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When Knowing Isn't Enough: Understanding Teachers' Pedagogical Content Knowledge for Teaching Reading Fluency to Students with Specific Learning Disabilities

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Abstract
Research investigating the relationship between teaching quality and student outcomes has found that teachers with higher knowledge for content and pedagogy are more likely to spend more time using effective practices while teaching than teachers with less knowledge. This is important, especially for teachers of students with specific learning disabilities, whose teachers require specialized knowledge and skill to support them in making gains. This qualitative study investigates three teachers' knowledge and skill of effective fluency instruction for teaching students with specific learning disabilities. Using three different approaches to assessing teacher knowledge, researchers examined the misconceptions, consistencies, and contradictions revealed in teachers' understandings across data sources. The researchers encourage researchers, teacher educators, and those involved in teacher evaluation to examine teacher understanding from multiple perspectives.

Keywords: Teacher knowledge, specific learning disabilities, teaching quality, teacher education

Introduction

As schools become increasingly inclusive and academic expectations become more rigorous, teachers must be equipped to meet the needs of *all* learners, including students with disabilities (ESSA, 2015; CCSSO, 2012). The demands for special education teachers is particularly high, as it is their job to provide intensive instruction and intervention while working in collaboration with general education colleagues to support students with disabilities' access to and success within grade level curricula (Brownell, Chard, Benedict, & Lignuaris/Kraft, in press). Since many students with disabilities have literacy difficulties, special education teachers must be especially knowledgeable and skilled in providing reading invention that supports students' access to the general education curriculum.

Special educators must have sufficient knowledge and pedagogical skill to implement a number of evidence-based practices focused on the skills struggling readers need (Moats & Foorman, 2003; Spear-Swerling, 2009; Spear-Swerling & Brucker, 2003). One area of instruction in which teachers require considerable skill is reading fluency. Reading fluency is commonly defined as accurately reading words, word parts (Hudson, Isakson, Richman, Lane, & Arriaza-Allen, 2011), and words in connected text effortlessly, without errors and with prosody (i.e., expression and phrasing; Adams, 1990; Hudson, Lane, & Pullen, 2005; Lane et al., 2009). For students with specific learning disabilities (SLD), reading fluency is especially important and challenging. For many students with SLD, reading sight words and decodable novel words is slow and arduous, making comprehending complex text difficult (Chard, Vaughn, & Tyler, 2002; Meyer & Felton, 1999). Empirical research shows that oral reading fluency influences students' overall reading abilities, including reading

comprehension (Gough, Hoover, & Peterson, 1996; Meyer & Felton, 1999; Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004). Due to the crucial role fluency plays in predicting development of successful reading skills, researchers have examined a range of instructional practices that teachers should use to promote students' fluency during reading instruction (e.g., Therrien, 2004; Strickland, Boon, & Spencer, 2013), including specialized recommendations for teaching fluency to struggling readers and students with disabilities (e.g., Chard, Vaughn, & Tyler, 2002; Wanzek, Wexler, Vaughn, & Ciullo, 2010; Wexler et al., 2008). Recommended practices include: constant time delay, flash cards, word banks for sight word fluency instruction (O'Connor, 2007), partner reading, timed reading, repeated reading, echo reading, and choral reading for connected text (Rasinski, Blachowicz, & Lems, 2012).

Although effective fluency practices have been identified, researchers have only limited knowledge about the degree to which teachers understand and can use these practices, especially for teachers of students with disabilities. Insufficient research-based information about special education teachers is troubling given what researchers know about the role of teachers' instructional knowledge (also known as pedagogical content knowledge, or PCK) in improving student outcomes for students without disabilities (Ball & Bass, 2000; Darling-Hammond, 1999; Shulman 1986; 1987). Teachers of struggling readers and students with SLD may require even more specialized knowledge of instruction to design and enact meaningful instruction aligned with their students' unique learning needs. Thus, improved understanding of special education teachers' PCK is critical.

Knowledge Needed to Teach Reading Fluency

Within the last decade, scholars have developed instruments designed to examine the PCK of elementary teachers providing literacy instruction. Specifically, they have developed paper and pencil assessments that can examine intersections among teachers' knowledge of literacy content area, knowledge of curriculum, and students as learners, as well as pedagogy more generally (Phelps & Schilling, 2004; Carlisle, Kelcey, Berebitsky, & Phelps, 2011; Carlisle, Kelcey, Rowan, & Phelps, 2011; Carlisle, Phelps, Rowan, & Johnson, 2006). These studies indicate that teachers with more knowledge use effective teaching methods for larger proportions of their instructional time (Carlisle, Kelcey et al., 2011).

Despite these advancements, teachers' knowledge for teaching reading fluency has been understudied. Only two studies specifically examined teachers' knowledge for reading fluency (Lane et al., 2009; Park, Kiely, Brownell, & Benedict, in review). Lane and colleagues (2009) developed five open-ended questions to evaluate teachers' knowledge of concepts and strategies for teaching reading fluency, as well as their knowledge of methods to assess students' reading fluency. They found that high teacher knowledge were predictive of first through third grade students' fluency gains, indicating teachers' content knowledge and knowledge of fluency strategies contributed to the effectiveness of their fluency instruction. One limitation of this study is that they did not directly observe teachers' reading practices, which may have mediated relationships between teachers' knowledge and students' gains.

In the only study of special education teachers, Park and her colleagues (in review) explored relationships among teachers' knowledge of reading fluency, their instructional practices, and their students' gains in oral reading fluency. Also using Lane et al.'s teacher knowledge instrument, they found that, among special education teachers teaching 3rd, 4th, and 5th graders in intensive reading groups, teachers' knowledge for teaching reading fluency predicted student gains on oral reading fluency measures, but did not predict teachers' instructional practices. Additionally, teachers'

reading instructional practices did not predict students' oral reading fluency gains.

Taken together, these studies demonstrate that teachers' knowledge for effective fluency instruction can be measured, and there is a relationship between teachers' knowledge and student achievement. However, it is less clear why what teachers' practice was unrelated to their knowledge; why is their knowledge about effective fluency instruction not reflected in their classroom practices? The purpose of this study was to explore this disconnect by closely examining intersections between teachers' knowledge of effective fluency instruction, as captured by Lane and colleagues' (2009) survey, the classroom practices teachers employed while engaged in reading fluency instruction for students with SLD, and the beliefs underlying their understandings. The following research questions were examined qualitatively:

1. What knowledge for teaching reading fluency to students with SLD do special education teachers reveal through:
   a. Paper-pencil fluency knowledge survey (Source 1)
   b. Their instructional practices (Source 2)
   c. Their talk about reading fluency instruction (Source 3)
2. How do different instruments yield different insights into teachers' understandings of effective fluency instruction?

Method

This qualitative study examining three upper elementary special education teachers' knowledge for effective fluency instruction. We approached this investigation using grounded theory methods (Charmaz, 2011), which supported us in making connections between quantitative and qualitative data sources.

Participants

Three 3rd - 5th grade elementary special education teachers from an urban school district in the southeast were recruited to participate in the study. One year prior to this investigation, each teacher had participated in an intensive, year long, professional development targeting advanced word study for students with SLD in upper elementary school. Fluency instruction was addressed in this professional development package. All teachers were appropriately certified to teach students with SLD and their experience in special education ranged from 4 to 25 years (see Table 1 for teacher's individual characteristics). To protect the identity of participants, all names are pseudonyms and this research was conducted under the approval of the institutional review board (IRB).

Data Sources

Teacher knowledge survey. In fall 2009 and spring 2010, teachers completed pre- and posttest of the Reading Fluency Survey (Lane et al., 2009). Researchers used the five open-ended questions included in the survey: (1)

Table 1. Teacher Participants' Demographic Information

Teacher	Gender	Ethnicity	# of Years teaching K-12[1]	Certification Area(s)	Degree
Laura	F	W	13	General education, Special Education	MA
Gina	F	W	4	General education, Special Education	BA
Julie	F	W	25	General education, Special Education	BA

*All names are pseudonyms

What is reading fluency? (2) Why is reading fluency important for children? (3) What knowledge and skills do children need to become fluent readers? (4) How can reading fluency be assessed? (5) What instructional methods could be used to develop reading fluency? (Lane et al., 2009, p. 4). Teachers' responses were scored, using Lane et al.'s criteria, by two researchers. On items where there was a disagreement, a third researcher was involved and asked to rate the item. Scores were discussed until 100% consensus was reached.

Low inference time sampling tool. Teachers' fluency instruction was video recorded three times during one week. One video observation (Gina Observation 3) was omitted due to a technology malfunction. Lessons were analyzed using a researcher developed low inference time sampling tool. The tool documented the total duration of instructional minutes dedicated towards fluency instruction, as well as what recommended practices (e.g. constant time delay, flash cards, word banks, choral reading, partner reading, timed reading, repeated reading, and echo reading) were enacted in intervals of 3 minutes, and the duration for how long each practice was used. Two trained observers completed the observations; scores were reported and discrepancies were discussed until 100% consensus was reached.

Field notes. While documenting teachers' fluency instruction using the low inference time sampling tool, raters also took detailed field notes. Field notes were used to record information about the sight words or text selected for fluency practice during instruction, the number of students present, and other information related to the teachers' fluency instruction that could not be captured using the measures described above. Only information related to fluency instruction from the time sampling tool, and field notes were used in the analysis.

Focus group interview. All teachers participated in one, hour-long, focus group interview facilitated by the first author. The purpose of the focus-group interview was to gain insight into teachers' school and classroom contexts and learn more about the instructional resources and curricula teachers had available to draw upon for their fluency instruction. The interview was designed to provide teachers an opportunity to discuss barriers they encountered while teaching reading fluency and provide insights into what information they drew from when making instructional decisions about fluency instruction.

Data Analysis: Looking Between the Representations of Knowledge

Descriptive statistics were first used to calculate teachers' performance on knowledge measures, time spent teaching fluency, and recommended practices employed, as captured by the instructional practice tool. The focus group interview was transcribed. Grounded theory methods (Charmaz, 2011) were employed to look within and between the data sources using an iterative coding process.

Trustworthiness. To ensure the analysis and findings are credible, three techniques were used to strengthen trustworthiness: memoing, peer debriefing, and triangulation (Brantlinger et al., 2005; Charmaz, 2011; Trainor & Graue, 2014). Memoing occurred following each coding stage (i.e. after initial coding, focused coding, and theoretical coding). Researchers took careful notes documenting patterns in and between data sources. Peer debriefing was used to share reflections between researchers and followed each analysis phase. Triangulation is when researchers approach data from various perspectives in efforts to answer their research question (Charmaz, 2011). To engage in triangulation in this study, researchers looked within and between various data sources, as well as within and across participants.

Findings

Through the analysis, we found three primary themes relating to *misconceptions* in teachers' understandings about effective fluency instruction that were revealed between data sources, *consistencies* of teachers' knowledge for teaching reading fluency that are coherent between data sources, and *contradictions* teachers revealed about their understandings of effective fluency instruction between data sources. In the following sections, we first describe the data revealed through each individual data source. We then discuss these three themes, describing how their revealed knowledge was consistent or contradictory across data sources.

Knowledge Revealed within Each Data Source

Teachers' knowledge on the Reading Fluency Survey (Lane et al., 2009) was, on average, in the adequate range, with teachers' total scores ranging from 10-12 (average of 2.2 per item, in the acceptable range). Individual item scores ranged between 1 (low knowledge) to 3, (expert knowledge; see table 2). Laura, the teacher with 13 years of experience and a masters in special education, scored the lowest (10 total, mean score of 2.0). Gina, the newest teacher to the group, scored 11 total points (a mean score of 2.2). Julie, the teacher with the most instructional experience, scored the highest on the measure (12 total, mean score of 2.4).

Next, we examined the time teachers' spent providing fluency instruction, and the recommended practices they chose to integrate. We should note that teachers had other instructional imperatives (e.g. teaching comprehension, vocabulary, etc.) to address during their time with students, so we did not expect them to devote all of their instructional time to fluency instruction. Laura taught sight word and connected text fluency instruction for a total of 21 minutes, with 9 of those minutes focused on using the recommended practices of using of flash cards, repeated reading, choral reading, and echo reading. During Gina's two lessons, she spent 11 minutes teaching fluency instruction using connected text, with 6 of those minutes using the recommended practices of echo reading, choral reading, and partner reading. Julie dedicated the most consecutive minutes towards fluency instruction using connected text (28 min), but she spent zero minutes implementing practices recommended within the literature.

Themes across Data Sources

Misconceptions. The analysis revealed multiple false beliefs, or misunderstandings, about teaching reading fluency to students with SLD and other struggling readers. Julie had the most knowledge as measured by the Reading Fluency Survey, but she had a fundamental misconception of the relationship between comprehension and reading fluency, reporting in her paper pencil survey, "To read fluently, children need some comprehension of text and knowledge of punctuation in order to read with correct intonation." Her misunderstanding was

Table 2.

Teacher Knowledge for Teaching Fluency (Reading Fluency Survey; Lane et al., 2009)

Teacher	Q1	Q2	Q3	Q4	Q5	Total	Mean
Laura	2	1	3	2	2	10	2
Gina	3	3	3	1	1	11	2.2
Julie	1	3	3	3	3	12	2.4

Q1: *What is reading fluency?* Q2=*Why is it important for children to develop fluency?* Q3: *What knowledge and skills do children need to become fluent readers?* Q4: *How can reading fluency be assessed?* Q5: *What types of methods can you use to rate/assess children's fluency ability?* The rating scale is as follows: 0 = No knowledge; 1 = Shows little knowledge; 2 = Some/acceptable level of knowledge; 3 = Excellent, expert knowledge, knowledge is detailed and deep

confirmed during the focus group interview, when asked to describe how she assessed students with learning disabilities' fluency progress. Instead of describing how she assessed students' fluency skills, she described how she assessed comprehension. She stated: "We use *Stars & Cars*. I do that a lot for the comprehension of reading passages, learning the main idea, so they know how to start identifying that. It works for the older kids. I don't use it for my younger. Fourth grade, I use it. Fifth grade, I use it." Additionally, Julie seemed unaware of the challenges her students encountered that would interfere with their fluency skill development. Field notes indicated that, instead of using recommended practices, Julie's teaching consisted of 28 minutes of round robin reading of a text that was very difficult for the students to independently decode, followed by multiple-choice comprehension questions.

Julie and Gina also believed that fluency instruction was not for *all* learners. Within the focus group interview, they shared that they did not teach fluency to every student on their special education case load. Gina states: "I'm excluding my kindergarteners from this because there is no fluency there." It seemed she felt that she didn't have time to teach fluency to her students in isolation and that assessment alone was sufficient, despite her awareness of their lack of fluency skill.

In addition, Julie further felt that it is difficult to tell which students require fluency instruction. When explicitly asked during the focus group interview, Julie disclosed that she believed that it was not her responsibility to promote older students' reading fluency skills and that if students had not mastered fluency by upper elementary grades, they never would. She stated, "Last year, the principal said, 'Don't you practice fluency with them?' and I said, 'By the

Table 3. Teacher Fluency Practices

	Observation	*Total time spent in fluency instruction for sight words*	*Time spent in recommended practices for sight words*	*Sight word recommend practices used*	*Time spent in fluency connected text instruction*	*Time spent fluency connected text using recommended practices*	*Fluency connected text recommended practices used*
Laura	1	7 min	2 min	Flash cards	2 min	0 min	None
	2	3 min	1 min	Flash cards	6 min	2 min	Repeated reading; Choral reading
	3	7 min	2 min	Flash cards	5 min	4 min	Echo reading; choral reading
		Total 10 min	*Mean* 5.6 min	*Total* 3 min	*Mean* 1.6 min		*Total* 11 min	*Mean* 4.3 min	*Total* 6 min	*Mean* 2 min	
Gina	1	0 min	0 min	None	5 min	2 min	Echo reading; Choral reading
	2	0 min	0 min	None	6 min	4 min	Partner reading; Echo reading
	3	NA	NA	NA	NA	NA	NA
		Total 0 min	*Mean* 0 min	*Total* 0 min	*Mean* 0 min		*Total* 11 min	*Mean* 5.5 min	*Total* 6 min	*Mean* 3 min	
Julie	1	0 min	0 min	None	10 min	0 min	None
	2	0 min	0 min	None	6 min	0 min	None
	3	0 min	0 min	None	12 min	0 min	None
		Total 0 min	*Mean* 0 min	*Total* 0 min	*Mean* 0 min		*Total* 28 min	*Mean* 9.3 min	*Total* 0 min	*Mean* 0 min	

fifth grade level, it's more of comprehending what they're reading. Even if they read slow, they have all the extended time they need to read for any assessment, so if they can read slow and comprehend, then that's what my job is for them to understand that.'" She seemed to believe that if a student is unable to read fluently by upper elementary school, they never will. Later in the discussion, Julie shared how, once a student is identified as a student with disabilities, she believed that fluency instruction became less important. She shared, "Once we have them staffed and they have extended time, I don't care if they read slow. I get the idea that they need to be able to read the words and make sense of them or rapid decoding, but just to speed through reading is not so important at some point."

Consistencies in knowledge. There were few instances where the understandings revealed by various data sources was consistent across those data sources. For instance, Laura and Gina's Reading Fluency Survey (Lane et al., 2009) indicated they had adequate understandings of effective fluency instruction, which was consistent with their implementation of recommended fluency practices, as captured by the low inference time sampling tool.

Laura and Gina were also able to consistently describe their understanding of the connection between their students' ability to reading fluently and their ability to comprehend complex text. On the Reading Fluency Survey and in the Focus Group interview, Laura conceptualized the ability to read fluently as crucial "for better comprehension of what they are reading" (Laura, Reading Fluency Survey), while Gina wrote, "If the student is spending too much time sounding out all the words, or reading word by word, it is hard for them to comprehend what they're reading. It takes them so long to read the passage that they will be worn out by the time they finish reading it! If the student reads fluently they can expend their brainpower on comprehending what they read." Between the Reading Fluency Survey and the focus group interview, Gina's and Laura's general conceptions of what constitutes reading fluency instruction is and why it is valuable for students with SLD were aligned.

Contradictions. Looking across data sources also revealed some contradictions in the teachers' knowledge, where they represented their understanding in one way, but later did something or said something that contradicted their initial representation of their understanding. For example, not once during the focus group interview or in the Reading Fluency Survey did teachers mention designing fluency instruction around sight words or connected text, yet all teachers implicitly integrated one or both of these fluency instructional approaches within their observed fluency lessons.

One major contradiction was between Gina's beliefs about the importance of fluency instruction and her resistance to teaching it consistently. In the knowledge survey, she indicated that fluency was a crucial skill to allow students to comprehend complex text, she shared later during the focus group interview that she believed not all learners needed fluency instruction. This was concerning because she teaches a population of the most struggler readers at her school, who are likely to have substantial fluency deficits. As she described the competing priorities she faced while determining what to teach her students, she reflected, "So, I'm going to tell you right now, they don't get fluency unless they need it. Unless they really, really need it. And even then, if it isn't something that was big enough [for me to put] on their IEP as a goal, then I don't…." On one hand she believes that fluency instruction is important, yet on the other hand, unless a student is struggling so greatly with reading that the child has an explicit goal dedicated towards reading fluency within his or her individualized education plan (IEP), then she does not take time to teach reading fluency.

The most glaring contradiction was between Julie's reflection on her experiences learning to

read as a student and the practices she chose to implement as a teacher of students with SLD.

During the focus group interview, Julie remembered how uncomfortable she used to feel when her teachers asked her to read aloud. She shared that she used to have to read aloud when she was little, and it was very stressful, saying "You want to cringe and put your head down. Maybe she won't see me if I don't make eye contact?" She further shared, "I did not like to read out loud." Yet, despite these powerful negative memories, her own fluency instruction relied solely on calling on students to read aloud to the group for several minutes. When they struggled, which field notes documented they did, she immediately jumped in and read the word or phrase for the student, without providing any explicit instruction to address their errors.

Discussion and Implications

In this study we compared teachers' understandings for effective fluency across various instruments (i.e., fluency knowledge survey, low inference observation tool examining teachers' fluency instructional practices, and their talk about reading fluency instruction revealed through a focus group interview). Data were analyzed using grounded theory methods. An iterative coding and analysis process, revealed variation within individual teachers across instruments. These findings demonstrate the importance of not relying on any single method to assess teachers' PCK. To obtain a more complete picture of teachers' capacity to teach fluency effectively, it is important to examine multiple representations of what teachers know, and how this knowledge is reflected in their implementation.

This may have implications for teacher educators' and researchers' efforts to assess teachers' knowledge. In order to capture a more authentic understanding of what teachers' know and how they teach reading fluency, we encourage teacher educators to collect multiple representations of teacher performance, extending beyond paper-pencil tests to include observations of classroom instruction, and teachers' talk about their instruction and instructional context.

There are several limitations to this study that future research can extend. This study was small and drew from three teachers within the same geographical region, and results are not generalizable. The current study's instructional observations were limited to only a single week; this is a limitation, as the content and nature of teachers' instruction varies throughout the school year, in response to various scheduling imperatives, such as high-stakes testing (Vannest & Parker, 2010). In addition, the use of focus group interviews, instead of individual interviews, may have created a social desirability bias; teachers may have changed what they chose to reveal in the interviews to fit with their conceptions of what they thought other teachers thought.

Future research is needed to engage in more close examinations of teachers' understandings, practices, and experiences within various contexts over a longer period of time. In addition, more research is needed to examine which instruments (i.e., paper-pencil fluency knowledge survey, low inference observation tool examining teachers' fluency instructional practices, and their talk about reading fluency instruction revealed through a focus group interview, and potentially others) reveal misconceptions better than others, and thus which may be most valuable for researchers and teacher educators engaged in support teachers' knowledge and skill development.

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