MUSIC AS A STIMULUS TO STUDY SPEECH

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Summary: Language is traditionally considered as the basis of human intelligence. Music, although accepted as a human universal, is often thought of as an additional ability dependent on or derived from language. On the contrary, we argue that it is more productive from a developmental point of view to describe spoken language as a specific type of music. We condemn the prevailing view that musical knowledge develops more slowly than language and is more complex; instead, we argue that learning music matches the speed and effort of learning a language. We conclude that music deserves a central place in our understanding of human development.

Key words: music, language, language acquisition, musical development, musical cognition, definition of music, emerging modularity. By adulthood, we all have well developed ideas about music based on our culture and individual taste. However, despite the fact that we all feel we know what music is, it has proven to be very difficult to define. Cross and Morley cite two dictionary definitions of music: "the art of combining the sounds of a voice or instrument to achieve beauty of form and expression of emotion" and "the art or science of organizing sounds into notes and rhythms to give a desired pattern or effect." They further state, "To modern musicologists, these definitions are seriously unsatisfactory." After examining other definitions, they come to the conclusion: "All these ideas about music turn out to be ideological constructions, rooted in the work of wider socio-economic and political forces that are changing" [2].

A language is usually defined as a symbolic means of communication, with a lexicon of meanings and a syntax for organizing its sentences. We don't just speak to be heard, we speak to be understood: to confess our love, order food and ask for directions. But while speech is symbolic, sound is the carrier of its message.

Depending on how a person listens, the same stimuli can be perceived as language or music. When someone listens to the same looped recording of speech repeatedly, it can start to sound like singing [8]: as attention to meaning saturates, the melodic features of prosodic intonation come to the fore. Conversely, sinusoidal speech, which tracks the formant frequencies of a spoken utterance without the other acoustic attributes of natural speech, sounds like a whistle to naive listeners. However, when the subjects are tuned to listen to the speech, the clips become distinctly legible [9].

As adults, we process “canonical” speech and music differently: for example, speech and music show opposite patterns of hemispheric dominance, with speech processing more dependent on the left hemisphere, and music more on the right [10]. However, the neural regions underlying speech and music perception show significant overlap even in adults, with both types of stimuli involving a bilateral frontotemporal network [11]. In addition, some differences should be expected between the areas that respond to speech and singing in adults: as we develop, our brain becomes much more specialized in many areas [18]. Although there are few studies comparing neural responses to speech and music in infants, there is evidence that neonates have a largely overlapping activation of infant-directed speech and instrumental music [14], suggesting differences in processing in the adult brain may have manifested. gradually in the course of development.

It has been suggested that speech and music may have inherent differences in low-level auditory characteristics that require different types of auditory processing: for example, some have suggested that speech involves very rapidly changing temporal characteristics, while music consists mainly of changing pitch characteristics. tones. over a longer period of time [19]. However, speech and music are closely related in this respect. No musical instrument starts with a stable frequency: there is always noise caused by the initial impulse that sets the sound in motion. This burst of noise is crucial for the perception of timbre [1]. As a result, the processing of both speech and musical timbre requires the same temporal sharpness [20]. The perception of musical timbres and phonemes depends on fast temporal processing.

Thus, both music and speech require sonic resolution on the same time scales. From a musical point of view, speech is a concert of phonemes and syllables melodically altered by prosody.

The congruence between speech and music at the level of atomic perception has become more apparent with the advent of recorded media and electronic acoustic analysis. Luciano Berio's song cycle "Circles" uses an extensive battery of percussion, which he uses to imitate the various consonants in the text. The effect is that the text resonates with the percussion, which supports and enhances the timbre of the words.

To function in a community, everyone must master basic speech. It must be understood, even if it is done quickly, and it must be able to perform even in moments of stress. All these factors contribute to the creation of this unique form of vocal performance [2].

But there is another important feature of the language: children must learn it. Many linguists and anthropologists emphasize that language as a symbolic system

of expression is limited by the ability of children to learn. Deacon writes: “The structure of language is under strong selection pressure because, when reproduced from generation to generation, it must pass through a bottleneck: children's consciousness” [3].

Language is a compromise between what adults have to say and children's ability to process and act on what they hear. What babies hear, as defined broadly above, is a form of music. We argue that language has a privileged status in the newborn brain that allows not only the acquisition of musical conventions, but also allows language to be learned. Without the ability to hear music, we would not be able to learn a language. Infants are known to be able to distinguish between the phonemes of all languages [5], an ability indicative of sensitivity to timbre. Although the ability of newborns to distinguish between different instrumental timbres has not yet been tested, infants are able to use timbre to separate sound sequences into separate perceptual streams [15]. If phonemic contrasts and instrumental timbre contrasts are based on overlapping perceptual mechanisms in infants, one would expect the same premature ability to distinguish between instrumental timbres in newborns.

In addition to timbre, newborns are sensitive to the rhythmic components of language and can distinguish languages based on their rhythmic characteristics [21] infants use the musical aspects of language (rhythm, timbre contrast, melodic contour) as a basis for further development of the semantic and syntactic aspects of language. Babies don't just listen for affective cues and focus solely on meaning: they listen for how their speech is composed.

Infants learn the musical information of speech when they are spoken to and sung to directly, as well as by "eavesdropping" on another language and music. Although all speech has musical aspects, speech addressed to infants is usually characterized by an even greater degree of musicality. This infant directed speech, or maternal language, is relatively high-pitched, slow and rhythmic, with a greater pitch range and more exaggerated melodic contours than typical adult directed speech [21]. Directed speech and singing in children aids in language learning by attracting and engaging attention and conveying affective information [21] and then reinforcing important speech patterns [13].

Of course, directed speech to children can serve all these purposes, and its role in language acquisition may change during development: first playing the role of attention and affectivity, and then directing attention to linguistically significant information [22]. The child's first direct exposure to verbal communication often has a heightened prosody when the music and the meaning of the speech are linked together.

Analyzing the results obtained, scientists put forward the following assumptions regarding music in speech:

- music and language can be cognitively and neurally different in adults, we assume that language is just a subset of music from a child's point of view[9];Music includes precise auditory processing, emotional engagement, repetition, and high attentional demands for speech development. Music in children can improve pre-linguistic communicative development.Language is initially transmitted to children through speech, musical cognition can play an important adaptive function, allowing children's linguistic skills to develop more quickly. Arguments in favor of innate language abilities often appeal to the problem of "poverty of incentives" [6]: the language is too complex for children to learn it based only on positive data. Along with facial expressions and gestures, the musical features of language can help overcome the "poverty of stimuli" and provide a richer context for language induction. From a developmental point of view, the sequence is clear: first we play with sounds; then we play with meanings and syntax[16]. It is our innate musical intelligence that makes us capable of mastering speech. Music as an art form can develop out of this initial confusion: it can allow us to continue to explore and use features of musical knowledge that language does not prioritize[18].

In summary: our research shows that teaching vocabulary and grammar through songs can be beneficial in elementary school. All over the world, babies are taught language through speech. Both music and speech involve "creative play with sound". Music is a universal language because, for developing people, it is at the heart of how we acquire language: it directs our attention and enhances the characteristics of speech. Considering the general positive influence of music and singing on the development of speech through songs on students should be studied further.

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