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Effects of Manipulating Attention during Listening on Undergraduate Music Majors' Error Detection in Homophonic and Polyphonic Excerpts: A Pilot Study

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ABSTRACT

Background

Musical textures, specifically homophony and polyphony, could be described as the extent of synchrony among musical events. Said another way, homophony could be described as being dominated by vertical simultaneity or "synchrony of notes across frequency regions" (Crawley, Acker-Mills, Pastore, & Weil, 2002, p. 367), with polyphony characterized by musical moments occurring in horizontal asynchrony, a texture which Sloboda (1985) suggests is capable of 'figure-ground reversal' and possibly necessitating differing attentional strategies while listening.

Aims

The synchrony of homophony likely enables—perhaps necessitates—wholistic attending, where one monitors and assesses all voices simultaneously as a result of synchrony. The melodic and rhythmic independence of polyphony and the asynchronous onset of musical material may force the listener to select the particular musical material they intend to focus on. Are these listening strategies (wholistic and selective attending) influential in the detection of musical performance errors? How, if at all, do variables of musical context interact with these strategies? Therefore, the purpose of this pilot study was to investigate the effects of wholistic versus selective listening strategies on music majors' detection of performance errors in homophonic and polyphonic music.

Method

Upper level undergraduate instrumental music majors (juniors and seniors, N = 14) listened to six, three-voice homophonic and polyphonic instrumental music excerpts and detected inserted pitch and rhythm errors. Two pitch and two rhythm errors were distributed equally in each voice across the six excerpts, resulting in a total of 24 errors.

Prior to error detection, all participants were familiarized with the excerpts by first hearing a full, correct performance of the excerpt followed by hearing each individual voice (from top to bottom) played in isolation before hearing an additional full, correct performance of the excerpt. This familiarization process presented the excerpts wholistically (full performance) and selectively (individual lines). Though all participants were familiarized with the excerpts in the same way, they were instructed to listen differently. The wholistic group (n = 7) were told they would detect more errors by attempting to listen to all voices at once rather than listening to individual lines, while the selective group (n = 7) were instructed listen to individual lines rather than trying to listen to all voices at the same time.

Participants heard the flawed performance twice, which meant they could not focus on one voice hearing and used different colored pens (blue then red) as means of indicating the order in which errors were detected. Participants circled the beat(s) in the specific instrumental part (top, middle, or bottom voice) where the error occurred and indicated the error type by writing "P" for a pitch error and "R" for a rhythm error next to the circled error. To account for the three parts of a circled response (beat, part, and error type), each error was worth three points. With four errors in each of the six excerpts, there were 72 possible points in this task.

Results

To determine the effects of treatment group, texture, error location, and error type on participants' detection of performance errors, a four-way factorial analysis of variance (ANOVA) with repeated measures was conducted in which texture (polyphonic/homophonic), error location (top, middle, and bottom), and error type (rhythm/pitch) functioned as within-subjects factors and treatment group functioned as the between-subjects factor. Results indicate no differences (p > .05) in participants' error detection scores as a result of treatment (wholistic versus selective). Treatment was also not involved in any significant interactions. Though texture, error type, and error location had no significant main effect on error detection (p > .05), these three contextual variables were involved in a significant, three-way interaction, F (2, 24) = 5.06, p = .02, partial η^2 = .20, indicating a lack of independence among these variables. Participant mean detection of rhythm errors located in the middle voice in both homophonic (M = 1.36, SD =1.5) and polyphonic (M = 1.5, SD = 2.07) was far lower than all other means (out of 6 points), while participants' mean detection of pitch errors in the middle voice of the homophonic excerpts was higher than their detection of errors in the top and bottom voices. Pitch error detection in the polyphonic excerpts was far more consistent across the three voices in polyphonic excerpts (top: M = 3.29, SD = 1.86; middle: M = 2.64, SD = 2.10; bottom: M = 2.71, SD = 2.16).

Conclusions

The results are extremely preliminary due to the small N and the lack of significant main effects due to texture and treatment group. The treatment seemed to have had little to no effect, though there is an obvious inability to know how and if participants listened to the music as instructed. Even if participants attempted to listen as instructed, perhaps the treatment was not strong enough to result in any behavioral differences.

These preliminary results do illustrate the influence of musical context on error detection and perhaps a unique familiarization process for each treatment group is necessary

to flesh out the relationship, if one exists, between listening/attending strategy and texture.

Keywords

Perception, education, attention, rehearsal

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