



BILINGUALISM MATTERS AT PENN STATE

Newsletter

Winter/Spring 2024

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Letter from the Editors

Dear Center for Language Science and Bilingualism Matters
Friends and Colleagues,

This latest issue of our Center for Language Science/Bilingualism Matters at Penn State newsletter tackles the topic of "The Science of Reading." Given that we are a language science center, and not a reading science center, you may be wondering why we would choose to center an entire issue around reading. There are a couple of reasons for this. For one, reading and language are quite closely related: while you do not need to know how to read in order to learn language (as evidenced by one- and two-year-olds everywhere, for example!), you do need to know a language in order to read in that language. But another, and perhaps more important reason, as you will see in this newsletter, is that the Science of Reading movement teaches us about the necessity for making connections between research on a particular topic, such as reading or language, and decisions made in the public domain related to that topic, such as how to teach children. When we allow research to inform our decisions, the benefits to the public can be life-changing. We hope you will enjoy and gain inspiration from the pieces in this newsletter, including a research summary, a featured partner interview with two local experts, and a fun piece for you to try out your own knowledge of the science of reading (and language!). As always, we invite and welcome your feedback, and we wish you a wonderful 2024 and beyond!

Sincerely,

Frances Blanchette, Deborah Adeyeye, Zahaira Cruz Aponte, Daisy Lei,
Pedro Millán, Kathryn Walters

FEATURED RESEARCH

“The Science of Reading”

The Importance of Translating Research to Practice

By Kathryn Walters & Zahaira J. Cruz Aponte

Over a century ago, scientists discovered that our eyes are constantly moving from point to point, and perceived information is only sent to the brain when the eyes are still. This had big implications for the study of reading; the community was flipped on its head! Whereas previously philosophical approaches predominated our understanding of reading, now reading scholars were asking more scientific questions, and working to answer them using machines that would lead to advances like the modern-day eye tracker. In short, the study of reading became a science.

Since reading is in many ways essential for navigating the world, it is important that we understand how it works. This is particularly true when it comes to teaching young kids how to read: Unlike language, reading doesn't come naturally through exposure, so understanding how the reading process works is essential for helping young learners acquire this important skill. However, despite over a hundred years of science-based reading research, the educational community has been slow to adapt to research-based practices. This has been to the detriment of many young students, leading to the current “Science of Reading” movement, which aims to bring insights from reading research into practice [1]. In this article we touch on some aspects of this movement and the research that motivates it and discuss how it provides a case study for why it is important to integrate research into our educational practices.

Our understanding of how reading works is the result of research from multiple disciplines, including psychology, education, communication sciences, neuroscience, and linguistics [1]. One of the important insights we have learned from reading science is that, unlike language, reading is “unnatural” and “artificial” [2]. What this means is that reading is something that must be learned through explicit instruction, as a skill. Science has taught us that children cannot learn to read simply through exposure to books, and they must be given tools to make sense out of the print in front of them. Research has shown quite clearly that understanding how sounds connect to letters (e.g., ‘a’ is for apple, ‘b’ is for bananas) is essential for reading [1]. In some languages, like Spanish, this relationship is fairly straightforward, while in others, like English it is less so. (See our fun piece in this newsletter for more on this!)

Despite the knowledge that connecting letters and sounds is essential for reading, for decades, predominant ways of teaching reading have left explicit instruction on this fundamental aspect of reading out of the curriculum. Instead, reading curricula used in most schools have focused on encouraging children to use context and other elements of the text to figure out what a word says [3]. However, it has now become clear that ignoring the science in this regard has been to the detriment of many emergent readers. In recent years, this has led to a ‘revolt’, led in large part by families and individuals who feel they were sold short by a school system that ignored results from science and therefore failed them in their reading instruction [4]. The science of reading movement emerged from this, as a demand to pay attention to the science and integrate research-based practices into how we teach reading.

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There are numerous connections between the science of reading and language science, which is the focus of our research here at the Center for Language Science. One of these connections has been made between children's understanding of the fundamental abilities associated with reading and the process of learning to read, such as knowledge of the alphabet. When children have a better awareness of the sounds around them, their understanding of the alphabet and how these sounds connect to letters tends to be enriched. This knowledge in turn helps in making the process of learning to read quicker and more efficient. And in turn, learning how to read in a more efficient way helps in improving overall language skills. This process can ultimately lead to gains that extend well beyond reading and language abilities, which is evident when one considers the many doors that both reading and language may open for individuals [5,6].

Looking beyond reading and language, there is much to be learned from the science of reading movement itself. The current movement shows us that, when we ignore lessons from science, this may be to the detriment of society. On the other hand, the path to integrating science into practice can be messy, and the correct way forward is not always clear. By conducting and, importantly, sharing reading and language research with the public in meaningful ways, we can contribute to more informed decisions and practices, and ultimately, to a better shared understanding of the world we live in. Such sharing is essential if we wish for our research to contribute toward improving the lives of and increasing the opportunities available to both current and future generations.

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Fun Feature

Reading and Rhyming Across Languages

By Deborah Adeyeye and Daisy Lei

Different languages have different writing systems, and often times these systems can be just as diverse as the languages themselves. One way in which writing systems vary across languages is in their level of “orthographic transparency”, which is the degree to which each letter corresponds one-to-one with a specific sound. In this activity, you’ll explore a few different languages to see just how orthographically transparent they are. To begin, try saying the words below out loud, and for the languages you know (this may be only English, and that’s okay!) write down 2-3 words that rhyme with each word on the list. Some possible solutions and an explanation are on the next page, but try not to look until you’ve done the activity:

English

o boat
o hair
o said
o two
o fairy

Spanish

o hago
o bota
o bicicleta
o cuna
o ratón
o sázo

Mandarin Chinese

o 你
o 音
o 筷
o 菜
o 听

WHAT DID YOU NOTICE? DO YOU THINK ALL THE LANGUAGES HAVE THE SAME AMOUNT OF ORTHOGRAPHIC TRANSPARENCY?



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FUN FEATURE (CONTINUED)

Here are some possible solutions for each of the word lists:

English

o boat: coat, moat, goat, tote, throat
 o fairy: airy, carry, dairy, berry, very
 o said: bed, fled, head, instead read
 o hair: fair, deer, pear, chair, rare
 o two: blue, due, few, knew, you

Spanish

o hago: lago, pago, mago, halago
 o bota: gota, pelota, derrota
 o bicicleta: maleta, libreta, tarjeta
 o cuna: luna, tuna, pluna, cluma, vacuna
 o ratón: cartón, cajón, varón, balón
 o sázon: tázon, calzon

Mandarin Chinese

o 你: 笛 题 齐
 o 音: 心 金 拼
 o 筷: 怪 帅 坏
 o 白: 抬 来 财
 o 听: 俤 星 丁

Here are some observations you may have made, depending on the languages you know:

- Words that rhyme in English may have different spellings
- Words that rhyme in Spanish have a consistent spelling
- Mandarin Chinese characters that rhyme do not look like each other. In this language there is no sound to letter correspondence!

Orthographic transparency describes the relationship between the written form (orthography) and how the words are pronounced, and as you can see, levels of orthographic transparency vary widely across languages. Connecting this to the theme of our newsletter, which is the “science of reading”, scientific research suggests that noticing these types of connections (or lack of connections) between letters and sounds helps kids learn how to read.

BONUS

**DO YOU KNOW OTHER LANGUAGES?
WHERE WOULD THEY FALL ON THIS SCALE?**



Recent Events

July 12, 2023

Volunteers from the Center for Language Science and Bilingualism Matters at Penn State participated in Children's and Youth Day at the Central Pennsylvania Festival of the Arts where they shared information about language science research through various activities and games including 'brain'-dough, multilingual face-painting, waveform name tags, and more.



August 25, 2023

CLS contributed to Penn State's Ask A Scientist event at the Centre County Grange Fair. We used hands-on activities to spread the word about language science and linguistic diversity, and had the chance to interact with lots of folks from Central Pennsylvania and beyond!



September 30, 2023

CLS contributed to Penn State's Haunted-U event at the University Park campus. We used fun activities, including creating name tags with the sound waves of our guests' names, to spread the word about language science to Penn State students and families. We even had a guest perform a bird call for us to graph!



November 8, 2023

CLS contributed to Exploration-U event at the Bellefonte Area High School. We used fun activities to teach people about language science, including a guess-the-celebrity game that uses the International Phonetic Alphabet, and "name tags" that captured the sound of people's voices.



FEATURED PARTNERS

Interviewed by Pedro Millán

We interviewed CLS faculty member Amy Crosson, an associate professor in education, and Jonathan Klingeman, Director of MTSS and Intervention Supports in the State College Area School District. Their experiences working in schools have given them a front-row seat to the science of reading movement, and how it is playing out in our communities. Their stories and viewpoints provide new insights into this not-so-new scientific approach to reading, and further illustrate the importance of translating research into practice.



Amy Crosson



Jonathan Klingeman

1. What is the science of reading and how does it relate to what you do?

Jonathan: Reading science is the interdisciplinary body of science-based research related to reading and writing. It has been empirically validated by over one hundred and fifty scientific studies. One of the main findings is that reading comprehension is the product of two components: word recognition and language comprehension. If we have deficiencies in either of these components, reading comprehension will suffer. My goal is to make sure access to science-based instruction in reading is equally accessible for all students. This is challenging because for a long time this has not been the only way to approach reading.

Amy: First, it might help to clarify what the “science of reading” is not. It is not a specific curriculum, nor is it a prescriptive approach to teaching reading. Instead, the science of reading is a growing body of research from neuroscience, psychology, and education, among other fields, that sheds light on the incredible feat of reading. It comprises empirical studies that have been carried out using scientific methods and are published in peer-reviewed journals. We know from this research that our brains are not hardwired to learn to read, and that we have to leverage areas of the brain in ways that do not come to us easily to be able to read.

While this body of research has been instrumental in our understanding of how people are able to read, there is much work to do to translate what these scientific advances mean for instructional practice. My work focuses on translational science—that is, taking what we are learning about psychological processes in the development of reading to design instructional practices that are most effective for students with different strengths and needs. I am very interested in taking what we have learned about the role of vocabulary knowledge in reading and the role of morphological processing in learning new word meanings to carry out classroom-based studies with multilingual adolescents.

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2. What are some ways in which we can effectively publicize reading science research? Can you think of measures that worked in this regard?

Jonathan: I highly recommend a podcast called *Sold a Story*, which is produced by Emily Hanford. It is an amazing series on the debate between the whole language and code based reading systems, where these systems came from and where they are now. I have seen this podcast make a positive impact on teachers by shedding light on the shortcomings of instructional practices that eschew the science of reading, and how they have negatively affected student learning.

Amy: There are some good examples of how to publicize reading science research. There are several accessible, interesting and informative podcasts with Maryanne Wolf of UCLA's Center for Dyslexia, Diverse Learners and Social Justice. Another great example of public engagement is Tim Shanahan's interactive blog called *What is the science of reading?*

3. How accessible do you find science of reading research to be for both academic and non-academic public? What are some obstacles in its accessibility, and how can we mitigate them?

Jonathan: While the research is accessible, it is a challenge that each teacher takes on as part of their journey. Oftentimes, change is gradual. One place where there are gaps right now is in trying to get this research to the parents. This is where the equity piece really comes into play, since once parents are informed, they can advocate for evidence-based curricular resources in their children's classrooms.

Amy: I think the science of reading research is quite accessible to academic audiences. In 2020, a flagship journal in reading research, *Reading Research Quarterly*, published two special issues focused on the science of reading (SOR). A recurring theme in the two special issues is that we need to expand our thinking about the SOR beyond early reading instruction (i.e., phonemic awareness and development of decoding skills) to empirical studies that focus on other aspects of reading such as word knowledge, morphology, and comprehension. Also, I am very excited to see an upcoming issue in the journal, *Scientific Studies of Reading*, that will be focused on the science of teaching reading. This will be a great contribution, as a major challenge has been taking findings from research in neuroscience and psychology and figuring out how this research can shape and be shaped by findings about teaching and learning in classroom settings.

4. What are some examples of reading research that has been applied easily in the classroom?

Jonathan: One example is code-based programs that make the scope and sequencing of the learning very explicit. Something called decodable books have made great strides in this new approach. A decodable is a book with words that have spelling patterns a child has been taught. Seeing these patterns, saying them, spelling them, and practicing them is what makes the material more prone to be successfully learned. Through practice, we can automatize this reading process. Another wonderful resource I want to shout-out for multilingual learners learning English at school is the *Literacy Foundation for English Learners* by Elsa Cárdenas-Hagan.

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Amy: Effective and engaging instruction is never easy! However, there are some very good examples of reading research that have been carefully supported for classroom implementation. One that has been particularly effective with multilingual learners at the elementary level is the CLAVES intervention by Rebecca Silverman, Patrick Proctor and colleagues, which integrates instruction on word analysis and discussion-intensive approaches to comprehension. My team carried out a project with multilingual adolescents called English Learners' Robust Academic Vocabulary Encounters where we developed highly supportive instructional materials and guides for application to classroom settings.

5. Are there activities that the teachers you work with have found particularly easy to implement that took inspiration from research findings?

Jonathan: For our kids in kindergarten, first and second grade, we are teaching them to take the skills they learn in the classroom and apply them to decodable texts. It's all about taking learning beyond just the teacher. The steady movement towards using decodable textbooks has been great. For example, we might have them practice the short [e] with the teacher, but also with a decodable text.

Amy: I think Jonathan's example of developing independence with decodable texts is a great example. With older learners— those in the upper elementary grades and into high school— a focus on morphology to spell, read, and understand the meaning of multisyllabic words is important. This will begin with work in prefixes and suffixes, to understand how they are added and taken away from base words, and how these changes shift their meanings and uses. Eventually a focus on bound roots, such as "bio" and "graph" in "biography" is great fodder for discussion, analysis, discovery, and connecting knowledge.

EXTRA CREDIT

CHECK THESE RECOMMENDATIONS FROM OUR FEATURED PARTNERS:

Biblingo: Learn the Biblical Languages. (2023, November 16). The Reading Brain: Insights from Neuroscience with Maryanne Wolf (Reading Fluency: Part 1) [Video]. YouTube.

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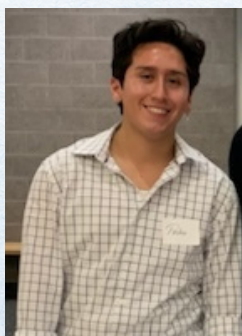
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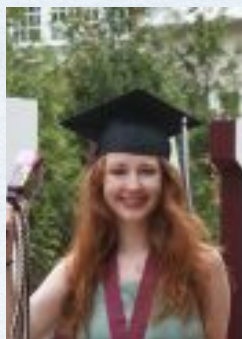
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