

Dual task experiment proposal



Hana Yoo LAPD Final Project Proposal Project proposal: Measuring the effectiveness of dual auditory tasks (simultaneous) against a single auditory task

Introduction

Performing dual or multiple tasks at once is difficult for people due to limitations of the human cognitive process (Mei-Ching, 2006). However sometimes people have to handle critical multiple tasks simultaneously. As an example an air traffic controller who is getting two messages simultaneously from two aircrafts may need to make a critical decision. On the other hand equipments providing multiple tasks have been produced to enhance the quality of life. Multi-channel imaging systems are designed to provide two or more programs on the same screen to fulfill the requirement of multiple viewers (freshpatents. com, 2007). Therefore determination of the effectiveness of dual or multiple tasks over single task is very important in many areas. It is interested to know whether someone can perform multiple and single auditory tasks with similar effectiveness. The objective of this study is to measure the effectiveness of dual auditory tasks against single auditory task. The hypothesis is effectiveness of a single auditory task is significantly higher than that of the dual auditory tasks.

It is expected to find out the human ability to correctly understand and interpret two verbal messages when heard simultaneously compared to separate events. In general these findings will be helpful to understand the divided attention in auditory tasks and thereby minimize human errors in critical situations.

Methods

Research design: Randomized controlled trial

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Equipment: This experiment requires two iPod players, one with a 3-minute news broadcast containing 5 news items and one with a 3-minute meaningful song consisted of 4 stanzas, which had not been heard by the subjects before (both in English).

Subjects are 60 undergraduates 30 males and 30 females between the ages 18 to 25, randomly selected from Johns Hopkins undergraduate students.

Persons having any type of hearing loss or mental illness or who cannot understand the English language are excluded. Fifteen males and 15 females are selected randomly from the total sample for the controlled group and the rest is considered as the experimental group. All the participants are given a reference number.

Procedure: This experiment is performed in a classroom with a quiet environment. Firstly, the controls are advised to seat in the class room and a question paper is given to list out news items and the meaning of the each stanza in the song. Then the song is played for 3 minutes and at the end 5 minutes time is allocated to write the meaning of the stanzas. Then the news broadcast is played and another 5 minutes time is provided to list out the news items.

The same procedure is followed for the experimental group but the both song and news broadcast are played simultaneously. Participants are advised to answer the question paper after simultaneous auditory test and 10-minute is allocated.

The audios are played from the middle of the classroom. It is assumed that all the participants clearly hear the both audios and overlapping of sound wave does not occur and all the participants hear audios at same intensity.

Marking the answers: Each correctly listed news item is given 10 marks and

answers that are incomplete and partially correct are given 5 marks. Any other types of answers or missing answers are given zero marks. Similarly correctly mentioned meaning of a stanza will be given 10 marks while incomplete or partially correct meaning is given 5 marks. Marks are totaled for each individual.

Statistical analysis: Data is entered in to a MS Excel Spreadsheet and Mean and the Standard deviation of the scores of two groups are calculated. The means of the scores of control group and experimental group are compared using two tailed Student's T- Test for independent samples at 0. 05 significant levels. Mean scores of males and females in each group are also compared.

Results: General characteristics of the sample are tabled and graphs are used to show the results of mean comparisons.

Discussion: In the discussion, how do the results prove or reject the hypothesis is discussed and the conclusion is drawn. Contradictory or supportive results of similar studies which were conducted earlier are discussed. Strong and weak points of this study such as physical barriers and suggestions to minimize those errors in future studies are also discussed.

References

A multi-channel imaging system freshpatents. com retrieved from <http://www.freshpatents.com/Multi-channel-imaging-system>

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Mei-Ching, L., Eric, R., James, C. J. (2006). Attentional Limitations in Doing Two Tasks at Once: The Search for Exceptions (abstract). Blackwell

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Instructions

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For controls: You have to report to the classroom 1 at 10. 00 am. You will be provided with two answer sheets. Indicate your reference number in both answer sheets and be seated throughout the trial. A song with four verses/stanzas will be played (for about 3 minutes). Listen to it carefully and at the end you have to write down the meanings of the each verse of the song in the answer sheet one. You will be given 5 minutes for the above purpose. Then 3-minutes news broadcast will be played. You have to listen to it carefully and at the end list down the news items you will hear, in the answer sheet two. Handover your answer sheets to the instructor and leave the class room. Do not talk with other participants during the trial and answers cannot be discussed. Please note that audios will be played only once. Bring your pen/pencil to the class room.

For experimental group: You have to report to the classroom 1 at 10. 30 am. You will be provided with an answer sheet. Indicate your reference number in the answer sheet and be seated throughout the trial. A song with four verses/stanzas and a news broadcast will be played simultaneously for about 3 minutes. You have to listen to them carefully. At the end you have to write down the meanings of each verse of the song and news items you will hear, in the answer sheet. You will be given 10 minutes to write the answers. Handover your answer sheets to the instructor and leave the class room. Do not talk with other participants during the trial and answers cannot be discussed. Please note that audios will be played only once. Bring your pen/pencil to the class room.