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Explicit linguistic knowledge is necessary, but not sufficient, for the provision of explicit early literacy instruction

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Abstract
Teacher's knowledge can influence the act of teaching and affect children's learning outcomes. Linguistic and language knowledge of teachers plays an important role in supporting learners at the beginning to read stage. This study examines the language and linguistic knowledge of teachers of beginning readers in New Zealand, how these teachers perceive their own practices in teaching reading, and the relationship with the nature of observed instructional practices. The teachers in the study used predominantly implicit approaches to early reading instruction, with word-level instruction and prompting used only after context, even when teachers with high linguistic knowledge used implicit approaches, suggesting that teacher's knowledge is not sufficient, on its own, to ensure effective, explicit, word-level instruction to beginning readers.

Keywords Beginning reading · Phonics instruction · Teachers' knowledge of language constructs · Teachers' word identification prompts

Introduction

Teacher's knowledge can influence the act of teaching and affect children's learning outcomes. The linguistic and language knowledge of teachers plays an important role in supporting learners at the beginning to read stage. Before teachers are able to teach children to read, it is important that they are knowledgeable about the code of written and spoken English (Moats 1999). This study examines the language and linguistic knowledge of teachers of beginning readers in New Zealand and how they apply that knowledge in a curriculum context that includes phonics as supplementary to early reading instruction (Tunmer and Chapman 2015; Tunmer et al. 2013).

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Teacher's knowledge

Spear-Swerling and colleagues have found that teacher's knowledge is clustered on aspects of fluency, vocabulary, and reading comprehension rather than on phonics, phonological awareness, and/or the assessment of the different aspects of reading (Spear-Swerling and Cheesman 2012; Spear-Swerling and Zibulsky 2014). A large number of studies have found that primary, or elementary, teachers have low levels of knowledge of the linguistic elements of the code (phonics, phonological awareness, morphology) required for teaching children to read (Brady et al. 2009; Cheesman et al. 2009; Cunningham et al. 2004; Joshi et al. 2009; Mahar and Richdale 2008; Piasta et al. 2009; Washburn et al. 2011).

Although the overall level of teacher's knowledge is found to be generally low, many teachers have implicit linguistic abilities, but they may not have sufficient explicit linguistic knowledge to teach these elements effectively to their students. That is, teachers can complete phonological awareness tasks but cannot explain the knowledge required for the same types of tasks. Joshi et al. (2009) and Washburn et al. (2011) found, for example, that pre-service teachers, in-service teachers, as well as teacher educators could identify words starting with the same phoneme, and they often provided incorrect responses when defining phoneme awareness and explaining different morpheme types.

As well as differences in implicit and explicit knowledge, different patterns of the type of knowledge have been found in pre-service teachers across different English-speaking countries (Washburn et al. 2015). In the study of Washburn et al. (2015), pre-service teachers in England were found to have high levels of phonics knowledge but were weaker on phonological, phonemic, and morphological knowledge. New Zealand pre-service teachers had higher phonological and phonemic knowledge but lower phonics and morphological knowledge. This same pattern of ability was also found in a sample of in-service New Zealand teachers (Chapman et al. 2018). In both England and New Zealand, this could be explained by the curriculum context and the resulting teacher education focus; in England, there is a requirement to teach phonics to beginning readers (Davis 2013), while in New Zealand, there is no requirement to teach phonics although many teachers do use phonological or phonics programs (Chapman et al. 2018).

Levels of teacher's knowledge of linguistic concepts are generally low across different studies. It may be that the levels of knowledge are influenced by the curriculum and policy context in which teachers are immersed. Tetley and Jones (2014) found that pre-service teachers' experiences in the field can influence their knowledge, even when the knowledge was taught prior to the field experience. In particular, they found that when pre-service teachers reported exposure to phonics-based programs, they had better phonological construct knowledge than those who reported they did not have such exposure. It is likely that school practices and the beliefs about literacy teaching will influence the specific practice of literacy. Similar findings have been found in early childhood education (ECE) settings where new teachers change their previous practice to match that of the ECE center (Smith 2018). Communities of practice, where teachers work together, such as in schools, can shape beliefs (Nuttall 2010) but also constrain how teachers implement their own practices (Wilcox-Herzog and Ward 2004).

Teaching practices

The connection between teacher's knowledge and student's development has been highlighted by Piasta et al. (2009), who found that lesson time spent on explicit decoding instruction was

only effective for student word-learning growth when teacher's knowledge of phonology, orthography, morphology, literacy acquisition, and instruction was high. Spending more time on explicit decoding instruction was not effective in promoting reading development if the teacher's linguistic knowledge was low.

Commensurate with the findings of Piasta et al. (2009), others have found that even when teachers do have knowledge of effective instructional practices, they seldom implement or plan for them in their lessons (McNeill and Kirk 2014; Spear-Swerling and Zibulsky 2014). McNeill and Kirk (2014) found that for the teaching of spelling, teachers were generally familiar with a variety of evidence-based practices but tended not to use them because they felt that they lacked the knowledge of how to use them in practice. For example, many teachers felt that they lacked the knowledge required for accurately explaining the rationale behind different spelling patterns. Additionally, Fielding-Barnsley (2010) found that pre-service teachers in both early childhood and primary education programs knew the importance of teaching phonics knowledge to beginning readers but lacked sufficient explicit knowledge required to explicitly teach such knowledge to their students.

In order to examine how teachers used the literacy teaching time, Spear-Swerling and Zibulsky (2014) asked teachers from kindergarten through to grade 5 to complete an activity grid for a 2-h literacy instruction block. They found that instructional allocation did not match research about a developmental progression of literacy skills. The time allocated to phonemic awareness instruction in K-1 teaching blocks, for example, was low compared to the time allocated to phonics instruction, even when phonemic awareness is required for effective phonics instruction. This pattern of time allocation changed only when teachers' knowledge of phonemic awareness and phonics was high. Overall, however, the majority of time allocated to literacy instruction by K-1 teachers was in teacher-directed reading fluency activities which involved children reading books aloud to the teacher, highlighting a mismatch with the need for developing phonemics and phonics.

The New Zealand context

In the New Zealand context, the view of how children acquire reading has emphasized individual meaning making over the accurate decoding of text. A multiple-cues approach to reading (Ministry of Education 2003a) or the "searchlights model" (Stuart et al. 2008) promotes the use of meaning and sentence structure as the driver of the reading process, with any word detail used in support of the first two cue sources. In its operationalization in the beginning primary school classroom, teachers of beginning readers typically focus on children reading a leveled book from the first day they start school; even at this early stage, the focus is about the making of meaning rather than on the accurate decoding of the print (Aitkin et al. 2018; Ministry of Education 2003b).

Greaney (2001) found that the focus on meaning leads teacher to direct teachers to encourage students to use text-based strategies such as picture cues or sentence context cues when they are attempting to read an unfamiliar word. Greaney (2001) presented a group of 16 primary school teachers (from two schools) with a variety of different reading error scenarios (e.g., the boy had sneaky/skinny legs and baggy trousers). The teachers were asked to write out preferred prompts that they would use to help the reader identify and rectify each error. In a context-based prompt, the teacher encourages the reader to focus on an accompanying illustration or prior knowledge as a means of decoding an unfamiliar word, for instance "Look at the picture and think what it could be." Such a prompt may well result in a successful response in this particular context, but the prompt would not support the learner to read the

same word in a different context. The suggested prompts were analyzed to investigate the extent to which they reflected either a word-level or context-based emphasis. The main results showed that teachers preferred to use context-based prompts over the word-level prompts.

Tunmer and Chapman (2002), in a study that asked children what they did when they did not know a word, found that weaker readers continued to independently use context-based cues. Encouraging readers to rely on context-based cues is akin to teaching the ineffective strategies that characterize those used by poor readers; for example, the weaker readers suggested that they would "guess," "think, guess what the word is," "read it over again," "read on," "have a look at the picture," "put my finger on the book and try other words and get a word that makes sense," or "miss it out and go to the end and go back and guess a word that makes sense" (Tunmer and Chapman 2002, p. 348). In contrast, they found that the better readers, regardless of the instruction they received, used word-level strategies for identifying unknown words such as "sound it out," "think of the sounds," "hear all the letters," and "listen to what the letters are" (p. 348). A teacher prompt that encourages the reader to focus on word-level characteristics, such as initial letter sounds and orthographic patterns, is more likely to assist the reader in developing strategic connections between the subcomponents of the written and spoken forms of the particular word. Connections of the small units in words allow for the storage of grapheme-phoneme correspondences for future use in phonological recoding (Arrow and Tunmer 2012).

This exploratory study examines the linguistic knowledge of teachers who have trained in a whole-language, multiple-cues curriculum context. The study aims to investigate

1. The levels of linguistic knowledge of a sample of teachers who trained in a multiple-cues, whole-language curriculum and policy context
2. If teachers with high linguistic knowledge apply that knowledge to the prompts they use when children make errors in their reading and to apply their knowledge to the explicit teaching of the concepts to beginning readers in reading lessons.

Method

Participants

Teachers (n = 27; male = 2) of beginning school children were recruited as part of a larger longitudinal study on teacher practices and child outcomes in New Zealand. The teachers were all qualified teachers; one had a 3-year teaching diploma and the rest had, at a minimum, a degree-level qualification (e.g., 3-year bachelor's degree). Five teachers had taught for between 1 and 5 years, and the rest had taught for between 11 and 30+ years. Teachers were evenly distributed across schools that varied by SES, school size (ranging from less than 100 students to more than 400 students in the school), and locality (rural, urban, semi-rural). Four teachers had also been Reading Recovery trained.

Measures

Teacher's knowledge and perceptions of knowledge

Teacher's knowledge and self-perceptions of knowledge were measured using a survey based on a measure of teachers' knowledge of basic language constructs developed by Binks-

Cantrell, Joshi, and Washburn (2012). Basic language constructs considered essential for early reading success include phonological and phonemic awareness, the alphabetic principle (phonics), and morphology. The scale of Binks-Cantrell et al. included 38 questions that examined teachers' understanding of basic language constructs in terms of knowledge and skills in relation to phonological and decoding elements. Implicit knowledge included questions that required teachers to identify examples of elements (e.g., a phoneme), but not to define those elements. In addition, we included six items designed to assess teacher's *perceived* teaching ability, such as "evaluate your knowledge of teaching phonemic awareness." Binks-Cantrell et al. reported that the teacher's knowledge measure has a Cronbach's alpha coefficient of 0.90 and good construct validity.

Teacher practice

The study used two measures of teacher practice. The first measure of teacher practice was a written response task asking how teachers would prompt children in an error during reading, adapted from Greaney (2001). The prompt task enables us to examine what teachers put most emphasis on in the reading process. The second measure of teacher practice used observations of teaching practices in a small-group reading lesson, coded on a researcher-developed scale from all implicit to all explicit instruction.

Prompts The prompt task was made up of five examples, across different Ready to Read (Ministry of Education 2014) text levels common for the first year at school, and with different types of errors (see Table 2). Teachers were asked to provide, in order, up to three prompts they would use with a child who had made that mistake. The responses were scored in three ways:

1. The number of times a word-level prompt was provided first across each item (maximum = 5)
2. The number of items with any word-level prompt provided (maximum = 5)
3. The number of word-level prompts that included explicit decoding strategy instruction (e.g., "you have to sound out the letters and blend them together"; maximum = 5).

Video observations During the course of the year, all teachers were videoed up to three times during reading instruction time. The videoed sessions range from 10 min to 1 h in length. Only those parts of the recording that captured instruction with a small group of children (often called a guided reading group) were used for coding.

Six elements of small-group instructional practice were coded on a continuum of very implicit to very explicit. These six aspects were the learning focus, use of instructional strategies, how code knowledge is addressed, choice of text, promotion of reading strategies, and materials used. Each element was coded on a scale of 0–4, and a mean score was calculated for each teacher. The type of practice promoted for success in early reading, particularly for any students likely to experience difficulty, is teacher-managed and explicit teaching (Byrne 2005; Connor et al. 2004; Hattie 2009; Prochnow et al. 2015). In contrast, most New Zealand teaching is based on the leveled text selection and teaching of word-level knowledge happens incidentally or implicitly through text experience (Arrow et al. 2015). In this case, the summarized total scores used in this study are coded from 0 to 4 and reflect patterns of practice outlined as follows:

1. Reading to find out what happens in story; behavioral focus; minimal or no teaching of code even when need arises
2. Implicit teaching with the meaning of the text as the teaching focus; teaching of code only when the need arises
3. Incidental teaching based on needs arising from text but may provide some initial instruction in high-frequency words
4. Explicit teaching, with planned word-level instruction based on text selection
5. Systematic teaching, with explicit word-level instruction taught first and text selection based on word-level teaching

The videos were coded by the second author. Three educators from the literacy field also viewed and scored randomly selected videos (28.5% of the lessons filmed) in order to check for the reliability of the scoring. When there was disagreement, differences were discussed and scores were altered when agreement was reached, or if no agreement was reached, it was left unaltered. For each lesson element, any disagreement was within one point. The inter-rater reliability coefficient was 0.75.

Results

The results are presented with the descriptions of teacher's knowledge and practice provided first. This is followed up by an analysis of the relationship between teacher's knowledge and the level of explicit instruction in which they engage.

Teacher's knowledge and self-confidence

The teachers in the study had high levels of phonological knowledge (see Table 1). Across the combined knowledge and ability questions for the four language constructs, phonological knowledge (87.50% accuracy) was the highest. This was followed by phonemic knowledge, which tapped into the knowledge and use of the smallest oral sound units (66.95% accuracy). In contrast, the constructs of phonics knowledge (45.66% accuracy) and morphological knowledge (26.39% accuracy) were the most difficult language constructs for teachers. These differences suggest teachers had knowledge of phonological units, including phonemes, and could use that knowledge. However, tasks requiring orthographic knowledge and application, such as phonics knowledge or how to use morphemes, were more difficult.

When the questions were analyzed in terms of questions that tapped into explicit articulation of teacher's knowledge, combined across constructs, there was 49% accuracy (see Table 1). For implicit knowledge, which measures teacher's ability without requiring explicit understanding, there was 68% accuracy. These differences suggest that the New Zealand teachers were generally able to complete linguistic tasks but did not necessarily have the explicit knowledge to know why they could answer them.

There were generally high correlations between the teacher's knowledge constructs and implicit and explicit knowledge (see Table 2). There were less robust correlations between the linguistic knowledge constructs themselves. There were no significant correlations between phonological knowledge and each of phonemic and phonics knowledge, which could be explained by the ceiling effect in the phonological knowledge construct. The correlation

Table 1 Mean and percent accuracy of teacher's linguistic knowledge items

Construct	Mean	SD	Accuracy (%)
Implicit knowledge (max = 26)	16.93	3.95	67.72
Explicit understanding (max = 12)	4.92	2.50	49.26
Phonological (max = 8)	7.00	0.74	87.50
Phonemic (max = 13)	8.70	2.91	66.95
Phonics (max = 9)	4.11	1.85	45.66
Morphological (max = 8)	2.11	2.58	26.39
Total	21.78	5.96	57.32

between phonics knowledge and morphological knowledge was also not significant. In this case, inspection of dot-plots indicated that the number of participants with floor effects on morphological knowledge had scores ranging from 0 to 8 on the phonics knowledge items. Explicit knowledge correlated most highly with phonics knowledge, and implicit knowledge correlated most highly with phonemic knowledge. These findings suggest that both implicit and explicit knowledge of the language constructs is variable within this sample of teachers.

With regard to teachers' self-perceptions of their knowledge in teaching these components, and others, it was found that teachers of beginning readers were most confident in teaching meaning-based teaching elements. As shown in Table 3, the aspect of teaching reading they felt most confident in was the teaching of comprehension (m = 2.50), followed by two other meaning-based elements: teaching literature (m = 2.35) and teaching vocabulary (m = 2.31). Teachers felt least confident in teaching phonological and orthographic elements of instruction, which included phonemic awareness (m = 2.04), fluency (m = 2.15), and phonics (m = 2.23).

There was a mixed pattern of positive correlations between self-perceptions of knowledge for teaching for different areas. Two items (self-perceptions of knowledge for the teaching of literature and self-perceptions of knowledge for teaching phonics) did not correlate well with the other items. Self-perceptions of knowledge for teaching literature only correlated with phonics. Self-perceptions of knowledge for teaching phonics did not significantly correlate with the two other meaning-based teaching items: that of teaching vocabulary and comprehension. All other items did significantly correlate with each other.

When examining the correlations with the teacher's knowledge items, self-perceptions of teaching had a weak correlation with any of the teacher's knowledge constructs. There was a weak, nonsignificant correlation between self-perceptions of knowledge for teaching phoneme awareness and the measure of teacher's phoneme knowledge. However, there was one significant, positive, correlation between the explicit knowledge of linguistic constructs and the self-perceived knowledge for teaching phonemic awareness. Although this correlation is not high, it suggests that the teachers' lower self-perceptions of knowledge for phoneme awareness more closely match their low levels of explicit linguistic knowledge. These findings suggest that, generally, there is little relationship between teachers' perceptions of knowledge for teaching reading and their actual levels of knowledge of constructs required for teaching reading.

Teacher practice: prompts

The nature of the responses to the teacher's prompt task was examined to identify how teachers directed attention to word-level cues and how they provided explicit instruction in the use of

Table 2 Correlations between all study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Video ob	–															
2. Implicit	.34	–														
3. Explicit	.01	.72**	–													
4. Phonemic	.25	.83**	.67**	–												
5. Phonological	.08	.50**	.48*	.20	–											
6. Phonic	− .05	.53**	.81**	.40*	.34	–										
7. Morphological	.33	.75**	.58**	.43*	.39*	.33	–									
8. SPphoneme	− .24	.28	.46*	.22	.22	.31	.34	–								
9. SPphonic	− .01	.34	.24	.38	.08	.16	.19	.66**	–							
10. SPfluency	− .29	− .03	− .01	− .01	.07	− .03	− .05	.60**	.43*	–						
11. SPvocab	− .43*	.16	.36	.16	.35	.30	.05	.69**	.31	.51**	–					
12. SPcomp	− .45*	− .03	.14	.10	.09	.08	− .14	.43*	.11	.57**	.67**	–				
13. SPlit	.43*	.28	.13	.16	.29	− .04	.38	.36	.43*	.35	.14	− .06	–			
14. W-L prompt	− .15	.10	.34	.18	.00	.39*	.12	− .08	− .17	− .20	.06	.09	− .16	–		
15. W-L prompt 1st	− .08	− .15	− .13	.02	− .36	− .18	.06	− .17	.02	− .16	− .13	− .17	− .03	.41*	–	
16. Explicit tch	− .10	− .14	.01	.03	− .35	− .13	.17	.04	.02	− .00	− .07	− .10	.10	.38	.38	–

Video ob = coded teacher practice; implicit = implicit ability items in teacher's knowledge test; explicit = explicit knowledge items in teacher's knowledge test; phonemic = phonemic knowledge items from teacher's knowledge test; phonological = phonological awareness items from teacher's knowledge test; phonic = phonics knowledge items from teacher's knowledge test; morphological = morphological knowledge items from teacher's knowledge test; SPphoneme = self-perceived knowledge for teaching phoneme awareness; SPphonic = self-perceived knowledge for teaching phonics; SPfluency = self-perceived knowledge for teaching fluency; SPvocab = self-perceived knowledge for teaching oral vocabulary; SPcomp = self-perceived knowledge for teaching comprehension; SPlit = self-perceived knowledge for teaching literature; W-L prompt = word cues given in the prompt task; W-L prompt 1st = word prompt given first in the prompt task; explicit Tch = explicit decoding instruction given in prompt task.

*$p < .05$. **$p < .01$

Table 3 Means and range for self-perceptions of knowledge for teaching

	Mean	SD	Range
Phonemic awareness	2.04	0.72	1–3
Phonics	2.23	0.65	1–3
Fluency	2.15	0.73	1–4
Vocabulary	2.31	0.62	1–4
Comprehension	2.50	0.58	2–4
Literature	2.35	0.56	1–3

1 = minimal knowledge, 2 = moderate knowledge, 3 = very good knowledge, 4 = expert knowledge

the word cues. Overall, the teachers identified at least one word-level prompt for an average of 3.52 reading error items (out of a maximum of five error items; see Table 4). However, giving a word-level prompt as the first cue only occurred for an average of 1.30 reading error items. A quarter of the teachers never provided a word-level prompt as the first cue. Explicit instruction related to word-level guidance occurred at least once on 1.26 reading error items. Although the majority of teachers did utilize explicit teaching at least once, 18.5% never provided such guidance.

When examining the correlations between responses on the teacher's prompt task and teacher's knowledge of linguistic constructs, the only significant correlation was a positive correlation between phonics knowledge and the provision of a word-level prompt at any time. All other correlations ranged from $r = -.36$ to .34, suggesting very little relationship between the levels of teacher's knowledge and how teacher use that knowledge to prompt children when making reading errors. The exception to this was phonics knowledge and the provision of word-level prompt at any point.

Teacher practice: video observations

Video observations were analyzed from 25 teachers. Not all teachers had a lesson filmed for various reasons, including not consenting to being videoed, not being available due to other school commitments, and issues with video quality. The mean implicit-explicit score (see Table 5 for an explanation) was 1.95 (SD = 0.83), ranging from .40 to 3.50. This mean score indicates that much of the small-group instruction had implicit and incidental word-level instruction. To illustrate the distribution of teacher practices, Table 5 provides the percent of teachers whose overall score fell within each level of explicitness. This shows how there were no teachers who taught explicitly with a structured systematic teaching of the code prior to reading texts.

Correlations between the video observation score and all other measures were also conducted. There was no correlation between the level of explicitness in teacher practice and teacher's knowledge of any linguistic construct or with how teachers responded in the prompt task. There was no correlation between the level of explicitness in teacher practice and self-

Table 4 Means and standard deviations for prompt responses with percentages of responses across items

	Mean	SD	Range	% teachers
Any word-level prompt	3.52	1.09	1–5	100
Word-level prompt first	1.30	1.03	0–4	74.1
Explicit teaching	1.26	1.06	0–5	81.5

Table 5 Summary of teaching and lesson focus at each level and percentage of teacher scoring within that range

Level of explicitness	Example	Percent of teachers
Little teaching/implicit (< 1)	Reading to find out what happens in story; behavioral focus; minimal or no teaching of code even when need arises	8
Implicit-incidental (1–1.99)	Reading to find out what happens in the story; teaching of code as need arises	48
Implicit (2–2.99)	Start with a review of high-frequency words; teach code as need arises; based on text	32
Explicit (3–3.99)	Teaching code relevant to text prior to reading; based on text	12
Explicit-systematic (4.0–maximum)	Teaching code from structured sequence prior to text reading; text selected to match code teaching	0

perceived knowledge for teaching phonemic awareness, phonics, or fluency. There were significant negative correlations between the level of explicitness and teachers' self-perceived knowledge for teaching comprehension and vocabulary. This suggests that the more confident teachers were in teaching these two meaning-based areas of reading, the less explicit they were in their teaching practice. In contrast and unexpectedly given the correlations with the other meaning-based areas of reading, there was a significant positive correlation between being explicit in teaching reading and self-perceptions in knowledge in teaching literature.

Level of knowledge and teaching practice

The descriptive findings have indicated that this sample of teachers tend to have low levels of explicit linguistic knowledge and low levels of knowledge of phonics and morphology. There were also no significant correlations between teacher's knowledge, measured by the linguistic constructs task and the application of knowledge in teaching, measured by the prompt task and the video observation scale. To better explore the lack of the expected relationship between the level of explicit knowledge and the application to practice, we examined the differences between the group of teachers who clustered at the low scores (one to four items correct) in the explicit knowledge and the teachers who were spread across the range of higher levels of explicit knowledge (five to ten items correct).

One-way ANOVA was used to examine the differences in teaching practice between teachers with higher and low levels of explicit linguistic knowledge. The 14 teachers with low explicit knowledge scores, between 1 and 4 (m = 2.93, SD = 1.00), were compared to the 13 teachers with higher explicit knowledge scores, between 5 and 10 (m = 7.07, SD = 1.66). Although we were interested in the comparisons on the prompt task and the video observation scale, we also compared teacher's knowledge on the linguistic constructs. The means and ANOVA results are provided in Table 6. Comparisons were also made on the self-perceived knowledge for teaching items, but there were no significant differences on any items so they are not reported on.

There were significant differences between the two groups of teachers on their performance on implicit knowledge items and on the phonemic knowledge, phonics knowledge, and morphological knowledge items. There was no significant difference on performance on the phonological knowledge items.

For teacher practice, there was no significant difference on the level of teaching explicitness between teachers with high and low levels of explicit knowledge. There was also no difference

Table 6 Means and ANOVA results for the comparison between high- and low-explicit knowledge groups

	Low (n = 14) M (SD)	High (n = 13) M (SD)	F	p
Implicit	14.79 (3.21)	19.23 (3.40)	12.12	.002
Phonemic	7.21 (3.17)	10.31 (1.44)	10.40	.004
Phonological	6.79 (0.70)	7.23 (0.71)	2.64	ns
Phonic	2.86 (1.56)	5.46 (0.97)	26.62	.000
Morphological	0.86 (1.17)	3.46 (3.01)	9.00	.006
Video obs	1.99 (0.95)	1.98 (0.67)	.001	ns
W-L prompt	3.07 (1.14)	4.00 (0.82)	5.83	.023
W-L prompt 1st	1.14 (0.77)	1.46 (1.27)	0.64	ns
Explicit tchg	1.07 (0.83)	1.46 (1.27)	0.91	ns

ns not significant

between them for the provision of explicit strategy instruction on the prompt task. Although there were also no differences on the provision of word-level prompt as the first prompt, teachers with more explicit knowledge were more likely to give any word-level prompt. These comparisons confirm that even teachers with explicit knowledge of linguistic constructs do not use that knowledge in their teaching practice, either in how they respond to students who make errors or in their own planned practice.

Discussion

There were two aims to this exploratory study; the first aim was to investigate the linguistic knowledge of teachers who have trained in a multiple-cues, whole-language curriculum and policy context. The second aim was to investigate if teachers in this context, and those who have high levels of explicit knowledge, applied that knowledge to support children's reading attempts and to how they taught reading lessons.

With regard to the first aim, the results indicate that this sample of New Zealand teachers had high levels of phonological knowledge and medium levels of phonemic knowledge. The sample of teachers also had low levels of phonics knowledge, but even lower morphological knowledge. Furthermore, teachers were better able to respond to items targeting implicit knowledge, which does not require explicit knowledge. For example, teachers could count syllables in words (implicit knowledge), but not be able to identify the syllable types (explicit knowledge). The teachers in the sample felt more confident in teaching meaning-based forms of knowledge, particularly comprehension and vocabulary. However, there was no relationship between teachers' actual knowledge of linguistic constructs and teachers' self-perceived knowledge for teaching. Teachers with high levels of explicit linguistic knowledge did not feel any more confident about their teaching of the word-level and decoding dependent skills than teachers with low levels of explicit knowledge.

With regard to the second aim, the results found that all teachers in the sample provided implicit instruction that did not include explicit and planned instruction in linguistic constructs. Even the teachers with high levels of the explicit linguistic knowledge did not apply that knowledge to their teaching practice. The exception to this finding was that the teachers in this study, with high levels of explicit knowledge, gave more word-level prompts to reading errors. However, the increased number of word-level prompts was not the first prompt that these

teachers would give to a reading error. This finding suggests that the teachers have the knowledge that can be applied to teaching but only do so as a last resort.

This study provides further evidence of the low levels of reading-related language skills in New Zealand in-service teachers, similar to the findings with other in-service teachers in the study by Chapman et al. (2018) and New Zealand pre-service teachers in the study by Washburn et al. (2015). Although there have been a number of studies that have investigated the levels of reading-related language and literacy knowledge and skills in New Zealand teachers (Carroll et al. 2012; Chapman et al. 2018), this is the first that has also examined how the same teachers use that knowledge in the classroom. The results indicate that teachers in this study used implicit practices in the teaching of reading. This implicit practice is typically driven by the reading of text as a group with any word-level instruction occurring as the result of words that the children came across that they could not read (Arrow et al. 2015).

The results of the prompt task provided further evidence of the low levels of explicit word-level instruction provided by teachers in New Zealand. Although all teachers gave at least one word-level prompt over the five items, it was rarely the first prompt teachers would give. Giving explicit decoding guidance in how to read an unknown word was even a less common occurrence. Greaney (2001) and Chapman et al. (2018) both found that New Zealand teachers prefer to give context-based prompts. Although not analyzed in this study, context-based prompts include responses such as "did that make sense?" and "did that sound right?" and are aimed at encouraging children to use meaning as the primary strategy for reading unknown words. The use of context-based prompts instead of explicit, word-level prompts, is consistent with the messages provided in publications on early reading provided to teachers (Ministry of Education 2003a) and by practitioners working in schools (Aitkin et al. 2018). These guidelines and messages stress the importance of the multiple-cues approach and, in particular, the importance of using meaning to support attempts at reading unknown words.

Teachers with higher explicit linguistic knowledge were more likely to provide a word-level prompt than those with lower explicit knowledge. However, they were not any more likely to give that prompt first; even though they have the knowledge to use it in teaching, they still use it as a last resort. They were also not any more likely to give explicit decoding instruction to help with reading an unknown word. Although previous research suggests higher levels of teacher's explicit knowledge are necessary for explicit instruction (Carreker et al. 2007; Piasta et al. 2009), the current findings suggest that knowledge alone is not sufficient when teachers are trained, and work, in a whole-language orientated teaching environment. High-knowledge teachers did not automatically use their knowledge, even when provided with a hypothetical reading error.

A recent study by Chapman et al. (2018) found that New Zealand schools claim to teach phonics, although the type of phonics programs identified by participants suggests that these programs tend to be phonological awareness programs that are taught outside of the reading program. The uptake of phonological awareness programs may explain why the teachers in this sample had high phonological awareness knowledge. Taken together, the two studies suggest that there are a large number of teachers who may be able to provide instruction in phonological awareness but are not necessarily able to effectively teach explicit reading skills that make use of phonics knowledge (Cunningham et al. 2004; Mather et al. 2001).

Additionally, previous research on pre-service teachers has found that their knowledge of linguistic concepts could be influenced by the nature of the teaching approach that they see in schools when on in-school teaching experiences (Tetley and Jones 2014). Chapman et al. (2018) note that the advice and resources provided by the New Zealand Ministry of Education do not make it easy for school to enact phonics instruction that is structured or systematic. Such advice

and guidance are used within schools, as a community of practice, and can limit how teachers can use what they know (Wilcox-Herzog and Ward 2004). The current research suggests that experienced teachers are also influenced by the curriculum context in which they are in, and that even when they have the knowledge to provide accurate guidance in supporting students with phonological, phonemic, and phonics knowledge, they do not do so as a first choice.

The findings have implications for meeting the needs of beginning readers, but especially the needs of beginning readers who begin school with fewer cognitive entry skills including alphabet knowledge and phonological awareness. Along with the evidence that teachers had weak knowledge of phonics, the provision of implicit, meaning-focused instruction cannot meet the needs of students who begin school with fewer cognitive entry skills (Arrow and Tunmer 2012). Children beginning school with fewer cognitive entry skills benefit most from instruction with systematic, explicit instruction in phonics as part of their literacy learning (Connor et al. 2004). However, this is not possible if teachers do not have the knowledge required to teach it (Piasta et al. 2009) or the practice experience in how to teach it.

The obvious limitation to consider is that the sample size is small, meaning the findings should be considered with caution. Another limitation is that the exact nature and the inclusion of explicit instruction in teacher training programs were not asked for, and thus, it is not clear if teachers had training in explicit instruction and did not apply it, or that they had not learnt what it meant to provide explicit literacy instruction. Regardless, even when explicit instruction was not required, but the application of knowledge was, such as in the prompt task, high-explicit knowledge teachers did not apply it.

Training in explicit instructional strategies may influence the use of teachers' own word-level knowledge. For example, many teachers in New Zealand use phonics or phonological awareness programs (Chapman et al. 2018), and the most common of those identified includes workshops for teachers. This may explain the high levels of phonological knowledge, but not the low levels of phonics knowledge. Accordingly, further research is needed to examine whether additional training in explicit teaching strategies can go on to influence practice in settings such as the current one, where the curriculum context provides contrary guidance.

Guiding students to use the alphabetic principle, and teaching systematic, explicit phonics, is necessary to support all beginning readers. This study has found that teacher's explicit knowledge of linguistic constructs, while necessary for effective literacy instruction, is not sufficient on its own. Teachers also need guidance in how to use and apply careful and systematic integration of phonics instruction in which their knowledge is best applied.

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