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Usability News is a free web newsletter that is produced by the Software Usability Research Laboratory (SURL) at Wichita State University. The SURL team specializes in software/website user interface design, usability testing, and research in human-computer interaction.
[Barbara S. Chaparro](#), Editor

Does Background Music Impact Computer Task Performance?

By [Christine Phillips](#)

Summary: The effects of music on performance on a computer-mediated problem-solving task were examined. Participants completed the task in anonymous dyads as they were exposed to either Classical music, Punk music, or No Music. Results indicate that those in the Classical music condition performed better on the problem solving-task than those in the Punk music or No Music conditions. However, those listening to the Classical music offered more off-task comments during the task than those listening to No Music. Implications for website designers are discussed.

As more customers begin to access the Internet with high-speed connections, website designers take advantage of this speed by using more sophisticated multimedia with music audio files to hopefully attract a greater number of users to their sites. Yet, little research has been done to determine whether the use of music actually improves user perception and/or performance on the Web.

Many studies have looked at non-computer task completion while listening to background music in a real-world setting. According to a study completed by Hallman, Price, and Katsarou (2002), calming music led to better participant performance on an arithmetic task and a memory task than no music. It was also found that background music on cognitive test performance led to improved performance when compared with a control condition (Cockerton, Moore, & Norman, 1997).

Arkes, Rettig & Scougale (1986) found that as a task increased in complexity, listeners preferred music that was simple. The Mozart Effect (Rauscher, Shaw, & Ky, 1993) is a well-known phenomenon that showed that participants who listened to Mozart performed better on spatial tasks. Nantias and Shellenberg (1999) replicated this study and found participants performed better on spatial tasks than those listening to nothing or easy listening music. However, another study involving computer-generated music found that it was the pairing of music that was preferred over the other selections and the task, and not specifically Mozart. This finding strengthens the argument that a pairing of a positive stimulus (music that is preferred by the listener) with a less engaging stimulus may increase performance (Nantias & Shellenberg, 1999).

This study investigated the influence of two different music genres on performance on a computer-mediated task. Half of the participants were given a time limit per task (10 minutes), and half were in an untimed condition. It was hypothesized that communication of participants would be more task-oriented when the music was perceived as conducive to the task and that those in the timed

condition would report more feelings of frustration on tasks and websites than those in the untimed condition.

METHOD

Participants

Seventy-two undergraduate and graduate students enrolled in undergraduate psychology courses and graduate methodology courses at Wichita State University participated in this study. Average age of the participants was 23.82. Participants were assigned to either a Classical, Punk, or No Music group based on their familiarity with the music type. Assignments were made so that all groups were balanced according to familiarity. In addition, participants were randomly assigned to either a timed or untimed condition.

Materials

A communication program was developed which allowed users to communicate with one other participant anonymously. Participants were given the task to assume they had been stranded on the moon and had to rank a list of 15 items in terms of importance to their survival with 1 being the most important and 15 being the least important. Scores were then compared to a recommended solution (Hall and Watson, 1970).

The computer program also randomized a music playlist for each participant. Each participant received a completely randomized version of the playlist. Participants listened to the background music through headphones.

Procedure

The experiment was conducted in a 16-computer classroom. Each participant communicated anonymously with one other participant in the room to complete the task. Participants communicated with each other until they came to agreement on the ranking of the 15 items, or until they ran out of time. All pairs of participants listened to the same type of music.

RESULTS

A 2 X 3 between-subjects ANOVA was computed to examine the effect of time and music type on the ranking of the 15-items. The difference between the participants ranking for each item and the NASA ranking for each item was totaled for a final score. The lower the score, the more accurate the ranking (i.e., the closer it was to the NASA solution). Figure 1 shows that those listening to classical music had a better score than those in the punk music and no music conditions. There was no significant effect of time or interaction.

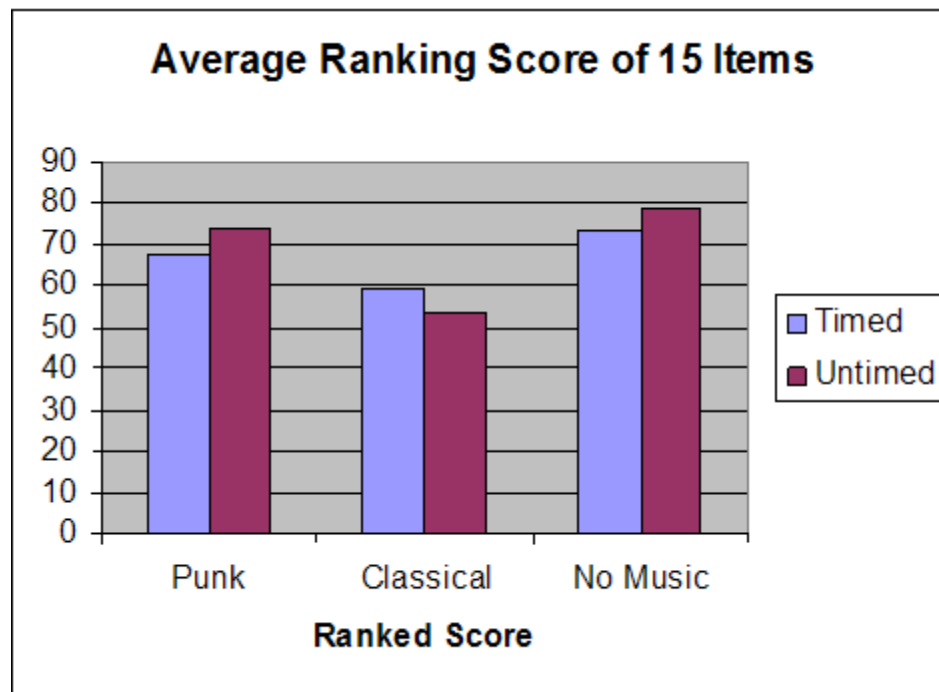


Figure 1. Performance Scores on the Moon Task Across Conditions (the lower the score the more accurate)

Communication Content

A content analysis was completed to identify all comments not relating directly to the problem-solving task. Those scores were then analyzed using a 2 x 3 between-subjects ANOVA with time and music type. There was a significant main effect of music type. Post hoc tests show the significant difference in the no music condition having significantly fewer off-task comments than those in the other conditions (Figure 2). There was no significant main effect of time or interaction.

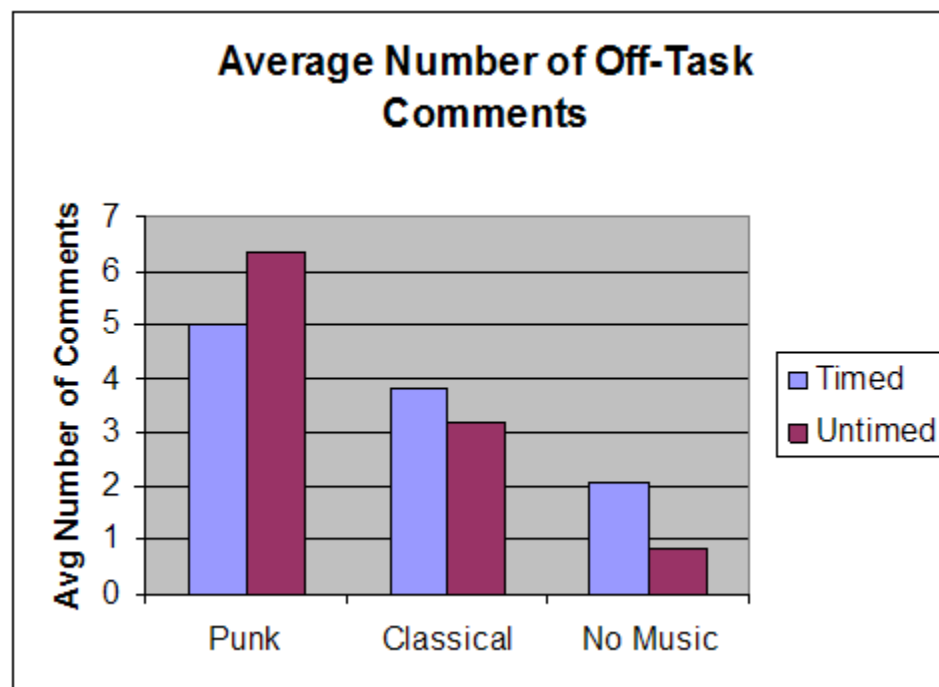


Figure 2. Number of Off-Task Comments Across Conditions

DISCUSSION

Results from this study showed that those in the classical music condition performed better on the problem-solving task than those in the Punk music or No Music conditions, regardless of time constraints. Interestingly, participants in the Classical music condition performed better despite the fact that they contributed more off-task comments to one another than the No Music condition and about the same number of off-task comments as the Punk music group. Most of the off-task comments were personal in nature (i.e., emoticons, jokes). These results are supportive of research by Jensen (2001), which states that participants listening to classical music are more likely to disclose personal information than those listening to no music.

Those in the classical music condition appeared to be more involved in the task, leading to better scores on the problem-solving task and an increase in the use of hyper-personal communication. It is possible that classical music helped the participants relax creating an opportunity for them to not only succeed at the problem-solving task, but also have a more interactive communication experience. Future studies should examine the effects of different types of Classical music on computer-mediated tasks as well as other types of computer-based tasks, such as Web browsing and playing online games.

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