The Effect of Visually Presented Lyrics on Song Recall

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When learning a song aurally, verbal information (i.e., text) and musical information (e.g., pitch and rhythm) are perceived through the aural channel. If a song is difficult and has much verbal and/or musical information, only using the aural channel might hinder one's ability to learn the song. When incoming information exceeds the learner's working memory capacity to process information, learners will experience cognitive overload. However, since humans have separate and partly independent processors for auditory and visual information, employing two sensory modalities – auditory and visual - rather than one could reduce cognitive overload (Mayer & Moreno, 1998; Mousavi, Low, & Sweller, 1995). While learning a song, if the lyrics are visually presented it is assumed that the aural channel load might be reduced because the verbal information would be processed in two channels. This reduction of cognitive load imposed on the aural channel might provide more capacity to process musical information, leading to better recall of the learned song. Another consideration is a working memory model. According to Baddeley's (1992) model, musical and verbal information is processed in the phonological working memory. If someone demonstrates high phonological working memory capacity, presentation/absence of visually presented lyrics might not matter, because s/he has enough capacity to process information without experiencing cognitive overload in the aural channel. Hence, the level of phonological working memory was utilized as a covariate to control for individual differences. In addition, individual's perceived task difficulty and preferred learning modality might play a role. Therefore, the purpose of this study was to investigate the effect of visually presented lyrics on song recall. Specifically,

1. After controlling for phonological working memory, does the recall accuracy of the learned songs differ between groups who learn songs with or without visually presented lyrics?
2. Do learning style and perceived task difficulty interact with the instructional condition?

In this quasi-experimental posttest only study, members of auditioned choirs at a Mid-Atlantic University were invited to participate. Originally, the college degree major of participants was not considered as a variable in this study because I had invited members of the auditioned choirs excluding the most select choir that is mostly comprised of music majors. However, due to difficulty to getting enough sample size, I expanded the participants' pool including the most select choir, which led to have 12 music majors out of 26 participants in total (female 16, average choral experience 9.73 semesters (SD 5.127, ranged from 1 to 20 semesters)). Hence, the major variable (music major vs. non-music major) was added in the additional analysis. The study volunteers were randomly assigned to one of two groups. While aurally learning an unfamiliar song, one group saw the lyrics and another group did not. After one individual instructional session, each participant sang the learned song from memory and their singing was recorded. Additionally, participants took a phonological working memory test, a perceived task difficulty report, and a learning style inventory. The recall accuracy of their singing was rated by two experienced music teachers in terms of lyrics, pitches, and rhythm.

Regarding research question 1 and 2, there were no group difference for the song recall accuracy and no interaction between group, task difficulty and learning style after adjusting phonological working memory. However, in the additional 2 way (Group x Major) MANCOVA analysis, a main effect for major and interaction between group and major were revealed controlling for phonological working memory. When participants did not see the lyrics, music majors recalled pitches and rhythm better than non-music majors. Non-music majors better recalled pitches and rhythm better when they saw the lyrics than when not. Seeing lyrics while learning a song seems helpful for non-music majors in recalling pitches and rhythm, but not helpful for music majors. For music majors, seeing lyrics might be redundant, which is congruent with the expertise reversal effect (Kalyuga, 2014). They may process verbal and musical information in a more integrated way than non-music majors (Ginsborg & Sloboda, 2007).

Applications to Teaching

- Instructors need to consider learners' limited cognitive capacity. Presenting too much information at a time hinders learning. Use some strategies (e.g., signal, segment) to reduce learner's cognitive load while presenting instructional materials.

- Since human has two separate and partly independent processing systems for visual and aural information, when presenting multiple information, consider presenting one information visually and the other information aurally.

- While aurally teaching a difficult song, showing lyrics can be helpful for the learners in learning pitches and rhythm of the song, if they are not music majors.

- While teaching a song, consider individual difference in learner's aural capacity.

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