GETTING TO AUTO-WORDS:
Why Phoneme Awareness and Phonics Go Together

The term "sight word" has accumulated too many meanings. It no longer means the same thing to everyone. We need a term with a very specific meaning to talk about how the brain learns to automatically and instantly recognize words. This essay is about getting to "auto-words." You cannot get there by memorizing the visual appearance of words. You have to take another route.

Trying to learn to read with just your eyes and your ears is like trying to drive a car without a motor. Speech is the motor. Before you learn to read, your speech motor is turned on and running. You can speak and you can understand what others are saying. But in order to drive toward literacy you have to engage some gears. When it was built, your speech motor was put together with quite a few parts (some say 40-44 for driving in English). They are the speech-bits or "phonemes." (The word phoneme is misleading because it means "sound-bit." Phonemes are more than sound-bits. They are speech-bits.)
Those parts work together to make spoken words. That is how you can say and understand so many words. You string individual speech sounds together to pronounce a word. To read, you have to shift gears. You have to link those speech-bits with 26 new visual symbols.

The first shift: Long, long ago, when people lived in caves and had to hunt for their food, they began to realize that they could make pictures of the things they saw around them. If you were a cave person, you might begin to draw on the walls of the caves where you lived--pictures of deer and lions, and pigs—even pictures of your own hands. You would find it exciting that you could make a picture (a symbol) that represented something real. You could leave messages for each other. A picture of a fish might mean "I've gone fishing." Eventually those messages got more complicated, with several pictures used to convey the message.

Adding new gears: Then, imagine that one day you made a huge discovery—you noticed that whenever you said a word, you were making different sounds with your mouth, stringing together speech-bits to pronounce the word. What if you could draw a picture that would be a symbol of a speech-bit! You could make words that you could see! And that's when the speech motor in your brain began to be re-designed (upgraded) with new gears for literacy.

You drew a picture for the speech sounds you made in a short word. Then you realized that you were using the same sound in other words. Eventually, you were able to draw every one of the speech-bits that your speech motor used to make words. Now, by engaging this new gear you could leave longer, more detailed messages. You could use these symbols like a code for the sounds you made with your mouth when you pronounced a word—you could write! And someone else, if they knew your code, could figure out what you had written. It was new gears you were adding to the speech motor in your brain. It was a discovery that changed the world!

Using new gears: Let's suppose that a little boy today is being introduced to this new skill of literacy. In order to engage new gears, he has to make connections between the speech-bits and the 26 letters. The speech-bits are all there in his speech motor and he has used them a lot to learn how to talk, but now he has to learn how to shift gears. Those speech-bits have all been connected in spoken words. To shift gears, he has to re-design his speech motor to break apart the speech-bits in the spoken words and connect them to letters. He has to add these new sound-symbol links systematically in a

way that makes sense to his brain. He has to do what his ancestor did so long ago—figure out the speech-bits in some short word, and then connect each speech-bit that he pronounces to a letter (or sometimes more than one letter, (e.g. ch, sh, ng, aw) he draws in order to write the word. (If drawing is hard at first, he can also assemble letter tiles, or press computer keys).

Upgrading his speech motor with new gears requires three connections— (1) the spoken word (and its meaning), (2) the speech-bits (phonemes), that are strung together to pronounce that word, and (3) the letters that stand for those speech-bits. Once he is successful at making the first connections between a few speech sounds and letters, he can practice over and over, sounding-out and constructing new three-letter words, noticing how he uses the same speech-bits in different words. He says the sounds as he creates each visual word. It's exciting! He is using a code (the alphabet) to "en-code" spoken words—to change them from words he can say and hear into words he can see.

Getting to auto-words: Early on, he is c*onsciously* linking pronunciations of meaningful words to strings of letters as he encodes more and more short words. With practice, these links become *automatic (and unconscious*) until he is proficient at identifying all the speech-bits in any word and linking them easily without conscious effort to the letters that represent them. This new gear connects his speech motor with the visual symbols that represent the sounds he is making with his mouth.

As he learns to encode, he can also learn to decode--to engage the "reverse" gear. Now he more easily understands how blending the sounds of each written letter in a string can result in a pronunciation of a word he might recognize. His speech motor now has two gears:
Gear 1--*encode*: Segmenting spoken words into speech-bits and encoding speech-bits with letters to make words.
Gear 2—*decode (reverse gear)*: Blending the speech--bit represented by each letter in a written word with the next in order to produce a pronunciation that resembles a recognizable word.

Now, with repetition, written words start to become familiar. The links between pronunciations and strings of letters are more and more easily connected. Those links are the neural pathways the brain uses to store visual (printed) words for instant recognition. Storing written words as links between pronunciations and strings of letters allows him to recognize them automatically. His brain is storing auto-words. These links create the neural pathways that produce the "orthographic mapping" phenomenon that enables automatic, instant word recognition. Now this lexicon (i.e., mental dictionary) grows as he encounters new written vocabulary and reads more complex text. He has added a new gear: Gear 3--*automatic*: Driving through literacy with automatic and instant recognition of words—that is, auto-words.

Implications for instruction: Memorizing the visual appearance of words does not create the neural pathways in the brain that are necessary for instant word recognition. Engaging the "speech motor" is essential because it is the "motor" that enables the identification, manipulation, and blending of phonemes. It is the motor act (and motor memory) of producing the sound, the kinesthetic feeling of the mouth articulating each sound, and the auditory feedback and memory of hearing the produced sound that help to cement these new links with visual letters. As this little boy reads effortlessly, his lips may not be moving, but his brain is talking.

Phoneme awareness (PA) is most efficiently achieved by segmenting very short (three-letter) spoken words into their individual speech-bits and linking them to letters. New sounds and letter can be introduced one-at-a-time. Onset-rime word families work very well because they repeat two of the

speech-sounds and only require changing the initial sound to make a new word. Other exercises frequently used to develop PA are less efficient because they introduce it as a separate skill, leaving the child (and the teacher) wondering "why am I doing this?" Or, they introduce PA as a purely auditory skill, asking "what sound did you *hear* at the beginning of that word?" rather than "what sound did you *say* at the beginning of that word?" Assessments to evaluate manipulation or deletion skills are not as quick and efficient as asking a child to spell a list of nonsense words. Assuming that you are teaching English literacy, if a child has difficulty segmenting and spelling a nonsense word, you can see right away which sounds or letters he has not yet mastered.

Creating visible words from spoken words is meaningful and fun. For most children, it has to happen in an explicit and deliberate sequence of instruction. Children can feel their powers growing and be excited with each new word they create. Read to them (*a lot!),* but don't ask them to read words (well, maybe few) that are not decodable until they get a basic feel for how written words are put together in English. Their brains are eager to notice patterns and rules. Encountering too many exceptions interrupts that process. Children can use implicit or intuitive learning to discover rules. For example, in the case of spoken language acquisition, children are known to regularize irregular verbs and say "I goed to the store yesterday" before anyone has told them about the past tense pattern of verbs ending in the sound /d/. In contrast, very few children can "discover" the regularities between speech sounds and letters. They need instruction.

Once they have mastered phoneme awareness and phonics and their brains have absorbed a few rules, they can start dealing with more complex words—incorporating morphology and new rules, and exceptions to those rules. When children master decoding there is no reliance on guessing to identify individual words. They will use their mastery of the code to tackle (de-code) any new word competently by themselves. They can use context and syntax to resolve ambiguity when words mean more than one thing, or when they are deducing the meaning of a new vocabulary word.

I have tried to create a simple analogy to explain how to get to auto-words. Of course real life is never simple. Even the "simple view of reading" is not simple. But I hope this analogy helps. I would like to imagine many, many more children driving their upgraded literacy cars independently down a superhighway, able to enjoy the meaning of what they are reading or writing without struggling over bumps in the road.

Special note:
Phonemes: The word phoneme is misleading because it means "sound-bit." Phonemes are more than sound-bits. They are speech-bits.

About the Author
Jeannine Herron, Ph.D., San Rafael, CA.

Dr. Herron, a research neuropsychologist, carried out EEG and Behavioral Investigations of Dyslexia at UCSF for ten years, and has been awarded five grants from the National Institute of Child Health and Development (NICHD) to develop and do research with materials for early literacy instruction.

Suggested reading:

1. Ehri, L. (2020) The Science of Learning to Read Words: A Case for Systematic Phonics Instruction. Reading Research Quarterly, August 55(3)
2. Herron, J. & Gillis, M. (2020) Encoding as a Route to Phoneme Awareness and Phonics, Perspectives on Language and Literacy, summer.
3. Kilpatrick, D. (2020). How the Phonology of Speech is Foundational for Instant Word Recognition, Perspectives on Language and Literacy, summer. pp 11-15.
3. Seidenberg, M. 2021, Lost in Translation, in press, Reading Research Quarterly.
4. Torgesen, J.K., Wagner, R.K., Rashotte, C.A., Herron, J., Lindamood, P. (2010). Computer assisted instruction to prevent early reading difficulties in students at risk for dyslexia: Outcomes from two instructional approaches, Annals of Dyslexia, vol 60, pp 40-46.