
COMBINED LEXICAL AND SUBLEXICAL TREATMENT FOR AGRAPHIA

For many people with agraphia, there is no one single cause for their writing difficulties. Rather, there are a variety of language processing components that are compromised and result in difficulty spelling single words. Cognitive neuropsychological models break writing down into a series of language processing components, each with their own unique contribution to the writing process (see Figure 1).

Using a cognitive neuropsychological approach, Johnson, Ross, and Kiran (2017) developed a multi-component spelling treatment that aims to target all aspects of spelling single words. Their hierarchy is as follows:

TREATMENT HIERARCHY (ADAPTED FROM JOHNSON, ROSS, & KIRAN, 2017)

1. Lexical Decision: Clinician speaks aloud 2 words (one that is the target written, and one that is a nonword foil). Client is asked to identify the target word. If the nonword foil is chosen, client is corrected and target written word is emphasized.

Language Processing Components Targeted: Phonological Input Lexicon

2. *Writing to Dictation: Clinician says aloud the target word and the client is asked to write it. Clinician provides feedback on accuracy.

Language Processing Components Targeted: Phonological Input Lexicon, Orthographic Output Lexicon

3. Copying: Clinician says the target word and provides a written model. Client is asked to copy this model.

Language Processing Components Targeted: Phonological Input Lexicon, Orthographic Input Lexicon, Orthographic Output Lexicon

4. Word-Picture Matching: 3 pictures are brought out (1 picture of the target word and 2 pictures of other words being trained). Clinician states target word and client is asked to identify which picture matches the target word. If client chooses an incorrect picture, remove the incorrectly identified picture and try again.

Language Processing Components Targeted: Phonological Input Lexicon, Semantic System

5. Semantic Feature Analysis/Generation: Client is asked to perform a Semantic Feature Analysis of the target word using the correct picture from Step 4 (e.g., client is asked where target is found, what it looks like, etc). If it is difficult for the client to come up with semantic features, perform a feature verification task (i.e., “Does this object live in the water?”)

Language Processing Components Targeted: Semantic System

6. *Grapheme-Phoneme Conversion: Letter tiles for each of the letters in the written target word are provided, as well as a few extra tiles for letters that are not in the word. Each letter is randomly presented to the client, and they are asked to give the sound/phoneme typically associated with that letter. Provide the correct sound and ask client to repeat if any letters are incorrect.

Language Processing Components Targeted: Grapheme-Phoneme Conversion

7. *Anagram Spelling: The letter tiles are scrambled and the client is asked to spell out the word using the correct letter tiles (extra letter tiles not in the target word can be placed to the side). Phonemic cues are given as needed.

Language Processing Components Targeted: Orthographic Output Lexicon, Phoneme-Grapheme Conversion

8. *Grapheme-Phoneme Conversion: Each grapheme/letter of the word is pointed to and client is asked to say the corresponding sound/phoneme as it is used in the word (start with letters at the beginning of the word). Models for incorrect productions are provided, and client is asked to repeat.

Language Processing Components Targeted: Grapheme-Phoneme Conversion

9. *Phoneme-Grapheme Conversion: A random sound/phoneme from the written target word is produced by the clinician, and the client is asked to identify which letter/grapheme goes with it. For incorrect responses, the clinician points to the correct one and the client is asked to look at it while repeating the correct sound/phoneme.

Language Processing Components Targeted: **Phoneme-Grapheme Conversion

10. *Writing to Dictation: Clinician says aloud the target word and the client is asked to write it. Clinician provides feedback on accuracy.

Language Processing Components Targeted: Phonological Input Lexicon, Orthographic Output Lexicon

11. Copying: Clinician says the target word and provide a written model. Client is asked to copy this model.

Language Processing Components Targeted: Phonological Input Lexicon, Orthographic Input Lexicon, Orthographic Output Lexicon

12. *Delayed Writing: Client is asked to count to 10, and then write the target word again. Clinician provides feedback on accuracy.

Language Processing Components Targeted: Graphemic Buffer, Orthographic Output Lexicon

13. Copying: Clinician says the target word and provide a written model. Client is asked to copy this model.

Language Processing Components Targeted: Phonological Input Lexicon, Orthographic Input Lexicon, Orthographic Output Lexicon

*These are the treatment steps that Johnson, Ross, and Kiran thought to be the most important in treatment gains

**Note that this component is not present in the provided Figure 1 model; for a model that incorporates this component, check out Patterson and Shewell's (1987) Logogen Model

Treatment Outcomes

Results of this treatment study found participants to improve spelling accuracy of both trained and untrained words, along with improvements in *reading* of trained and untrained words! The researchers also theorized that the following steps were the most helpful in treatment gains: Writing to Dictation, Grapheme-Phoneme Conversion, Anagram Spelling, Phoneme-Grapheme Conversion, and Delayed Writing. Given the theoretical rationale and treatment gains from this study, consider adding a Multi-Component approach to your agrpahia treatment toolbox!

References:

Johnson, J., Ross, K. & Kiran, S. (2017). Multi-step treatment for acquired alexia and agraphia (Part I): efficacy, generalisation, and identification of beneficial treatment steps. *Neuropsychological Rehabilitation*, 29(4), 534-564.

Patterson, K., & Shewell, C. (1987). The cognitive neuropsychology of language. *Speak and spell: dissociations and word class effects*. London: Erlbaum, 273-94

Figure 1

