Explicit Rime Unit Teaching using the 37 Dependable Rimes

Abstract

A problem many students have is inefficient word-reading strategies and poor orthographic knowledge at the word and letter-cluster levels. This effects accuracy, phrasing and fluency. Research has shown that improvement in word recognition skills is linked to comprehension, and that reading strategies that use rime unit knowledge can readily be transferred to read unknown words.

The present study examines the effectiveness of explicit rime unit instruction, and whether it leads to improved accuracy in reading unknown words.

Four students in Years 2 and 3 who have reading difficulties were exposed to 1:1 explicit teaching in reading monosyllabic words containing the 37 dependable rime units. The teaching targeted explicit awareness of particular rime units and their automatisation.

Word reading accuracy was tested before, during and after the intervention. Data was collected for six categories of words: _isolated rime units, c-rimes, cc-rimes, pseudowords, rimes taught_ and _rimes not taught_. How correct responses were read was also analysed in five categories: _rapid, after pause, in segments, onset-rime_ and _self-corrected._

All four students improved in word reading accuracy across all categories and the proportion of correct responses that were read rapidly also increased, indicating growth in orthographic knowledge and automaticity.

Introduction

A number of Middle Primary students who have experienced reading difficulties since beginning school exhibit slow, hesitant and often inaccurate prose reading that lacks phrasing and fluency. This may be a manifestation of poor word and letter-cluster knowledge combined with inefficient word-reading strategies.

Strong word recognition skills allow children to read quickly and accurately. It has been argued that this rapid or automatic word recognition frees up working memory allowing the reader to focus attention on meaning (Adams, 1990; Chard & Osborn, 1999; Fitzsimmons, 1998; Juel & Minden-Cupp, 1999; Lyon, 1997).

Hiebert (1998) contends that successful readers learn to attend to orthographic features of words. The key orthographic feature is the onset-rime structure of words (Stahl & McKenna, 2001). Juel and Minden-Cupp (1999) support this view, describing rime units as "psychologically accessible (and) predictable" (p. 3). Most poor readers had not learned to recognise these frequently occurring letter-clusters as individual rime units (Adams, 1990) and rarely *chunked* words into onsets and rimes (Juel & Minden-Cupp, 1999).

It is widely accepted that proficient readers use analogy to transfer orthographic knowledge from familiar words to unfamiliar words, but even inexperienced readers can use analogy to generalise their rime unit knowledge (Moustafa, 2000; Reynolds,2001; Wray, 1994).

The present study aims to link the earlier research by examining the influence of rime unit knowledge on monosyllabic word reading accuracy. This study is limited to *isolated* word reading, and doesn't answer the questions about transferring rime unit knowledge into unknown words in prose reading.

Hypothesis:

Explicit teaching in reading monosyllabic words with a common rime unit will improve reading accuracy in unknown monosyllabic words with the same rime units.

Method

Design:

The study uses a case study OXO (ATA- Assess Teach Assess) design, in which the gain in monosyllabic word reading accuracy following explicit rime-unit instruction for monosyllabic words is monitored for Year Two and Three students who have reading difficulties.

Participants:

The participants are 2 students in Year Two and 2 in Year Three who attend the same Victorian Catholic Primary School and have a history of reading difficulties. All participants were successfully discontinued from the Reading Recovery program in the last two years, but continue to manifest reading difficulties at the word level. On isolated word-reading tasks (in the absence of meaning or structure cues) they automatically recognise a limited number of high frequency words, and with some attention can read a similarly limited number of one/two-syllable or phonetically regular words using letter-by-letter sounding and some letter-cluster segmenting. They appear to have poorly developed orthographic knowledge that doesn't extend consistently beyond the individual letter level.

They may have difficulty:

- learning and storing letter-clusters,
- recognising and quickly naming letter-clusters in words
- segmenting words into onset and rime
- transferring letter-cluster information from one word to other similar words
- processing words beyond the single letter level

Materials:

Materials used include the following

- Pre-test & Post-test: Word-reading was assessed using an isolated word-reading test of 37 Dependable Rime units. (Appendix 2) Three examples of each rime unit were presented in three forms that vary in complexity: *consonant-rime, consonant-consonant-rime* and *consonant-rime (pseudoword)*.

- Rime-unit tasks: Students read words from twelve ***** rime-unit families on individual flash-cards. (*****Each student analysed an individual set of 12 rime units based on the results of the Pre-test. The criteria for rime unit choice are discussed below in the Procedure section.) Words presented include known, unknown and pseudowords.
  Students constructed words and broke them into onset-rime chunks using magnetic letters.
  Students wrote words on a whiteboard.

- On-going assessment: Flash-card words from the previous session were tested at the beginning of each new session.

- Rime unit test 1 & 2: knowledge of rime units taught was assessed progressively after the first six rime units, and after the final six rime units. (Appendix 4 & 5)
- Rime unit test 3: knowledge of all the rime units taught was also assessed at the completion of the program. (Appendix 6)

Procedure:

The students worked 1:1 with the teacher in the Reading Recovery room. They were individually withdrawn from their classrooms 3 times each week for 10-minute sessions over 4 weeks for a total of 12 sessions.

Session 1:   Pre-test

Session 2-10: Rime unit teaching sessions

Session 8:   Test for 1st 6 rime units

Session 10:   Test for 2nd 6 rime units

Session 11:   Test for all 12 rime units

Session 12:   Post-test

Rime unit teaching sessions:

The teacher taught a sequence of ten steps for analysing one-syllable word families that involved segmenting words into onset and rime, recognising the rime units in words and reading unknown words with the same rime units.

The students followed the sequence of steps for analysing twelve one-syllable word families with phonetically regular and consistent two or three letter rime units.

Each new rime unit was analysed using the following ten steps:

1. Read words from previous session

2. Read each word

3. Identify shared rime unit

4. Read each word in segments

5. Blend onset & rime

6. Write each word

7. Write new word/s

8. Locate rime unit in other words

9. Read pseudoword with same rime unit

4

10. Re-read all words

(Detailed description Appendix 1)

Data Collection:

Changes in the students' abilities to accurately read unknown words and pseudowords that contain the '37 dependable rimes' were observed. The percentage of words read accurately was recorded and the way the words were read was also recorded.

Data was classified in the following categories:

How word is read	symbol
• Correct & rapid	✓
• Correct after pause	✓#
• Correct in segments	✓s
• Correct in onset-rime	✓o-r
• Self-correct	✓sc
• Incorrect	X

Data was collected in three ways:

- pre-test and post-test- 111 words (3 of each dependable rime)
- two progressive tests and one cumulative test of rime units analysed (rime unit & pseudoword for each rime)
- daily observation of unknown words & pseudowords read

Results

The students' abilities to accurately read monosyllabic words that contain the *37 Dependable Rimes* are described in two sections: all words (37 rime units X 3 words = 111 words), and rime units taught (12 rime units).

All Words

The students' Pre-test and Post-test scores for accurately reading monosyllabic words containing the 37 dependable rimes were calculated. Their results were described in two ways: -percentages of words read accurately

    -percentages of words read accurately and rapidly

These data are shown in Table 1.

Table 1: Percentages of words read accurately in Pre- and Post-tests.

	PRE-TEST		POST-TEST		CHANGE	
	accurate	**rapid**	**accurate**	**rapid**	**accurate**	**rapid**
c-rime	81.8%	74.3%	89.2%	82.4%	+7.4%	+16.7%
cc-rime	80.4%	45.9%	88.5%	64.2%	+8.1%	+18.3%
pseudo	56.8%	39.9%	76.4%	62.8%	+19.6%	+22.9%
all	73%	53.2%	84.7%	69.9%	+11.7%	+16.7%

Trends for the group indicated that students benefited from explicit teaching in reading monosyllabic words with common rime units. The most significant gains were in reading pseudowords and rapid-accurate reading.

Rime Units Taught

Rime unit choice:

Pre-test results for each of the 37 rime units were grouped into five categories according to the relative accuracy of the student responses.

1. Three correct- rapid
2. Three correct- slow, segmented, self-corrected
3. Two correct
4. One correct
5. Zero correct

Only rime units from categories 3 & 4 were chosen for subsequent analysis during the intervention.

(Details of rime units taught to each student Appendix 3).

The students' accuracy was monitored in two progressive tests (Rime unit test 1 & 2), and a cumulative test (Rime unit test 3). Their results were described in terms of accuracy for reading taught rime units in isolation and monosyllabic pseudowords that contain those rime units. These data are shown in Table 2.

Table 2:Progressive & cumulative accuracy of rime units taught

	TEST 1	TEST 2	TEST 3
isolated rime units	79.2%	100%	95.8%
pseudowords	70.8%	83.3%	77.1%
all	75%	91.7%	86.5%

Trends for the group indicated overall improvement in accuracy as the sessions progressed, with isolated rime unit scores greater than pseudoword scores.

The changes in students' abilities to read monosyllabic words in the Post-test that contain the rime units taught were analysed. Their results were described in terms of overall accuracy, and changes in relative accuracy categories, as described above.
These data are shown in Tables 3 & 4.

Table 3:Overall accuracy for rime units taught.

	PRE-TEST	POST-TEST	CHANGE
rime units taught	62.5%	89.6%	+27.1%
other rime units	78%	82.3%	+4.3%

Table 4: Changes in relative accuracy categories for rime units taught.

	increase	same	decrease
rime units taught	73%	25%	2%
other rime units	47%	33%	20%

Trends for the group indicated that the impact of explicit teaching of monosyllabic words with common rime units had greater impact on the students' reading accuracy for monosyllabic words that contain the same rime units as those taught than those not taught.
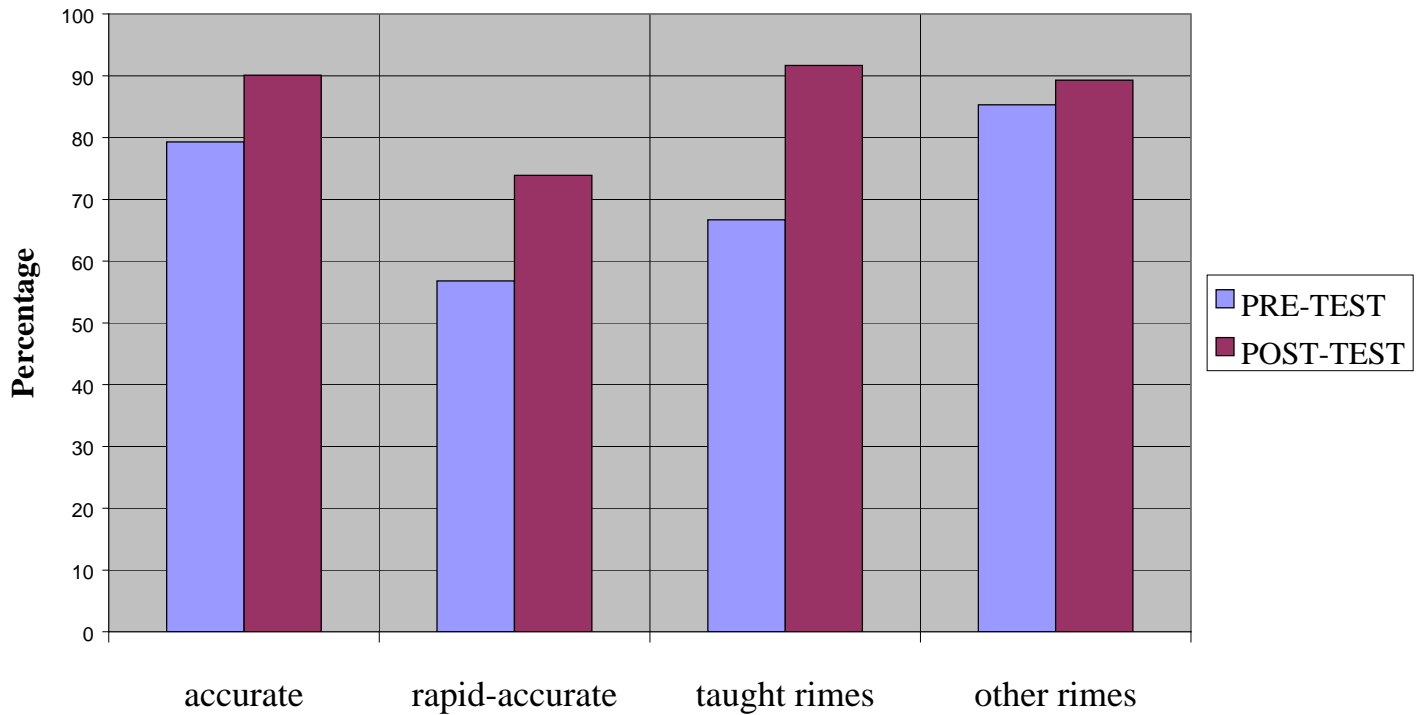
Student 1
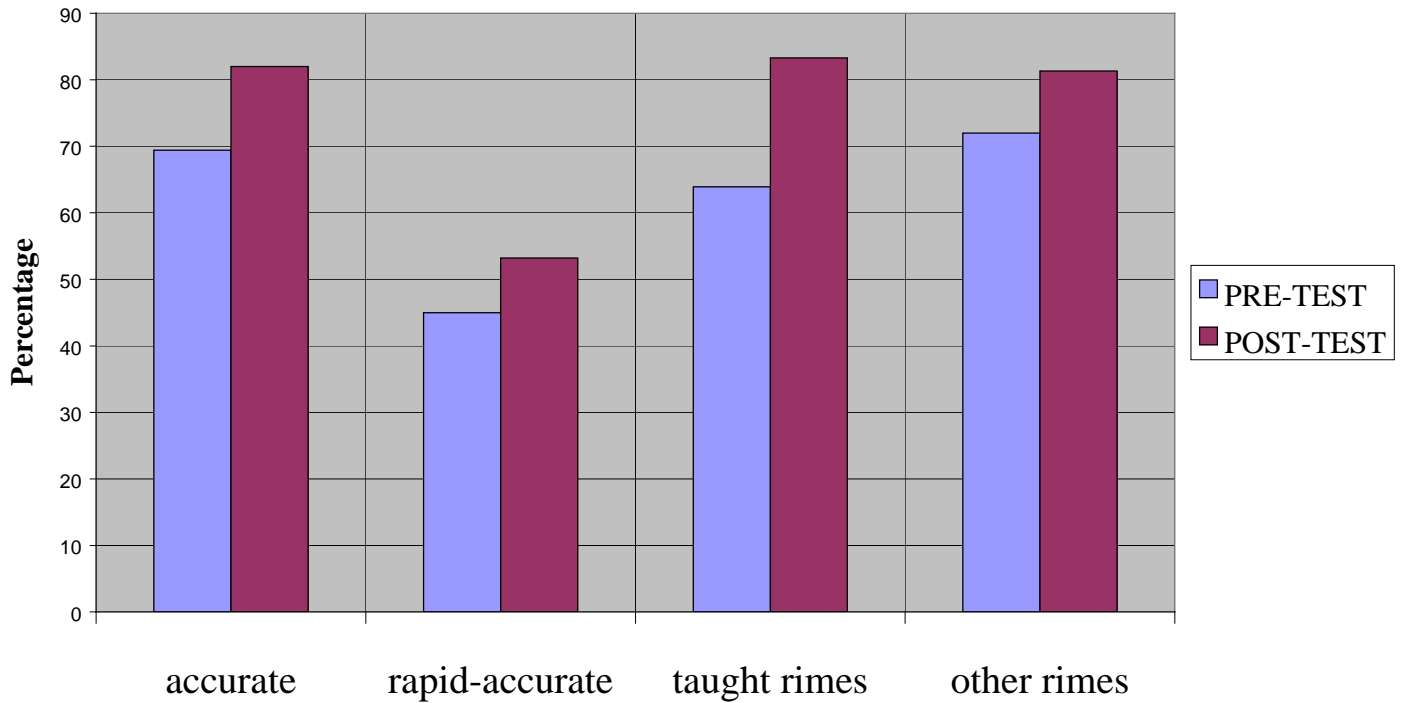
Student 1 made an overall improvement of 12.6% in accurate reading and 8.2% in rapid-accurate reading. The greatest improvement was in reading pseudowords, and the least was in reading cc-rime words.

Student 1's accuracy in reading words containing the rime units taught improved by 19.4% compared to 9.3% in words containing rime units not taught.

Relative accuracy categories for rime units taught improved in 58% of the rime units and stayed the same for the other 42%.

Student 2

Student 2

Student 2 made an overall improvement of 10.8% in accurate reading and 17.1% in rapid-accurate reading. The greatest improvement was in reading pseudowords, and in rapid-accurate reading.

Student 2's accuracy in reading words containing the rime units taught improved by 25% compared to 4% in words containing rime units not taught.

Relative accuracy categories for rime units taught improved in 75% of the rime units and stayed the same for the other 25%.
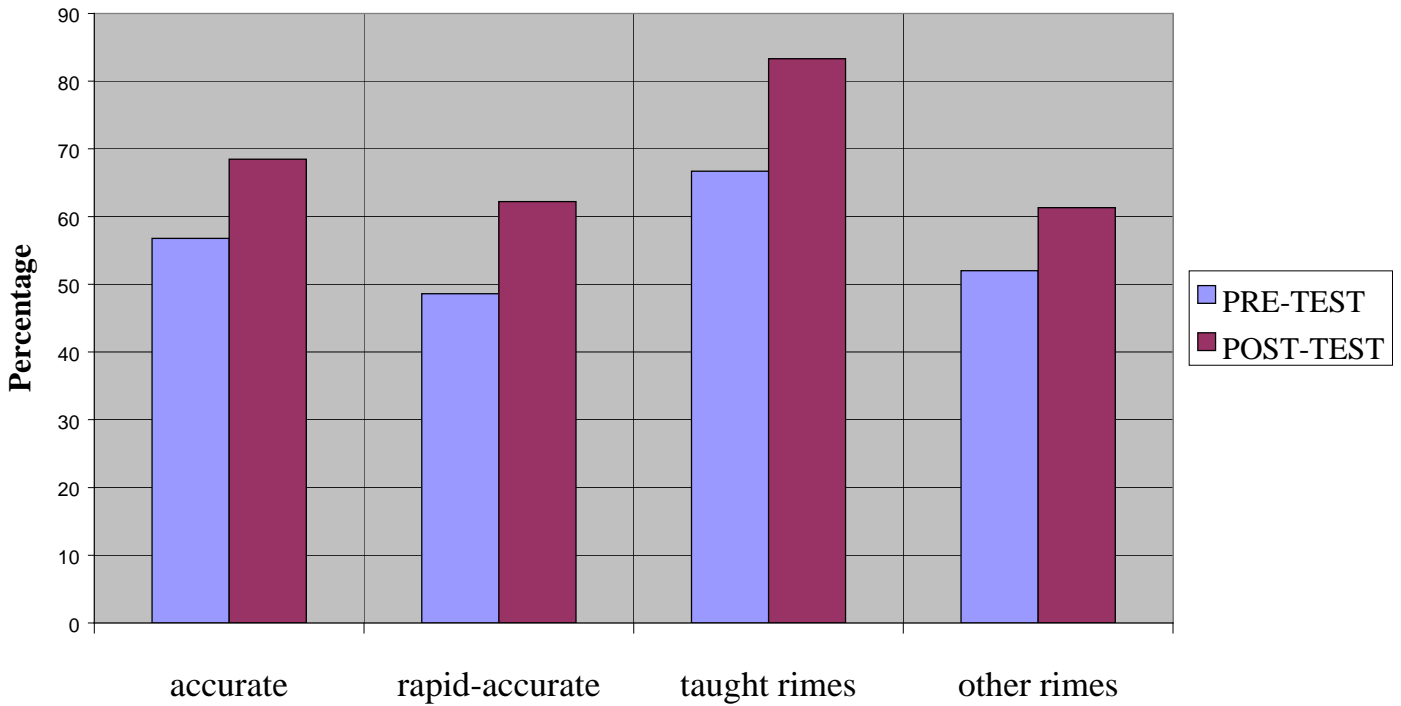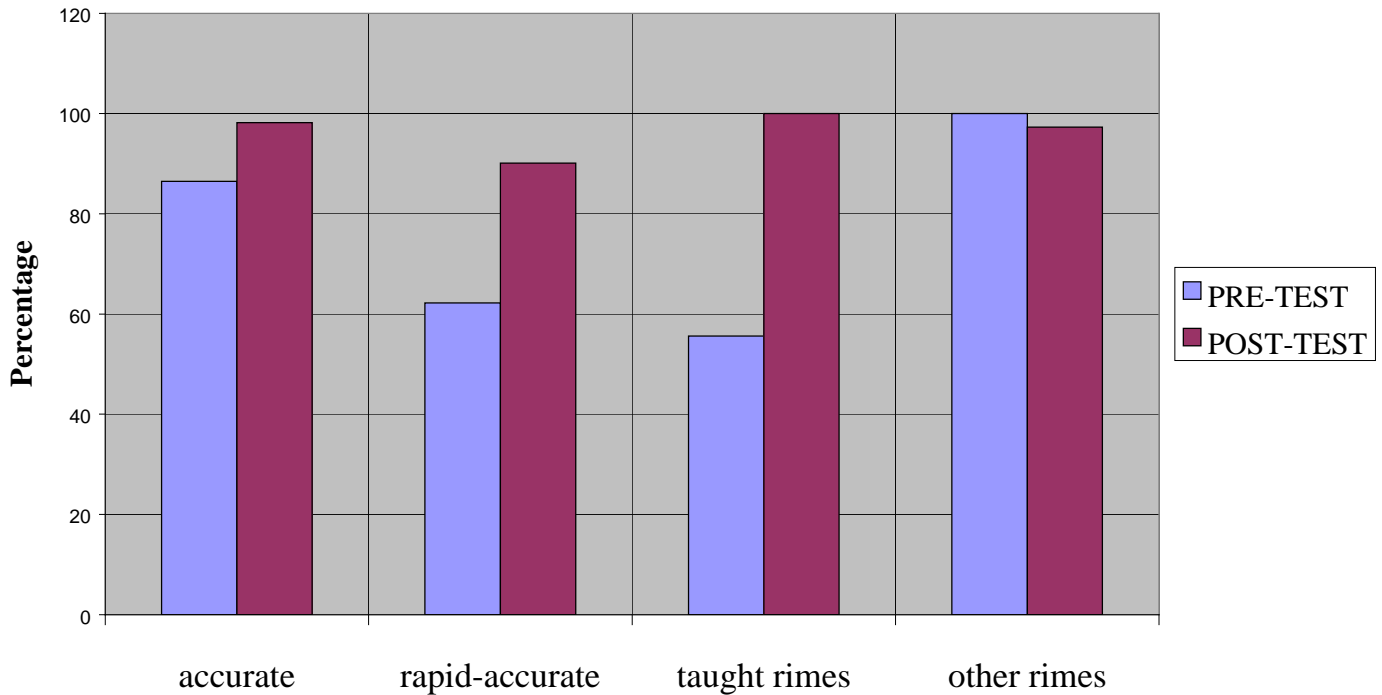
Student 3

Student 3

Student 3 made an overall improvement of 11.7% in accurate reading and 13.6% in rapid-accurate reading. The greatest improvement was in reading pseudowords, and in rapid-accurate reading.

Student 3's accuracy in reading words containing the rime units taught improved by 16.6% compared to 9.3% in words containing rime units not taught.

Relative accuracy categories for rime units taught improved in 58% of the rime units, stayed the same for 33% and decreased for only 8% (1 rime unit).

Student 4

Student 4 made an overall improvement of 11.7% in accurate reading and 27.9% in rapid-accurate reading. The greatest improvement was in rapid-accurate reading, and all c-rime and cc-rime words were read accurately.

Student 4's accuracy in reading words containing the rime units taught improved by 44.4% (all correct) compared to –2.7% in words containing rime units not taught.

Relative accuracy categories for rime units taught improved in 100% of the rime units.

Discussion

The results of this research generally lend support to the hypothesis being tested. The majority of data indicate improved reading accuracy in monosyllabic words that contain any of the 37 dependable rimes.

Comparison of Pre-test and Post-test aggregate scores for all four students and the group show increases in accuracy for all word categories.

20% of rime units not taught, scored a lower accuracy category in the Post-test, indicating the fragility of the students' orthographic knowledge. However, this figure is out-weighed by the 47% of rime units not taught that scored a higher accuracy category. This figure suggests some transfer of word reading strategies and increase in orthographic knowledge.

Accuracy scores improved from Test 1 to Test 2, and fell at test 3, but the overall trend from Test 1 to Test 3 was positive. Interestingly, the group performed better on reading isolated rimes taught than pseudowords in both accuracy and overall improvement. This suggests a possible weakness in blending onsets and rimes. Pseudowords also scored lower than real words in the Pre-test and Post-test. Analysis of the pseudoword errors revealed that many substitutions were real words with very similar phonemic characteristics in the rime unit (e.g. *yell: yale; find: fide; rock: roke*). The students' search for meaning may have impacted on the visual analysis of the decontextualised nonsense words, but not in the case of the isolated rime units- which are also pseudowords. The intervention may have reinforced the concept that rime units can be viewed as discrete pseudo-meaningful *chunks*.

Although the group was weaker at reading pseudowords, the scores for reading pseudowords improved more than those for the real words. This demonstrates an improvement in word-level reading strategies in the absence of meaning and context.

Two significant outcomes from this research are the strong gains in rapid- accurate reading scores; and the difference in gains between rime units taught and rime units not taught.

Research conducted by Adams (1990), Chard & Osborn (1999), Fitzsimmons (1998), Juel & Minden-Cupp (1999), and Lyon (1997) asserts that improved rapid accurate word reading (automatic recognition) enables readers to use more memory and attention to focus on comprehension, phrasing and fluency. By improving the automaticity of the students' word reading, this intervention should lead to improved prose reading.

By focusing on rime units as key orthographic features of words the students have learnt to recognise more rime units as individual chunks. The work of Adams (1990), Juel & Minden-Cupp (1999), and Stahl & McKenna (2001) suggests that this should lead to more successful prose reading.

The relatively low increase in accuracy for words not containing the rime units taught indicates a weakness in transferring general awareness of onset-rime segmenting as a reading strategy, and weak overall orthographic knowledge. Consistent with the findings of Moustafa (2000), Reynolds (2001), and Wray (1994), these students have used analogy to varying degrees to

transfer some rime unit knowledge to new words. However, it appears that these students will benefit most from regular explicit instruction that builds up orthographic knowledge of specific rime units over time. With ongoing practice they will become more experienced and efficient at *reading rime units* and generalising more widely through the use of analogy.

The present study lends support to the benefits of specific rime unit instruction, but has been limited to observing changes in isolated, decontextualised reading, thereby limiting the possible confounding variables of meaning, context, prior knowledge etc. The study could be expanded to include continuous prose reading. In this way the question of whether explicit teaching of rime units will improve reading accuracy and fluency on continuous text may be explored. This is warranted, because a major aim of this study was to improve the students' general reading ability.

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Appendices

Appendix 1:

RIME UNIT TEACHING SESSIONS

Appendix 2:

PRE-TEST & POST-TEST

Appendix 3:

RIME UNITS TAUGHT TO EACH STUDENT

Appendix 4:

RIME UNIT TEST 1

Appendix 5:

RIME UNIT TEST 2

Appendix 6:

RIME UNIT TEST 3

Appendix 1

<u>Rime unit teaching sessions</u>

These teaching sessions are designed to help the students learn to read words more efficiently. The aims are to:

➢ Improve knowledge of text features (i.e. letter-clusters, rime units) at the word level

➢ Develop skills in using reading strategies (i.e. recognising letter-clusters and rime units; segmenting words into letter-cluster units and recoding to sounds; making analogies between words with the same rime units; rapid-naming of words and letter-clusters) at the word level

➢ Improve self efficacy when reading unknown words

Procedure

▪ Each rime unit is introduced in a word family of 3 words: e.g. cat hat bat.

▪ The structure/components of the intervention draw on several elements of a Reading Recovery lesson (Clay, 1993) that are familiar to all the students, and is based on a teaching sequence outlined in John Munro's lecture notes (Early Reading Intervention: *Part 4. Designing a Reading Intervention.* Page 6).

▪ The teacher models all ten steps of the intervention, and gives step-by-step instructions and cues to establish the tasks.

▪ 2-letter rime units are analysed before 3-letter rime units.

▪ Sessions 2-7: introduce one rime unit per session.

▪ Sessions 8-10: introduce two rime units per session.

Session Steps:

1. Read words from previous session

2. Read each word

Read each word (on flashcards) 2-3 times

  Read again and run finger underneath

3. Identify shared rime unit

  Read each word again

Say what each word has in common

*letter-cluster: e.g. *at*

*sound unit: e.g. *"at"*

"If you can read cat, you can read hat, and you can read bat, because they all have- at."

4.Read each word in segments

Read each word (magnetic letters)

Break each word into onset & rime

Run finger underneath segmented words and read onset & rimes separately

e.g. *"cat"* is read as *"c" – "at"*

"What do all three words have in common?"

"How are they the same?"

"What does 'a-t' say?"

"How do you spell '-at'?"

5. Blend onset & rime

Join onset & rime (magnetic letters)

Run finger underneath each word and read

"If you can read cat, you can read hat, and you can read bat, because they all have- at."

6. Write each word

Write each word and underline the common rime unit

-say the onset & rime separately as it is written

-read as onset & rime

-read as whole word

"What do all three words have in common?"

"How are they the same?"

"What does 'a-t' say?"

"How do you spell '-at'?"

7. Write new words

Write new words and pseudowords

Underline the common rime unit

"What does 'a-t' say?"

"How do you spell '-at'?"

*week 1: new words- *c-rime*

*week 2: new words- *c-rime, cc-rime*

*week 3: new words and pseudowords- *c-rime, cc-rime*

*week 4: new words and pseudowords- c-rime, cc-rime, compound words (2 syllables)

8. Locate rime unit in other words

Quickly locate another word with the same rime unit from a group of words (on flashcards) e.g. *sat*

Read the new word

"How is this word the same as cat, hat & bat?"

9. Read pseudoword with same rime unit

Quickly read a pseudoword with the same rime unit (on a flashcard) e.g. *zat*

"How is this word the same as cat, hat, bat & sat?"

10. Re-read all words

Quickly read all words on flashcards

*week 4: shuffle both rime unit families

Name and spell the common rime unit

Appendix 2 **_PRE-TEST / POST-TEST –37 Dependable Rimes_**

back	fright	night	spit
bale	gat	nin	spot
bame	got	nuck	state
bink	hake	pell	stay
black	hice	pink	stick
blank	hop	plan	stop
brake	jank	pock	store
bring	jick	rain	stuck
bug	joke	ride	stump
bunk	jump	rill	tank
cail	kale	rit	tash
cash	kaw	rock	tay
cat	leat	sain	test
clap	line	san	ting
claw	lip	saw	train
clock	lunk	scale	**treat**
crest	mail	sick	trunk
cump	make	sing	twice
dap	man	sit	vack
day	map	skill	vore
dight	mate	skin	well
drink	meat	slide	will
drip	mest	slug	win
duck	more	smash	wop
fide	mot	smell	wug
fip	name	smoke	zine
flat	nate	snail	zoke
frame	nice	spine	

Rime units taught

Rime unit	Flash Cards			New Words		Students			
	c-rime	*cc-rime*	*3rd*	*unknown*	*pseudo*	*1*	*2*	*3*	*4*
an	man	plan	ran	can	gan	*		*	*
at	cat	flat	that	mat	dat	*	*	*	
aw	saw	claw	paw	jaw	taw				*
ay	day	stay	play	way	fay			*	
it	sit	spit	hit	fit	jit			*	
op	hop	stop	shop	top	dop		*	*	
ot	got	spot	not	hot	fot		*	*	
ug	bug	slug	hug	mug	nug			*	
ack	back	black	track	pack	dack		*		
ank	tank	blank	thank	bank	mank			*	
ash	cash	smash	crash	rash	fash		*		*
ell	well	smell	shell	bell	rell				*
ick	sick	stick	chick	lick	yick		*		
ill	will	skill	hill	bill	vill			*	
ing	sing	bring	thing	wing	hing		*	*	
ink	pink	drink	wink	sink	tink	*			
ock	rock	clock	shock	lock	bock			*	
unk	bunk	trunk	dunk	punk	runk	*	*		
ail	mail	snail	tail	hail	zail	*			
ain	rain	train	brain	main	fain				*
eat	meat	treat	wheat	heat	jeat	*	*		
ake	make	brake	take	cake	pake			*	*
ale	bale	scale	whale	sale	zale				*
ate	mate	state	hate	late	vate	*			
ice	nice	twice	lice	rice	gice		*		
ide	ride	slide	hide	wide	bide	*			*
ine	line	spine	shine	mine	tine				*
oke	joke	smoke	choke	coke	noke	*	*	*	
ore	more	store	shore	core	nore	*			

Rime unit test 1

Student 1	Student 2	Student 3	Student 4
an	at	*an*	an
at	op	at	aw
ash	ot	ay	ash
ink	ack	it	ake
unk	ash	op	ale
ail	ick	ot	ide
han	lat	han	han
lat	nop	lat	vaw
zash	sot	nay	zash
bink	vack	rit	nake
tunk	zash	nop	yale
kail	bick	sot	fide

Rime unit test 2

Student 1	Student 2	Student 3	Student 4
eat	ing	ug	ine
ale	unk	ank	ell
ate	eat	ill	unk
ide	ice	ing	ain
oke	ide	ock	ack
ore	oke	ake	ail
deat	ming	pug	bine
yale	tunk	lank	kell
pate	leat	rill	tunk
fide	pice	ming	nain
roke	fide	vock	vack
kore	roke	nake	kail

Rime unit test 3

Stud 1		Stud 2		Stud 3		Stud 4	
an	eat	at	ing	*an*	ug	an	ine
at	ale	op	unk	at	ank	aw	ell
ash	ate	ot	eat	ay	ill	ash	unk
ink	ide	ack	ice	it	ing	ake	ain
unk	oke	ash	ide	op	ock	ale	ack
ail	ore	ick	oke	ot	ake	ide	ail
han	deat	lat	ming	han	pug	han	bine
lat	yale	nop	tunk	lat	lank	vaw	kell
zash	pate	sot	leat	nay	rill	zash	tunk
bink	fide	vack	pice	rit	ming	nake	nain
tunk	roke	zash	fide	nop	vock	yale	vack
kail	kore	bick	roke	sot	nake	fide	kail