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A Brief Analysis of the Use of Audio Visual Stimuli in Psychophysiology, Neuroscience, and Psychology

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Abstract

It is a common practice in psychological and psycho physiological studies to create experiments and subsequent results depending on various audio-visual stimuli. Examples vary between showing subjects certain images for inducing certain behaviors such as showing an image of a spider or snake to measure the reactions of fear, whereas some studies rely on audio stimuli. The process in each and every one of these studies are rigorously and meticulously evaluated for their methodologies, the shortcomings of the study is questioned in each step. Except for one crucial component: the choice of the audio and visual materials that are utilized in the studies.

This paper examines why and how the neuroscience, psychophysiology, and psychology studies seem to overlook the importance of the social and cultural components of the audio and visual stimuli that are chosen for the studies. Often times researchers fall into their own biases to determine the audio and visual components in these studies which might inevitably effect the results of the research.

Keywords: Neuroscience, Psychophysiology, Psychology, Media Studies, Image Studies, Visual Studies

Introduction

Social sciences have long debated the involvement of the researchers bias and prejudices present in the research and tried to find ways of addressing this issue without disrupting the research process. An important player in this field that heralded change for recognizing the importance of the researcher as a person present with the subjects during the research and as the interpreter of the results, has been ethnography, and social anthropology. The researchers at first decided to not even talk with the subject and simply observe them in their natural environment (1), which led to very weird encounters and twisted results. This point of view of the observer from a high point looking down at its subjects raised a lot of criticism and finally a self reflexive technique for conducting research was developed by researchers like Georges and Jones (2).

This trend of self reflexive research seeped into other methodologies of both qualitative and quantitative studies in social sciences. Although it seems like a necessary and important part of the research process today, before the development of

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such methods used by McDougall's and others, it was viewed as flimsy and unnecessary during the earlier period. As we live in an immensely connected and multi-disciplinary world today access to research from different fields help shed light on certain areas of collaboration and mutual growth. Every researcher can now easily find articles and publications that are of interest to them. This change in the academic sphere now helps the researcher to identify the problems and shortcomings of their own methodologies and also pinpoint topics for further improvement in others. It is thus the aim of this paper to show the ways in which audio visual materials use in experiment design can be improved with a few techniques borrowed from social sciences. Looking from a perspective of media studies, the experiment designs lack rigor in the selection and creation process of the audio visual material and this may lead to problems in the conclusions of these studies.

This component should be identified differently than the social psychophysiology methods as they focus on gathering data from the subjects through various self reporting techniques to focus on attitudes, persuasions, and various social behaviors. This is different from the self reflexivity of the researchers in identifying the audio visual material for the studies.

Materials and Methods

In this paper various different studies that utilize audio and visual stimuli are analyzed for their specific conditions and identify the problems with this methodology. 3 papers are taken for this case study that are cited many times by other studies. The importance of identifying the images and audio used in the studies where highlighted.

Results

Hare et. al. (3) on spider-phobic women identifies its methodology as showing slides of fear inducing and neutral images. The fear inducing images here have spiders and the neutral ones do not. The heart rate was measured in the study and they found people with spider-phobia had an increase in heart rate, cephalic vasoconstriction, and increase in palmar skin conductance while viewing these images. This experiment design is only focused on females and this brings the question whether there was an assumption by the researchers that women in general are more spider-phobic. This assumption is tide in to the researchers social and cultural circumstance; the researchers are white males in Western cultures and this brings about certain stereotypes when they conduct the study. The inclusion of only females and the subject-mater being spider-phobia implies a certain amount of social and cultural bias towards the selection of the subjects and design of the study. The images that are chosen for the study are only selected on the basis of the spider being present or not.

The researchers did not answer the following issues that is directly related to the reactions people will give to images; the quality of the images, the size of the slides shown (which is important especially if the image was projected in a big size surrounding the subject completely, the effects would be different than when shown

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on a small computer screen for example), the choice of the images on the neutral slides (might also seem like spiders perhaps on a structural level and this might effect the results of the study), the position of the spider in the frame (as in photography was the spiders placed at the center of the frame? If so the effects would be diminished as the center is considered to be the "dead area" in visual studies(4)), the color of the spider (red color for example is known to increase heart rate compared to blue for example (5)). These are crucial questions that the study does not mention or pay attention to. This study is cited 94 times.

A similar study by Klorman, et. al. (6) created an experiment on mutilation fear with 32 subjects. The study showed 6 slides that were in three categories: neutral, incongruous, and mutilation. Again the questions of size, framing, color, and composition are not even mentioned in the study. These crucial components of the visual perception process is completely neglected by the researchers. This study is cited by 24 articles.

Globisch et. al. examines the startle reflex potential after fear inducing images are shown. As a continuation of the similar methodology slides are shown to 38 high fear and 48 low fear subjects along with acoustic startle probes (7). This study again does not mention the size, framing, color, and composition of the images. The sound bites used in the study are described as loud noises to create startle reflexes yet, the sound level, frequency, and closeness of the subject to the speakers are not mentioned. Creating a startle effect with sound is fairly easy yet for subjects that do not hear certain frequencies or are heavy music listeners might respond differently to the same sound effect. The study should have mentioned the conditions of the audio as well as the visual. This study is cited 139 times.

Discussion

Psychophysiology, neuroscience, and psychology fields rely heavily on audio and visual stimuli to create non-intrusive methods to study human behavior and physiology. The importance of the way the images are constructed might effect the results of the studies and hence it is imperative that such studies take into consideration the above mentioned key aspects of the audio-visual stimuli.

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