DECONSTRUCTING THE CONSTRUCTS: SPEECH, LANGUAGE, AND MUSIC

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BACKGROUND

- Human activities
- Pitch, rhythm, duration, timbre, dynamics, tempo, and form
- Express ideas, convey emotions, and/or arouse feelings
- Disorders
  - Speech impairment: Articulation errors (inaccurate speech sounds)
  - Language impairment: Aphasia (loss of language ability)
  - Musical impairment: Amusia (loss of musical ability)
RELEVANCE

- Speech, language, and music exist as different constructs
  - Features and functions in modern society characterize each
- Yet, overlap could lead to simultaneous and natural improvement in another
  - e.g., singing activities in general music enhancing phonological awareness (Degé & Schwarzer, 2011)
- Disabilities could negatively impact a student’s development in multiple areas (Baker & McLeod, 2011; Call, 1980) and participation in music classrooms
- Music teachers should seek to help students improve in all three areas (music, speech, language) when possible
- Understanding can promote natural and concurrent growth across domains
AIMS

The purposes of this presentation are to:

- discuss the distinct features of and similarities between the constructs of speech, language, and music; and

- provide suggestions to allow music teaching praxis to naturally support simultaneous growth and development in each domain.
MUSIC IS A UNIVERSAL LANGUAGE

YES? NO? UNSURE?
WHY OR WHY NOT?
“UNIVERSAL”

BI-LINGUAL
BI-MUSICAL
Firstly it would be foolish to claim that music is simply another natural language. There are many fundamental differences which cannot be overlooked, the most obvious being that we use language to make assertions or ask questions about the real world and the objects and relationships in it. If music has any subject matter at all, then it is certainly not the same as that of normal language.

Sloboda, 1985, p. 12
MUSIC IS A UNIVERSAL HUMAN EXPERIENCE

Although every person does not speak the same language or derive the same meaning from the same musics, music in some form exists throughout the world as a human experience.
MUSIC IS A HUMAN KNOWLEDGE SYSTEM

DECONSTRUCTING THE CONSTRUCTS
Definition: “The communication or expression of thoughts in spoken words, that is, in oral, verbal communication” (Bauman-Wängler, 2012, p. 419)

Features: Time, frequency, timbre, intensity

Function: To create sounds orally

Relationship to Language: Speech helps express language, but can be produced without an understanding of the language (e.g., autism)

Relationship to Music: Speech and music share features (e.g., time/rhythm, frequency/pitch, timbre, intensity/dynamics); and both can be produced (re-produced) without understanding
**LANGUAGE**

**Definition:** “A complex and dynamic system of *conventional symbols* that is used in various modes for thought and communication” (Bauman-Wängler, 2012, p. 414, emphasis added)

**Features:** Phonemic Awareness, Phonological Awareness, Semantics (meaning), Syntax (grammar), Fluency, Orthographic awareness (speech coding into symbols)

**Function:** Thought and communication

**Relationship to Speech:** Language can be used without oral or aural elements (i.e., sign or written language), but oral/aural elements can be used to express or receive language

**Relationship to Music:** Language is not dependent on aural features, whereas music seldom exists without a basis in and experience of aural elements, which are akin to those found in language (Phonological (contour/phrase) phonemic (individual sounds or articulation); semantics (patterns); syntactic (form-repetition/contrast); fluency (delivery) orthographic (notational understanding, i.e. scale) elements
MUSIC

**Definition:** Sound organized over time. Sounds arranged “in time so as to produce a continuous, unified, and evocative composition” (Farlex, Inc., 2016). Our brains organize the aural attributes (Levitin, 2006, p. 14), by which sounds (vibrations) are interpreted as music.

**Features:** Global Elements (timbre, time, pitch, dynamics); Form (repetition, contrast); Sections; Contours; Phrases; Patterns (motifs/words); Discrete utterances (Individual sounds, rhythm values/pitches); Articulation

**Function:** To express, experience, and/or understand thoughts or meaning from organized sounds

**Relationship to Speech:** Music and speech share features (e.g., time/rhythm, frequency/pitch, timbre, intensity/dynamics); and both can be produced (re-produced) without understanding.

**Relationship to Language:** Music seldom exists without a basis in and experience of aural elements, which are akin to those found in language (Phonological (contour/phrase) phonemic (individual sounds or articulation); semantics (patterns); syntactic (form-repetition/contrast); fluency (delivery) orthographic (notational understanding, i.e., scale) elements, whereas language is not dependent on aural features
Speech

Oral creation of linguistic code

Agreed upon coded meaning

Express (share) & receive (know) inner & outer world

Time, frequency, timbre, intensity

Sounds organized over time

Music

Language

Thought and purposeful communication

Phonologic, semantic, orthographic, syntactic, fluency, elements

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NEUROLOGICAL PERSPECTIVES: DEVELOPMENT

• **Auditory Cortex**
  • Develops in utero and fetuses can respond to musical and speech sounds (Bauman- Wängler, 2012; Hodges & Sebald, 2011)

• **Recalling Sounds**
  • Fetuses can register musical and speech sounds that will affect behavior after birth (Bauman- Wängler, 2012; Hodges & Sebald, 2011)

• **Neural Pruning – Discriminating Sounds**
  • The infant brain has more synaptic connections in the auditory cortex than it will as an adult
  • Synaptic connections for music processing may disappear altogether if the sounds associated with those neural pathways are never heard again (Hodges & Sebald, 2011)
  • Infants up to 8 months discriminate between two similar nonnative phonemes
    • By 10-12 months, the ability disappears (Bauman-Wängler, 2012)
NEUROLOGICAL PERSPECTIVES: NEURAL NETWORKS

• Shared and distinctive neural networks (Brown, Martinez, & Parsons, 2006)
  • Some of the same areas in the auditory and motor cortices;
  • Distinct, domain-specific areas to process syntactic elements
• Children with deficits processing linguistic syntax also had deficits processing musical syntax (Jentschke, Koelsch, Sallat, & Friederici, 2008)
• Music casts a wide neural net, recruiting areas of the brain for different musical tasks (Alluri et al., 2012)
NEUROLOGICAL PERSPECTIVES: COLLATERAL BENEFITS

• Neural plasticity (Hodges & Sebald, 2011)
• Neural recruitment (Alluri et al., 2012)
  • aphasia (Gfellar, 2012; Polovoy, 2014)
  • autism (Lim, 2012)
• Musical training and participation
  • lexical stress (Kolinsky, Cuvelier, Goetry, Peretz, & Morais, 2009)
  • speech perception (Moreno et al., 2009)
    • speech-in-noise perception (Slater, Skoe, Strait, O’Connell, Thompson, & Kraus, 2015)
  • word learning (Cooper & Wang, 2012)
  • second language acquisition (Yang, Ma, Gong, Hu, & Yao, 2014)
  • phonological awareness (Degé & Schwarzer, 2011; Moritz, Yampolsky, Papadelis, Thomson, & Wolf, 2013)
  • muscle tension dysphonia (Goffi-Fynn & Carroll, 2013)
  • speech sounds (El Mogharbel et al., 2006)
CONSIDER OUR PROFESSIONAL CONSTRUCTS AND APPROACHES:

1) Focused toward Speech (specifics of performance such as articulation/diction);
2) Focused toward Language (patterns of meaning such as the style/genre/emotion);
3) Focused on Music (basic elements of music).

If MUSIC is our goal, we must always look for the “universal” elements and then extend from those first –

Global music elements: Timbre, Time, Pitch, Dynamics
### Ways to Use Music to Improve Speech and Language-Related Processes

#### Speech
- Animal, environmental, or nonsense sounds
- Student name
- Rhythm

#### Language
- Continuation (fill in the blank)
- Songs/Singing
- Pictures (and picturable) words with students

#### Both
- As a reward
- Movement (gesture)
- Student interest
- Games
- Instruments

(Culp & Roberts, 2015)
CONCLUSIONS

• Similarities among the constructs can create blurred lines that can serve for arguments that posit the three constructs are one and the same (e.g., music is language).

• However, differences in the function, organization, expression, and reception of each help define three unique human constructs.

• Growth in each domain can be realized concurrently through well-planned activities that capitalize on similarities and differences among the constructs.
THANK YOU FOR COMING
QUESTIONS
REFERENCES

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WORKS CONSULTED

