Seizing the Sounds: Considering Phonological Awareness in the Context of Vocabulary Instruction

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Abstract In this chapter, we call attention to vocabulary's role in the development of students' phonological awareness skills. First, we will consider how oral language and phonological development are related to each other, as a part of Lexical Restructuring Theory. Then, we present classroom-based research, which examines beginning readers' phono-semantic errors, highlighting the significance of both the phonological and semantic properties of words. Further, we consider how educators can use this knowledge to improve instruction for students.

Keywords Vocabulary instruction • Phonological awareness • Semantic development • Lexical Restructuring Theory • Phono-semantic errors

Struggling readers often have phonemic awareness deficits, which can impede the development of early reading skills. We've known this for several decades. As a result, an industry of interventions now exists that is aimed at improving phonological awareness, as well as letter knowledge, related phonics and metalinguistic skills. However, less attention is paid to how the meanings of words play a role in developing more fine-grained phonological representations. In order to advance our knowledge of how to help readers, we need to increase our understanding of *how vocabulary is connected to phonological development*.

In this chapter, we call attention to vocabulary's role in the development of students' phonological awareness skills. First, we will consider how oral language and phonological development are related to each other, as a part of Lexical Restructuring Theory (Metsala & Walley, 1998). After discussing this connection, we call attention to the need to develop a deeper understanding about the ways in which phonological and semantic development run alongside each other during word learning lessons.

Our position is that highly effective vocabulary instruction must attend to more than just meaning; it must emphasize the phonological properties of words, as well.

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Moreover, in return, lessons focusing on sounds in words must not exclude attention to the meanings of these spoken words. Students must understand the ways in which the smallest variation in sound can completely transform a word's meaning; in this way, sounds and meanings are linked.

Then, we present classroom-based research which examines beginning readers' phono-semantic errors (Strom, 2013), highlighting the significance of both the phonological and semantic properties of words. Throughout this chapter, we champion phonological awareness as an inextricable—and underexplored—dimension of vocabulary development. We also call attention to the ways in which focusing on the semantic aspects of words is absolutely central to all reading and language instruction. Further, we consider how educators can use this knowledge to improve instruction.

1   Lexical Restructuring Theory

Lexical Restructuring Theory, put forth by Metsala and Walley (1998), is based on the idea that as children begin to learn oral language, they process it as a whole—as a kind of seamless, undifferentiated stream of speech. Over time, their phonological awareness becomes increasingly attuned to the acoustics, words, and syllables in language. Finally, as brain development continues, children's perception of phonological nuances becomes more precise, facilitating their sensitivity to individual words. With this specialized level of awareness comes the ability to distinguish and represent distinct sounds in words, a skill that is essential for matching speech to print, a requisite skill for beginning to read.

However, the lexical restructuring process does not happen in isolation. Rather, it is related to other aspects of language development. Researchers have suggested that growth in oral language is related to vocabulary (Metsala, 1999; Walley, Metsala, & Garlock, 2003). That is, the process of being able to distinguish and represent smaller units of language is a function of a child's vocabulary size and growth rate (Metsala & Walley, 1998; Walley, 1993). Indeed, phonological awareness expands as more words are learned; increasing knowledge of words fosters finer phonemic distinctions (Luce & Pisoni, 1998). In many ways, vocabulary development and phonological skill development are dependent on one another; as one expands, the other refines and deepens. They're interrelated. As students are beginning to (or struggling with) learning words and their meanings, they are vulnerable to making errors that, we argue, can serve as valuable opportunities to contrast and elaborate on both new sounds and meanings. Meanings and sounds are the cornerstones of all language instruction; having a strong foundation in both is fundamental to being able to read well.

1.1 Words Under Pressure

The underlying hypothesis in Lexical Restructuring Theory (Metsala & Walley, 1998) is that, as children acquire more words (and become more facile with language overall), their lexicons are under a developmental pressure to reorganize. This structural shift hones their ability to distinguish and represent words into progressively smaller segments—such as the syllable, onset, rime, and phoneme. In other words, vocabulary growth pushes phonological boundaries, influencing the ways in which sounds are stored and represented in memory. Phonemic awareness skills are thought to emerge from this push, as well as from associated changes in phonological neighborhoods.

Typically, the words that are under the most pressure to restructure are ones that are familiar to children (already in their vocabulary) and/or which share phonological neighborhoods with already known words (Coady & Aslin, 2003). In other words, both vocabulary and phonology are implicated in this restructuring. The way that a word is stored is connected to its meaning, as well as to its distinct sounds. In contrast, words that are less familiar and/or phonologically dissimilar place fewer restructuring demands. So, for example, if a child knows just a few words (such as, for example, "bed" and "sister"), holistic representations would be sufficient to differentiate one word from the other; "bed" and "sister" share no phonemes. In effect, one would need very little phonemic information about these words in order to distinguish them. Further, the words "bed" and "sister" could be distinguished just by their number of syllables (one versus two, respectively).

However, as children's vocabulary expands, it becomes less efficient to mentally store words like these as wholes. As a student learns more words, it will become increasingly difficult to distinguish words from other, similar sounding words. For example, let's take "bed" from the example above. As discussed, when compared to the word "sister," it is relatively easy to distinguish globally and syllabically. However, as other words from the same phonological neighborhood are learned (such as, in this case, words that share a phonological neighborhood with "bed," like "bet," "bid," "bud" and "red"), it will become harder to distinguish "bed." At this point, in order to advance written and spoken language skills, "bed" would need to become stored in an *increasingly segmented way*, to make room for an *ever-expanding vocabulary*.

Going one step further, at the same time that these segmental representations are being altered, children are also learning about semantic concepts and words that are associated with "bed." In other words, they're developing a schema for "bed"—one that might include "nighttime," "sleep," or "pajamas." At the same time, they may also understand "bed" as closely related to the word "crib," since it, too, is a place for sleeping. Additionally, they might associate the word "bed" with a phrase such as, "time to go to bed." Put another way, the word "bed" ignites a storehouse of meaningful associations that are being learned and linked. One of the key ideas in this chapter is that *semantic knowledge and phonological knowledge shift alongside*

each other, why is why Lexical Restructuring Theory (Metsala & Walley, 1998), makes sense as framework.

Given these ideas, it follows that if we want to improve children's phonemic awareness skills, we must keep in mind that vocabulary plays a critical role. In order to improve instruction for struggling readers, a greater effort is required to understand early reading instruction in the context of Lexical Restructuring Theory. Framing phonological awareness and vocabulary development as intimately related helps make what we know about effective literacy instruction more robust, and capable of being more responsive to the needs of a wider range of learners.

2   Into the Classroom

To that end, in this chapter, we examine first graders' word errors through the lens of Lexical Restructuring Theory, showcasing how phonological awareness and semantic development intermingled during reading lessons. We analyze a conversation between a student and teacher about the word, "ranch," and use this analysis to discuss both phonological and semantic development. We share tables of students' errors and explain how words were classified according to their salient phonological properties, as well as to how they were contextualized—and given meaning—during lessons. Then, we discuss a conversation between a student and a teacher about the word, "cot," further demonstrating how phonemic awareness skills impact meaning-making and vocabulary skills. In particular, we note the ways in which teachers turned misrepresentations (of sounds or of meanings) into opportunities to deepen students' semantic knowledge.

2.1   Phono-semantic Errors

The data presented here is taken from a larger ethnographic study, which focused on the nature of students' errors during early reading instruction. One of the overall findings of that study was that students frequently made phono-semantic errors (Strom, 2013), which provided important information about phonological and vocabulary development. By "phono-semantic" errors, we mean students' oral errors during classroom conversations, which served to clarify the ways in which students were developing insights about differences in sounds, as well as differences in words and their associated meanings, more generally. In analyzing phono-semantic errors, we focus on how unfamiliar vocabulary and/or unfamiliar phonemes impacted the trajectory of word learning, as well as on how discussion of a word's meaning grounded linguistic and conceptual development. In the transcript that follows, the phono-semantic error is around the target word, "ranch," which was featured in a book the teacher was about to read with a group of students.

Teacher: Ok, who knows what a "ranch" is?

Student: A tool.

Teacher: Hmmm. What kind of tool?

Student: Um, like my dad, he uses a "ranch" to fix my bike. It is long and I think metal? It has two like, kinda like teeth, like little pieces, at the top?

Teacher: Oh! I think you're thinking of a "wrench." Yes, it sounds like the word "ranch," except let's listen to the middle. "R…ă…nch" and "wr…ĕ…nch." Can everyone repeat that?

Class: R…ă…nch and wr…ĕ…nch.

In this lesson, after the teacher queries the class about the target word, "ranch," a student's response alerts us that she probably heard it as "wrench" (which she then confirms as she explains that one function of a "ranch" is to fix a bike). So, going back to the teacher's original question, do we know whether or not this child knows what a "ranch" is? No, we don't. We don't know because the student made a *phono-semantic error*, which gives this particular instructional interaction a new twist. Phono-semantic errors obfuscate what we can know about a students' phonological and conceptual knowledge.

We define a phono-semantic error as: an oral response that shares a *phonological neighborhood* with the target word, and is also a *real word*. In the case of "ranch," the phono-semantic error comes in the form of the word "wrench," which is a word that shares all of its consonant speech sounds with "ranch" (/r/, /n/, /ch/) but is obviously not the same word. This kind of error plays a role in how the meanings of two different words are unraveled and classified. Further, phono-semantic errors become particularly significant when educators use them to contextualize—and elaborate on—a word's meaning.

Additionally, if treated as a unit of analysis, a phono-semantic error can tell us a lot about students' linguistic development, and about what kinds of instruction they need. While "wrench," may not be the sought after word in this exchange (which was "farm," a synonym for "ranch"), it has still taught us something about this particular student's way of thinking about the meaning a word, as well as about her phonological skills. Further, this error offers an opportunity for a teacher to respond in a way that helps students navigate new and contrasting meanings.

Going a little deeper, there are two main possibilities for why the student in this transcript confused "ranch" and "wrench." First, it is possible that this student heard the word "ranch" correctly during the lesson but perhaps had never heard of it before, so was unfamiliar with what a "ranch" signifies. In that case, it makes sense that she would not have a mental representation available for "ranch"—no matter how many times the word was repeated or enunciated. It would be a word that was meaningless to a student even if heard "properly." Thus, in trying to make sense of the word, she used her existing word knowledge as a default system, pulling up the closest phonological approximation she could find that she recognized: "wrench."

In other words, it is possible that she heard the word "ranch" correctly, but didn't know what it meant. So, she equated it with "wrench" (a word *unrelated semantically* but with very *similar phonological* properties to "ranch"). If this were the case,

then the student's implicit thinking was probably that words that *sound* like each other (like "ranch" and "wrench") must have the similar *meanings*. In this case, the student concludes that, like "wrench," a "ranch" is also a tool. This illustrates one way in which a phono-semantic error can give us some insight about what lexical restructuring looks like in classrooms—where a students' phonological skill levels (and assumptions about similar sounding words) are bumping up against their lexical knowledge.

However, a second possibility is that this student's phonological skills were not developed enough to allow her to hear the differences between the two medial vowels, short ă (as in "ranch") and short ĕ (as in "wrench"). So, perhaps, when the teacher said "ranch," the student actually heard it as "wrench" (and proceeded to define it in a context). In this case, it is safe to assume that the student was still working on differentiating short vowel sounds, as well as fine-tuning their related phonemic awareness skills. In this scenario, a weaker ability to discriminate between short ă and short ĕ became a complicating factor in the attempt to grasp the intended meaning of a word.

As the conversation moved along, the teacher did not simply ignore the student's "wrong" answer, or prompt her with the "right" answer. Rather, the teacher validated what the student had "heard" (in terms of similar sounds), called attention to the contrasting sounds and asked the class to repeat the sounds. After that, the conversation continued:

Teacher: Okay, good, so yes, a "wre…ĕ…nch" is a tool, yeah. But, a "r…ă…nch" is a place. It is just like a farm. See? (*opening the book and pointing to a picture*) Look at this page. See all of this? The farm, all of the horses. Yeah, this is a ranch. Remember we read a book about a farm a little while ago? A farm is just like a ranch. They're very, very similar things.

Here, the teacher used a phono-semantic error ("wrench") as an indication of what the student was *hearing* and *made conclusions about how they were making sense*, *overall*. Rather than evaluate the student's response as simply wrong (which some teachers may have done since a "ranch" is simply *not* a "tool"), the teacher took this answer, made some phonological sense of it herself, and then clarified the perceived confusion by calling attention to word meaning. The teacher ultimately grounded the conversation in the service of semantic development of the target word, "ranch."

As the teacher went on to clarify "ranch," she did so by providing an image, offering a synonym ("farm"), and associating it with other words ("horses"). Specifically, the teacher called students' attention to a picture of a "ranch," providing a visual explanation of the word. Further, the teacher reminded the class that they had read about a "farm," before and then explained that it is similar, in meaning, to a "ranch,"—contextualizing it in terms of a place they already know about. Additionally, the teacher also linked "ranch" to horses, explaining that they are often associated with each other, further building students' understanding of the word.

We argue that this type of exchange also illuminates lexical restructuring in action. In this case, a teacher managed to use a sound-based error to expand students' vocabulary knowledge and enrich their schema for "ranch." Seen through the lens of Lexical Restructuring Theory, this teacher instigated something like a metalinguistic, "restructuring push," characterized by calling attention to specific phonemes and to the ways in which they impact meaning.

2.2 Error Tables

Thus, in this conversation, phonemic properties and semantic properties of words implicated each other, and were deemed worthy of expansion. As noted earlier, phono-semantic errors were entered into Error Tables, which were designed to call attention to what happened (on both a phonemic and semantic level) to the target word. Further, Error Tables (See Fig. 1) facilitated error classification into one of the three phonological neighborhoods. Traditionally, phonological neighbors are classified in terms of: (1) consonant neighbors (CN); (2) rime neighbors (RN); (3) onset-vowel neighbors (OVN). An example of these categories for a target word such as "bed" would be "heard" words like *bid* or *bad* (CN), *red* or *fed* (RN), *bet* or *beg* (OVN).

Error tables were also used to keep track of how teachers clarified the meanings of—and between—words. They contained a column where researchers could record any vocabulary strategy used (such as providing visuals, synonyms, associations, or an associated movement, etc.…) to help students develop ascertain the meaning of "ranch."

For the larger study, Error Tables were used to further analyze and classify words within the larger data corpus. Details on that process are beyond the scope of this chapter but we include the Error Tables here in order to better illustrate the concept of a phono-semantic error, and to frame it as a valuable piece of research data. Further, by using the Error Table format to document students' phono-semantic errors, we want to illustrate how these can be *useful tools for educators*. If students' phono-semantic errors are systematically coded and analyzed for specific properties, teachers' can (more efficiently) determine which specific phonological proper-

Target Word	Phono-semantic Error	(CN)					(R)	(OVN)	How Meaning was Clarified
		A	E	I	O	U			
Ranch	Wrench	X	X	-	-	-	-	-	• *Visual method* (picture of ranch) • *Synonym* (farm) • *Conceptual association* (horses)

Fig. 1 Error table for "Ranch"-"Wrench"

ties need practice and review. Further, by collecting data on how teachers respond to these kinds of errors, we will be able to deepen our understanding of how vocabulary-teaching strategies work, and how semantic knowledge is elaborated upon and fostered by teachers.

The second phono-semantic error we are going to discuss is "cut," and is based on the target word, "cot" (referring to a small bed). This target word emerged as the teacher was previewing vocabulary from an upcoming story:

Teacher: "Does anyone know what a "cot" is? It is going to be in this story. Think about if you've ever heard of a "cot" before."
Student: Like you have a "cot" on your finger?
Teacher: What do you mean?
Student: Like a cot, and you need a band aid.
Teacher: Oh, I think you're thinking of "cut." They sound alike but let's look at them, they're different (*proceeds to write the words "cut" and "cot" next to each other*, *underlining the "u," and "o," respectively*). Let's say them together, okay?
Class: "C….ŏ….t," "c….ŭ….t."
Teacher: Okay, so a "c….ŏ….t," is a small bed (*draws picture*). We don't really hear the word "cot" so often, though.

Much like in the "ranch"-"wrench" exchange, this "cot-cut" exchange revolves around a medial vowel feature (see Fig. 2 for Error Table for "Cot"-"Cut"). Like "wrench" to "ranch," "cut" to "cot" fits the definition of a phono-semantic error: a "cut" refers to something real and shares a phonological neighborhood (in this case, consonant sounds) with the word "cot." In terms of phonological development, this conversation tells us that discriminating between short ŏ and short ŭ is a learning need for this student (and likely for some other students, as well). Semantically, we also learn from this error that this student is able to contextualize his understanding of "cut," which is a degree of linguistic understanding that is important to acknowledge.

As in "Ranch"-"Wrench," the teacher takes a semantic error (that a "cot" is something you might have on your finger) and gives it some phonological rationale, calling attention to the distinctiveness of the respective medial vowels. *But*, *the*

Target Word	Phono-semantic Error	(CN)					(R)	(OVN)	How Meaning was Clarified
		A	E	I	O	U			
cot	cut	-	-	-	X	X	-	-	• *Visual* (picture of cot) • *Synonym* (small bed)
shop	chop	-	-	-	-	-	CH SH	-	• *Synonym* (store) • *Movement* (motion of chopping vegetables for "chop")
strep	stress	-	-	-	-	-	-	_P _SS	• *Movement* (point to throat for "strep")

Fig. 2 Error table. "Cot"-"Cut." "Shop"-"Chop." "Strep"-"Stress"

teacher also expands and elaborates on the meaning of "cot," contextualizing it as very similar to a "small bed" (generating a synonym) and drawing a picture (providing an image). In contrast to "Ranch"-"Wrench," the teacher does not have the students solely "listen" for the middle sound. Rather, she writes the target word and its phono-semantic error as a pair, right next to each other, and underlines the medial vowels, "o" and "u," pointing out their distinct orthographic properties. Rather than directing the class to "listen to the middle" (as the teacher did with "ranch-wrench"), she directed the class to "look at" how the words were written—encouraging engagement in a different kind of compare and contrast exercise.

In order to illustrate how other phono-semantic errors would be recorded, we have included additional examples in Fig. 2. One of the phono-semantic error entries recorded is "chop." Unlike "cut" or "wrench," "chop" shares a rime with its phono-semantic error (-op). In this case, the sounds that are difficult to distinguish are the consonant digraphs, "SH" and "CH." To clarify the differences between the meanings of these words, the teacher provided the synonym "store" for "shop" and also modeled a motion of "chopping vegetables," providing a kinesthetic link to "chop." The third phono-semantic error in Fig. 2 occurred between "strep" (as in "strep throat") and stress. "Strep" and "stress" are OVN pairs, sharing the lead letters (s,t,r,e) but having different final sounds (_P, _SS, respectively).

Those familiar with miscue analysis (Goodman, 1973) will likely see commonalities between that process, and our process of classifying and coding phono-semantic errors. However, unlike what we traditionally think of when we think of "miscues," phono-semantic errors are based on spoken language during instruction rather than on the cueing systems being used while a student reads a text. Further, a phono-semantic error analysis is used to crystallize a student's specific phonological and semantic areas of strength and need—rather than to assess the kinds of more general reading skills strategies they need to work on. Phono-semantic analyses are based on how phonological and semantic properties intermingle, and how they instantiate ideas in Lexical Restructuring Theory.

3   Implications

Throughout this chapter, we have paid close attention to phono-semantic errors and to the ways in which they illuminate central aspects of Lexical Restructuring Theory. We have also called attention to some of the unique and productive ways that teachers capitalized on students' errors, treating them as opportunities to help them build semantic knowledge of a target word. Now, we turn to the implications that all of this has for instruction.

First, we make the point that phono-semantic errors are particularly important to consider in the context of struggling readers, who often have difficulty developing or advancing their phonological awareness skills, and who need strong vocabulary instruction, as well. Further, since we know that phonological awareness can be a

predictor of later reading achievement, it makes sense to loop more "sound aware-ness" or "sound consciousness" into all kinds of language instruction. In this way, we suggest a nuance to the idea of fostering "word consciousness," a popular idea in vocabulary instruction. We aim to promote the idea that semantic and phonologi-cal development are more inter-related than they are usually given credit for. Finally, we provide guidelines to help educators use phono-semantic errors as resources during instruction.

3.1 Struggling Readers

It is widely accepted that phonological awareness is a critical factor involved in a child's reading development. Typically, it is a fundamental piece of any reading program designed specifically for students with language-based learning disabili-ties. Indeed, since struggling readers and students with learning disabilities often have difficulty acquiring phonological skills, those who teach them are often trained to guide students in phonological and phonemic awareness activities. Of course, these often include levels of word and sound manipulation tasks (such as rhyming, clapping syllables, isolating onset and rime, isolating sounds, phoneme blending, segmentation and elision). This helps students with their auditory discrimination skills, facilitating their being able to then match individual sounds to symbols.

However, typically, these kinds of phonological awareness tasks do not pay much attention to the meanings of words, their semantic nuances, or associations. This is largely because vocabulary instruction is traditionally treated as relatively disconnected from phonological awareness instruction. By a similar token, phono-logical awareness instruction is often framed as being exclusively about sound iden-tification and manipulation—rather than about the meanings of the words that they are attached to.

However, in line with Lexical Restructuring Theory, we posit that vocabulary and phonological awareness are related, and that improving one is connected to the other. As discussed in our data, students' *weaker phonological representations impacted the ways in which they came to understand the meanings* of words; this provides a clear connection between the phonologic and semantic dimensions of learning. In other words, instruction for struggling readers in phonological aware-ness should not exclude a focus on word meanings. Not only does a focus on the semantic level of words enrich and contextualize phonological awareness instruc-tion, but it also helps students build conceptual knowledge and vocabulary—which are both essential to more global reading skills. Working to design more robust phonological awareness instruction for students with learning disabilities will involve taking vocabulary into greater account.

3.2   Word Conscious, Sound Conscious

In conjunction, creating more effective vocabulary instruction for struggling readers needs to take into account *how individual phonemes* are heard and produced, calling further attention to how sounds have the power to impact meaning. Related to this, *fostering word consciousness* is often cited as a best practice in vocabulary instruction (Beck, McKeown, & Kucan, 2002; Scott & Nagy, 2004). Students who are "word conscious" have a noted awareness and appreciation of words as they are written or spoken, read or heard (Graves & Watts-Taffe, 2002). Our work is in line with this idea but puts emphasis on words as they are spoken and heard.

In other words, more attention needs to be paid to the ways in which being *sound conscious* facilitates oral language development. While it is important to get students interested in thinking about words around them and engaging in language building practices, such as dialogic reading (Lonigan & Whitehurst, 1998), it is just as important to get students interested in thinking about *sounds* around them. Shared reading practices become more robust when explicit attention is paid to the nuances of sounds in words. Being *sound conscious* involves being curious about how sounds can drastically alter meaning.

3.3   A Phono-semantically Integrated Approach to Vocabulary Instruction

So, what would an actual lesson look like that integrated vocabulary knowledge and phonological awareness (what we're calling phono-semantically integrated vocabulary instruction)? Let's pretend that a new vocabulary word to be learned was the word "lime," referring to the sour, citrus fruit. First, an educator would show students picture(s) of a lime, or perhaps bring in a real one. They would help students classify "limes" into different semantic categories such as "small fruits" (with other words such as "lemons" or "kiwis") or in a category labeled "things that grow on trees." An educator would then direct the conversation to the ways in which "limes" share (or differ in their) semantic properties with the words in these categories and would contextualize "limes" in a text or in a familiar situation. In other words, an effective lesson would help identify these kinds of word properties so that *semantic base* would be established.

Our argument is that an effective vocabulary lesson does not end there. Phono-semantically integrated vocabulary also attends to the *phonological dimensions* of "lime." Our position is that more sophisticated vocabulary instruction focuses on this dimension of "lime," as well. By calling students' attention to the way words sound, it is possible that the word's conceptualization, overall, is strengthened. In the case of "lime," (in addition to focusing on its semantic properties mentioned earlier), an effective vocabulary lesson then turns attention to words that share pho-
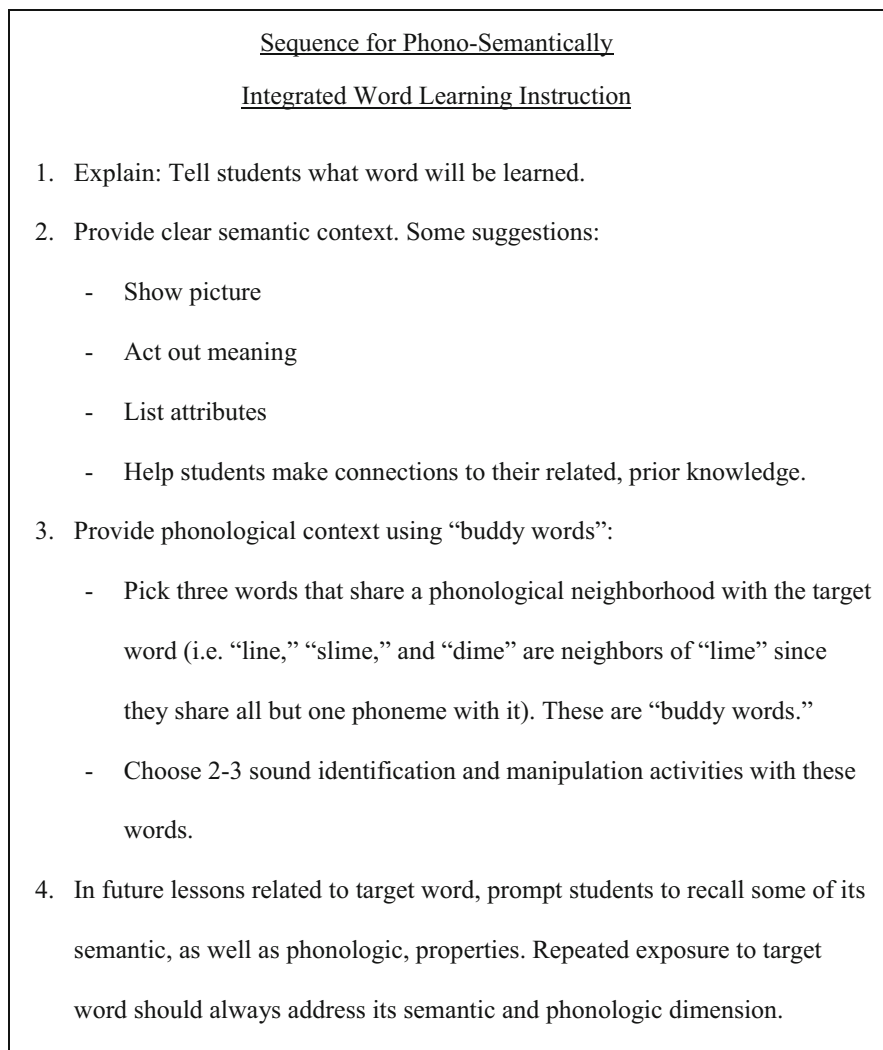
Sequence for Phono-Semantically

Integrated Word Learning Instruction

1. Explain: Tell students what word will be learned.

2. Provide clear semantic context. Some suggestions:

   - Show picture

   - Act out meaning

   - List attributes

   - Help students make connections to their related, prior knowledge.

3. Provide phonological context using "buddy words":

   - Pick three words that share a phonological neighborhood with the target

     word (i.e. "line," "slime," and "dime" are neighbors of "lime" since

     they share all but one phoneme with it). These are "buddy words."

   - Choose 2-3 sound identification and manipulation activities with these

     words.

4. In future lessons related to target word, prompt students to recall some of its

   semantic, as well as phonologic, properties. Repeated exposure to target

   word should always address its semantic and phonologic dimension.

Fig. 3 Lesson sequence

nological neighborhoods (or, phonemes), with "lime"—such as "line," "slime," and "dime." In these lessons, words like these are labeled "buddy words," to facilitate students' understanding the premise that they are very similar to each other, which can make them more difficult to distinguish. Teachers use the "buddy words" to engage students in sound identification and/or manipulation activities.

For example, the teacher might have students generate words that rhyme with "lime" (dime, slime, time) or would have students engage in wordplay that requires them to substitute one of the phonemes for another (such as changing "lime" to "line" or to "like"). Our argument, buttressed by Lexical Restructuring Theory, is

that more intense focus on the unique sounds in new words helps students differentiate it from others that they know. This increases the likelihood that these sounds will become more refined and available to attach to a word's meaning, *strengthening the speech-meaning connection*. Further guidelines for phono-semantically integrated instruction are as follows are in Fig. 3.

4 In Conclusion

One of the key ideas in this chapter is that vocabulary and phonological awareness are related. To this end, we call explicit attention to the existence of phono-semantic errors, and to the ways in which they blur phonological and semantic lines. We also emphasize that order to be most effective for struggling readers, robust vocabulary instruction needs to be grounded in the meanings of words but it also means giving special attention to the particular sounds in words. We developed this idea in the context of Lexical Restructuring Theory, which also frames vocabulary and phonological development as connected. All students (but particularly those with learning disabilities and those who are working on refining their phonological skills) cannot afford to lose out on valuable opportunities to deepen and extend their semantic knowledge. By focusing on what students are both *hearing and thinking about* during word learning, we offer a more enhanced way of studying and responding to students' oral language errors during reading instruction.

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