

Three Queuing Systems

Some of the References

Andrew P. Johnson, Ph.D.

www.teaching-reading.com

Orthographic Mapping

1. Mapping – neural pathways and neural networks

2. Orthographic system - letters, letter patterns, and arrangement of letters to represent sounds.

3. Logographic systems – logo is a symbol used to represent a thing.

4. Orthographic mapping – words are memorized and stored in LTM based on letter patterns.

Ehri, L. (2014). Orthographic mapping in the acquisition of sight word reading, spelling memory, and vocabulary learning. *Scientific Studies of Reading, 18*, 5-21

5. Semantic mapping (memory) – concepts are encoded and organized in LTM

Morais, A., Olsson, H., & Schooler, (2012). Mapping the structure of semantic memory. *Cognitive Science 37*, 125-145

Rogers T., & Wolmetz M. (2016) Conceptual knowledge representation: A cross-section of current research. *Cogn Neuropsychol, 33*, 121-129

6. Words stored in LTM, networks are connected to other words with semantic relationship.

Collins, A., & Loftus, E. (1975). A spreading-activity theory of semantic processing. *Psychological Review, 82*, 407-428.

Deacon, S.H., & Kieffer, M. (2018). Unraveling the relationship between syntactic awareness and reading comprehension: Evidence from mediation and longitudinal models. *Journal of Educational Psychology, 110*, 72-86.

Siew, C., (2019). Spreadr: An R package to simulate spreading activation in a network. *Behavior Research methods, 51*, 910-929.

7. The strongest level of word representation in LTM is not letter patterns (bottom), but meaning (top). Orthographic may be a thing, but semantic mapping is much more of a thing.

a. top - conceptual level – contains the semantic information about words

b. next – lexical level – word form that matches the concept

c. bottom - phonological level – sound information that corresponds to the word

Damasio, H., Grabowski, T.J., Tranel, D., Hichwa, R.D., & Damasio, A.R. (1996). A neural basis for lexical retrieval. *Nature, 380*, 499-505.

Spreading Activation

1. Semantic memory is organized by semantic distance or relatedness, not letter patterns Semantic similarities not orthographic similarities

Collins, A., & Loftus, E. (1975). A spreading-activity theory of semantic processing. *Psychological Review, 82*, 407-428.

2. Activation of a node on a network spreads to related nodes and facilitates word recognition.

Collins, A., & Loftus, E. (1975). A spreading-activity theory of semantic processing. *Psychological Review, 82*, 407-428.

3. Spreading activation accounts for semantic priming

Collins, A., M., & Loftus, E.F. (1975). A spreading activation theory of semantic processing. *Psychological Review, 82*, 407-428.

Kintsch, W. (1988). The role of knowledge in discourse comprehension: A construction-integration model. *Psychological Review, 95*, 163-182

- Rumelhart, D.E. (1994). Toward an interactive model of reading. In R.B. Ruddell, M.R. Ruddell, & H. Singer, (Eds), *Theoretical models and process of reading*, (pp. 864-894). International Reading Association.
- Siew, C., (2019). Spreadr: An R package to simulate spreading activation in a network. *Behavior Research methods*, 51, 910-929.

Predictor

1. The brain is a predictor – reading and reality – constantly reaching out and filling in the blanks.

Gavard, E., & Ziegler, J. (2022). The effects of semantic and syntactic prediction on reading aloud. *Experimental Psychology*, 69, 308-319.

Lupyan, G., & Clark, A. (2014). Words and the world: Predictive coding and the language-perception-cognition interface. *Association for Psychological Science*, 24, 279-284
2. Hierarchically system, used to predict activity below.
 - a. Concepts used to predict words. Meaning used to recognize words

Lupyan, G., & Clark, A. (2014). Words and the world: Predictive coding and the language-perception-cognition interface. *Association for Psychological Science*, 24, 279-284
3. Readers use higher level linguistic ability (semantic knowledge and syntactic awareness) to perform lower level skills (word reading) in context

Goodman, K.S. (1967). Reading: A psycholinguistic guessing game. *Journal of the Reading Specialist*, 6, 126-135.

Laroche, A., & Decon, A.H. (2019). The relation between syntactic awareness and contextual facilitation in word reading: What is the role of semantics? *Journal of Research in Reading*, 42, 178-192

Priming Studies

1. A word precedes a target
 2. Participants are asked to identify a target or select the correct target word
 3. Done in a sentence
 4. Done outside a sentence
 5. Semantic primes –
 6. Syntactic primes –
1. Priming studies examine how quickly and accurately a person identifies a word or concept based on a previous stimuli (association).

Higgins E., Rholes W., & Jones C. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, 13, 141–154.

Tulving, E. (1962). Subjective organization in free recall of “unrelated” words. *Psychological Review*, 69, 344-354.
 2. We identify words much more quickly and accurately when put in the context of a sentence vs. in isolation

Higgins E., Rholes W., & Jones C. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, 13, 141–154

Semantics

1. Semantic priming correlated with both word reading and comprehension.

Gavard, E., & Ziegler, J. (2022). The effects of semantic and syntactic prediction on reading aloud. *Experimental Psychology*, 69, 308-319.

Nobre, A.P., & Salles, J.F. (2016). Lexical-semantic processing and reading: Relations between semantic priming, visual word recognition, and reading comprehension. *Educational Psychology*, 36, 753-770.

Siew, C., (2019). Spreadr: An R package to simulate spreading activation in a network. *Behavior Research methods*, 51, 910-929.

2. Semantic priming shows (a) faster word recognition time and (b) enhanced accuracy. Example: Bread to butter vs. bread to nurse

Collins, A., & Loftus, E. (1975). A spreading-activity theory of semantic processing. *Psychological Review*, 82, 407-428.

Gavard, E., & Ziegler, J. (2022). The effects of semantic and syntactic prediction on reading aloud. *Experimental Psychology*, 69, 308-319.

Higgins E., Rholes W., & Jones C. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, 13, 141-154.

Nobre, A.P., & Salles, J.F. (2016). Lexical-semantic processing and reading: Relations between semantic priming, visual word recognition, and reading comprehension. *Educational Psychology*, 36, 753-770.

Siew, C., (2019). Spreadr: An R package to simulate spreading activation in a network. *Behavior Research methods*, 51, 910-929.

Syntax

1. Syntax plays an important role in learning to read.

Bowery, J.A. (1986). Syntactic awareness in relation to reading skill and ongoing reading comprehension monitoring. *Journal of Experimental Child Psychology*, 41, 282-299.

Tunmer, W., Nesdale, A., & Wright, A.D. (1987). Syntactic awareness and reading acquisition. *British Journal of Developmental Psychology*, 5, 25-34.

2. Syntax contributes to reading comprehension

Bowery, J.A. (1986). Syntactic awareness in relation to reading skill and ongoing reading comprehension monitoring. *Journal of Experimental Child Psychology*, 41, 282-299.

Brimo, D., Apel, K., & Fountain, T. (2017). Examining the contributions of syntactic awareness and syntactic knowledge to reading comprehension. *Journal of Research in Reading*, 40, 57-74.

Brimo, D., Lund, E., & Sapp, A. (2018). Syntax and reading comprehension: A meta-analysis of different spoken-syntax assessments. *International Journal of Language & Communication Disorders*, 53, 431-445.

Deacon, S.H., & Kieffer, M. (2018). Unraveling the relationship between syntactic awareness and reading comprehension: Evidence from mediation and longitudinal models. *Journal of Educational Psychology*, 110, 72-86.

Gavard, E., & Ziegler, J. (2022). The effects of semantic and syntactic prediction on reading aloud. *Experimental Psychology*, 69, 308-319.

Goodman, G. O., McClelland, J.L., & Gibbs, R.W. (1981). The role of syntactic context in word recognition. *Memory & Cognition*, 9, 580-586

Guo, Y., Roehrig, A., & Williams, R. (2011). The relation of morphological awareness and syntactic awareness to adults' reading comprehension: Is vocabulary knowledge a mediating variable. *Journal of Literacy Research*, 43, 159-183.

Kennedy, D. K., & Weener, P. (1973). Visual and auditory training with the cloze procedure to improve reading and listening comprehension. *Reading Research Quarterly*, 8, 524-541.

MacKay, E., Lynch, E., Duncan, T.S., & Deacon, S.H. (2012). Informing the science of reading: Students' awareness of sentence-level information is important for reading comprehension. *Reading Research Quarterly*, 56, s221-s230

Mokhtari, K., Thompson, H. B. (2006). How problems of reading fluency and comprehension are related to difficulties in syntactic awareness skills among fifth graders. *Reading Research and Instruction*, 46, 73-94.

Poulsen, M., & Gravgard, A.K.D. (2016). Who did what to whom? The relationship between syntactic aspects of sentence comprehension and text comprehension. *Scientific Studies of Reading*, 20, 325-338

Proctor, C.P., Silverman, R. E., Haring, J.R., Jones, R.I., & Hartranft, A.M. (2020). Teaching bilingual learners: Effects of a language-based reading intervention on academic language and reading comprehension in grades 4 and 5. *Reading Research*

3. Syntactic information improves word recognition

Gavard, E., & Ziegler, J. (2022). The effects of semantic and syntactic prediction on reading aloud. *Experimental Psychology*, 69, 308-319.

Goodman, G., McClelland, J., & Gibbs, R. (1981). The role of syntactic context in word recognition. *Memory and Cognition* 9, 580-586. Context facilitates word recognition.

4. Syntax correlated with reading comprehension, comprehension monitoring, and reading achievement.

Bowery, J.A. (1986). Syntactic awareness in relation to reading skill and ongoing reading comprehension monitoring. *Journal of Experimental Child Psychology*, 41, 282-299.

Gavard, E., & Ziegler, J. (2022). The effects of semantic and syntactic prediction on reading aloud. *Experimental Psychology*, 69, 308-319.

5. Training to develop syntax improves comprehension

Bowery, J.A. (1986). Syntactic awareness in relation to reading skill and ongoing reading comprehension monitoring. *Journal of Experimental Child Psychology*, 41, 282-299.

Kennedy, D. K., & Weener, P. (1973). Visual and auditory training with the cloze procedure to improve reading and listening comprehension. *Reading Research Quarterly*, 8, 524-541.

Mokhtari, K., Thompson, H. B. (2006). How problems of reading fluency and comprehension are related to difficulties in syntactic awareness skills among fifth graders. *Reading Research and Instruction*, 46, 73-94.

Poulsen, M., & Gravgard, A.K.D. (2016). Who did what to whom? The relationship between syntactic aspects of sentence comprehension and text comprehension. *Scientific Studies of Reading*, 20, 325-338

Proctor, C.P., Silverman, R. E., Haring, J.R., Jones, R.I., & Hartranft, A.M. (2020). Teaching bilingual learners: Effects of a language-based reading intervention on academic language and reading comprehension in grades 4 and 5. *Reading Research*

Weaver, P. A. (1979). Improving reading comprehension: Effects of sentence organization instruction. *Reading Research Quarterly*, 15, 129-146.

Syntax and Semantics

1. Students benefit by being taught to use both phonics and context (semantics and syntax)

Schotter, R., Angele B., & Rayner, K. (2012). Parafoveal processing in reading. *Attention, Perceptions, and Psychophysics*, 74, 5-35

2. Semantic and syntactic information are important sources of contextual information used to recognize words during reading.

Cain, K. (2007). Syntactic awareness and reading ability: Is there any evidence for a special relationship? *Applied PsychoLinguistics*, 28, 679-694

Christopher, M.E., Miyake, A., Keenan, J.M., Pennington, B., DeFries, J.C., Wadsworth, S., J., & Olson, R.K. (2012). Predicting word reading and comprehension with executive function and speed measures across development: A latent variable analysis. *Journal of Experimental Psychology*, 141, 470-488.

Laroche, A., & Decon, A.H. (2019). The relation between syntactic awareness and contextual facilitation in word reading: What is the role of semantics? *Journal of Research in Reading*, 42, 178-192

Kennedy, D. K., & Weener, P. (1973). Visual and auditory training with the cloze procedure to improve reading and listening comprehension. *Reading Research Quarterly*, 8, 524-541.

3. Reading comprehension requires both syntactic and semantic processing.

Bowery, J.A. (1986). Syntactic awareness in relation to reading skill and ongoing reading comprehension monitoring. *Journal of Experimental Child Psychology*, 41, 282-299.

Eye Movement

1. We look longer at low-frequency words than high frequency words (doesn't matter the length of the word.) Fixations shorter and less frequent with highly predictable words

Ehrlich, S.F., & Rayner, K. (1981). Contextual effects on word perception and eye movements during reading. *Journal of Verbal Learning and Verbal Behavior*, 20, 641-655

Schotter, R., Angele B., & Rayner, K. (2012). Parafoveal processing in reading. *Attention, Perceptions, and Psychophysics*, 74, 5-35.

2. When words are predictable (using semantic or syntactic clues), fixations short or tended to be skipped over vs. fixated on.

Ehrlich, S.F., & Rayner, K. (1981). Contextual effects on word perception and eye movements during reading. *Journal of Verbal Learning and Verbal Behavior*, 20, 641-655

3. Word skipping decisions based on semantic processing

Goodman, G. O., McClelland, J.L., & Gibbs, R.W. (1981). The role of syntactic context in word recognition. *Memory & Cognition*, 9, 580-586

Schotter, R., Angele B., & Rayner, K. (2012). Parafoveal processing in reading. *Attention, Perceptions, and Psychophysics*, 74, 5-35.

4. Information about a word can be obtained before the eyes fixate on it.

Schotter, R., Angele B., & Rayner, K. (2012). Parafoveal processing in reading. *Attention, Perceptions, and Psychophysics*, 74, 5-35

6. Syntax facilitate eye skipping

Goodman, G. O., McClelland, J.L., & Gibbs, R.W. (1981). The role of syntactic context in word recognition. *Memory & Cognition*, 9, 580-586