



## ABSTRACT

The purpose of this study was to explore how the brain processes information, stores it in long-term memory and then applies that knowledge to teaching music in a classroom/rehearsal setting. We observed how the working memory, the system responsible for processing information from short-term and long-term memory can function with greater efficiency. We observed how the number of items available for processing in the working memory may be increased through a process identified as “chunking.” Chunking is when short patterns, or bits of information, are combined to form longer sequences. When applying these brain-friendly learning concepts to music, the instructor taught a series of short tonal and rhythmic patterns, graduating in difficulty. These patterns were combined to form longer phrases of melody or rhythm. The short patterns were extracted from a selection of repertoire being sung by the choir. They were pre-taught during the music literacy component of the warm-up sequence at the beginning of rehearsal. Once the students had learned the patterns aurally and stored them in long-term memory, the patterns were quickly recognized when they appeared in the music, often aurally first. The repertoire became much easier for the children to comprehend. Thus, the choir quickly and efficiently learned the music and performed it with ease and aesthetic awareness. These patterns, stored in long-term memory, allow the working memory to access them later and apply them to other repertoire. This application of knowledge is called transfer and is a necessary part of the teaching and learning process.

## LITERACY

### LANGUAGE

Children learn to speak by:

- Imitating others’ speech (such as primary caregivers)
- Observing the new vocabulary used in the conversation
- Practicing the pronunciation of the new words
- Creating a basic vocabulary bank known as the **mental lexicon**

**MENTAL LEXICON:** the set of words that a person uses regularly or recognizes when used by others. Psycholinguistics has proposed various models for such a lexicon, in which words are mentally organized with respect to such features as meaning, lexical category (e.g., noun, verb), frequency, length, and sound. Also called **lexical memory**.

### LEARNING TO READ

- Pictorial – the child’s brain photographs words and visually adjusts to the shape of the alphabet’s letters
- Phonological – the child begins to decode the letters (graphemes) into sounds (phonemes)
- Orthographic – the child recognizes words quickly and accurately

### LETTERS WITH SOUNDS

The letter (grapheme) the child sees must correspond to what the child hears (phoneme).

**GRAPHEME:** a symbol used in the writing system of a particular language

**PHONEME:** a speech sound that plays a meaningful role in a particular language, already stored in the **lexical memory**

### THREE NEURAL NETWORKS

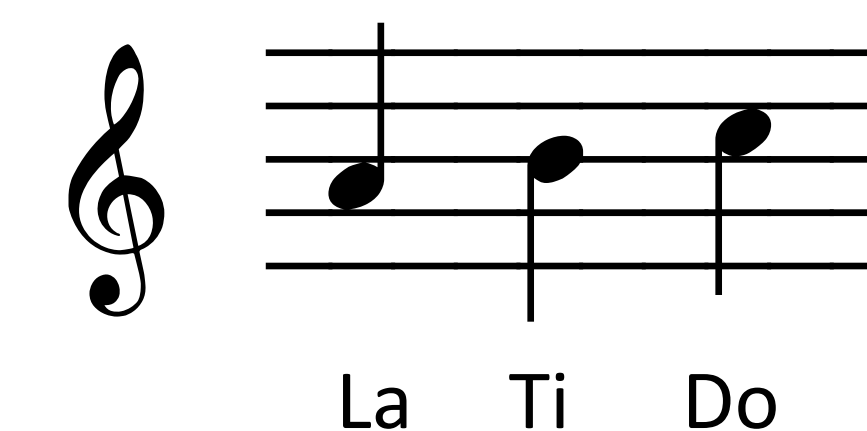
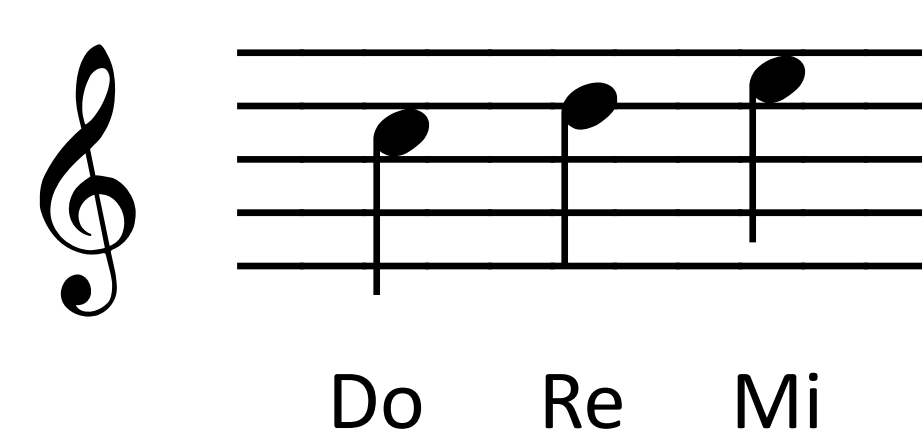
- Orthography (visual processing)
- Phonology (phoneme recognition)
- Semantics (word interpretation)

## MELODIC PATTERNS

### PITCH SOLFEGE

DI RI FI SI LI  
DO RE MI FA SOL LA TI DO  
RA ME SE LE TE

### EXAMPLES



Patterns selected from *Cantate Canon* by Donald Moore.

## RHYTHMIC PATTERNS

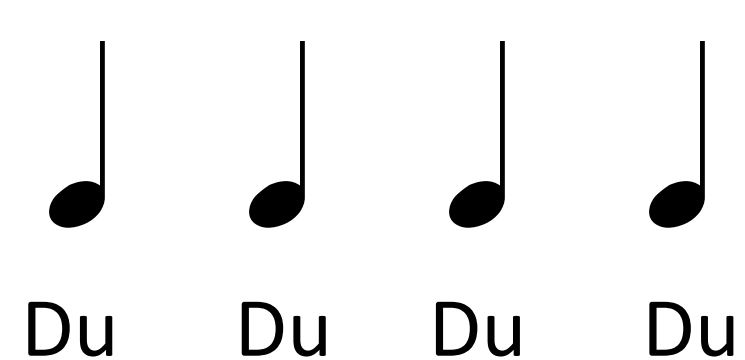
### EDWIN GORDON

#### GRAPHEME

#### PHONEME



### EXAMPLES



Patterns selected from *Cantate Canon* by Donald Moore.

## MUSIC

### SKILL LEARNING SEQUENCE

**DISCRIMINATION LEARNING** is rote learning. This is where students do not fully understand the content they are learning, but are aware that they are learning.

- Aural/Oral
- Verbal Association
- Partial Synthesis
- Symbolic Association
- Composite Synthesis

**INFERENCE LEARNING** is not rote learning, but rather when students fully comprehend the content being taught and make their own discoveries and inferences about the content.

- Generalization
- Creativity/Improvisation
- Theoretical Understanding

### EDWIN GORDON

**MUSIC LEARNING THEORY** is an explanation of how we learn when we learn music. Based on an extensive body of research and practical field testing by Edwin E. Gordon and others, Music Learning Theory focuses attention on *audiation*, Gordon’s term for hearing music without it being physically present and the *skill learning sequence*, the process of learning musical skills.

Grapheme = Symbolic Association

### SOLFEGE

**SOLFEGE** is the application of specific syllables to a musical scale, melody or rhythm.

Phoneme = Verbal Association

### THREE NEURAL NETWORKS

- Orthography (visual processing)
- Phonology (phoneme recognition)
- Semantics (musical comprehension)

### LEARNING TO READ MUSIC

- Pictorial – the child’s brain photographs rhythmic/melodic patterns and visually adjusts to the shape of the music notes
- Phonological – the child begins to decode the notes (graphemes) into pitches/durations (phonemes)
- Orthographic – the child recognizes the melody/rhythm quickly and accurately

## REFERENCES

APA *Dictionary of Psychology*. American Psychological Association, 2018, <https://dictionary.apa.org>. Accessed 27 January 2019.

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*The Gordon Institute for Music Learning*. The Gordon Institute of Music Learning, 2019, <https://giml.org>. Accessed 3 January 2019.

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