

Some Variables Affecting Student Error Response Patterns in a Multiple Choice Reading Comprehension Task: Implications for Primary Teachers

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ABSTRACT

The recent introduction of the national Reading and Writing Standards in New Zealand (Ministry of Education, 2009) and the high stakes testing regimes that are now presented in many other countries has resulted in more emphasis being placed on the use of literacy assessments for accountability purposes. Furthermore, many of these mandated tests use various forms of multiple choice question-answer formats. While there are currently no mandated literacy assessments in New Zealand primary schools, the teachers do have access to more assessments in literacy than for any other curriculum area. Between 1996 and 2009 there was a series of national surveys of academic achievement undertaken at the years 4 and 8 levels. These surveys were carried out by the Otago University National Education Monitoring Project (NEMP) unit. One curriculum area that was surveyed in the 2008 evaluation project included aspects of reading comprehension performance. One particular task in the survey involved the silent reading of a prose passage followed by 15 multiple choice questions. Analyses of the types of questions, the text features and the students' error response patterns were undertaken in an attempt to investigate the possible reasons why particular incorrect answer options may have been selected by the students when they had completed the task.

Keywords: reading comprehension assessments, question answer relationships, question types

INTRODUCTION

The recent introduction of the national Reading and Writing Standards for years 1-8 (Ministry of Education, 2009) in New Zealand primary schools will mean that data from both formal and informal assessments will be an important part of the reporting of progress and achievement process for teachers. According to an Education Review Office report (1999) "New Zealand teachers have access to more published procedures for the assessment of achievement in reading than in the other curriculum areas" (p.17). However, in a later Education Review Office report (2005) it was noted that achievement data was "not always analyzed to determine patterns of achievement across the school or to identify groups of students who could benefit from extra assistance" (p. 30). It is often reported that while teachers are good at using assessment tools in literacy to collect data, they are less effective at analyzing the data to inform teaching practice. Reasons for this may be due in part to the particular format of the assessment tool and the type of data that the assessment offers.

A reading assessment that requires the student to respond orally while undertaking the tasks (e.g., a running record of oral reading or the Burt word reading test) allows the teacher more insights into particular reading strategies that students use while taking the assessment than would be the case with an assessment that requires the student to complete the tasks silently, such as the Progressive Achievement Test (PAT) of Reading Comprehension, (Darr, McDowall, Ferral, Twist & Watson, 2008) or the Supplementary Test of Achievement in Reading or STAR (Elley, 2001). One reason that oral responses offer teachers more useful diagnostic information is that the process of 'recording in situ' as the responses are made could potentially allow the teacher to discuss with the student (at the conclusion of the assessment process), the reason(s) why particular responses were selected. A second reason why oral responses in assessments are diagnostically useful is because such responses allow the teacher opportunities to pick up cues from voice patterns that could indicate sources of confusion.

While reading assessments that are completed silently (and often in whole class or large group situations) have advantages over individually-administered assessments, the data that silent reading assessments yield may be less useful for diagnosing individual learning problems. This is because, for the silent reading assessments, the teacher is reliant on only the responses recorded on the answer sheet by the student, so they are 'end product' accounts of comprehension rather than evidence of actual strategy use. This problem is further exacerbated when only multiple choice answer responses are required. In such assessments the total raw scores of the correct responses are the only data that teachers are able to consider to inform their teaching practice. However, recent studies by Greaney and Tunmer (2007), and Greaney (2004) demonstrate that useful information on the reasons why students select particular options within multiple choice assessment tasks can be obtained and can offer valuable insights into the types of strategies (effective and ineffective) that students activate during the taking of such tests. It is also useful to investigate error response patterns in relation to question type, when analyzing student achievement patterns from silent reading assessments. In this paper we present the results from an analysis of error response patterns obtained from a sample of 447 Year 4 students who had completed a silent reading comprehension assessment involving multiple choice answer responses.

Reasons for poor reading comprehension in literacy assessments

The key to any reading activity is that the reader understands what is read. Reading for meaning is the key outcome of what we read. Several factors help (or hinder) a student's ability to understand what is read. Some of these factors include: the level of the text difficulty in relation to the reading ability of the student, the text genre, the student's prior knowledge about the content of the text, and the student's attitudes and/or interest in the topic. A key practice for teachers when assessing reading comprehension is to include tasks that require students to answer comprehension questions based on the text. Research also demonstrates that the types of questions used (particularly in formal assessment tools) may also affect students' levels of comprehension performance (Raphael & Au, 2005; Mesmer & Hutchins, 2002; Raphael & McKinney, 1983, Dymock & Nicholson, 1999; Greaney, 2004; Dewitz & Dewitz, 2003). Furthermore, the more teachers are aware of how different question types may affect their students' ability to respond correctly, the more effective they are likely to be at teaching general comprehension strategies (Dewitz & Dewitz, 2003; Greaney 2004; Greaney & Tunmer, 2007).

In order to better understand why some students performed poorly on a mandated reading test, Valencia and Buly (2004) undertook an analysis of test data and identified several subgroups of reading disability. Most of the reasons for the poor scores related to inefficient word identification skills. In

support of their analysis processes for identifying underlying problems with the students' tests performances, these authors concluded that "simply knowing which students have failed is a bit like knowing that you have a fever when you are feeling ill but having no idea of the cause or cure. A test score, like a fever, is a symptom that demands more specific analysis of the problem" (p. 520). Similarly in another study that investigated why 4th grade students had failed the mandated Washington Assessment of Student Learning (WASL) reading test Buly and Valencia (2002) drew attention to the problems of using group-administered tests to identify reading difficulties at the individual level. These authors noted that "from the scores alone, derived from a group-administered measure, little was known about the specific reading disabilities or difficulties that may have contributed to their poor performances" (p. 124). In a third study, Dewitz and Dewitz (2003) investigated the reasons why some 4th and 5th grade students had failed the mandated Qualitative Reading Inventory (QR1-3). In their analyses, the authors asked the students to elaborate on the reasons for their responses to the test items. Such elaborations and discussions allowed the investigators to identify inefficient or inappropriate reading strategies that the students may have used while they took the test. In a New Zealand study, Greaney (2004) interviewed students who had scored poorly on the PAT test of reading comprehension to investigate the reasons why they had selected incorrect multiple choice responses in this test. The students were asked to explain their reasons for selecting the incorrect answers. Like the Dewitz and Dewitz (2003) study, Greaney (2004) noted several reasons for incorrect responses including: inappropriate use of prior knowledge, an inability to link key ideas within the passages, a reliance on matching key words in the passages with the same words in the questions, and a reliance on the illustrations to influence the answer selection options.

METHOD

Multiple choice tests and question types

Several tasks in the NEMP survey of reading assessments involve silent reading with the answers presented in multiple choice formats. While multiple choice answer tests are easy to mark, the two-dimensional answer responses (e.g., correct or incorrect), offer teachers limited diagnostic information. The type of questions (including multiple choice answer options) can also often have an influence on the outcomes of the results for the students. Different types of questions present different levels of cognitive demands for the students and an understanding of these varying cognitive demands may be useful for helping the students to gain high scores. Raphael and Au (2001) identify two groups of question types: 'In the Book' and 'In my Head'. Two sub-types of 'In the Book' questions are: 'Right There' and 'Think and Search'. Two sub-groups of 'In my Head' questions are: 'On my Own' and 'Author and Me'. These subgroups reflect the particular cognitive processing demands that may be required in order for the student to either correctly locate the answer within the text or to make inferences from a wider knowledge base beyond the text. According to the Raphael and Au (2001) typology of question types, the answers to 'Right There' questions are located usually within a single sentence in the text. While answers to 'Think and Search' questions may also be found within the text, these answers are usually imbedded within more than one sentence and may even be embedded across several paragraphs of text. 'Think and Search' questions require more depth of cognitive ability to answer than 'Right There' questions. The 'In my Head' questions demand an even higher level of thinking skills to answer as in both subtypes (i.e., 'On my Own' and 'Author and Me') the answers are not found solely within the text. The 'On my Own' questions rely solely on the students using their own ideas and experiences (prior knowledge) whereas the "Author and Me' questions require the students to link the text ideas to their own personal experiences and/or knowledge to come up with an answer.

The Context of the Study: NEMP Silent Reading Task

One of the reading tasks in the New Zealand NEMP (Crooks, Smith & Flockton 2008) survey involved the silent reading of a narrative text and answering multiple choice comprehension questions (see appendix 1). Answer response patterns from 447 year 4 students (237 girls and 210 boys) were analyzed to investigate the pattern of incorrect responses for the questions. As well as the correct answer response (for each of the questions), the most frequently selected incorrect answer response was identified from the raw data set. A further investigation of these most selected (incorrect) options and the relevant text features relating to each question was undertaken in an attempt to identify the likely causes of the incorrect selections.

Cool, Cool Joanna (Mooney, 1993) A silent reading comprehension task

For this task the students were required to silently read a prose passage (876 words in length) about a young girl called Joanna who had helped some senior students from her school to collect money for sick children in other countries. However, while Joanna was collecting, a boy had taken her collection bag of money but despite her young age, Joanna was clever enough to assist the police with the identification and apprehension of the boy. (See Appendix 1)

The data files for the year 4 sample (n = 447) of students who had completed this particular reading comprehension task in the 2008 survey were obtained in order to undertake a retrospective analysis of student response patterns for the 15 multiple choice questions. The most frequently selected incorrect answer (from the 4 options) for each question was recorded for further analysis in an attempt to investigate the possible reasons for the particular incorrect selection prevalence.

ANALYSES OF THE QUESTIONS AND THE TEXT FEATURES

Each question was categorized according to the Raphael and Au (2001) question typology model. Features within the text (e.g., the location of the answer, the level of transparency of the answer, the relationship between the wording of the question and the wording in the text) were also investigated.

RESULTS AND DISCUSSION

The data presented in the following tables show the summary of the analyses of the questions, the patterns of responding and the categories of the question types. The question types presented are as follows: R/T = Right There, T/S = Think and Search, O/O = On my Own, A/M = Author and Me.

Table 1: Question and answer analyses for questions 1-5 showing percentage selecting both correct option and most frequently selected incorrect option as a function of question type and gender.

Question	Type	Boys (n=237)		Girls (n=210)	
		n	%	n	%
1. What did Joanna do when the big dog growled at her and her sister?	R/T				
a. She looked surprised and growled too		35	14.7	25	11.9
b. *she growled back and walked on		79	75.5	169	80.4

2. Who was planning to collect money in this story?	R/T				
a. The teachers		45	18.9	35	16.6
c. *The senior children		140	59.0	139	66.1
3. Why did Joanna go with her big sister that day?	T/S				
a. *Her parents had other things to do		141	59.4	143	68.0
b. She liked collecting money		36	15.1	25	11.9
4. What did Joanna do when the teacher told her she was too young?	T/S				
a. She said she was a big girl		26	10.9	21	10.0
b. *She said nothing		171	72.1	165	78.5
5. They were collecting money for?	R/T				
a. the school		39	16.4	29	13.8
b. *sick children		172	72.5	166	79.0

* = correct answer

Both the question type and relevant text features relating to each focus question will be discussed in an attempt to offer some likely explanations for the students' incorrect responses. The data in table 1 show that the mean percentage of year 4 students who had selected the correct answer options for the each of the first 5 questions ranged from 59% to 75.5% (for boys) and 66.1% to 80.4% (for girls). The mean percentage of students selecting the most frequently selected incorrect options for these same questions ranged from 10.9% to 18.9% (boys) and 10% to 16.6% (girls).

Question types and likely reasons for selecting incorrect options for questions will be discussed in this section. Questions 7 and 13 will be discussed separately at the end of the section because more students had selected incorrect answer options than the correct ones for these two questions.

Question 1: What did Joanna do when the big dog growled at Joanna and her sister?

Correct answer: She growled back and walked on.

This was categorized as a Right There (R/T) question because the answer to this question was evident within a single sentence in the text ('Joanna just growled back at it and walked past'). Furthermore, the correct answer option ("She growled back and walked on") allowed the students to match the wording of the question with wording in the text. However, 14% overall selected the option 'She looked surprised and growled too'. A possible reason why this option was selected was that the text contained the sentence 'The dog looked quite surprised' and so these students may have misread the question and focused on what the dog had done rather than what Joanna had done. This confusion was further highlighted as some students appear to have linked the wording in the text (e.g., 'the dog looked surprised') with the wording in the answer option ('she looked surprised') and therefore may have confused the characters.

Question 2: Who was planning to collect money in this story?

Correct answer: The senior children.

This was categorized as a Right There (R/T) question because the answer was evident within a single sentence in the text ('One morning our school was collecting for sick children in other countries-the seniors, that is'). However, 17% over-all incorrectly selected the option 'the teachers' because the activity had involved the school, and according to these students, would therefore have also included the teachers.

Question 3: Why did Joanna go with her big sister that day?

Correct answer: Her parents had other things to do.

This was categorized as a Think and Search (T/S) question because the answer was only apparent across several sentences (e.g., 'The thing was that Mum was going to church to polish the brass and she didn't want to take Joanna with her. Dad was going to help his friend Wally to paint his roof and he certainly didn't want Joanna with him'). Many of the 13% of students who had selected the incorrect option 'She liked collecting money' may have misread the words in the text ('too little for collecting') as 'liked collecting' and had matched these up with the wording in the incorrect answer option.

Question 4: What did Joanna do when the teacher told her she was too young?

Correct answer: She said nothing.

This was categorized as a Think and Search (T/S) question because the answer is embedded within more than a single sentence (e.g., 'Joanna lined up with the rest of us. Miss Lewis said, "You're too little for collecting dear". Joanna didn't budge'). Furthermore, the students were expected to link the statement 'Joanna didn't budge' as being synonymous with the answer option 'she said nothing'. However, 10% selected the incorrect option 'She said she was a big girl' probably because these students had assumed that Joanna was one of the senior (and therefore 'big') students.

Question 5: They were collecting money for?

Correct answer: sick children.

This was categorized as a Right There (R/T) question because the correct answer (i.e., sick children) appeared within a single sentence (e.g., 'On Saturday morning our school was collecting for sick children in other countries'). However, over-all 15% of the students had selected the incorrect option (the school) because the readers may not have made the distinction between who was doing the collecting and the purpose of the collecting.

The data in Table 2 present a summary of the question and answer analyses for questions 6, 8, 9 and 10 of the task. The mean percentage of students who had selected the correct options for these questions ranged from 46.8% to 58.6% (boys) and 51.9% to 65.1% (girls).

The mean percentage of students selecting the most frequently selected incorrect option for these questions ranged from 13% to 26.1% (boys) and 13.3% to 25.7% (girls).

Table 2: Question and answer analyses for questions 6, 8, 9, & 10 showing percentage selecting both correct option and most frequently selected incorrect option as a function of question type and gender

Question	Type	Boys (n=237)		Girls (n=210)	
		n	%	n	%
6. What did the driver want Joanna to do while they were collecting?	R/T				
a. Wait inside the car		33	13.9	33	15.7
c. *Wait near the car		120	50.6	126	60.0
8. Why did the boy on the bike put his hand in his pocket?	A/M				
a. So he could get some money out		49	20.6	54	25.7
b. *So Joanna would hold the bag out to him		132	55.6	122	58.0
9. What did the boy on the bike do next?	T/S				
c. *Took Joanna's bag		139	58.6	139	65.1
d. Ran off down the street		31	13.0	26	12.3
10. Who believed they would recognise the boy if they saw him again?	R/T				
b. *Joanna		111	46.8	109	51.9
d. The policeman		62	26.1	40	19.0

* = correct answer

Question 6: What did the driver want Joanna to do while they were collecting?

Correct answer: Wait near the car.

This was categorized as a Right There (R/T) question because the answer could be located within a single sentence in the text ('So he suggested that she stand beside the car and wait for us'). However, two possible points of confusion may have hindered many students' ability to select the correct answer. The first relates to the pronoun 'he' in the text where the student is required to link 'he' with 'the driver', and these students may not have made this link. The second possible point of confusion may have related to the wording in the correct answer ('wait near the car') and the wording in the text ('stand beside the car'). Over-all 14% of the students had selected the incorrect answer ('wait inside the car') for this question suggesting that many of these students may have matched the word 'beside' in the text with the word 'inside' in this answer option and therefore made their selection on this basis.

Question 8: Why did the boy on the bike put his hand in his pocket?

Correct answer: So Joanna would hold the bag out to him.

This was categorized as an Author and Me (A/M) question because the reader was required to make an inference based on both implicit text clues (e.g., 'He rode up to Joanna and stopped and put his hand in his pocket') and personal experiences (that money is usually kept in pockets and that hands are used to take money out). Over-all 22% of the students had selected the incorrect option ('So that he could get some money out') also suggests that these students may have taken the literal meaning of this answer

rather than the implied meaning. These students were probably unable to conceive that the boy in fact may not have had any money in his pockets at all!

Question 9: What did the boy on the bike do next?

Correct answer: Took Joanna’s bag.

This was categorized as a Think and Search (T/S) question because there is no explicit wording to match the answer in the text and the students needed to understand that the answer related to the event that followed directly from the previous question. To select the correct answer option the reader would also have needed to have linked the meaning of the word ‘snatched’ in the text with the word ‘took’ in the answer option. Also the time element inherent in the question required the reader to link this question back to the previous one. Over-all 12% of students had selected the incorrect option ‘Ran off down the street’ and a possible reason may be that these students had used their prior knowledge and put themselves in the same position as the boy and ‘ran off’ as well.

Question 10: Who believed they would recognise the boy if they saw him again?

Correct answer: Joanna.

This was categorized as a Right There (R/T) question as the correct answer was explicitly stated within a single sentence (‘I’d know him’ interjected Joanna’). Over-all 22% had selected the incorrect answer (‘the policeman’) probably because many of these students had inappropriately used their prior knowledge about the problem solving skills of policemen!

The data in Table 3 present a summary of the question and answer analyses for questions 11, 12, 14, and 15. The mean percentage scores for students who had selected the correct answer options for these questions ranged from 29.9% to 51.4% (boys) and 31.4% to 52.3% (girls). The mean percent of students selecting the most frequently selected incorrect option for these same questions ranged from 16.4% to 26.5% (boys) and 10.9% to 22.8% (girls).

Table 3: Question and answer analyses for questions 11, 12, 14 & 15 showing percentage selecting correct option and most frequently selected incorrect option as a function of question type and gender

Question	Type	Boys (n=237)		Girls (n=210)	
		n	%	n	%
11. How did they search for the boy?	T/S				
c. They walked round the neighbourhood		39	16.4	23	10.9
d. *Joanna went in a patrol car		112	51.4	110	52.3
12. What does ‘simultaneously’ mean?	O/O				
a. loudly		63	26.5	44	20.9
b. *at once		71	29.9	74	35.2
14. What did Joanna do when the boy claimed he was innocent?	T/S				

b. She called the policeman	54	22.7	48	22.8
d.*She said we should find his bike	82	34.9	77	36.6
15. How did the policeman eventually decide that they T/S had the right boy?				
c. They recognised his face and bike	43	18.1	36	17.1
d.*They found Joanna’s bag on his bike	84	35.4	66	31.4

* = correct answer

Question 11: How did they search for the boy?

Correct answer: Joanna went in a patrol car.

This was categorized as a Right There (R/T) question because it was stated in one sentence that ‘The policeman explained that Joanna was being driven around the neighbourhood in a patrol car to see if the boy could be spotted’. However, the most frequently selected incorrect option (‘they walked round the neighbourhood’) may have been selected because these students had linked the word ‘neighbourhood’ in the answer option with the same word in the text.

Question 12: What does simultaneously mean?

Correct answer: at once.

This was categorized as an On Your Own (O/O) question because the correct answer was based on the students’ personal vocabulary knowledge. A substantial number (23%) had selected the incorrect answer option (‘loudly’) and the most likely reason for this may have been because the focus word (**simultaneously**) had been printed in **bold** font and such font often denotes a loud speech emphasis in narrative writing.

Question 14: What did Joanna do when the boy claimed he was innocent?

Correct answer: She said we should find his bike.

This was categorized as a Think and Search (T/S) question because the reader was required to read and understand the following sections of information and link them together to locate the correct answer.

“I never took any money,” the boy proclaimed aggressively. “She’s only a stupid kid anyway.” At this, the policeman seemed uncertain. “Look at his bike!” Said Joanna.

Furthermore, the reader also needed to understand that the statement ‘the boy proclaimed aggressively’ also refers to ‘when the boy claimed he was innocent’. Over-all 22% had selected the incorrect option (She called the policeman) probably because, while the policeman featured several times in the text, these students had used the earlier information about notifying the policeman but had misread the time sequence element that was suggested in the question.

Question 15: How did the policeman eventually decide that they had the right boy?

Correct answer: They found Joanna’s bag on his bike.

This was categorized as a Think and Search (T/S) question because the reader was required to recognise that the word ‘eventually’ in the question represented a time element that referred to the final piece of evidence that led to the boy. 17% had incorrectly selected the option ‘They recognised his face and bike’ because, while these also featured as potential clues, these students may have misinterpreted the time element inherent in the word ‘eventually’.

Analysis of Questions 7 and 13

These two questions warrant a separate analysis because in both cases, more students had selected incorrect answers than the correct ones. The results presented in table 4 shows that the mean percent of students who selected the correct answer options for questions 7 and 13 ranged from 17.7% to 21.9% (boys) and 19.5% to 25.2% (girls). For the most frequently selected incorrect responses the mean scores ranged from 31.6% to 41.4% (boys) and 35.2% to 44.7% (girls).

Table 4: Question and answer analyses for questions 7 & 13 showing percentage selecting both correct option and most frequently selected incorrect option as a function of question type and gender

Question	Type	Boys (n=237)		Girls (n=210)	
		n	%	n	%
7. Why do you think so many people put money in Joanna’s bag?	O/O				
b. She looked furious at being left alone		75	31.6	74	35.2
d.*They admired the little girl for her efforts		42	17.7	41	19.5
13. How did Joanna identify the boy?	T/S				
a.*She examined his face		52	21.9	53	25.2
c. She looked for his bike		99	41.4	94	44.7

* = correct answer

Question 7: Why do you think so many people put money in Joanna’s bag?

Correct answer: They admired the little girl for her efforts.

Question 7 was categorised as an On my Own (O/O) question because the readers were required to consider both the text information and their own personal thoughts about how the other characters in the story reacted to Joanna’s presence and how they themselves (e.g., the students) might have thought about Joanna in this situation. Over-all only 18% had selected the correct option for question 7 and the most frequently selected incorrect option (‘She looked furious at being left alone’) was selected by 33% of the students. A possible reason for this high number may have been because the students had linked the words in the (incorrect) answer option (‘looked furious at being left alone’) with the words in the text (‘Joanna looked furious, so the driver relented’). These students had not understood that the demands of the question required them to take their own personal views about Joanna and her situation into account as well as the views of the other characters in the text, and then link all of these to the appropriate answer option.

Question 13: How did Joanna identify the boy?

Correct answer: She examined his face.

This was categorised as a Think and Search (T/S) question because the answer was embedded within several sentences in the text:

A policeman was standing patiently at the counter, while Joanna was confidently prowling around the machines, pausing at each one and closely observing the face of the player. Most of them were preoccupied and failed to notice her. Eventually Joanna stopped beside one machine and signalled to the policeman. "That's him", she announced decisively.

Again, more students had selected incorrect answers for this question than the correct answer option. Over-all only 23% had selected the correct answer and the most frequently selected incorrect option ('she looked for his bike') was selected by 43% of the students. A possible reason for this may have been because many of these students had linked the text statement "look at his bike" said Joanna with the answer option ("She looked for his bike") and made their selection on the basis of the similarity of the wording. A further potential source of confusion for these students was that they were required to link the text statement 'closely observing the face of the player' as meaning the same as the (correct) answer option 'she examined his face'.

Implications for teaching and general discussion

With the growing emphasis on accountability in education, there is also likely to be a corresponding emphasis on using assessment data for monitoring and reporting student achievement and progress. Results from such assessments may also be used to better inform teachers when designing instruction to meet the specific needs of groups and individuals. However, the quality and amount of data that is generated from any particular literacy assessment is determined by several factors including:

- The test environment (one-to-one versus large groups)
- The amount of reading required
- The type of reading required (silent versus oral)
- The amount and type of questions and
- The type of answers required (written versus multiple choice)

Furthermore, because assessments of silent reading comprehension invariably require the students to answer different types of questions, it is important that they are familiar with both the types of questions and the question-text relationships. The students should also have an awareness of the relevant metacognitive strategies necessary to enable them to successfully answer each of the questions. Teachers also require this knowledge in order for them to effectively teach such strategies to their students whenever the need arises. A flow-on effect from such knowledge will also encourage teachers to be more effective at teaching comprehension skills in the classroom.

Silent reading comprehension assessments, particularly with multiple choice questions do not allow teachers to investigate the strategies that the students may have used to influence their answer selections. Because most reading assessments are undertaken as silent reading tasks and because multiple choice questions are frequently used in such assessments, the findings from this study are particularly relevant for primary teachers. Understanding why students select particular answers in such tests may give teachers insights into the variables that may be acting as deterrents to comprehension processing. From mid primary school and through secondary school most students will be exposed to

various forms of silent reading assessments including formal examinations. Furthermore, because many of these assessments involve answering multiple choice questions, it is therefore particularly important that the students are taught to be 'test aware' and that different types of questions demand different types of metacognitive strategies or thinking before they can be correctly answered. It is therefore also important that teachers are aware of these strategies so that they are able to successfully design appropriate instruction for their students. In support of this view Raphael and Au (2005) claim that through QAR (Question-Answer Relationships) instruction, "teachers do not need to teach to a particular test but instead are able to unpack the task demands as appropriate to the different tests students face" (p. 218).

CONCLUSIONS

Our findings are based on an analysis of some likely reasons why the students had selected incorrect answer options in the multiple choice scenarios in a reading comprehension task. A more accurate understanding of these reasons would have been obtained had we interviewed the students immediately following their assessment. Interviews with each student would have enabled them to explain their reasoning for their selections, but because the data used in the analysis was from a 3 year old national data set, the interviews were not possible. However, there is no reason why regular class teachers cannot undertake such an analysis with some of their students soon after they complete such a test, to investigate their reasons for their responses. This level of analysis of the data offers more information to teachers than does aggregated information alone such as stanines or percentage scores. Popham (2003) also warns that most accountability tests offer very little value for improving teaching and learning. In fact Popham argues that such tests can often "lull educators into believing that they have appropriate data when they do not, and as a consequence, many educators fail to ask for more meaningful, instructionally valuable data that would help them teach students better" (p. 192). In the current study we attempted to investigate the more meaningful and instructionally valuable data from one particular silent reading comprehension assessment task.

Finally, where multiple choice assessment tasks are well constructed, student selections of any of the distracter items can still offer teachers useful additional diagnostic information. This advantage was noted by Popham (2012) when he stated that "another pay-off of well constructed multiple choice items is that their distracters can be phrased in such a way so that if students opt for particular wrong answers, this can provide the sorts of diagnostic information teachers need when delivering additional instruction for students who are having difficulties" (p.17). Our study demonstrates how such diagnostic information may be obtained from an analysis of student error response patterns from a reading comprehension multiple choice task.

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Appendix 1: Cool, Cool Joanna (Mooney, 1983)

Questions/Instructions

This story has three parts. Read Part 1 and answer the questions for that part. Then read Part 2 and answer its questions. Then do the same for the third part. Do as much as you can.(Circle the answer)

Part 1:

My little sister Joanna is a cool, cool kid. She isn't afraid of anything. Once when the cat left a dead rat on the doorstep, Joanna just picked it up by the tail and took it to school for the nature table.

The thing was that mum was going to church to polish the brass and she didn't want to take Joanna with her. Dad was going to help his friend Wally to paint his roof and he certainly didn't want Joanna with him.

Another day there was this great big dog standing on the footpath, growling at us. Joanna just growled back at it and walked past. The dog looked quite surprised.

Joanna didn't say anything. She only talks when she has something to say.

One Saturday morning our school was collecting for sick children in other countries – seniors, that is. Joanna was still in the junior school, but she came along too.

When we got to school, Miss Lewis was giving out the collection bags. Joanna lined up with the rest of us. Miss Lewis said, "You're too little for collecting, dear."

"I know she's too little for collecting," Mum Said, "but you'd better take her."

Joanna didn't budge. I explained that she was my little sister and that I was in charge of her. Miss Lewis **sighed** and handed Joanna a collecting bag.

1. What did Joanna do when the big dog growled at Joanna and her sister?
- a) She looked surprised and growled too
 - b) She growled back and walked on
 - c) She took it to school with her
 - d) She growled and grabbed her sister

2. Who was planning to collect money in this story?
- a) The school teachers
 - b) The junior school children
 - c) The senior school children
 - d) The parents

3. Why did Joanna go with her big sister that day?
- a) Her parents had other things to do
 - b) She like collecting money
 - c) She wanted to go to school
 - d) She didn't want to go with her parents

4. What did Joanna do when the teacher told her she was too young?
- a) She said she was a big girl
 - b) She said she could help
 - c) She started to cry
 - d) She said nothing

5. They were collecting money for:
- a) The school
 - b) Old people
 - c) Young people
 - d) Sick children

Part 2.

When we reached our collecting street, our driver instructed me to knock on every door on one side of the street. Another girl was to accompany him on the opposite side. He seemed uncertain about what to do with Joanna.

Joanna held out the bag to him. Quick as a wink, the boy snatched it and pedalled off at high speed.

"She's too young to go up and down all these driveways." He said. So he suggested that she stand beside the car and wait for us.

Joanna let out a roar that stopped passing cars and brought people out of their houses. Our driver came running and wondered what to do.

Joanna looked furious, so the driver relented. "Perhaps people will put a contribution in your bag too. If you ask them politely." He suggested.

"Tell Miss Lewis," Joanna said. So we bundled into the car, returned to school and informed Miss Lewis. She was most upset, and immediately phoned the police. "I said she was too young for collecting," she complained.

Every time I emerged from a driveway I looked back towards Joanna. She wasn't smiling, or asking politely, but she was collecting all right. She just looked at people and held out her bag. Strangely enough, nearly everyone seemed to oblige.

When the police arrived they asked me if I would recognise the boy if I saw him again. I was doubtful. "I'd know him," interjected Joanna. "And I'd know his bike."

I was at the far end of the street when I noticed a boy on a bike ride up to Joanna. He stopped, and put his hand in his pocket.

The policeman judged Joanna to be too young to be sure, but she **insisted**.

6. What did the driver

7. Why do you think so

8. Why did the boy on

9. What did the boy on

10. Who believed they

want Joanna to do while they were collecting? a) Wait inside the car b) Walk up and down <input checked="" type="radio"/> c) Wait near the car d) Go with her sister	many people put money in Joanna's bag? a) She smiled and asked politely b) She looked furious at being left alone c) They felt sorry for people in other counties <input checked="" type="radio"/> d) They admired the little girl and her efforts	the bike put his hand in his pocket? a) So that he could get some money out <input checked="" type="radio"/> b) So that Joanna would hold the bag out to him c) So that he could hide something d) So that Joanna would get curious	the bike do next? a) Gave Joanna some money b) Roared at Joanna <input checked="" type="radio"/> c) Took Joanna's bag d) Ran off down the street	would recognise the boy if they saw him again? a) The driver <input checked="" type="radio"/> b) Joanna c) Joanna's sister d) The policeman
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Part 3.

I rushed off to acquaint our parents with the state of affairs, and they both hurried to the police station in a panic. The policeman explained that Joanna was being driven around the neighbourhood in a patrol car to see if the boy could be spotted.

"Poor little girl!" the policeman said. "She's so immature for this."

"Poor little nothing!" replied Dad. "You don't know our daughter."

We traced the patrol car to The Dive, a place where young people go to play the machines, a place we were normally forbidden to enter. Mum was most upset, but nevertheless we ventured inside. A policeman was standing patiently at the counter, while Joanna was confidently prowling around the machines, pausing at each one and closely observing the face of the player. Most of them were preoccupied and failed to notice her.

Eventually Joanna stopped beside one machine, and signalled to the policeman. "That's him," she announced decisively.

Then everyone spoke **simultaneously**. The policeman interrogated the boy, Mum told him off, and the other kids crowded around and made their own contribution to the hullabaloo.

"I never took any money," the boy proclaimed aggressively. "She's only a stupid kid anyway." At this, the policeman seemed uncertain.

"Look at his bike!" said Joanna.

So they all trooped out to the bicycle stand and located his bike. "That's the one," announced Joanna, triumphantly. "I can tell."

When the policeman began to examine the bag on the rear carrier, the boy changed his tone and quickly looked round for an escape route. Too late. The other policeman from the patrol car barred his way. All the other kids suddenly decided it was time to go home. The missing collecting bag was found and the culprit was caught red-handed.

Back at the police station, Joanna was the centre of attention as she proudly spelled out the details of the story, and the police took every word down – for the record. Joanna just loves to talk when she has something to say – and everyone is listening.

Now you can see why my sister is so cool. Mum says she's smart, and she'll go far, she will.

11. How did they search for the boy? a) The collection driver took Joanna in his car b) Joanna went with her parents c) They walked round the neighbourhood <input checked="" type="radio"/> d) Joanna went in a patrol car	12. What does "simultaneously" mean? a) loudly <input checked="" type="radio"/> b) at once c) angrily d) simply	13. How did Joanna identify the boy? <input checked="" type="radio"/> a) She examined his face b) She saw the collecting bag c) She looked for his bike d) The other kids told her	14. What did Joanna do when the boy claimed he was innocent? a) She said nothing b) She called the policeman c) She said he was lying <input checked="" type="radio"/> d) She said we should find his bike	15. How did the policemen eventually decide that they had the right boy? a) Joanna told them he was the one b) The other kids told on him c) They recognised his face and his bike <input checked="" type="radio"/> d) They found Joanna's bag on his bike.
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