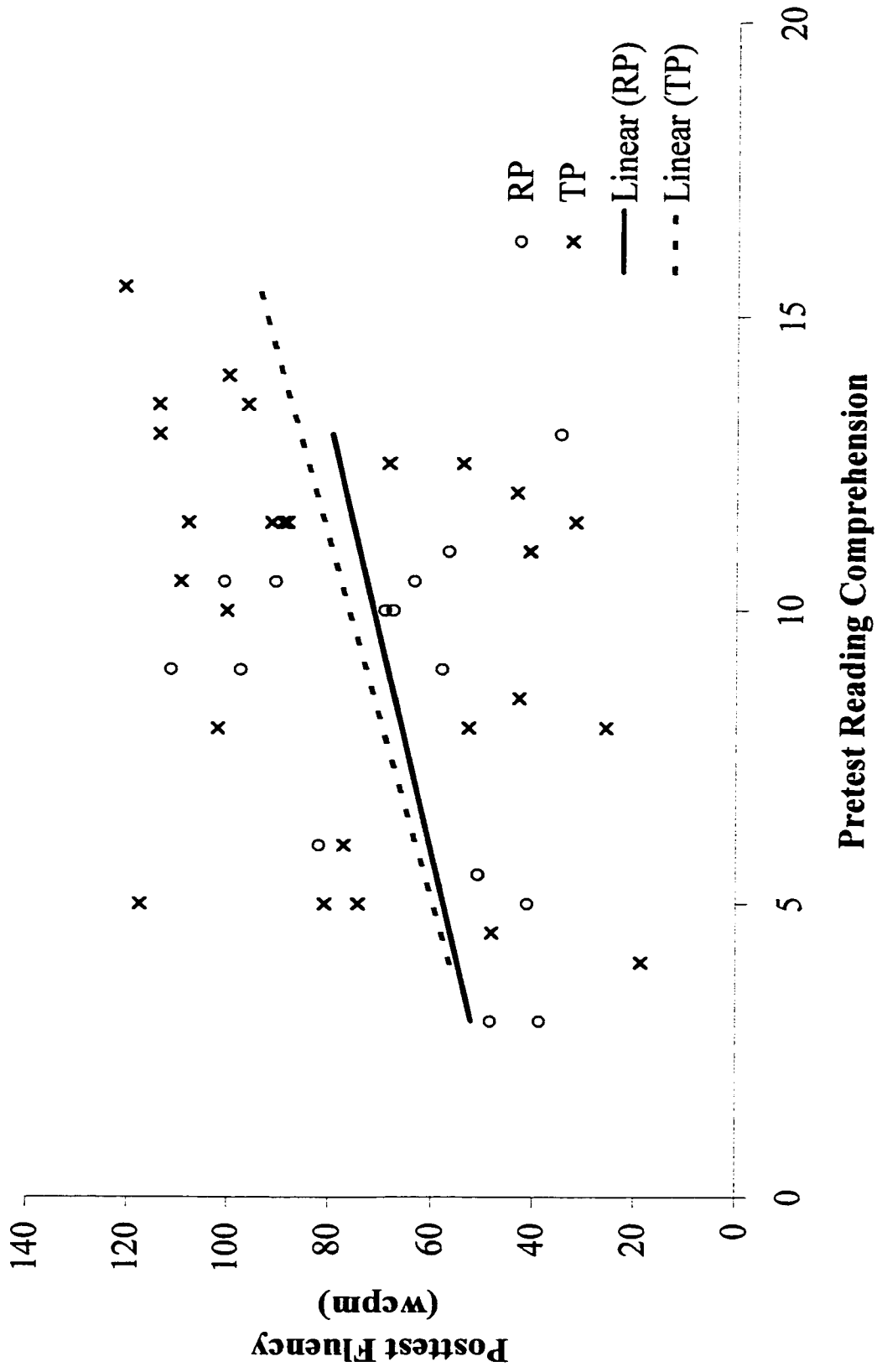


Figure 8. Pretest Reading Comprehension Composite and Program as Predictors of Posttest Fluency Composite.

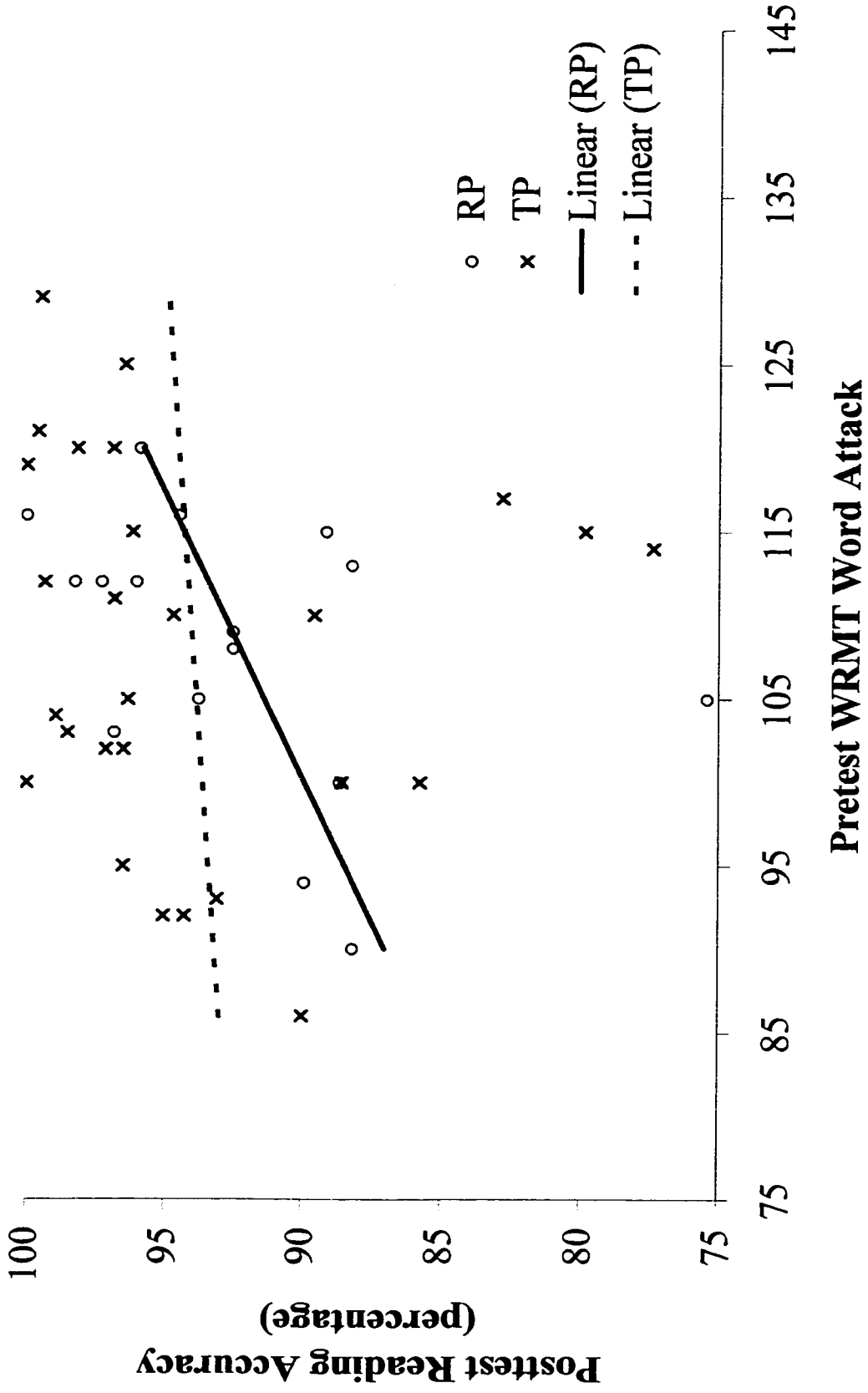
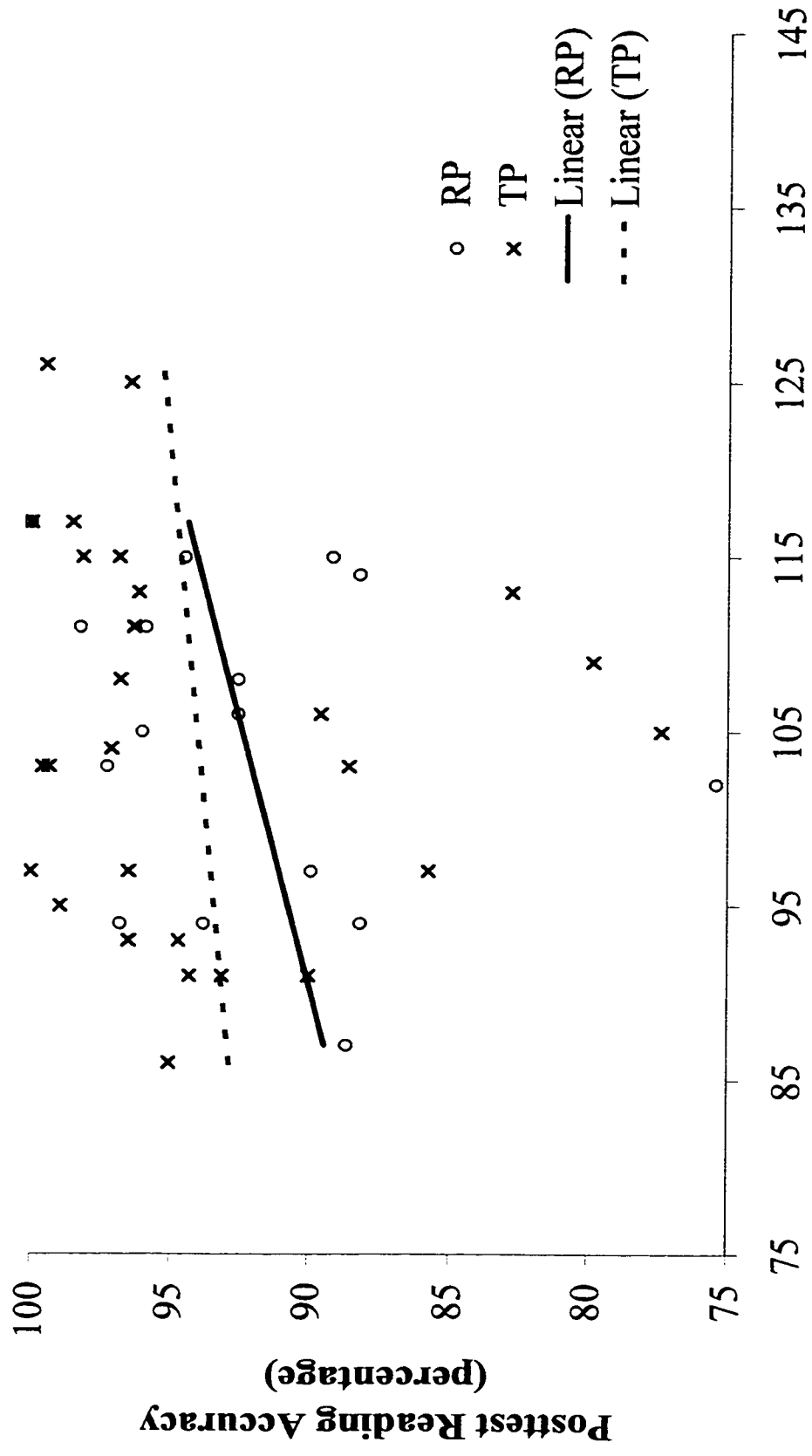


Figure 9. Pretest WRMT Word Attack Standard Score and Program as Predictors of Posttest Reading Accuracy Composite.



**Pretest WRMT Word Identification**

Figure 10. Pretest WRMT Word Identification Standard Score and Program as Predictors of Posttest Reading Accuracy Composite.

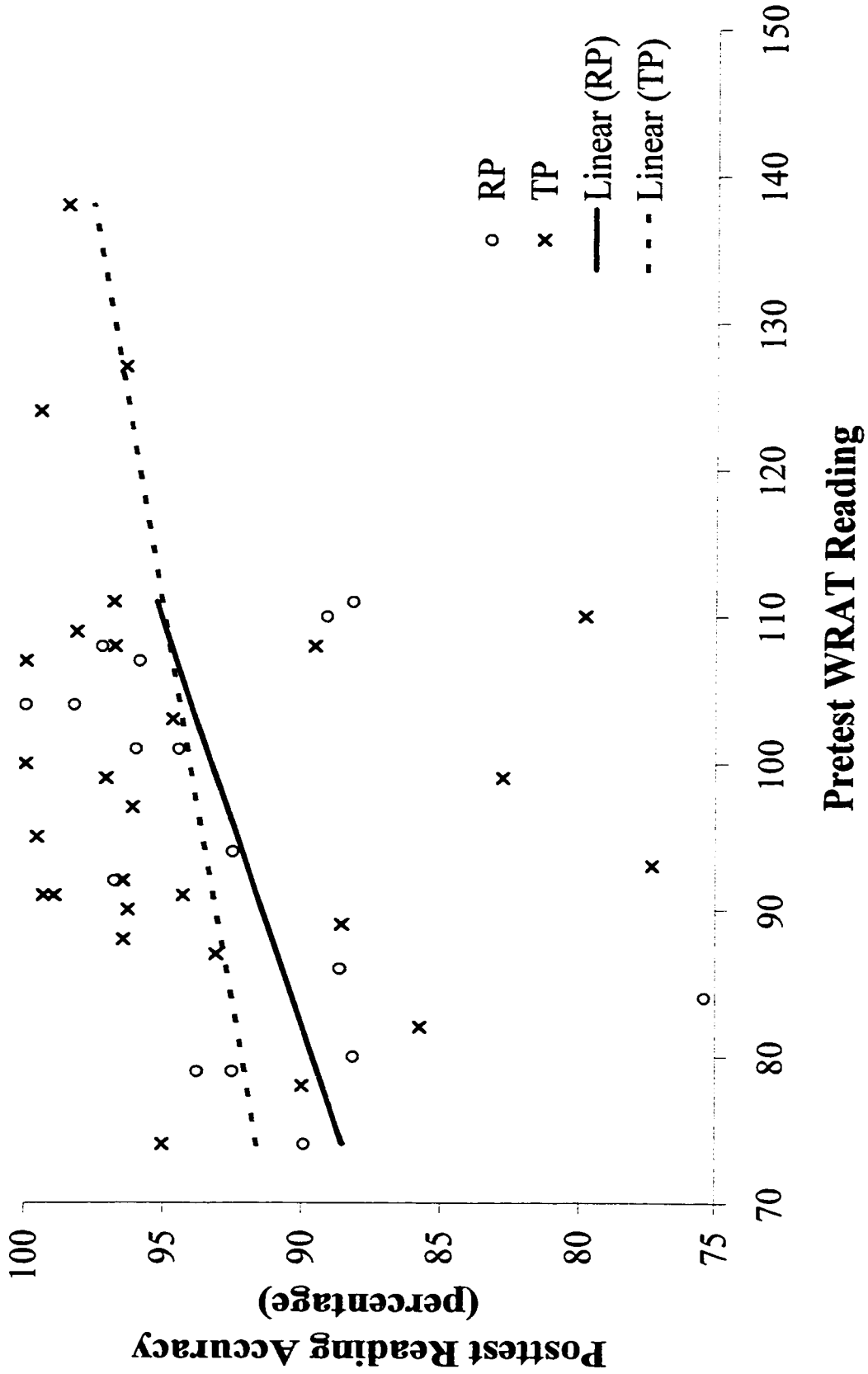


Figure 11. Pretest WRAT Reading Standard Score and Program as Predictors of Posttest Reading Accuracy Composite.

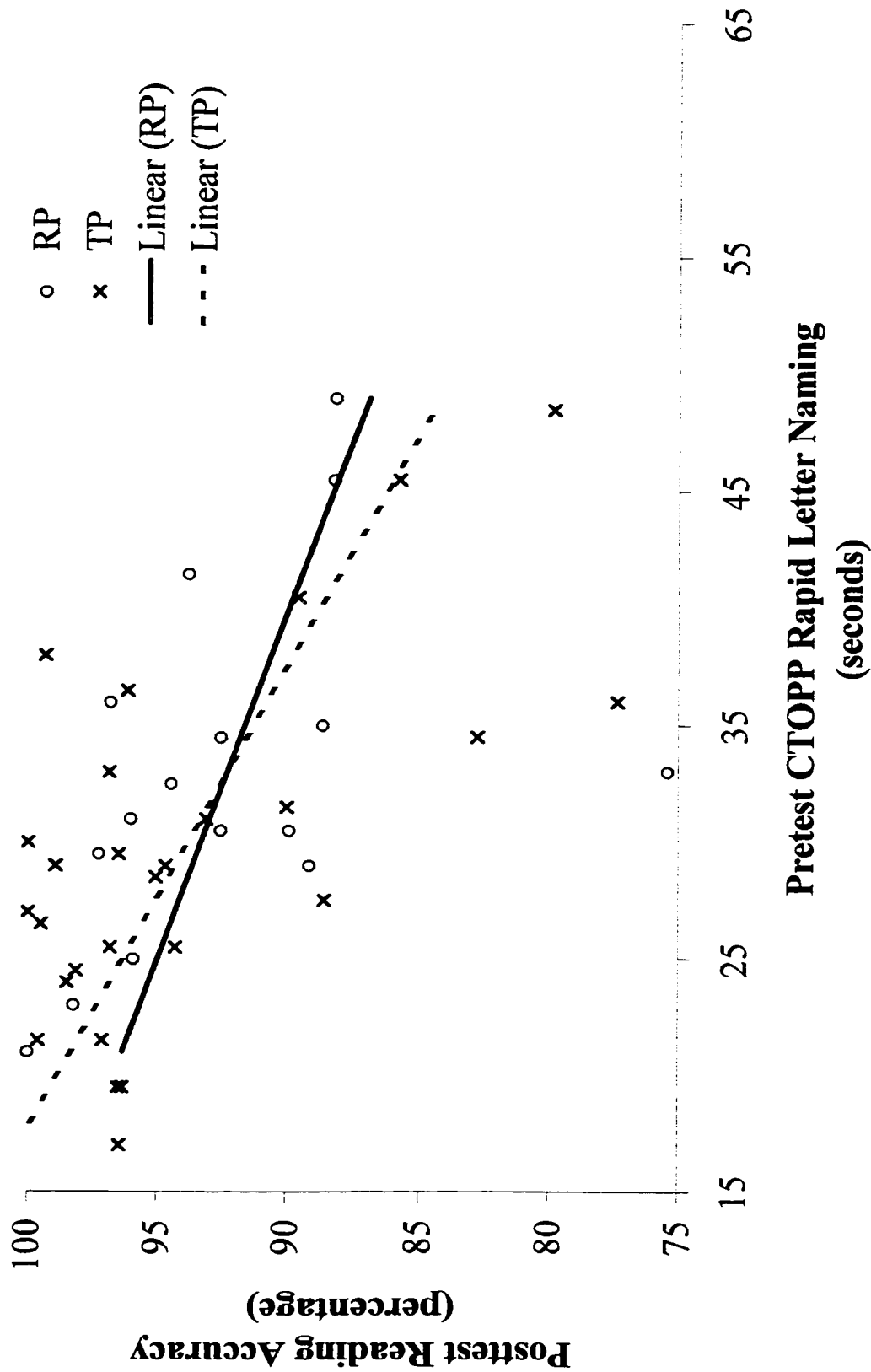
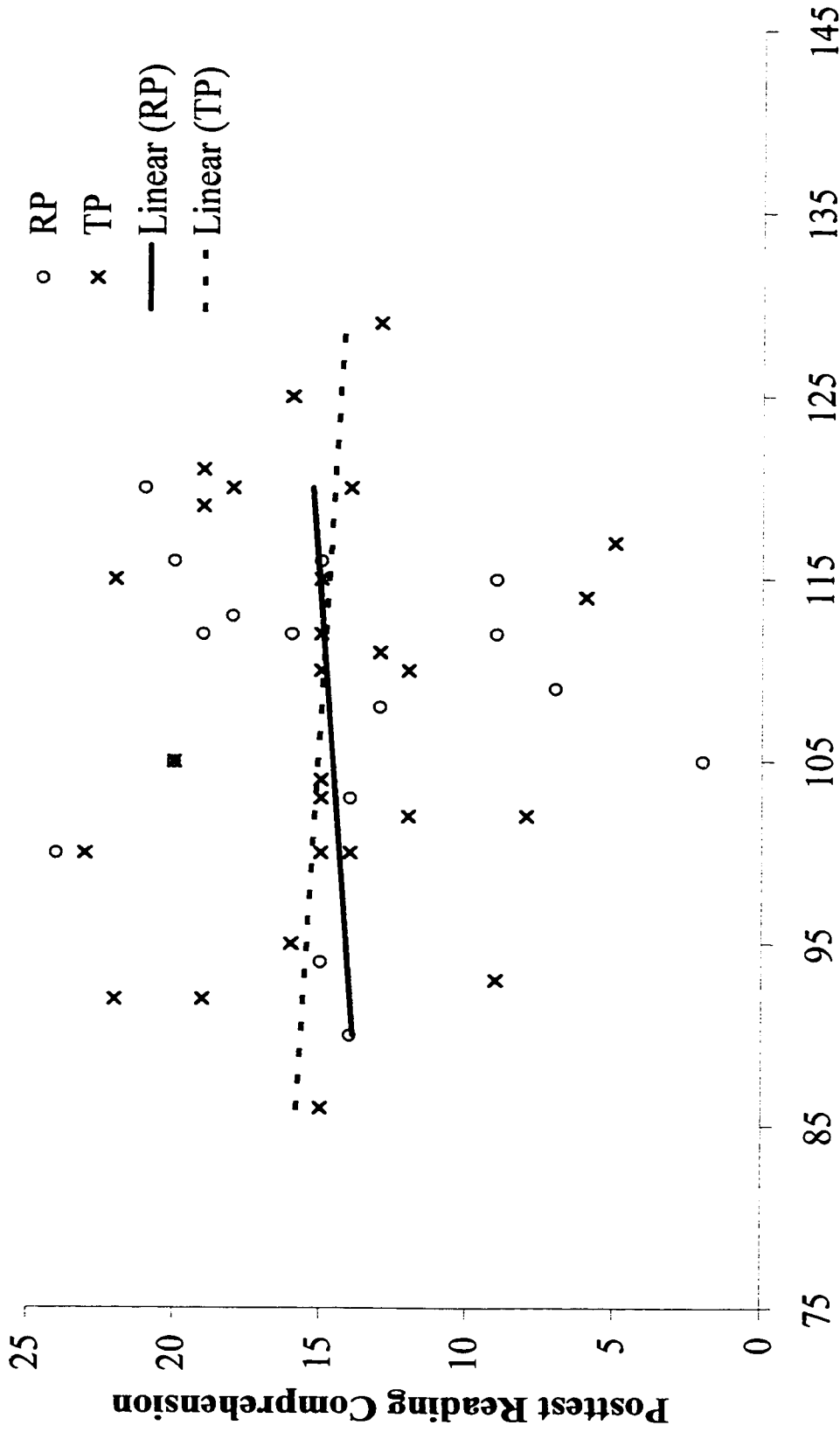


Figure 12. Pretest CTOPP Rapid Letter Naming and Program as Predictors of Posttest Reading Accuracy Composite.



**Pretest WRMT Word Attack**

**Figure 13.** Pretest WRMT Word Attack Standard Score and Program as Predictors of Posttest Reading Comprehension Composite.

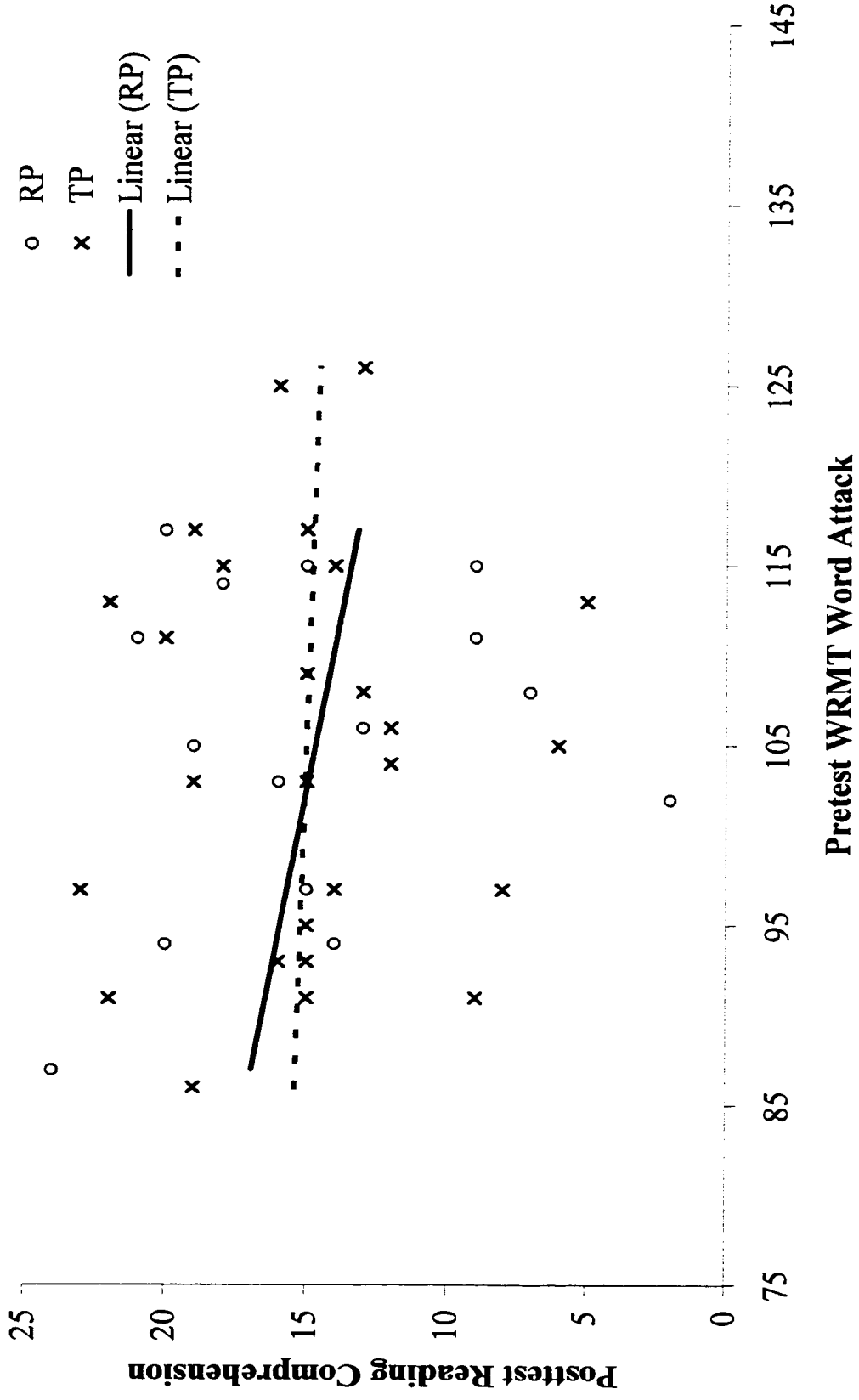


Figure 14. Pretest WRMT Word Identification Standard Score and Program as Predictors of Posttest Reading Comprehension Composite.

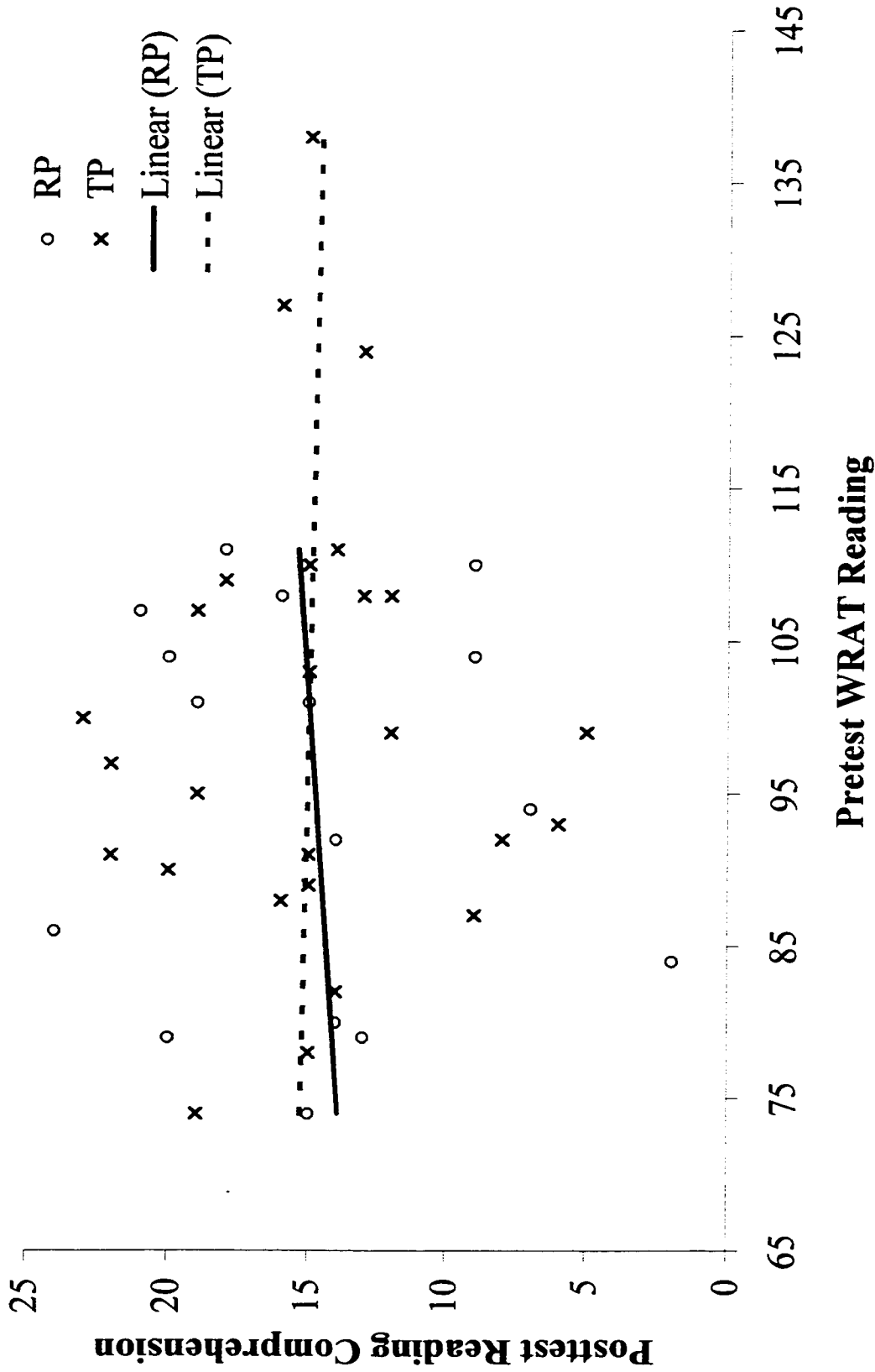


Figure 15. Pretest WRAT Reading Standard Score and Program as Predictors of Posttest Reading Comprehension Composite.

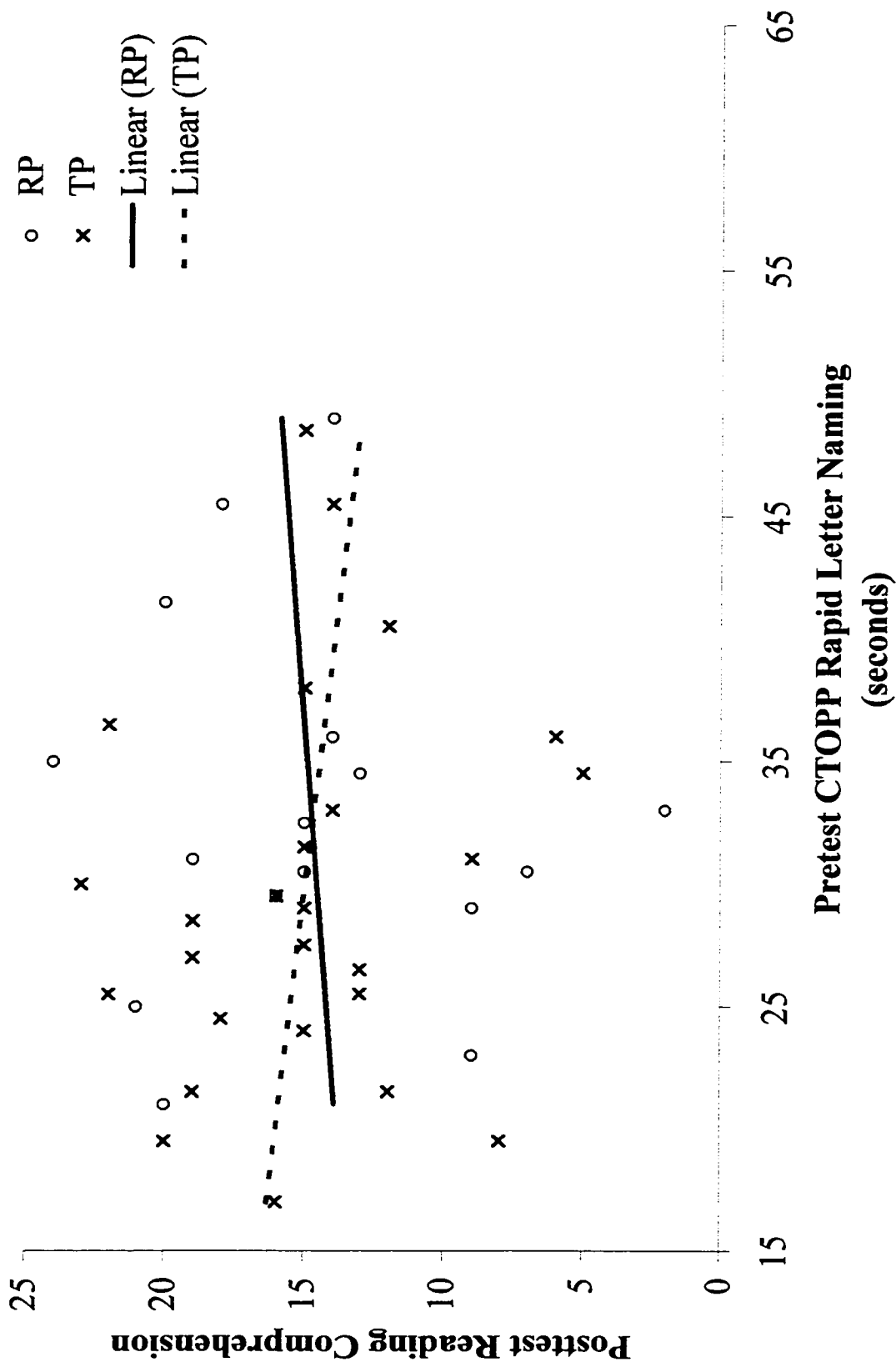


Figure 16. Pretest CTOPP Rapid Letter Naming and Program as Predictors of Posttest Reading Comprehension Composite.

### Improvements Over Time

The raw scores of both groups increased significantly from pretest to posttest on the major reading outcomes: word identification, fluency, accuracy, and comprehension. Age-adjusted standard scores decreased as much as one third of a standard deviation on word-level skills from pretest to posttest. Nonetheless, standard posttest scores on word-level skills were at or within one point of grade level for both groups. These findings for standard scores suggest that students maintained word-level reading skills at grade level through the end of second grade, although their overall level of reading skills declined somewhat over the course of the school year. These findings on the stability of word-level skills are similar to those reported by Torgesen et al. (2000) in their two-year follow up of students with severe reading disabilities who received explicit phonological intervention. Like the students in this study who received phonological reading tutoring in first grade, students in the Torgesen et al. study maintained word-level reading skills at grade level at a two-year follow up.

### Treatment Differences

Both groups increased in both fluency and comprehension by comparable amounts, although the nature of instruction they received differed considerably. These similarities in outcomes despite contrasting treatments raise several questions: 1) whether there are alternative instructional pathways in acquisition of reading comprehension skills (Berninger, 1994); 2) whether neither treatment was strong enough to produce the intended effects; 3) whether the nonstandard measures of fluency and comprehension were not sufficiently sensitive to capture differences in students' performance; and 4) whether the students' pretest skill levels were already too high to be significantly raised through supplementary tutoring.

The students in this study were provided with two very different approaches to comprehension instruction— repeated reading and strategy instruction. I expected that they would show differential gains in the use of reading skills targeted by each treatment, that is, that students in the Reading Partners treatment would have higher fluency rates at posttest, and students in the Thinking Partners treatment would have higher comprehension scores at posttest. This was not the case, however, and the groups did not differ significantly at posttest in word level, fluency, or comprehension skills. I will discuss these findings on fluency and comprehension each in turn.

Lack of differential fluency effects. Although there were no significant differences between groups at posttest on fluency measures, it should first be noted that both groups gained an average of 47 correct words per minute in rate during the 20 weeks of instruction between pre and posttest. This is about 17 words per minute (57%) more than the 30 word per minute gain that was predicted by Fuchs et al.'s (1993) estimate of 1.5 words per week as a realistic rate of fluency gain. In contrast, Carver (1990) estimated 14 words per minute as an average annual silent reading growth rate. The final reading rates for both groups (Reading Partners 68 wcpm, Thinking Partners 78 wcpm) are comparable to those reported by Stahl, Heubach, and Cramond (1977) for students (on unread material) with comparable entering levels of reading skills in their year-long classroom-based fluency-oriented reading program for second graders.

There are several possible explanations for the lack of differential fluency effects in the repeated reading treatment. Research on repeated readings supports the general conclusions that if at the transitional stage in learning to read words by sight students are at or below grade level on word identification skills, and if they practice rereading passages at an instructional/independent reading level, their fluency rates improve (Dowhower, 1987; Herman, 1985; Samuels, 1979). The research however fails to show that different approaches to fluency produce differential effects, only that students receiving fluency treatments outperform no-treatment controls (Kuhn & Stahl, 2000). In

their review of fluency research Kuhn and Stahl (2000) concluded that successful fluency treatments had students read text at instructional or frustration level, and it may be that difficulty of text in Reading Partners was not controlled carefully enough. Carver (1990) suggests that rate increases are most likely when all words are recognized when spoken, accuracy is near 100%, and most words are not yet automatic. In my study, differential transfer effects (relative to Thinking Partners) were not found when Reading Partners were tested on different passages than those used during treatment. Rashotte and Torgesen's (1985) findings suggest that the higher rate for repeated reading only transfers to other passages that share a majority of words.

Further, in their review of the fluency research, Kuhn and Stahl (2000) found that fluency results for repeated or assisted reading treatments for average achieving students reading at grade level were equivocal. They found that fluency treatments appear most beneficial for students reading below grade level. In light of Kuhn and Stahl's (2000) findings, the lack of differential fluency effects is not surprising given the subjects' relatively high word-level pretest scores. However, in the National Reading Panel's (National Institute for Child Health and Human Development, 2000) meta-analysis of fluency studies, effect sizes for repeated and guided repeated oral reading were higher for average than for low-level readers. In one of the studies included in the NRP review, Faulkner and Levy (1999) observed that while good readers develop prosody from

repeated reading, poor readers appear to develop word-level skills. In my study I did not use a measure of prosody, and although the raw word-level scores for Thinking Partners were higher than for Reading Partners at pretest, Reading Partners had higher word-level raw scores at posttest. The comparisons of Reading Partners' fluency gains based on their word identification skills revealed no significant differences for students with high or grade-level vs low or below- grade-level word identification skill. However, these word ID splits may have been confounded by other factors, including IQ and reading experience that contributes to rapid lexical accessing of words stored in memory as a consequence of repeated exposures (Ehri, 1997). Carver suggests that after accuracy and automaticity are at asymptote, differences in rate are attributed to cognitive speed.

Others have called attention to variables in addition to word level skill that may also affect fluency performance, including general reading practice, breadth of reading, practice reading in context (Barr et al., 1990), and developing comprehension skills. Reading Partners addressed to some degree all of these factors except comprehension skills. However, the treatment may not have provided sufficient practice in these areas, and furthermore, the comprehension treatment may have indirectly contributed to fluency skills because it also influenced these variables. O'Shea et al.'s (1985) repeated reading study suggests that metacognitive cuing to direct the student to fluency goals is

necessary, and perhaps the purpose of the multiple readings was not emphasized often or explicitly enough in my study.

Berninger and her colleagues (Berninger, Abbott, Billingsley, & Nagy, 2000) have recently raised the question whether repeated reading practice is based on a naive assumption that a single mechanism underlies reading rate and fluency. In their series of experiments, Berninger et al. (2000) suggest that fluency may be more complex than is reflected in a rate of reading. These experiments suggest that fluency includes efficiency, automaticity, and executive function aspects, and that a repeated reading treatment that addresses rate only is unlikely to benefit those disabled readers who lack automaticity on a large proportion of words in the passages, or who cannot self-monitor or self correct reading errors due to executive coordination problems. It may be that a more powerful fluency treatment would include a metacognitive component to develop executive control. As Berninger et al. speculate, perhaps automaticity is developmental, and this aspect of fluency may not emerge until the student has made the transition to sight word reading and begins to coordinate word level reading and reading text at the sentence level. That is, fluency and comprehension may not yet be distinct aspects of reading at the second-grade level for lower-skilled readers. Stanovich, Cunningham, and West (1981), using first graders' response to a Stroop task, demonstrated that more skilled readers had higher interference scores that suggested they had automatized word

recognition. They described a trend in automaticity that increases during first grade and then levels off.

Measurement of fluency is also problematic, and may contribute to the lack of effects in this study. Berninger et al. (2000) point out the lack of consensus whether fluency should be measured at each child's instructional level (based on accuracy), or at grade level, which may not be the same. In this study students were posttested on passages written at the second grade level regardless of the student's actual reading level. Had I recorded a measure of untimed reading accuracy, I would have been able to examine the contribution of accuracy to reading rate, as well as the contribution of rate to accuracy (Breznitz, 1987).

If fluency is influenced by background knowledge and text type, students with limited experiences may remain less fluent until these individual differences are eliminated. As Lipson and Lang (1991) illustrate in their case studies, individual fluency is influenced by prior knowledge, text type, and motivation/interest level— as well as by repeated text reading practice. For example, if knowledge of syntax, which the child draws upon to coordinate linguistic information within a text, is a product of reading and language experience (Catts, 1993), limited oral language experience may limit fluency and related prosody growth. Tunmer and Hoover's (1992) cognitive developmental model of

reading comprehension suggests that environmental influences may delay the development of metalinguistic skills, including syntactic awareness, that contribute to reading comprehension by way of phonological recoding. These same delays in metalinguistic skills may limit fluency development.

To the extent that listening comprehension measures are sensitive to individual differences in syntactic knowledge, I was able to examine syntactic influence on growth in fluency. Students who were below the median in listening comprehension showed fluency gains that were not significantly different than the gains of students above the listening median.

Lack of differential comprehension effects. There are likewise several possible reasons for the lack of differential comprehension effects in the Thinking Partners comprehension strategy instruction. First, the added reading practice afforded to both groups appeared to maintain word level skills that were appropriate for their grade. This may have been sufficiently strong to allow Reading Partners to construct meaning of the text passages. Specifically, repeated readings may have freed working memory for comprehension processes for the Reading Partners students. Second, even though Reading Partners did not focus on comprehension, it may have helped students improve their skills in constructing meaning from text. Reading Partners were exposed to a wide variety of

expository reading passages which may have increased their knowledge of syntax and vocabulary, and reading these passages may have created opportunities for students to practice constructing situation models (van Dijk & Kintsch, 1983) using strategies informally acquired rather than explicitly taught. Exposure to high interest, challenging expository text may have spurred Reading Partners to develop comprehension strategies not explicitly taught, or may have enabled these students to achieve similar comprehension outcomes without explicit strategy use. The finding that both groups had similar comprehension skills at posttest suggests that there may be several routes to improving reading comprehension.

Third, Thinking Partners students may have learned to monitor their comprehension through the strategies they were taught, but continued to process text at the sentence level, failing to integrate propositions across the text necessary to construct meaning (Garner, 1981). Rubman and Waters (2000) suggest that students benefit from explicit instruction in representing text using storyboards to integrate propositions and detect text inconsistencies. Explicit instruction in text integration may have been particularly appropriate and beneficial for second graders.

Fourth, tutor implementation of Thinking Partners was probably lower than reflected in my measures and contributed to the lack of differential comprehension effects. Even

though Thinking Partners was considerably more difficult to deliver than the more straightforward Reading Partners treatment, tutor fidelity ratings both averaged 93%. Surprisingly, time engaged in reading during each lesson was also similar for both groups (i.e., 12 minutes for Reading Partners students and 11 minutes for Thinking Partners students) given the focus on teacher-student interaction in Thinking Partners. The total average minutes spent on reading focussed instruction during lessons was 21 minutes for Thinking Partners students and 16 minutes for Reading Partners students. These differences appeared to result from the non-instructionally engaged time spent graphing and talking about the timings in the Reading Partners group.

Although most of the observational data recorded on tutors fail to describe the unevenness of Thinking Partners implementation, I have several impressions from the 148 tutor observations made during the intervention (118 made by me). I observed that some Thinking Partners tutors were very thoughtful and demonstrated a deep understanding of the skills they were asked to teach. Other tutors found it very difficult to understand the instructional objectives. Tutors had most difficulty teaching students how to make connections (inference making). The lessons provided examples of prompts and models for the tutors to use at points in the stories where I expected students would need to make an inference to further their understanding of the story. However, tutors were instructed that these prompts and models were not necessarily the only places

where students would need to make a connection. Tutors were also told that in some cases, students may have already made the connection/inference targeted in the prompt, in which case the tutor should be observant and should stop and prompt the student at other points where the tutor noticed, either through the student's retell or inadequate response to the tutor's question, that the student may not be making an important inference. Tutors differed in their initiation of nonscripted prompting and modeling of inference making.

In other cases, students sometimes said things during their reading of a story that indicated they had made a connection to something that had happened to them, to something they already knew about a topic, or to another part of the story. Some tutors reminded students to point out when they used one of the strategies in their reading. These tutors understood that it was beneficial for students to be aware of using these skills, they noticed when students made connections or noticed new vocabulary, and were very excited and reinforcing when their students demonstrated these skills. Other tutors, however, failed to notice these student behaviors, failed to name them, and failed to help their students become more aware of skills that they were practicing. To test the possibility that tutor skill limited the effectiveness of Thinking Partners, I compared comprehension gain of students taught by more and less skilled tutors and found there were no reliable differences between the groups. Unfortunately, I did not have a more

sensitive and focussed measure of tutor scaffolding skill to examine the influence of these nonscripted tutor behaviors on comprehension outcomes.

Some tutors and students were quite adept at making connections. For example, one student was reading a story in which a character named his toy sailboat Moby Dick. The student stopped and told her tutor “I’m making a connection! Moby Dick is the name of a book and a movie about a whale.” But overall, this strategy was difficult to initiate and for students to learn. Thus, we changed it. I modified the lesson formats and introduced the making questions strategy in the second half of the treatment as a more straightforward and easy-to-deliver means of giving students practice in inference making. Students were more successful in making questions than making connections and many students easily generated “why” questions that reflected how they were processing the text. Often these questions reflected that the student was overtly aware of using a strategy and was monitoring her understanding of the text.

There are various possible reasons for students’ low level of self-monitoring. As Kinnunen and Vauras (1995) clarified, comprehension monitoring (as measured by time spent reading text with comprehension obstacles, and look backs and rereadings) and comprehension (as measured in summaries of main ideas) are interdependent. Further, the student’s level of comprehension may be reduced by various factors including

decoding problems, unfamiliarity with text structure, limited vocabulary, inadequate background knowledge, limited attentional resources, and low motivation. In this study it would have been difficult to train tutors to tailor instruction based on these student characteristics and obstacles. Instead, tutors were provided with a range of models that reflected several common comprehension obstacles the students might experience (i.e., word level, sentence level, integration of sentences/passages, match of text with prior knowledge). It is likely that a skilled reading teacher would have been able to adapt and scaffold instruction to address these varied influences on text processing and thereby enhance the student's ability to monitor comprehension. Most of the tutors were not skilled enough to adjust their instruction when these other factors interfered with comprehension, nor were they expected or trained to be concerned with these factors. Tutors were trained to model and scaffold student practice in a limited set of strategies. As Torgesen et al. (1999) also reported in their comparison of instructional conditions for students with poor phonological skills in which instructional aides delivered the instruction, I was unable to train tutors to the level at which they could provide optimal practice opportunities in addition to the scripted instruction. In conclusion, tutor implementation of the specific strategy instruction outlined in this program was inconsistent and likely diminished treatment effects for Thinking Partners. Comprehension instruction requires the knowledge and experience to make individual

decisions about student needs, cannot be realistically scripted for tutors, and is best addressed by skilled teachers.

Fifth, observed lack of group differences in comprehension may be due to relatively insensitive measures of comprehension skills taught in the treatment. I attempted to employ measures, in particular the Oakhill passages and questions, along with similar questions written for the other passages, that emphasized inferencing skills and more general and higher level comprehension skills. However, even passages like those written by Oakhill to emphasize inferencing skills are limited and do not reveal the use of prior knowledge, or the student's ability to integrate text. I decided not to include a norm-referenced comprehension measure at posttest due to the length of the posttest measures (over one hour per student), a decision I regret, even though the effect sizes on standardized measures in Rosenshine et al.'s (1994, 1996) meta-analyses of strategy instruction were very low. In retrospect, however, a norm-referenced comprehension measure would increase confidence in these findings of no treatment differences, and would provide an absolute level of comprehension performance.

On the other hand, it may be that the fluency treatment in this study, as Kuhn and Stahl (2000) suggest, affected the students' comprehension at the sentence level. In this case, higher level comprehension skills featured in Thinking Partners may not have been

captured by standardized measures. Furthermore, neither the Oakhill passages nor a standardized reading test would have captured the metacognitive awareness of strategy use that Thinking Partners may have developed.

As noted, the most difficult skill taught in Thinking Partners was making connections. Of the total number of comprehension questions on the posttest, 66% were inference questions and 34% were literal questions. Because the comprehension posttest passages emphasized the skill that was most difficult to teach, they may underestimate student proficiency in the skills that were taught more successfully, like on-line summarizing or predicting. Although, when I examined group differences on detail questions they were not significant.

Sixth, strategy use may not confer an advantage for comprehension at the second-grade. Students may not yet have developed the cognitive skill to employ strategies effectively, and second-grade text may not require the use of strategies often enough to reward students for their use. In Wilson and Rupley's (1997) structural equation modelling of reading comprehension grades 1 through 6, strategy use did not begin to play an important role in comprehension until grade 4. As noted earlier in the review of the literature for this study, comprehension strategy instruction has been implemented most often with students older than second graders. In the National Reading Panel's (2000)

meta-analysis of strategy instruction studies, the modal grade for studies that taught comprehension monitoring, multiple comprehension strategies, and question generation was grade 4 or higher. The second graders in this study may not have been developmentally ready to learn skills that required higher order thinking and metacognitive awareness and the mastery of decoding and basic reading skills.

Finally, my inability to constitute a second-grade control group from the original Sound Partners first-grade sample severely limits my interpretation of treatment effects. Lacking this control group I cannot conclude that either treatment was effective, only that the two produced roughly equivalent outcomes.

### Findings on Predictors

Neither word-level skills nor fluency nor the difference between pretreatment listening and reading comprehension predicted comprehension posttests after controlling for comprehension pretests. Naming speed, or accessing phonological codes, as measured by the CTOPP Rapid Letter Naming Subtest, however, uniquely predicted both fluency and accuracy, after controlling for initial fluency and accuracy, respectively. That individual differences in accessing name codes would affect students' reading fluency is not surprising, as rapid automatic naming tasks have been demonstrated to predict word-

level growth in the early grades (Wagner et al., 1997; Wolf, 1991). The finding that naming skill predicts reading accuracy may be explained by the contribution of naming speed to orthographic skills. For example, Bowers et al. (1994) hypothesized that naming tasks reflect a timing mechanism allowing the reader to coordinate phonological and visual representations to form orthographic codes. In a longitudinal study of reading development, Bowers (1995) reported that rapid naming predicted word reading accuracy, but the contribution fell short of being significant. More recently, Manis, Doi, and Bhadha (2000) reported that letter naming speed accounted for significant variance in orthographic skills (as measured by an orthographic choice test) in second graders. In a study of Copenhagen second graders Elbro (1999) found that naming speed was a stronger predictor than phonological skill of reading. Elbro noted that in studies of reading in languages with regular orthographies like German, naming speed is found to be more important early in reading because decoding accuracy is more quickly acquired. In my study, naming speed was an important predictor at the beginning of second grade, the stage at which the subjects who entered first grade with poor reading skills are beginning to consolidate their word reading skills (and naming speed at the beginning of first grade did not predict word identification or fluency). Unlike Bowers (1995) and Manis et al. (2000), Torgesen et al. (1997) in their study of the growth of reading skills reported that rapid naming did not predict fourth- and fifth-grade orthographic accuracy beyond the level predicted by word reading skills at second and third grade. Torgesen et

al. (1997) predict that naming speed is strongly related to orthographic skills (as measured by an orthographic choice task) in primary grades, and less so in higher grades. It will be important to examine this relationship in my study's population in follow-up tests.

According to the verbal efficiency hypothesis (Lesgold & Perfetti, 1978), good readers because of their superior word-level skills are better able to selectively and effectively allocate their attentional resources to comprehension. Poor readers, on the other hand, may consume attentional resources on word identification, leaving fewer resources for comprehension. Efficiency in strategy use may confer on students a processing advantage in comprehension, just as efficiency confers an advantage in word identification (Reynolds, 2000) for good readers. In short, a reader may need highly efficient word level skills (as reflected in accuracy and rate) in order to have sufficient resources left over to support strategy use and monitoring (as well as fluency). Although the work of Kinnunen and her colleagues (Kinnunen & Vauras, 1995; Kinnunen, Vauras, & Niemi, 1998) suggests that word reading efficiency and listening comprehension influence comprehension monitoring (as reflected in strategy use) I failed to find a relationship between strategy use and word level or listening comprehension skills. Further, there were only modest correlations for two out of eight measures of strategy use with the posttest comprehension scores, including inferencing skills. My finding that word level

skills and fluency failed to predict comprehension performance (after controlling for comprehension pretest) does not fit well with verbal efficiency theory. When I examined whether, as would also be expected by the theory, concurrent measures of word identification and fluency predicted comprehension, only word identification was significant.

My finding that listening comprehension did not predict reading comprehension is not surprising and supports the findings of others that listening comprehension accounts for a greater proportion in reading variance at higher skill levels (Curtis, 1980; Daneman & Carpenter, 1980; Jenkins & Pany, 1981; Smiley, Oakley, Worthen, Campione, & Brown, 1977).

No aptitude-by-treatment interactions were significant in predicting differential response to treatment based on entry level skills (as measured in standard scores). These two instructional approaches may not interact with students' reading skill, at least with the range of entry skills found in my sample.

### Limitations

The conclusions that can be drawn from these results are limited by the instruments used to measure progress in fluency and comprehension. The modest correlations among posttest comprehension measures raise the issue of validity. Lacking a norm-referenced comprehension measure at posttest, I was unable to examine the validity of my comprehension measures.

Additionally, the comprehension measures are limited by the demands on comprehension monitoring and performance they make on readers. The Oakhill reading passages used as a posttest at the end of second grade, although selected and revised to specifically capture the use of higher level comprehension skills, lack normative and psychometric data on reliability. None of the comprehension measures required students to demonstrate use of comprehension strategies, and because strategy use was not observed, it is not possible to determine whether students actually learned to use the strategies they were taught. A more direct test of strategy use, such as a think aloud, would have helped clarify these findings, although this type of test may have made unrealistic demands of second graders.

Conclusions about the effects of strategy instruction on comprehension are limited by my inability to examine long-term effects of the one-year-long treatments. The strategy instruction treatment may enable students to benefit from more advanced classroom strategy instruction and may therefore have delayed effects. For example, on-line summarization skills taught in Keeping Track may prepare the student for more difficult summarizing skills taught in their classroom. The effects of the comprehension strategy treatment may not become evident until students consolidate their reading skills, or until classroom instruction reinforces the tutoring strategy, or creates increased opportunities for the students to practice and apply their strategies.

The findings may also be limited because the treatment was only implemented for one year, which may have been insufficient for students to learn the skills and apply them in their reading. Cross and Paris (1988) speculated that their younger third-grade subjects who failed to benefit from strategy instruction may have required extended treatment. These youngest students also demonstrated the greatest discrepancy between their reading performance and their reading awareness. Brown et al. (1996) concluded, in their evaluation of the SAIL Transactional Strategies Instruction, that self monitoring strategies are developed over years of practice, and a program like Thinking Partners may simply initiate this process in young readers who have had problems in beginning reading skills and who lack metacognitive skills.

The findings on comprehension strategy instruction are also limited by the fact that the treatment was implemented by nonexperts who would not be expected to deliver the nuanced instructional that a trained reading teacher might use. Although the internal validity of the treatment might have been limited by the tutors' inexperience, the findings have a higher external validity because the tutor implementation ratings suggest that it is possible for nonteachers and tutors to implement basic comprehension strategy instruction as well as fluency instruction. Many of the Thinking Partners tutors had more than one year of experience working with the research staff for this study, and had acquired practical skills in student management and reading instruction. These tutors were probably similar in skill level to instructional assistants hired by many schools.

Effects of both treatments, but especially for Thinking Partners, were constrained because they were supplementary and not coordinated with classroom instruction. It could be said that the Reading Partners repeated reading treatment was more likely to have an additive effect on students' reading instruction. Even as an isolated tutoring program Reading Partners was likely to enhance classroom instruction in word level, fluency, and comprehension skills regardless of the type of reading instruction in the classroom. Thinking Partners, on the other hand, might have been more effective if the strategy instruction had been reinforced in classroom reading experiences and aligned with the classroom teacher's comprehension instruction.

My inability to detect differential treatment effects may have been limited because subjects' average word-level and comprehension skills were nearly at grade level at pretest. Had the groups presented a profile of reading skills more characteristic of less skilled readers, I might have observed treatment differences.

The major finding of the study, however, is that the two seemingly distinct treatments in this comparison did not produce differential reading outcomes. Unfortunately, because the study does not include a no-treatment control group it is not possible to determine whether the treatments had any influence on students' reading growth.

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**Thinking Partners**  
**Scope and Sequence Table 1999 - 2000**

**Strategy Included**

Storybook Title/Author	Keeping Track	Making Connections	Understanding Words	Thinking Ahead	
1. The Teeny Tiny Woman	✓				
2. Follow Me	✓				
3. Kit and Kat	✓	✓			
4. Ready, Set, Go	✓	✓			
5. Wake Me in Spring	✓	✓	✓		
6. All Stuck Up	✓	✓	✓		
7. Two Crazy Pigs	✓	✓	✓	✓	
8. Mr. Big Brother	✓	✓	✓	✓	
9. The Only Lonely Dog	✓	✓	✓	✓	
10. P. J. Funnybunny	✓	✓	✓	✓	
11. Glasses for DW	✓	✓	✓	✓	
12. No Mail for Mitchell	✓	✓	✓	✓	
13. The Hating Book	✓	✓	✓	✓	
14. A Kiss for Little Bear	✓	✓	✓	✓	
15. A Surprise Party	✓	✓	✓	✓	
16. Poppleton Forever	✓	✓	✓	✓	
17. Mrs. Brice's Mice	✓	✓	✓	✓	
18. The Meanest Thing to Say	✓	✓	✓	✓	
19. Aunt Eater Loves a Mystery	✓	✓	✓	✓	
20. Little Bear's Friend	✓	✓	✓	✓	
21. Shipwreck Saturday	✓	✓	✓	✓	
22. The Best Way to Play	✓	✓	✓	✓	
23. Dinosaur Babies (E)	✓	✓	✓	✓	
24. Poppleton and Friends	✓	✓	✓	✓	
25. Watch Out for Bears	✓	✓	✓	✓	

## Strategy Included

Storybook Title/Author	Strategy Included				
	Keeping Track	Making Connections	Understanding Words	Thinking Ahead	Making Questions
26. Young Cam Jansen & The Lost Tooth	✓	✓	✓	✓	
27. A Snake Mistake (E)	✓	✓	✓	✓	
28. The Bravest Dog Ever: The True Story of Balto (E)	✓	✓	✓	✓	
29. Mr. Putter and Tabby Fly the Plane	✓	✓	✓	✓	✓
30. Poppleton in Spring	✓	✓	✓	✓	✓
31. Dolphins (E)	✓	✓	✓	✓	✓
32. Days with Frog and Toad	✓	✓	✓	✓	✓
33. Gorillas - Gentle Giants of the Forest (E)	✓	✓	✓	✓	✓
34. Mr. Putter and Tabby Bake the Cake	✓	✓	✓	✓	✓
35. Whales-The Gentle Giants (E)	✓	✓	✓	✓	✓
36. The Baseball Birthday Party	✓	✓	✓	✓	✓
37. The Wednesday Surprise	✓	✓	✓	✓	✓
38. Monster Bugs (E)	✓	✓	✓	✓	✓
39. Newt	✓	✓	✓	✓	✓
40. Porcupine's Pajama Party	✓	✓	✓	✓	✓
41. Twisters	✓	✓	✓	✓	✓
42. Henry and Mudge and the Careful Cousin	✓	✓	✓	✓	✓
43. Young Cam Jensen and the Missing Cookie	✓	✓	✓	✓	✓
44. Hooray for the Dandelion Warriors	✓	✓	✓	✓	✓
45. Wild, Wild Wolves	✓	✓	✓	✓	✓

12.

**No Mail for Mitchell**  
Catherine Siracusa

Flags on Pages:

9 17 25 32

Background: Do you ever get letters or packages in the mail?  
How does it make you feel when you get something?  
This is a story about a mailman who never gets any mail. What do you think he feels like? Let's find out what happens to him.

Tutor: Review 4 expert reader cards.

Prompts, Models, Praise

<p><b>Page 9</b> What's happening so far?</p> <p>What do you need to figure out?</p>	<p>How did the story start? Good keeping track!</p> <p>Word: What a <u>sack</u> is. What <u>deliver</u> means.</p> <p>Connect: What Mrs. Groundhog got in the mail. What Mitchell will do with the letter. That Mitchell is writing a letter to himself because he doesn't get any mail.</p>
<p><b>Page 17</b> What's happening so far?</p> <p>What do you need to figure out?</p>	<p>Where did we leave off? Good keeping track!</p> <p>Word: What "<u>count on you</u>" means. What "<u>through</u>" means.</p> <p>Connect: That Mitchell is a very good mailman to work at night.</p> <p>Predict: If Mitchell is going to get sick from getting so wet.</p>
<p><b>Page 25</b> Follow Up</p> <p>What is happening so far?</p> <p>What do you need to figure out?</p>	<p>So, did _____ (ask student to check last prediction).</p> <p>Where did we leave off? Good keeping track!</p> <p>Word: What "<u>special delivery</u>" means.</p> <p>Connect: That Mitchell is lonely. Why Mitchell misses his job.</p>

<p><b>Page 32</b> What's happening so far?</p> <p>What do you need to figure out?</p>	<p>Where did we leave off? Good keeping track!</p> <p>Word: What it means that Mr. Pig <u>hands</u> Mitchell the bag of mail.</p> <p>Connect: That people really like Mitchell If Bobby really will be a mailman.</p>
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Retelling:

- Tell me the story again, but shorter.

Mitchell the mailman never got mail.

He wrote himself a letter but it blew away.

He made a special delivery to the Beavers.

Mitchell got very wet and got a cold.

When he was sick in bed, his boss delivered his mail.

Mitchell's boss brought him lots of letters from his customers who missed him.

Total points      /9

- Tutor – use retell prompts to fill in.

Self Check

What expert secrets did you use today to read this story?

Yes -- you used \_\_\_\_\_:

Keeping track

Making connections

Understanding words

Thinking ahead

DAY 2.

Reread the story for fun.

Retelling:

Ok -- do your short retell again. Use prompts.

Story Talk:

Why did Mitchell write himself a letter?

What made his customers write letters to Mitchell?

How did that make him feel?

**Key**

Circle component observed.  
 Circle criteria met.  
 Slash criteria not met.  
 No mark if not observed.

Tutor: \_\_\_\_\_  
 Student: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 School: \_\_\_\_\_  
 Observer: \_\_\_\_\_  
 Book: \_\_\_\_\_

**Thinking Partners**  
 Tutor Observation Form  
 1999-2000

Component	Criteria
<b>Keeping Track</b>	1. Stops at correct flags to review. ----- 2. Scaffolds student on-line summarization. ----- 3. Models strategy correctly when needed. ----- 4. Specific praise for good efforts.
<b>Making Connections</b>	1. Models how to go back to text. ----- 2. Models how to use prior knowledge. ----- 3. Scaffolds student attempts.
<b>Understanding Words</b>	1. Prompts student in pronunciation of new word. ----- 2. Prompts student to notice unfamiliar words. ----- 3. Models the strategy correctly when needed.
<b>Thinking Ahead</b>	1. Prompts student to think about what will happen. ----- 2. Models the strategy correctly when needed.
<b>Corrections and Praise</b>	1. Uses sounding out/sight word corrections appropriately. ----- 2. Provides model, prompt, or scaffold as appropriate. ----- 3. Uses specific praise. ----- 4. Prompts student to return to the text when necessary.

<b>Use of time</b>	<b>yes</b>	<b>no</b>
Tutor has materials organized	<input type="checkbox"/>	<input type="checkbox"/>
Starts on time	<input type="checkbox"/>	<input type="checkbox"/>
Transitions smooth/quick	<input type="checkbox"/>	<input type="checkbox"/>
Tutors full 30 minutes	<input type="checkbox"/>	<input type="checkbox"/>

<b><u>Tutor Instruction</u></b>	<b>yes</b>	<b>no</b>
Identifies and adds practice in weak areas	<input type="checkbox"/>	<input type="checkbox"/>
Corrects errors immediately	<input type="checkbox"/>	<input type="checkbox"/>
Corrects without negative comments	<input type="checkbox"/>	<input type="checkbox"/>
Uses specific praise effectively	<input type="checkbox"/>	<input type="checkbox"/>
Positive affect	<input type="checkbox"/>	<input type="checkbox"/>

***Notes:***

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**Key**  
 Circle component observed.  
 Circle criteria met.  
 Slash criteria not met.  
 No mark if not observed.

Tutor: \_\_\_\_\_  
 Student: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 School: \_\_\_\_\_  
 Observer: \_\_\_\_\_  
 Book: \_\_\_\_\_

**Reading Partners**  
**Criteria for Tutor Implementation**  
**of Lesson Components**

<b>Component</b> Circle if Observed	<b>Criteria</b>
<b>Cold Read</b>	1. Requires student to use fingersliding. ----- 2. Does not correct errors. ----- 3. Correctly computes wcpm. ★ Changes/adaptations _____ _____
<b>Graph</b>	1. Records date, passage, wcpm. ----- 2. Has student mark check sheet. ----- 3. Has student color graph in blue. ----- 4. Explains goal to student. ----- ★ Changes/adaptations _____ _____
<b>Partner Reading</b>	1. Sets a pace that "pulls student along." ----- 2. Requires fingersliding. ----- 3. Models reading with attention to punctuation. ----- 4. Reads passage twice. ----- 5. Has student mark check sheet. ----- ★ Changes/adaptations _____ _____
<b>Solo Reading</b>	1. Has student read entire passage. ----- 2. Corrects student errors. ----- 3. Requires student to re-read any sentence with an error. ----- ★ Changes/adaptations _____ _____
<b>Timed Practice</b>	1. Corrects student <u>after</u> timing. ----- 2. Has student mark check sheet. ----- ★ Changes/adaptations _____ _____

<b>Component</b> Circle if Observed	<b>Criteria</b>
<b>Hot Read</b>	1. Requires student to use fingersliding. ----- 2. Does not correct errors. ----- 3. Correctly computes wcpm. ★ Changes/adaptations _____
<b>Graph</b>	1. Records wcpm on graph. ----- 2. Has student color graph correctly, in red. ----- 3. Has student mark check sheet. ★ Changes/adaptations _____
<b>Goal-setting</b>	1. Follows guidelines. ----- 2. Communicates next step clearly to student. ----- ★ Changes/adaptations _____

     /25

**Use of time**

	yes	no
Tutor has materials ready/organized	<input type="checkbox"/>	<input type="checkbox"/>
Starts on time	<input type="checkbox"/>	<input type="checkbox"/>
Transitions smooth/quick	<input type="checkbox"/>	<input type="checkbox"/>
Tutors full 30 minutes	<input type="checkbox"/>	<input type="checkbox"/>

**Tutor Instruction**

Follows lesson format consistently	<input type="checkbox"/>	<input type="checkbox"/>
Uses correction procedures where indicated	<input type="checkbox"/>	<input type="checkbox"/>
Corrects without negative comments	<input type="checkbox"/>	<input type="checkbox"/>
Uses <u>specific</u> feedback	<input type="checkbox"/>	<input type="checkbox"/>
Communicates with student about progress	<input type="checkbox"/>	<input type="checkbox"/>
Encourages	<input type="checkbox"/>	<input type="checkbox"/>

     /10

**Percentages**

Components \_\_\_\_\_ %  
 Management \_\_\_\_\_ %

**Notes:**

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## PROFESSIONAL EXPERIENCE

- 1989-present    **Washington Research Institute,**  
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 U.S. Department of Education 1998-2003  
 Field-Initiated Research  
 "Prereferral Assessment and Tutoring Intervention"
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 U.S. Department of Education 1997-2001  
 "Sustainability of Promising Innovations"
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 Schools."
- Principal Investigator, Field Initiated Studies  
 Office of Educational Research and Improvement  
 U.S. Department of Education, 1991-1992.  
 "Minority Students with Disabilities in the Small Rural School District."
- Project Coordinator, Head Start Research Project  
 U.S. Department of Health and Human Services, 1990-1991.  
 "Variations in Service Delivery Models in Region X."
- Principal Investigator, Synthesis and Dissemination Project  
 U.S. Department of Health and Human Services, 1989-1990.  
 "Evaluation of Child Abuse Prevention Projects."
- 1979-1989    **University of Washington, Child Development and Mental Retardation Center,**  
 Seattle, WA  
 Project Manager, Early Childhood Special Education
- 1978-1979    **University of Washington, Department of Community Dentistry,**  
 Seattle, WA  
 Research Associate
- 1975-1976    **Wayne State University, Department of Community Medicine,**  
 Detroit, MI  
 Research Assistant

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**EDUCATION**

- 2000-           **College of Education**  
University of Washington, Seattle, WA  
Ph.D.
- 1983           **School of Public Health and Community Medicine**  
University of Washington, Seattle, WA  
M.P.H.
- 1974           **Monteith College, Wayne State University, Detroit, MI**  
B.A.

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**PROFESSIONAL SERVICE**

- Grant reviewer: Office of Special Education Programs, 1993-95.  
Office of Maternal and Child Health, U.S. Public Health Service, 1989.  
March of Dimes Research Grant Programs, 1988.

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**PUBLICATIONS**
**Books**

- Meyer, D.J., & Vadasy, P.F. (1996). *Living with a brother or sister with special needs: A book for sibs. Second Edition.* Seattle, WA: University of Washington Press.
- Meyer, D.J., & Vadasy, P.F. (1994). *Sibshops: Workshops for siblings of children with special needs.* Baltimore, MD: Paul H. Brookes.
- Hawkins, J.D., Catalano, R.F., Brown, E.O., & Vadasy, P.F. (1987). *Preparing for the drug (-free) years: A family activity book.* Seattle, WA: Developmental Research and Programs, Inc.
- Fewell, R., & Vadasy, P.F. (Eds.) (1986). *Families of handicapped children: Needs and supports across the lifespan.* Austin, TX: PRO-ED.
- Fewell, R., & Vadasy, P.F. (1983). *Learning through play.* Hingham, MA: Teaching Resources.

**Curricula**

- Notari-Syverson, A., O'Connor, R.E., & Vadasy, P.F. (1998). *Ladders to Literacy: A preschool activity book.* Baltimore, MD: Paul H. Brookes.
- O'Connor, R.E., Notari-Syverson, A., & Vadasy, P.F. (1998). *Ladders to Literacy: A kindergarten activity book.* Baltimore, MD: Paul H. Brookes.
- Vadasy, P.F., Wayne, S.K., O'Connor, R.E., Jenkins, J.R., & Pool, K.P. (1997). *Sound Partners: A one-to-one tutoring program in early reading skills.* Washington Research Institute, Seattle, WA.

Articles

- Jenkins, J.R., Vadasy, P.F., Firebaugh, M., & Profilet, C. (2000). Tutoring first-grade struggling readers in phonological reading skills. *Learning Disabilities Research and Practice, 15*, 75-84.
- Vadasy, P.F., Jenkins, J.R., & Pool, K. (2000). Effects of tutoring in phonological and early reading skills on students at risk for reading disabilities. *Journal of Learning Disabilities, 33*, 579-590.
- O'Connor, R.E., Notari-Syverson, A., & Vadasy, P.F. (1998). First-grade effects of teacher-led phonological activities in kindergarten for children with mild disabilities: A follow-up study. *Learning Disabilities Research and Practice, 13*, 43-52.
- Antil, L.R., Jenkins, J.R., Wayne, S.K., Vadasy, P.F. (1997). Cooperative learning: Prevalence, conceptualizations, and the relation between research and practice. *American Educational Research Journal*. Submitted for publication.
- Meyer, D., & Vadasy, P. (1997). Meeting the unique concerns of brothers and sisters of children with special needs. In B. Carpenter (Ed.), *Families in context: Emerging trends in family support and early intervention* (pp. 62-75). London, Great Britain: David Fulton Publishers, Ltd.
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- Vadasy, P.F., Jenkins, J.R., Antil, L.R., Wayne, S.K., & O'Connor, R.E. (1997). The effectiveness of one-to-one tutoring by community tutors for at-risk beginning readers. *Learning Disabilities Quarterly, 20*, 126-139.
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- O'Connor, R.E., Notari-Syverson, A., & Vadasy, P.F. (1996). Ladders to literacy: The effects of teacher-led phonological activities for kindergarten children with and without disabilities. *Exceptional Children, 63*, 117-130.
- Maddox, M., & Vadasy, P.F. (1995). Staff development for cultural diversity. Voices from a rural community. *Journal of Staff Development, 16*, 40-45.
- Vadasy, P.F., & Maddox, M. (1992). *The Yakima Equity Study: Conditions of Success for Migrant, Hispanic, and Native American Students in the Yakima Valley*. Washington Research Institute, Seattle, WA.
- Vadasy, P.F. (1991). *Parent aide and respite care programs: A profile of models for prevention and family support*. Washington Research Institute, Seattle, WA.

- Vadasy, P.F., Maddox, M., & Davidson, M. (1991). *Equity and special education policy for minority students in small rural school districts*. *Journal of Educational Issues of Language Minority Students, 11*, 233-250.
- Edgar, E., & Vadasy, P.F. (1990). *Research strategies to improve the outcome of secondary special education programs for mildly handicapped students: System support strategies*. Washington, DC: COSMOS Corporation.
- Fewell, R.R., & Vadasy P.F. (1989). Play as an intervention strategy with young children who are deaf-blind. In M. Bullis (Ed.), *Communication Skills Center Research Monograph*. Monmouth, OR: Teaching Research Division.
- Frey, K.S., Fewell, R.R., & Vadasy, P.F. (1989). Parental adjustment and changes in child outcomes among families of young handicapped children. *Topics in Early Childhood Special Education, 8*, 38-57.
- Vadasy, P.F. (1989). Child maltreatment and the early childhood special educator. *Topics in Early Childhood Special Education, 9*, 56-72.
- Finn, D., Fewell, R.R., & Vadasy, P.F. (1988). The play of young children who have dual sensory impairments. In M. Bullis and G. Fielding (Eds.), *Communication development in young children with deaf blindness: Literature review*, Monmouth, OR: Teaching Research Division.
- Fewell, R.R., & Vadasy, P.F. (1987). Measurement issues in studies of efficacy. *Topics in Early Childhood Special Education, 7*, 85-96.
- Mills, P.E., Fewell, R.R., & Vadasy, P.F. (1987). Preparing early childhood special educators for rural settings: An urban university approach. *Topics in Early Childhood Special Education, 7*, 59-74.
- Pruess, J.B., Vadasy, P.F., & Fewell, R.R. (1987). Language development in Down syndrome children: An overview of recent research. *Education and Training of the Mentally Retarded, 22*, 44-55.
- Vadasy, P.F. (1987). Children's health care: Brief report. Grandparents of children with special needs. *Children's Health Care, 16*, 21-23.
- Pruess, J.B., Vadasy, P.F., & Fewell, R.R. (1986). Affect, cognition, and play in young children with Down syndrome: An overview of recent research. *Journal of the Division for Early Childhood, 10*, 65-72.
- Romer, L.T., Busse, D.G., Fewell, R.R., & Vadasy, P.F. (1986). The relative effectiveness of special education teachers and peer tutors in instructing students with severe handicaps and deaf-blindness. *Education of the Visually Handicapped, 17*, 99-115.
- Sandall, S.R., Fewell, R.R., Schlater, A., & Vadasy, P.F. (1986). A computer-assisted program for underserved families. *Journal of the Division for Early Childhood, 10*, 216-223.

- Vadasy, P.F. (1986). Single mothers: A social phenomenon and population in need. In R.R. Fewell and P.F. Vadasy (Eds.), *Families of handicapped children: Needs and supports across the lifespan*. Austin, TX: PRO-ED.
- Vadasy, P.F., & Fewell, R.R. (1986). Mothers of deaf-blind children. In R.R. Fewell and P.F. Vadasy (Eds.), *Families of handicapped children: Needs and supports across the lifespan*. Austin, TX: PRO-ED.
- Vadasy, P.F., Fewell, R.R., Greenberg, M.T., Dermond, N.L., & Meyer, D. J. (1986). Follow-up evaluation of the effects of involvement in the Fathers Program. *Topics in Early Childhood Special Education, 6*, 16-31.
- Vadasy, P.F., Fewell, R.R., & Meyer, D.J. (1986). Grandparents of children with special needs: Insights into their experiences and concerns. *Journal of the Division of Early Childhood, 10*, 36-44.
- Vadasy, P.F., & Sandall, S.R. (1986). Putting computers to work for children with handicaps: Evaluating the delivery of personalized services to rural families. In D. Gentry and J. Olson (Eds.), *Research in Family Involvement Practices, Monograph III, The Family Support Network Series*. University of Idaho, Moscow, ID.
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- Vadasy, P.F., Fewell, R.R., Meyer, D.J., & Greenberg, M. T. (1985). Supporting fathers of handicapped young children: Preliminary findings of program effects. *Analysis and Intervention in Developmental Disabilities, 5*, 151-164.
- Vadasy, P.F., & Fewell, R.R. (1984). Predicting the futures of deaf-blind adolescents: Their living and vocational options. *Education of the Visually Handicapped, 16*, 12-19.
- Vadasy, P.F., Fewell, R.R., Meyer, D.J., & Schell, G. (1984). Siblings of handicapped children: A developmental perspective on family interactions. *Family Relations, 33*, 155-167.
- Vadasy, P.F., Fewell, R.R., Meyer, D.J., Schell, G., & Greenberg, M.T. (1984). Involved parents: Characteristics and resources of fathers and mothers of young handicapped children. *Journal for the Division of Early Childhood, 8*, 13-25.
- Meyer, D.J., Vadasy, P.F., Fewell, R.R., & Schell, G. (1982). Involving fathers of handicapped infants: Translating research into program goals. *Journal of the Division for Early Childhood, 5*, 64-72.
- Vadasy, P.F. (1982). Review of *Handbook of infant development*, edited by J.D. Osofsky. *Topics in Early Childhood Special Education, 2*, 80-83.

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**PRESENTATIONS**

"The SEFAM curriculum for fathers of young children with handicaps." American Association of Mental Deficiency Regional Meeting, Vancouver, BC, November, 1981.

"Families of young handicapped children." Handicapped Children's Early Education Program/Division of Early Childhood Annual Conference, Washington, DC, December, 1982.

"Grant writing for early childhood program directors." Early Childhood Management Institute, Seattle, Washington, September, 1985.

Grant writing workshop for state and local education staff. South Atlantic Regional Resource Center. Austin, TX, April, 1992.

Interview with Frank Catalano, "Healthnet" show, KING-AM radio, "Living with a brother or sister with special needs," July, 1986.

"The Yakima Equity Study: Major findings." Washington State Staff Development Council, March, 1993.

"Effects of community tutor delivered one-to-one phonological skills training on high risk first graders." Paper presented at the Third Annual Pacific Coast Research Conference, Laguna Beach, CA, February, 1995.

"Build them and they will come, or will they?" Panel presented at the Fourth Annual Pacific Coast Research Conference, La Jolla, CA, February, 1996.

"Teaching young children who lack critical phonological and early reading skills: Delivery, measurement, and myriad implementation issues." Paper presented at the Fifth Annual Pacific Coast Research Conference, La Jolla California, February, 1997.

"Predicting reading disabilities." Summer Institute, Washington State Association of School Psychologists, Seattle University, Seattle, WA, July, 1998.

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**TRAINING**

One-day training sessions in Sound Partners tutoring instruction (1995-present) in the following public school districts, and universities, private schools; Seattle, Highline, Issaquah, Edmonds, Sedro Wooley, Lummi Island, Methow Valley, West Valley (Spokane), Spokane, St. Therese, Seattle Hebrew Academy; Arizona State University, Eastern Washington University.